2019 Remedial Investigation & Interim Response Action Groundwater Monitoring Annual Report

Tennessee Valley Authority
Allen Fossil Plant
Memphis, Tennessee

Stantec

Prepared for:
Tennessee Valley Authority

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REVISION 1

September 2, 2020

SIGN-OFF SHEET

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1.0 INTRODUCTION

The Tennessee Valley Authority (TVA) developed this 2019 Remedial Investigation and Interim Response Action Groundwater Monitoring Annual Report for the East Ash Disposal Area at TVA's Allen Fossil Plant (ALF) in Memphis, Tennessee (**Figure 1**). This effort was completed in accordance with the 2019 Remedial Investigation and Interim Response Action Groundwater Monitoring Plan (GWMP), submitted to the Tennessee Department of Environment and Conservation (TDEC) on March 1, 2019, and accepted by TDEC on March 14, 2019.

The 2019 GWMP specified collecting and analyzing groundwater samples from 55 monitoring wells on a quarterly basis. The well network includes remedial investigation ALF-series wells surrounding the East Ash Disposal Area, pre-design performance monitoring wells (PMW) in the north and south impacted areas, and five Allen Combined Cycle Plant (ACC) wells that serve as background groundwater quality wells for the Alluvial aquifer, as summarized in the table below:

ALF Well Locations	Monitoring Well IDs
North Side of East Ash Disposal Area	
P-4	P-4; P-4-S
203	ALF-203; ALF-203B; ALF-203A
PMW-02	PMW-02A; PMW-02B; PMW-02C
PMW-04	PMW-04A; PMW-04B; PMW-04C
PMW-07	PMW-07A; PMW-07B; PMW-07C
204	ALF-204; ALF-204B; ALF-204A
205	ALF-205; ALF-205B; ALF-205A
206	ALF-206
East Side of East Ash Disposal Area	
213	ALF-213; ALF-213B; ALF-213A
217	ALF-217; ALF-217B; ALF-217A
South Side of East Ash Disposal Area	
212	ALF-212; ALF-212A
215	ALF-215
202	ALF-202; ALF-202B; ALF-202A
PMW-10	PMW-10A; PMW-10B; PMW-10C
PMW-11	PMW-11A; PMW-11B; PMW-11C
PMW-14	PMW-14A; PMW-14B; PMW-14C
201	ALF-201; ALF-201B; ALF-201A
214	ALF-214; ALF-214B; ALF-214A
210	ALF-210; ALF-210A
ACC Plant	ALF-216; ACC-1A; ACC-3A; ACC-5A; ACC-5B
Total No. of Wells	**55**

2.0 GROUNDWATER FLOW DIRECTION AND GRADIENTS

At the beginning of each quarterly groundwater sampling event, water levels in all 55 wells in the East Ash Disposal Area well network were manually measured in relation to a surveyed reference point (i.e., top of well casing) using an electronic water level indicator. Groundwater elevations from these monitoring wells and an elevation of McKellar Lake obtained from the automated McKellar Lake gauging station via TVA's i-Site system (see **Table 1**) were used to evaluate groundwater flow and hydraulic gradients within the shallow, intermediate and deep intervals of the Alluvial aquifer. Hydrographs created from the 2019 automated pressure transducer dataset are included in **Appendix A**.

2.1 BLUE CLAY ZONE OF THE SHALLOW ALLUVIAL AQUIFER

Groundwater elevation maps of the blue clay zone of the shallow Alluvial aquifer derived from data collected in the 2019 quarterly events are included as **Figures 2a** through **2d.** The blue clay zone is composed of silty clay and interbedded very fine-grained sand up to 27 ft in thickness within the shallow Alluvial aquifer. As discussed in the May 31, 2019 *Updated Remedial Investigation Report* (RIR), shallow wells screened above and within the blue clay zone exhibit groundwater elevations that are mounded when compared with shallow wells screened in sandy intervals beneath the blue clay zone. Thus, wells above and within the blue clay zone are mapped separately.

Typically, the highest groundwater elevations in the blue clay zone wells north of the East Ash Disposal Area were observed at wells EW-N02 and PMW-07A. For each quarterly gauging event, the horizontal hydraulic gradient within the northern blue clay zone was estimated using three-point solutions for groundwater elevation data from representative monitoring wells (one set includes wells EW-N02 [an extraction well installed in this north area as part of the Initial Remedial Action system], PMW-02A, and PMW-04A, and the other set includes wells EW-N02, PMW-02A and PMW-07A). Separate three-point solutions were used to represent the partially radial flow directions. Results are summarized in **Table 2**, and the magnitude and direction of the gradient vectors for each 2019 quarterly event are plotted in **Figures 2a** through **2d**. The horizontal groundwater flow direction between EW-N02, PMW-02A, and PMW-04A was consistently to the west-southwest toward well ALF-203. The horizontal groundwater flow direction between EW-N02, PMW-02A and PMW-07A varied from directly north to northwest, but ultimately was always toward McKellar Lake.

Typically, the highest groundwater elevations in blue clay zone wells south and east of the East Ash Disposal Area were observed at ALF-217 and PMW-14A. For each quarterly gauging event, the horizontal hydraulic gradient of the blue clay zone south of the East Ash Disposal Area was estimated using a three-point solution for groundwater elevation data from representative monitoring wells ALF-202, ALF-212 and ALF-215. Results are summarized in **Table 2**, and the magnitude and direction of the gradient vector for each 2019 quarterly event are plotted in

Figures 2a through **2d**. The horizontal groundwater flow direction between these wells varied from directly south to south-southeast, but ultimately was always away from the East Ash Disposal Area.

2.2 SANDY ZONE OF THE SHALLOW ALLUVIAL AQUIFER

The horizontal hydraulic gradient within the sandy zone of the shallow Alluvial aquifer was estimated using a three-point solution for groundwater elevation data from representative monitoring wells ALF-201, ALF-204 and ALF-213 that cover a representative geographic area. The results are summarized in **Table 2**, and the magnitude and direction of the gradient vector for each 2019 quarterly event are plotted in **Figures 3a** through **3d**. The horizontal groundwater flow direction between sandy zone of the shallow Alluvial aquifer wells varied significantly depending on surface water levels in McKellar Lake. High lake levels (e.g., 209.89 ft elevation [April 2019], 212.53 ft elevation [June 2019], and 205.25 ft elevation [December 2019]) resulted in groundwater flow to the south to south-southeast. Lower lake levels (e.g., 189.58 ft elevation [September 2019]) resulted in groundwater flow to the north to north-northeast toward McKellar Lake.

2.3 INTERMEDIATE ALLUVIAL AQUIFER

The horizontal hydraulic gradient within the intermediate Alluvial aquifer was estimated using a three-point solution for groundwater elevation data from representative wells ALF-202B, ALF-204B, and ALF-205B that cover a representative geographic area. The results are summarized in **Table 2**, and the magnitude and direction of the gradient vector for each 2019 quarterly event are plotted in **Figures 4a** through **4d.** Similar to the groundwater flow in the sandy zone of the shallow Alluvial aquifer, the horizontal groundwater flow direction in the intermediate Alluvial aquifer varied significantly depending on surface water levels in McKellar Lake. High lake levels in April 2019, June 2019, and December 2019 resulted in groundwater flow to the south. Lower lake levels in September 2019 resulted in groundwater flow to the north toward McKellar Lake.

2.4 DEEP ALLUVIAL AQUIFER

The horizontal hydraulic gradient within the deep Alluvial aquifer was estimated using a three-point solution for groundwater elevation data from representative wells ALF-202A, ALF-204A and ALF-205A that cover a representative geographic area. The results are summarized in **Table 2**, and the magnitude and direction of the gradient vector for each 2019 quarterly event are plotted in **Figures 5a** through **5d.** Similar to the groundwater flow in the sandy zone of the shallow Alluvial aquifer and the intermediate Alluvial aquifer, the horizontal groundwater flow direction in the deep Alluvial aquifer varied significantly depending on surface water levels in McKellar Lake. High lake levels in April 2019, June 2019, and December 2019 resulted in groundwater flow to the south. Lower lake levels in September 2019 resulted in groundwater flow to the north toward McKellar Lake.

2.5 ALLUVIAL AQUIFER VERTICAL GRADIENTS

The vertical gradients within the Alluvial aquifer were calculated from 2019 quarterly groundwater elevation data acquired from September 2017 to December 2019 from the blue clay zone and sandy zone wells of the shallow Alluvial aquifer and the intermediate and deep monitoring wells at 23 co-located well locations (see **Table 3a** and **Table 3b**). In **Table 3a**, data from the blue clay zone wells in the shallow Alluvial aquifer were compared to data from intermediate and deep Alluvial aquifer wells. In **Table 3b**, data from the sandy zone wells in the shallow Alluvial aquifer were compared to data from intermediate and deep Alluvial aquifer wells. Average vertical gradients reported between the sandy zone shallow and intermediate well pairs were designated as "S-I," between the sandy zone shallow and deep well pairs as "S-D," and between the intermediate and deep well pairs as "I-D."

Figure 6a, **Figure 6b,** and **Figure 6c** display the average vertical gradients calculated for each co-located S-I, S-D and I-D well pair after incorporating the December 2019 gauging event into the data set. A negative hydraulic gradient indicates a downward groundwater flow potential, whereas a positive gradient indicates an upward groundwater flow potential. In the vicinity of the East Ash Disposal Area, the gradients between the sandy zone shallow wells and co-located intermediate wells range from 0.020 ft/ft to -0.028 ft/ft. Gradients between the sandy zone shallow wells and co-located deep wells range from 0.015 ft/ft to -0.005 ft/ft. Gradients between the intermediate wells and co-located deep wells range from 0.007 ft/ft to -0.001 ft/ft.

3.0 GROUNDWATER ANALYTICAL RESULTS

3.1 FIELD PARAMETERS

During each groundwater sampling round, the monitoring wells were purged and sampled using dedicated groundwater sampling pumps (see **Appendix B** for the groundwater sampling forms for each quarterly event). Low-flow sampling protocol was used to collect field parameter data using a flow-through cell prior to the collection of the groundwater samples. Parameters measured in the field included turbidity (in nephelometric turbidity units [NTUs]), pH (in standard units [SU]), temperature, conductivity, dissolved oxygen (DO), and oxidation-reduction potential (ORP).

The full data set of the field parameters from each 2019 quarterly event is provided in **Tables 4a** through **4d**.

3.2 LABORATORY ANALYTICAL DATA

TVA collected groundwater samples after the aforementioned field parameters had stabilized, per the criteria in TVA TI ENV-TI-05.80.42. Samples were collected in laboratory-supplied containers and delivered to the analytical laboratory daily. Groundwater samples were analyzed for the

same suite of analytical parameters used during the Remedial Investigation. The analytical suite included the following:

- CCR-related constituents listed in 40 CFR 257, Appendices III and IV.
- Five metals listed in Appendix I of TN Rule 0400-11-01-.04 (copper, nickel, silver, vanadium, and zinc).
- Speciated arsenic.
- Major cations/anions (magnesium, potassium, sodium, carbonate, and bicarbonate).

Laboratory analytical testing was conducted by Pace Analytical Services, LLC, Minneapolis, MN and data validation was performed by Environmental Standards, Inc., Valley Forge, PA. Laboratory analytical reports and data validation reports for this sampling event were submitted electronically via a file transfer portal. A summary of the analytical results for each 2019 quarterly event are provided in **Tables 5a** through **5d**. In addition, **Table 6** provides historical data for monitoring wells since November 2016.

To evaluate the distribution of arsenic, fluoride, lead, and boron in groundwater, **Figure 7a, Figure 7b, Figure 7c,** and **Figure 7e** were prepared to illustrate the Alluvial aquifer monitoring well sampling network near the East Ash Disposal Area and the respective constituent concentrations in groundwater. Concentrations exceeding maximum contaminant levels (MCL) in the analytical results summary boxes are color coded in yellow; the respective well symbols are color coded in yellow if the most recent sampling event reported herein (December 2019) for these constituents indicated an exceedance of an MCL. In addition, the distribution of pH values is illustrated in **Figure 7d** with pH values above 8.0 SU colored coded in yellow to indicate concentrations above this screening level.

3.2.1 Arsenic

Figure 7a depicts the locations at the East Ash Disposal Area where arsenic was detected in groundwater in 2019; concentrations above its MCL (10 µg/L) are highlighted yellow. The highest concentrations of arsenic detected in 2019 on the north side was in shallow Alluvial aquifer well PMW-02A (between 3,310-3,700 µg/L), which is within the range of maximum concentrations observed in this vicinity between 2017-2018 (1,800-4,140 µg/L) (**Table 6**). The highest concentration of arsenic detected in 2019 on the south side was in shallow Alluvial aquifer well ALF-202 (between 287-378 µg/L), which is within the range of concentrations observed in this well between 2017-2018 (176-426 µg/L) (**Table 6**).

All the shallow and intermediate pre-design PMW wells in these north and south locations exhibited similar concentrations above the MCL that were observed in the November-December 2018 analytical results reported in the *Updated RIR*. Other ALF-series shallow Alluvial aquifer wells with arsenic consistently above the MCL in 2019 included ALF-203, ALF-204, ALF-212, and ALF-217 at similar concentrations observed in 2017-2018. Arsenic was also detected above its MCL in intermediate Alluvial aquifer well ALF-203B and ALF-217B in 2019. Where detectable, arsenic

concentrations in other ALF-series wells located outside of these north and south impacted areas were below the MCL.

3.2.2 Fluoride

Figure 7b shows the locations at the East Ash Disposal Area where fluoride was detected in groundwater in 2019; concentrations above its MCL (4 mg/L) are highlighted yellow. The only ALF-series monitoring wells with an MCL exceedance for fluoride in 2019 was the shallow ALF-203 well (between 4.9-6.4 mg/L) in the north area and shallow ALF-202 well (between 4.2-4.5 mg/L) in the south area. Fluoride concentrations in all other ALF-series wells were below the MCL, and the overall 2019 analytical results for fluoride are consistent with the 2017-2018 analytical results (**Table 6**).

3.2.3 Lead

Figure 7c shows the locations at the East Ash Disposal Area where lead was detected in groundwater in 2019; concentrations above its MCL (15 µg/L) are highlighted in yellow. The only ALF-series monitoring well with an MCL exceedance for lead in 2019 was ALF-203 (between 23.2-47.7 µg/L). Lead concentrations in all other ALF-series wells were below the MCL, and the overall 2019 analytical results for lead are consistent with the 2017-2018 analytical results (**Table 6**).

3.2.4 pH

Figure 7d depicts the pH values at the East Ash Disposal Area in groundwater in 2019. The only ALF-series monitoring well with an elevated pH above 8.0 SU (highlighted yellow) was ALF-203 (between 9.1-9.6 SU). The occurrence of elevated pH in the north area, as indicated by the 2019 results from PMW-02 and PMW-07, are consistent with 2017-2018 analytical results (**Table 6**).

3.2.5 Boron

Figure 7e depicts boron concentrations at the East Ash Disposal Area based on 2019 data. An MCL has not been established for boron.

4.0 BACKGROUND STATISTICAL ANALYSES REVIEW

Using groundwater data from the five ALF background wells (listed in Section 1.0), a statistical evaluation was completed on March 19, 2020 and the site-specific background threshold values for the Alluvial aquifer were updated for this report. The evaluation included the Federal CCR Rule Appendix III and Appendix IV constituents, TDEC Appendix I Metals, and additional water quality criteria. In addition, a geochemical evaluation was conducted on the five ALF background wells to document the groundwater chemistry did not indicate the presence of constituents related to CCR. The geochemical evaluation is provided in **Appendix C**.

These updated background values are summarized in **Table 7** and are reflected in the **Table 5a-d** and **Table 6** analytical results tables. The data relied upon and methods used to develop these

background values are described in detail in **Appendix D**. A brief summary of the methods used is provided below.

1. Validated analytical data were compiled from seven sampling events, which took place between September 2017 and September 2019, from the following five wells: ALF 216, ACC-1A, ACC-3A, ACC-5A, and ACC-5B. These wells are hydraulically upgradient of any regulated coal combustion residual (CCR) units and do not exhibit constituents at concentrations typically associated with CCR-impacted groundwater (e.g., sulfate).

2. For each constituent, data from all five wells were pooled and screened for outliers. Two outliers were confirmed in total, one for total dissolved solids (TDS) and one for zinc. These outliers were excluded from further analysis.

3. The pooled baseline data (with identified outliers excluded) were analyzed to determine whether they could be fit to a known statistical model. This was achieved by applying a series of mathematical transformations to the data and then testing the transformed data for normality. For datasets that were normal or could be normalized using a mathematical transformation, the best- fitting model for that dataset is identified in the 'Distribution' column in **Table 7**. The remaining datasets, for which no suitable normalizing distribution was identified, are identified in the 'Distribution' column of **Table 7** as non-parametric.

4. Per the methods described in the USEPA document: "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. Unified Guidance" (Unified Guidance – USEPA, 2009), upper tolerance limits (UTLs) were generated using either parametric methods (for data that fit a known distribution) or non-parametric methods (if no suitable distribution was identified). When all data for a COC were non-detect, the UTL was set to the highest reported detection limit. For pH, a lower tolerance limit (LTL) was also calculated to create a tolerance interval.

The resulting UTLs (and LTL for pH) are summarized in **Table 7**.

5.0 SCHEDULE UPDATE

The tentative 2020 groundwater sampling event at the East Ash Disposal Area is anticipated to be as follows:

- February 10-21
- May 9-20
- August 9-20
- November 9-20

Quarterly reports will be provided six weeks following receipt of the validated laboratory analytical reports. The Annual report, which will summarize all four sampling events, will be provided to TDEC by March 31, 2021.

TABLES

Table 1
Monitoring Well Groundwater Elevation Data (May 2017-December 2019)
TVA Allen Fossil Plant, Memphis, Tennessee

Well ID	TOC Elevation	Depth to Groundwater (ft)									Groundwater Elevation (NGVD 29)								
		5/30/2017	9/20/2017	10/16/2017	11/13/2017	12/26/2018	4/9/2019	6/18/2019	9/10/2019	12/10/2019	5/30/2017	9/20/2017	10/16/2017	11/13/2017	12/26/2018	4/9/2019	6/18/2019	9/10/2019	12/10/2019
RI Monitoring Wells																			
ALF-201	222.21	21.06	34.65	36.72	33.33	NG	15.52	16.64	28.46	23.56	201.15	187.56	185.49	188.88	198.80	206.69	205.57	193.75	198.65
ALF-201B	222.65	-	35.99	37.69	34.06	NG	16.64	15.85	29.75	24.35	-	186.66	184.96	188.59	198.07	206.01	206.80	192.90	198.30
ALF-201A	222.47	-	35.73	37.43	33.76	NG	16.32	16.33	29.45	24.06	-	186.74	185.04	188.71	198.30	206.15	206.14	193.02	198.41
ALF-202	220.18	12.88	15.56	16.35	15.60	NG	8.31	11.58	16.03	14.75	207.30	204.62	203.83	204.58	207.82	211.87	208.60	204.15	205.43
ALF-202B	220.75	-	34.79	35.65	32.01	NG	15.56	15.48	28.33	23.81	-	185.96	185.10	188.74	197.41	205.19	205.27	192.42	196.94
ALF-202A	220.25	-	34.17	35.05	31.38	NG	14.95	14.84	27.73	22.22	-	186.08	185.20	188.87	197.56	205.30	205.41	192.52	198.03
ALF-203	222.39	15.44	32.70	33.16	29.25	NG	11.94	11.14	28.65	18.79	206.95	189.69	189.23	193.14	203.20	210.45	211.25	193.74	203.60
ALF-203B	222.30	-	40.54	37.84	31.23	NG	13.63	11.87	QC	19.29	-	181.76	184.46	191.07	201.60	208.67	210.43	190.16	203.01
ALF-203A	222.34	-	40.59	37.88	30.25	NG	13.67	11.80	QC	19.33	-	181.75	184.46	192.09	201.66	208.67	210.54	190.17	203.01
ALF-204	218.58	15.62	37.94	33.59	25.74	NG	9.93	7.90	28.51	15.20	202.96	180.64	184.99	192.84	201.78	208.65	210.68	190.07	203.38
ALF-204B	218.70	-	38.03	33.56	25.79	NG	10.01	7.97	28.62	15.26	-	180.67	185.14	192.91	201.85	208.69	210.73	190.08	203.44
ALF-204A	218.76	-	37.95	33.62	25.74	NG	9.93	7.90	28.52	15.22	-	180.81	185.14	193.02	201.89	208.83	210.86	190.24	203.54
ALF-205	221.62	17.37	40.46	37.89	30.19	NG	14.06	12.25	32.12	19.40	204.25	181.16	183.73	191.43	200.60	207.56	209.37	189.50	202.22
ALF-205B	221.31	-	40.80	36.27	28.59	NG	12.98	11.06	31.17	18.27	-	180.51	185.04	192.72	201.50	208.33	210.25	190.14	203.04
ALF-205A	221.14	-	40.44	35.99	28.25	NG	12.62	10.70	30.81	17.94	-	180.70	185.15	192.89	201.68	208.52	210.44	190.33	203.20
ALF-206	226.02	21.65	45.33	41.03	33.50	NG	17.91	16.11	35.73	23.28	204.37	180.69	184.99	192.52	201.22	208.11	209.91	190.29	202.74
ALF-207	231.61	25.61	47.60	49.50	40.98	31.83	21.78	20.31	NG	28.98	206.00	184.01	182.11	190.63	199.78	209.83	211.30	NA	202.63
ALF-207B	232.67	-	-	-	-	-	-	-	-	29.48	-	-	-	-	-	-	-	-	203.19
ALF-207A	232.04	-	49.14	49.27	40.62	32.27	22.32	20.80	NG	28.79	-	182.90	182.77	191.42	199.77	209.72	211.24	NA	203.25
ALF-208	230.97	24.56	48.39	48.72	38.41	30.78	21.07	19.08	NG	26.71	206.41	182.58	182.25	192.56	200.19	209.90	211.89	NA	204.26
ALF-208B	231.62	-	-	-	-	-	-	-	-	28.22	-	-	-	-	-	-	-	-	203.40
ALF-208A	231.27	-	48.54	48.67	39.91	31.40	21.47	19.06	NG	27.93	-	182.73	182.60	191.36	199.87	209.80	212.21	NA	203.34
ALF-209	208.52	-	25.93	26.15	16.75	8.35	Flooded	Flooded	NG	4.46	-	182.59	182.37	191.77	200.17	Flooded	Flooded	NA	204.06
ALF-209B	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALF-209A	210.58	-	28.22	28.33	19.27	10.63	Flooded	Flooded	NG	7.10	-	182.36	182.25	191.31	199.95	Flooded	Flooded	NA	203.48
ALF-210	219.78	16.38	33.12	35.48	30.83	NG	10.46	10.81	26.03	19.41	203.40	186.66	184.30	188.95	200.14	209.32	208.97	193.75	200.37
ALF-210B	221.09	-	-	-	-	-	-	-	-	20.19	-	-	-	-	-	-	-	-	200.90
ALF-210A	220.46	-	33.62	35.91	30.88	NG	11.04	11.62	27.53	19.58	-	186.84	184.55	189.58	200.72	209.42	208.84	192.93	200.88
ALF-212	239.70	33.49	35.50	35.94	35.14	NG	28.74	32.04	35.92	34.84	206.21	204.20	203.76	204.56	206.66	210.96	207.66	203.78	204.86
ALF-212A	239.65	-	54.42	54.63	50.47	NG	34.30	34.01	47.57	41.29	-	185.23	185.02	189.18	197.84	205.35	205.64	192.08	198.36
ALF-213	240.40	38.36	57.11	55.54	49.70	NG	33.64	32.75	49.11	39.99	202.04	183.29	184.86	190.70	199.09	206.76	207.65	191.29	200.41
ALF-213B	241.18	-	-	-	-	NG	34.20	33.27	49.81	40.51	-	-	-	-	199.49	206.98	207.91	191.37	200.67
ALF-213A	241.16	-	-	-	-	NG	34.12	33.19	49.74	40.45	-	-	-	-	199.93	207.04	207.97	191.42	200.71
ALF-214	221.29	-	33.76	36.13	32.30	NG	13.52	13.71	27.48	21.96	-	187.53	185.16	188.99	199.51	207.77	207.58	193.81	199.33
ALF-214B	221.17	-	33.89	36.15	32.40	NG	13.76	13.74	27.57	21.90	-	187.28	185.02	188.77	199.11	207.41	207.43	193.60	199.27
ALF-214A	221.28	-	34.06	36.34	32.35	23.86	13.88	13.84	27.70	22.03	-	187.22	184.94	188.93	197.42	207.40	207.44	193.58	199.25
ALF-215	216.36	-	13.57	14.27	13.95	NG	6.58	9.79	12.91	20.95	-	202.79	202.09	202.41	205.66	209.78	206.57	203.45	195.41
ALF-216	217.16	-	29.30	31.23	29.32	NG	11.89	12.24	23.29	20.19	-	187.86	185.93	187.84	196.76	205.27	204.92	193.87	196.97
ALF-217	240.97	-	-	-	-	NG	25.19	27.42	30.27	29.16	-	-	-	-	213.66	215.78	213.55	210.70	211.81
ALF-217B	240.82	-	-	-	-	NG	34.57	33.64	48.96	41.18	-	-	-	-	197.98	206.25	207.18	191.86	199.64
ALF-217A	240.90	-	-	-	-	NG	34.47	34.01	49.05	41.25	-	-	-	-	198.63	206.43	206.89	191.85	199.65
ALF-218	221.51	-	-	-	-	-	-	-	-	18.75	-	-	-	-	-	-	-	-	202.76
ALF-218B	221.71	-	-	-	-	-	-	-	-	19.10	-	-	-	-	-	-	-	-	202.61
ALF-218A	221.69	-	-	-	-	-	-	-	-	19.92	-	-	-	-	-	-	-	-	201.77
ALF-219	238.14	-	-	-	-	-	-	-	-	37.94	-	-	-	-	-	-	-	-	200.20
ALF-219B	238.14	-	-	-	-	-	-	-	-	36.51	-	-	-	-	-	-	-	-	201.63
ALF-219A	237.72	-	-	-	-	-	-	-	-	36.81	-	-	-	-	-	-	-	-	200.91
ALF-P-2	232.62	26.67	49.27	50.80	40.90	32.84	22.88	21.11	NG	29.04	205.95	183.35	181.82	191.72	199.78	209.74	211.51	NA	203.58
ALF-P-3	233.29	27.62	50.71	50.41	41.29	33.57	24.50	21.99	NG	29.62	205.67	182.58	182.88	192.00	199.72	208.79	211.30	NA	203.67
ALF-P-4	221.20	15.89	40.50	38.94	30.42	NG	13.74	11.85	32.48	19.40	205.31	180.70	182.26	190.78	200.31	207.46	209.35	188.72	201.80
ALF-P-4S	215.89	-	34.40	32.83	24.81	NG	NA	5.41	26.54	12.86		181.49	183.06	191.08	201.30	NA	210.48	189.35	203.03
ACC Wells																			
ACC-1A	214.82	-	27.39	29.26	26.87	NG	9.59	9.98	21.18	17.96	-	187.43	185.56	187.95	196.95	205.23	204.84	193.64	196.86
ACC-3A	219.10	-	30.62	33.46	30.96	NG	11.13	11.88	24.20	20.55	-	188.48	185.64	188.14	198.71	207.97	207.22	194.90	198.55
ACC-5A	220.33	-	32.42	34.78	32.03	NG	13.60	13.93	26.31	22.04	-	187.91	185.55	188.30	198.07	206.73	206.40	194.02	198.29
ACC-5B	220.33	-	32.62	34.78	32.12	NG	13.75	14.10	26.38	22.19	-	187.71	185.55	188.21	198.29	206.58	206.23	193.95	198.14

Table 1
Monitoring Well Groundwater Elevation Data (May 2017-December 2019)
TVA Allen Fossil Plant, Memphis, Tennessee

Well ID	TOC Elevation	Depth to Groundwater (ft)									Groundwater Elevation (NGVD 29)								
		5/30/2017	9/20/2017	10/16/2017	11/13/2017	12/26/2018	4/9/2019	6/18/2019	9/10/2019	12/10/2019	5/30/2017	9/20/2017	10/16/2017	11/13/2017	12/26/2018	4/9/2019	6/18/2019	9/10/2019	12/10/2019
Pre-Design IRA Wells																			
EW-N02	220.28	-	-	-	-	12.07	7.59	7.60	NG	13.48	-	-	-	-	208.21	212.69	212.68	202.15	206.80
EW-S03	220.76	-	-	-	-	11.87	8.66	11.79	NG	15.17	-	-	-	-	208.89	212.10	208.97	204.53	205.59
PMW-02A	220.12	-	-	-	-	NG	7.99	7.72	19.33	14.44	-	-	-	-	206.38	212.13	212.40	200.79	205.68
PMW-02B	219.90	-	-	-	-	NG	10.80	9.01	29.74	16.47	-	-	-	-	201.94	209.10	210.89	190.16	203.43
PMW-02C	219.98	-	-	-	-	NG	11.50	9.04	29.89	16.49	-	-	-	-	202.04	208.48	210.94	190.09	203.49
PMW-04A	220.87	-	-	-	-	NG	9.04	8.75	22.80	15.57	-	-	-	-	205.95	211.83	212.12	198.07	205.30
PMW-04B	220.99	-	-	-	-	NG	12.19	10.32	30.65	17.79	-	-	-	-	202.01	208.80	210.67	190.34	203.20
PMW-04C	220.90	-	-	-	-	NG	12.06	10.19	30.55	17.64	-	-	-	-	202.0	208.84	210.71	190.35	203.26
PMW-07A	219.02	-	-	-	-	NG	6.44	6.20	16.65	12.03	-	-	-	-	208.15	212.58	212.82	202.37	206.99
PMW-07B	219.03	-	-	-	-	NG	10.18	8.18	29.02	15.55	-	-	-	-	201.97	208.85	210.85	190.01	203.48
PMW-07C	219.07	-	-	-	-	NG	10.17	8.16	29.07	15.92	-	-	-	-	202.18	208.90	210.91	190.00	203.15
PMW-10A	222.26	-	-	-	-	NG	10.20	13.22	18.05	16.76	-	-	-	-	208.56	212.06	209.04	204.21	205.50
PMW-10B	222.34	-	-	-	-	NG	17.03	16.97	29.84	24.33	-	-	-	-	197.85	205.31	205.37	192.50	198.01
PMW-10C	222.31	-	-	-	-	NG	17.01	16.94	29.85	24.31	-	-	-	-	197.85	205.30	205.37	192.46	198.00
PMW-11A	218.11	-	-	-	-	NG	7.44	10.65	14.67	13.48	-	-	-	-	206.73	210.67	207.46	203.44	204.63
PMW-11B	217.97	-	-	-	-	NG	12.74	12.73	25.36	20.08	-	-	-	-	197.86	205.23	205.24	192.61	197.89
PMW-11C	218.00	-	-	-	-	NG	12.75	12.72	25.44	20.06	-	-	-	-	197.69	205.25	205.28	192.56	197.94
PMW-14A	240.34	-	-	-	-	NG	27.49	30.74	35.29	33.99	-	-	-	-	209.26	212.85	209.60	205.05	206.35
PMW-14B	240.47	-	-	-	-	NG	35.13	35.00	48.31	42.36	-	-	-	-	197.87	205.34	205.47	192.16	198.11
PMW-14C	240.45	-	-	-	-	NG	35.11	34.95	48.08	42.32	-	-	-	-	197.92	205.34	205.50	192.37	198.13
McKellar Lake											206.90	178.65	186.14	194.73	203.55	209.89	212.53	189.58	205.25

NOTES:

TOC	Top of Casing - Water level measurement reference point
ft	feet
NAVD29	North American Vertical Datum of 1929
-	Well was not yet installed
Flooded	Well was surrounded or covered by floodwaters so no water level measurement was obtained
NA	Well was inaccessible so no water level measurement was obtained
QC	iSite groundwater elevation data was used instead of manual gauging result based on review of data
NG	Not gauged; when available, iSite groundwater elevation was used in the absence of manual measurements
McKellar Lake	Lake McKellar elevation listed for November 2017 through September 2019 gauging events is based on TVA's automated gauging station. Values listed for June, September, and October 2017 gauging events were estimated from the USGS Mississippi River gauging station at Memphis.

Table 2
Alluvial Aquifer Horizontal Hydraulic Gradients
TVA Allen Fossil Plant
Memphis, Tennessee

Blue Clay Zone of the Shallow Alluvial Aquifer (North Well-Triplet 1)						
	Groundwater Elevation (ft NAVD29)			Calculated Vector Components		
Gauging Date	PMW-02A	PMW-04A	ALF-EW-N02	Direction (degrees azimuth)	Direction (16-wind)	Magnitude (ft/ft)
12/26/2018*	206.38	205.95	208.21	250.7	West-Southwest	0.0599
4/9/2019	212.13	211.83	212.69	246.8	West-Southwest	0.0233
6/18/2019	212.40	212.12	212.68	243.4	West-Southwest	0.0157
9/10/2019	200.79	198.07	202.15	239.8	West-Southwest	0.1188
12/10/2019	205.68	205.30	206.80	249.2	West-Southwest	0.0400
					Average	**0.0515**

Blue Clay Zone of the Shallow Alluvial Aquifer (North Well-Triplet 2)						
	Groundwater Elevation (ft NAVD29)			Calculated Vector Components		
Gauging Date	ALF-EW-N02	PMW-02A	PMW-07A	Direction (degrees azimuth)	Direction (16-wind)	Magnitude (ft/ft)
12/26/2018*	208.21	206.38	208.15	341.3	North-Northwest	0.0187
4/9/2019	212.69	212.13	212.58	346.9	North	0.0059
6/18/2019	212.68	212.40	212.82	321.6	Northwest	0.0027
9/10/2019	202.15	200.79	202.37	334.5	North-Northwest	0.0134
12/10/2019	206.80	205.68	206.99	334.2	North-Northwest	0.0110
					Average	**0.0103**

Blue Clay Zone of the Shallow Alluvial Aquifer (South)						
	Groundwater Elevation (ft NAVD29)			Calculated Vector Components		
Gauging Date	ALF-202	ALF-212	ALF-215	Direction (degrees azimuth)	Direction (16-wind)	Magnitude (ft/ft)
9/20/2017	204.62	204.20	202.79	175.5	South	0.0044
10/16/2017	203.83	203.76	202.09	180.4	South	0.0042
11/13/2017	204.58	204.56	202.41	181.2	South	0.0052
12/26/2018*	207.82	206.66	205.66	168.0	South-Southeast	0.0054
4/9/2019	211.87	210.96	209.78	170.5	South	0.0052
6/18/2019	208.60	207.66	206.57	169.8	South	0.0050
9/10/2019	204.15	203.78	203.45	168.3	South-Southeast	0.0017
12/10/2019	205.43	204.86	204.00*	170.6	South	0.0033
					Average	**0.0043**

Sandy Zone of the Shallow Alluvial Aquifer						
	Groundwater Elevation (ft NAVD29)			Calculated Vector Components		
Gauging Date	ALF-201	ALF-204	ALF-213	Direction (degrees azimuth)	Direction (16-wind)	Magnitude (ft/ft)
5/30/2017	201.15	202.96	202.04	188.6	South	0.0010
9/20/2017	187.56	180.64	183.29	16.3	North-Northeast	0.0036
10/16/2017	185.49	184.99	184.86	53.8	Northeast	0.0003
11/13/2017	188.88	192.87	190.70	186.5	South	0.0021
12/26/2018*	198.80	201.78	199.09	168.0	South-Southeast	0.0019
4/9/2019	206.69	208.65	206.76	165.2	South-Southeast	0.0013
6/18/2019	205.57	210.68	207.65	183.5	South	0.0028
9/10/2019	193.75	190.07	191.29	19.7	North-Northeast	0.0019
12/10/2019	198.65	203.38	200.41	181.5	South	0.0026
					Average	**0.0019**

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Table 2
Alluvial Aquifer Horizontal Hydraulic Gradients
TVA Allen Fossil Plant
Memphis, Tennessee

	Groundwater Elevation (ft NAVD29)			Calculated Vector Components		
Intermediate Alluvial Aquifer						
	Groundwater Elevation (ft NAVD29)			Calculated Vector Components		
Gauging Date	**ALF-202B**	**ALF-204B**	**ALF-205B**	**Direction (degrees azimuth)**	**Direction (16-wind)**	**Magnitude (ft/ft)**
9/20/2017	185.96	180.67	180.51	16.9	North-Northeast	0.0029
10/16/2017	185.10	185.14	185.04	93.7	East	0.0001
11/13/2017	188.74	192.91	192.72	187.0	South	0.0022
12/26/2018*	197.41	201.85	201.50	182.4	South	0.0023
4/9/2019	205.19	208.69	208.33	179.0	South	0.0018
6/18/2019	205.27	210.73	210.25	181.1	South	0.0028
9/10/2019	192.42	190.08	190.14	9.7	North	0.0012
12/10/2019	196.94	203.44	203.04	184.8	South	0.0034
					Average	**0.0021**

Deep Alluvial Aquifer						
	Groundwater Elevation (ft NAVD29)			Calculated Vector Components		
Gauging Date	**ALF-202A**	**ALF-204A**	**ALF-205A**	**Direction (degrees azimuth)**	**Direction (16-wind)**	**Magnitude (ft/ft)**
9/20/2017	186.08	180.81	180.70	16.1	North-Northeast	0.0029
10/16/2017	185.20	185.14	185.15	347.9	North-Northwest	0.0000
11/13/2017	188.87	193.02	192.89	188.8	South	0.0022
12/26/2018*	197.56	201.89	201.68	186.2	South	0.0023
4/9/2019	205.30	208.83	208.52	180.2	South	0.0018
6/18/2019	205.41	210.86	210.44	181.9	South	0.0028
9/10/2019	192.52	190.24	190.33	7.6	North	0.0012
12/10/2019	198.03	203.54	203.20	184.2	South	0.0029
					Average	**0.0020**

Notes

NAVD29 -	National Geodetic Vertical Datum of 1929
degrees azimuth -	Direction measured in degrees from north (positive values indicate direction measured clockwise from north)
16-wind -	Direction specified using the eight principal directions and the eight half directions with 22.5 degrees separating each
ft/ft -	Feet per foot
*	Groundwater elevations shown were based on automated pressure transducer values based on review of manual gauging data or because manual gauging data was not available

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Table 3a
Alluvial Aquifer Vertical Hydraulic Gradients in Co-Located Monitoring Wells: Blue Clay Zone (Shallow), Intermediate, Deep
TVA Allen Fossil Plant
Memphis, Tennessee

Co-Located Well Group	Gauging Date	Sandy Zone of Shallow Well Details			Intermediate Well Details			Deep Well Details			Delta H (ft)			Submerged			Calculation Point (ft NAVD29)			Vertical Gradient (ft/ft)			Average Vertical Gradient (ft/ft)		
		TOS (ft NAVD29)	BOS (ft NAVD29)	GWE (ft NAVD29)	TOS (ft NAVD29)	BOS (ft NAVD29)	GWE (ft NAVD29)	TOS (ft NAVD29)	BOS (ft NAVD29)	GWE (ft NAVD29)	S-I	S-D	I-D	S	I	D	S	I	D	S-I	S-D	I-D	S-I	S-D	I-D
ALF-202	9/20/2017	196.8	175.6	204.62	136.7	126.7	185.96	80.2	70.2	186.08	-18.66	-18.54	0.12	TRUE	TRUE	TRUE	186.2	131.7	75.2	-0.342524	-0.16706	0.002124	-0.215	-0.104	0.004
	10/16/2017			203.83			185.10			185.20	-18.73	-18.63	0.1	TRUE	TRUE	TRUE	186.2	131.7	75.2	-0.343809	-0.167871	0.00177			
	11/13/2017			204.58			188.74			188.87	-15.84	-15.71	0.13	TRUE	TRUE	TRUE	186.2	131.7	75.2	-0.29076	-0.14156	0.002301			
	12/26/2018			207.82			197.41			197.56	-10.41	-10.26	0.15	TRUE	TRUE	TRUE	186.2	131.7	75.2	-0.191086	-0.092451	0.002655			
	4/9/2019			211.87			205.19			205.30	-6.68	-6.57	0.11	TRUE	TRUE	TRUE	186.2	131.7	75.2	-0.122618	-0.059201	0.001947			
	6/18/2019			208.60			205.27			205.41	-3.33	-3.19	0.14	TRUE	TRUE	TRUE	186.2	131.7	75.2	-0.061126	-0.028744	0.002478			
	9/10/2019			204.15			192.42			192.52	-11.73	-11.63	0.1	TRUE	TRUE	TRUE	186.2	131.7	75.2	-0.215316	-0.104796	0.00177			
	12/10/2019			205.43			196.94			198.03	-8.49	-7.4	1.09	TRUE	TRUE	TRUE	186.2	131.7	75.2	-0.155843	-0.06668	0.019292			
ALF-203	9/20/2017	189.3	168.3	189.69	138.4	128.4	181.76	110.0	100.0	181.75	-7.93	-7.94	-0.01	TRUE	TRUE	TRUE	178.8	133.4	105.0	-0.174708	-0.107603	-0.000352	-0.064	-0.037	0.005
	10/16/2017			189.23			184.46			184.46	-4.77	-4.77	0	FALSE	TRUE	TRUE	178.8	133.4	105.0	-0.105159	-0.064669	0			
	11/13/2017			193.14			191.07			192.09	-2.07	-1.05	1.02	TRUE	TRUE	TRUE	178.8	133.4	105.0	-0.045605	-0.01423	0.035915			
	12/26/2018			203.20			201.60			201.66	-1.6	-1.54	0.06	TRUE	TRUE	TRUE	178.8	133.4	105.0	-0.03525	-0.02087	0.002113			
	4/9/2019			210.45			208.67			208.67	-1.78	-1.78	0	TRUE	TRUE	TRUE	178.8	133.4	105.0	-0.039216	-0.024123	0			
	6/18/2019			211.25			210.43			210.54	-0.82	-0.71	0.11	TRUE	TRUE	TRUE	178.8	133.4	105.0	-0.018066	-0.009622	0.003873			
	9/10/2019			193.74			190.16			203.01	-3.58	-3.57	0.01	TRUE	TRUE	TRUE	178.8	133.4	105.0	-0.078872	-0.048381	0.000352			
	12/10/2019			203.60			203.01			203.01	-0.59	-0.59	0	TRUE	TRUE	TRUE	178.8	133.4	105.0	-0.012998	-0.007996	0			
ALF-212	9/20/2017	187.9	171.9	204.20	-	-	-	80.3	70.3	185.23	NA	-18.97	NA	TRUE	NA	TRUE	179.9	NA	75.3	NA	-0.181352	NA	-	-0.105	-
	10/16/2017			203.76			-			185.02	NA	-18.74	NA	TRUE	NA	TRUE	179.9	NA	75.3	NA	-0.179154	NA			
	11/13/2017			204.56			-			189.18	NA	-15.38	NA	TRUE	NA	TRUE	179.9	NA	75.3	NA	-0.147032	NA			
	12/26/2018			206.66			-			197.84	NA	-8.82	NA	TRUE	NA	TRUE	179.9	NA	75.3	NA	-0.084319	NA			
	4/9/2019			210.96			-			205.35	NA	-5.61	NA	TRUE	NA	TRUE	179.9	NA	75.3	NA	-0.053631	NA			
	6/18/2019			207.66			-			205.64	NA	-2.02	NA	TRUE	NA	TRUE	179.9	NA	75.3	NA	-0.019311	NA			
	9/10/2019			203.78			-			192.08	NA	-11.7	NA	TRUE	NA	TRUE	179.9	NA	75.3	NA	-0.111851	NA			
	12/10/2019			204.86			-			198.36	NA	-6.5	NA	TRUE	NA	TRUE	179.9	NA	75.3	NA	-0.06214	NA			
ALF-217	12/26/2018	191.6	169.6	213.66	119.5	109.5	197.98	58.6	48.6	198.63	-15.68	-15.03	0.65	TRUE	TRUE	TRUE	180.6	114.5	53.6	-0.237041	-0.118285	0.01067	-0.189	-0.098	0.002
	4/9/2019			215.78			206.25			206.43	-9.53	-9.35	0.18	TRUE	TRUE	TRUE	180.6	114.5	53.6	-0.144069	-0.073584	0.002955			
	6/18/2019			213.55			207.18			206.89	-6.37	-6.66	-0.29	TRUE	TRUE	TRUE	180.6	114.5	53.6	-0.096298	-0.052414	-0.004761			
	9/10/2019			210.70			191.86			191.85	-18.84	-18.85	-0.01	TRUE	TRUE	TRUE	180.6	114.5	53.6	-0.284812	-0.148348	-0.000164			
	12/10/2019			211.81			199.64			199.65	-12.17	-12.16	0.01	TRUE	TRUE	TRUE	180.6	114.5	53.6	-0.183979	-0.095698	0.000164			
PMW-02	12/26/2018	201.1	180.1	206.38	171.5	161.5	201.94	100.7	90.7	202.04	-4.44	-4.34	0.1	TRUE	TRUE	TRUE	190.6	166.5	95.7	-0.184309	-0.045742	0.001413	-0.182	-0.047	-0.001
	4/9/2019			212.13			209.10			208.48	-3.03	-3.65	-0.62	TRUE	TRUE	TRUE	190.6	166.5	95.7	-0.125778	-0.03847	-0.008758			
	6/18/2019			212.40			210.89			210.94	-1.51	-1.46	0.05	TRUE	TRUE	TRUE	190.6	166.5	95.7	-0.062682	-0.015388	0.000706			
	9/10/2019			200.79			190.16			190.09	-10.63	-10.7	-0.07	FALSE	TRUE	TRUE	190.4	166.5	95.7	-0.444027	-0.112953	-0.000989			
	12/10/2019			205.68			203.43			203.49	-2.25	-2.19	0.06	TRUE	TRUE	TRUE	190.6	166.5	95.7	-0.0934	-0.023082	0.000848			
PMW-04	12/26/2018	201.5	180.5	205.95	169.0	159.0	202.01	101.6	91.6	202.00	-3.94	-3.95	-0.01	TRUE	TRUE	TRUE	191.0	164.0	96.6	-0.145689	-0.041813	-0.000148	-0.139	-0.039	0.000
	4/9/2019			211.83			208.80			208.84	-3.03	-2.99	0.04	TRUE	TRUE	TRUE	191.0	164.0	96.6	-0.11204	-0.031651	0.000593			
	6/18/2019			212.12			210.67			210.71	-1.45	-1.42	0.03	TRUE	TRUE	TRUE	191.0	164.0	96.6	-0.053616	-0.015032	0.000445			
	9/10/2019			198.07			190.34			190.35	-7.73	-7.73	0	FALSE	TRUE	TRUE	189.3	164.0	96.6	-0.305383	-0.083354	0			
	12/10/2019			205.30			203.20			203.26	-2.1	-2.04	0.06	TRUE	TRUE	TRUE	191.0	164.0	96.6	-0.077651	-0.021595	0.00089			
PMW-07	12/26/2018	200.1	190.1	208.14	169.6	159.6	201.97	106.6	96.6	202.18	-6.17	-5.96	0.21	TRUE	TRUE	TRUE	195.1	164.6	101.6	-0.202024	-0.063739	0.003335	-0.182	-0.059	0.000
	4/9/2019			212.58			208.85			208.90	-3.73	-3.68	0.05	TRUE	TRUE	TRUE	195.1	164.6	101.6	-0.122131	-0.039356	0.000794			
	6/18/2019			212.82			210.85			210.91	-1.97	-1.91	0.06	TRUE	TRUE	TRUE	195.1	164.6	101.6	-0.064503	-0.020426	0.000953			
	9/10/2019			202.37			190.01			190.00	-12.35	-12.36	-0.01	TRUE	TRUE	TRUE	195.1	164.6	101.6	-0.404374	-0.132184	-0.000159			
	12/10/2019			206.99			203.48			203.15	-3.5	-3.83	-0.33	TRUE	TRUE	TRUE	195.1	164.6	101.6	-0.1146	-0.04096	-0.005241			
PMW-10	12/26/2018	199.7	178.7	208.56	159.5	149.5	197.85	80.3	70.3	197.85	-10.71	-10.71	0	TRUE	TRUE	TRUE	189.2	154.5	75.3	-0.308193	-0.094016	0	-0.232	-0.071	-0.0002
	4/9/2019			212.06			205.31			205.30	-6.75	-6.76	-0.01	TRUE	TRUE	TRUE	189.2	154.5	75.3	-0.194239	-0.059341	-0.000126			
	6/18/2019			209.04			205.37			205.37	-3.67	-3.67	0	TRUE	TRUE	TRUE	189.2	154.5	75.3	-0.105608	-0.032216	0			
	9/10/2019			204.21			192.50			192.46	-11.71	-11.75	-0.04	TRUE	TRUE	TRUE	189.2	154.5	75.3	-0.336969	-0.103145	-0.000505			
	12/10/2019			205.50			198.01			198.00	-7.49	-7.5	-0.01	TRUE	TRUE	TRUE	189.2	154.5	75.3	-0.215533	-0.065837	-0.000126			

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Table 3a
Alluvial Aquifer Vertical Hydraulic Gradients in Co-Located Monitoring Wells: Blue Clay Zone (Shallow), Intermediate, Deep
TVA Allen Fossil Plant
Memphis, Tennessee

Co-Located Well Group	Gauging Date	Sandy Zone of Shallow Well Details			Intermediate Well Details			Deep Well Details			Delta H (ft)			Submerged			Calculation Point (ft NAVD29)			Vertical Gradient (ft/ft)			Average Vertical Gradient (ft/ft)		
		TOS (ft NAVD29)	BOS (ft NAVD29)	GWE (ft NAVD29)	TOS (ft NAVD29)	BOS (ft NAVD29)	GWE (ft NAVD29)	TOS (ft NAVD29)	BOS (ft NAVD29)	GWE (ft NAVD29)	S-I	S-D	I-D	S	I	D	S	I	D	S-I	S-D	I-D	S-I	S-D	I-D
PMW-11	12/26/2018	201.5	180.5	206.73	160.6	150.6	197.86	79.0	69.0	197.68	-8.87	-9.05	-0.18	TRUE	TRUE	TRUE	191.0	155.6	74.0	-0.250976	-0.07736	-0.002205	-0.193	-0.059	0.000
	4/9/2019			210.67			205.23			205.24	-5.44	-5.43	0.01	TRUE	TRUE	TRUE	191.0	155.6	74.0	-0.153925	-0.046416	0.000122			
	6/18/2019			207.46			205.24			205.28	-2.22	-2.18	0.04	TRUE	TRUE	TRUE	191.0	155.6	74.0	-0.062815	-0.018635	0.00049			
	9/10/2019			203.44			192.61			192.56	-10.83	-10.88	-0.05	TRUE	TRUE	TRUE	191.0	155.6	74.0	-0.306434	-0.093003	-0.000612			
	12/10/2019			204.63			197.89			197.94	-6.74	-6.69	0.05	TRUE	TRUE	TRUE	191.0	155.6	74.0	-0.190708	-0.057187	0.000612			
PMW-14	12/26/2018	201.8	180.8	209.26	161.0	151.0	197.87	88.6	78.6	197.92	-11.39	-11.34	0.05	TRUE	TRUE	TRUE	191.3	156.0	83.6	-0.322654	-0.105268	0.00069	-0.250	-0.081	0.001
	4/9/2019			212.85			205.34			205.34	-7.51	-7.51	0	TRUE	TRUE	TRUE	191.3	156.0	83.6	-0.212742	-0.069715	0			
	6/18/2019			209.60			205.47			205.50	-4.13	-4.1	0.03	TRUE	TRUE	TRUE	191.3	156.0	83.6	-0.116994	-0.03806	0.000414			
	9/10/2019			205.05			192.16			192.37	-12.89	-12.68	0.21	TRUE	TRUE	TRUE	191.3	156.0	83.6	-0.365145	-0.117707	0.0029			
	12/10/2019			206.35			198.11			198.13	-8.24	-8.22	0.02	TRUE	TRUE	TRUE	191.3	156.0	83.6	-0.233421	-0.076305	0.000276			

Notes:

Co-Located Well Group	Generalized name of wells completed in close proximity with different screened intervals.
TOS	Elevation of Top of Screen
BOS	Elevation of Bottom of Screen
GWE	Groundwater Elevation
ft	feet
NAVD29	North American Vertical Datum of 1929
S	Shallow Well
I	Intermediate Well
D	Deep Well
S-I	Comparison between Shallow and Intermediate Well
S-D	Comparison between Shallow and Deep Well
I-D	Comparison between Intermediate and Deep Well
Delta H	Difference in groundwater elevation between wells
Calculation Point	For submerged screens the calculation point is equal to the mid point elevation of the screen. For partially submerged wells the calculation point is mid point of the wetted screen interval.
Vertical Gradient	Calculated as Delta H / (Calculation Point for Shallower Well - Calculation Point for Deeper well)
ft/ft	Feet per foot
-	Not applicable or not available

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Table 3b
Alluvial Aquifer Vertical Hydraulic Gradients in Co-Located Monitoring Wells: Sandy Zone (Shallow), Intermediate, Deep
TVA Allen Fossil Plant
Memphis, Tennessee

Co-Located Well Group	Gauging Date	Sandy Zone of Shallow Well Details			Intermediate Well Details			Deep Well Details			Delta H (ft)			Submerged			Calculation Point (ft NAVD29)			Vertical Gradient (ft/ft)			Average Vertical Gradient (ft/ft)		
		TOS (ft NAVD29)	BOS (ft NAVD29)	GWE (ft NAVD29)	TOS (ft NAVD29)	BOS (ft NAVD29)	GWE (ft NAVD29)	TOS (ft NAVD29)	BOS (ft NAVD29)	GWE (ft NAVD29)	S-I	S-D	I-D	S	I	D	S	I	D	S-I	S-D	I-D	S-I	S-D	I-D
ALF-201	9/20/2017	198.9	172.3	187.56	138.8	128.8	186.66	102.2	92.2	186.74	-0.9	-0.82	0.08	FALSE	TRUE	TRUE	179.9	133.8	97.2	-0.019507	-0.009911	0.002186	-0.008	-0.004	0.001
	10/16/2017			185.49			184.96			185.04	-0.53	-0.45	0.08	FALSE	TRUE	TRUE	178.9	133.8	97.2	-0.011751	-0.005508	0.002186			
	11/13/2017			188.88			188.59			188.71	-0.29	-0.17	0.12	FALSE	TRUE	TRUE	180.6	133.8	97.2	-0.006197	-0.002038	0.003279			
	12/26/2018			198.80			198.07			198.30	-0.73	-0.5	0.23	FALSE	TRUE	TRUE	185.6	133.8	97.2	-0.014104	-0.005659	0.006284			
	4/9/2019			206.69			206.01			206.15	-0.68	-0.54	0.14	TRUE	TRUE	TRUE	185.6	133.8	97.2	-0.013124	-0.006108	0.003825			
	6/18/2019			205.57			206.80			206.14	1.23	0.57	-0.66	TRUE	TRUE	TRUE	185.6	133.8	97.2	0.023739	0.006447	-0.018033			
	9/10/2019			193.75			192.90			193.02	-0.85	-0.73	0.12	FALSE	TRUE	TRUE	183.0	133.8	97.2	-0.017265	-0.008505	0.003279			
	12/10/2019			198.65			198.30			198.41	-0.35	-0.24	0.11	FALSE	TRUE	TRUE	185.5	133.8	97.2	-0.006772	-0.002719	0.003005			
ALF-204	9/20/2017	169.6	159.4	180.64	135.0	125.0	180.67	108.5	98.5	180.81	0.03	0.17	0.14	TRUE	TRUE	TRUE	164.5	130.0	103.5	0.00087	0.002788	0.005283	0.002	0.003	0.004
	10/16/2017			184.99			185.14			185.14	0.15	0.15	0	TRUE	TRUE	TRUE	164.5	130.0	103.5	0.00435	0.00246	0			
	11/13/2017			192.84			192.91			193.02	0.07	0.18	0.11	TRUE	TRUE	TRUE	164.5	130.0	103.5	0.00203	0.002952	0.004151			
	12/26/2018			201.78			201.85			201.89	0.07	0.11	0.04	TRUE	TRUE	TRUE	164.5	130.0	103.5	0.00203	0.001804	0.001509			
	4/9/2019			208.65			208.69			208.83	0.04	0.18	0.14	TRUE	TRUE	TRUE	164.5	130.0	103.5	0.00116	0.002952	0.005283			
	6/18/2019			210.68			210.73			210.86	0.05	0.18	0.13	TRUE	TRUE	TRUE	164.5	130.0	103.5	0.00145	0.002952	0.004906			
	9/10/2019			190.07			190.08			190.24	0.01	0.17	0.16	TRUE	TRUE	TRUE	164.5	130.0	103.5	0.00029	0.002788	0.006038			
	12/10/2019			203.38			203.44			203.54	0.06	0.16	0.1	TRUE	TRUE	TRUE	164.5	130.0	103.5	0.00174	0.002624	0.003774			
ALF-205	9/20/2017	187.1	166.1	181.16	145.2	135.2	180.51	119.1	109.1	180.70	-0.65	-0.46	0.19	FALSE	TRUE	TRUE	173.6	140.2	114.1	-0.019438	-0.007726	0.00728	0.020	0.015	0.007
	10/16/2017			183.73			185.04			185.15	1.31	1.42	0.11	FALSE	TRUE	TRUE	174.9	140.2	114.1	0.037725	0.023346	0.004215			
	11/13/2017			191.43			192.72			192.89	1.29	1.46	0.17	TRUE	TRUE	TRUE	176.6	140.2	114.1	0.03542	0.023353	0.006513			
	12/26/2018			200.60			201.50			201.68	0.9	1.08	0.18	TRUE	TRUE	TRUE	176.6	140.2	114.1	0.024712	0.017274	0.006897			
	4/9/2019			207.56			208.33			208.52	0.77	0.96	0.19	TRUE	TRUE	TRUE	176.6	140.2	114.1	0.021142	0.015355	0.00728			
	6/18/2019			209.37			210.25			210.44	0.88	1.07	0.19	TRUE	TRUE	TRUE	176.6	140.2	114.1	0.024163	0.017115	0.00728			
	9/10/2019			189.50			190.14			190.33	0.64	0.83	0.19	TRUE	TRUE	TRUE	176.6	140.2	114.1	0.017573	0.013276	0.00728			
	12/10/2019			202.22			203.04			203.20	0.82	0.98	0.16	TRUE	TRUE	TRUE	176.6	140.2	114.1	0.022515	0.015675	0.00613			
ALF-207	9/20/2017	202.9	171.5	184.01	142.2	132.4	-	111.0	101.0	182.90	NA	-1.11	NA	FALSE	NA	TRUE	177.8	NA	106.0	NA	-0.015469	NA	-	0.001	-
	10/16/2017			182.11			-			182.77	NA	0.66	NA	FALSE	NA	TRUE	176.8	NA	106.0	NA	0.009321	NA			
	11/13/2017			190.63			-			191.42	NA	0.79	NA	FALSE	NA	TRUE	181.1	NA	106.0	NA	0.010524	NA			
	4/9/2019			209.83			-			209.72	NA	-0.11	NA	TRUE	NA	TRUE	187.2	NA	106.0	NA	-0.001355	NA			
	6/18/2019			211.30			-			211.24	NA	-0.06	NA	TRUE	NA	TRUE	187.2	NA	106.0	NA	-0.000739	NA			
	9/10/2019			191.60			-			191.30	NA	-0.3	NA	FALSE	NA	TRUE	181.6	NA	106.0	NA	-0.003971	NA			
	12/10/2019			202.63			203.18			203.25	0.55	0.62	0.07	FALSE	TRUE	TRUE	187.1	137.3	106.0	0.011054	0.007648	0.002236			
ALF-208	9/20/2017	202.2	175.3	182.58	141.2	131.4	-	96.8	86.8	182.73	NA	0.15	NA	FALSE	NA	TRUE	178.9	NA	91.8	NA	0.001722	NA	-	-0.002	-
	10/16/2017			182.25			-			182.60	NA	0.35	NA	FALSE	NA	TRUE	178.8	NA	91.8	NA	0.004025	NA			
	11/13/2017			192.56			-			191.36	NA	-1.2	NA	FALSE	NA	TRUE	183.9	NA	91.8	NA	-0.013028	NA			
	4/9/2019			209.90			-			209.80	NA	-0.1	NA	TRUE	NA	TRUE	188.7	NA	91.8	NA	-0.001032	NA			
	6/18/2019			211.89			-			212.21	NA	0.33	NA	TRUE	NA	TRUE	188.7	NA	91.8	NA	0.003405	NA			
	12/10/2019			204.26			203.40			203.34	-0.86	-0.92	-0.06	TRUE	TRUE	TRUE	188.7	136.3	91.8	-0.016419	-0.009493	-0.001347			
ALF-209	9/20/2017	193.9	172.8	182.59	-	-	-	92.3	82.3	182.36	NA	-0.23	NA	FALSE	NA	TRUE	177.7	NA	87.3	NA	-0.002544	NA	-	-0.004	-
	10/16/2017			182.37			-			182.25	NA	-0.12	NA	FALSE	NA	TRUE	177.6	NA	87.3	NA	-0.001329	NA			
	11/13/2017			191.77			-			191.31	NA	-0.46	NA	FALSE	NA	TRUE	182.3	NA	87.3	NA	-0.004842	NA			
	12/10/2019			204.06			-			203.48	NA	-0.58	NA	TRUE	NA	TRUE	183.4	NA	87.3	NA	-0.006038	NA			
ALF-210	9/20/2017	192.6	171.7	186.66	141.7	131.9	-	100.5	90.5	186.84	NA	0.18	NA	FALSE	NA	TRUE	179.2	NA	95.5	NA	0.002151	NA	-	0.002	-
	10/16/2017			184.30			-			184.55	NA	0.25	NA	FALSE	NA	TRUE	178.0	NA	95.5	NA	0.003031	NA			
	11/13/2017			188.95			-			189.58	NA	0.63	NA	FALSE	NA	TRUE	180.3	NA	95.5	NA	0.007428	NA			
	12/26/2018			200.14			-			200.72	NA	0.58	NA	TRUE	NA	TRUE	182.1	NA	95.5	NA	0.006695	NA			
	4/9/2019			209.32			-			209.42	NA	0.1	NA	TRUE	NA	TRUE	182.1	NA	95.5	NA	0.001154	NA			
	6/18/2019			208.97			-			208.84	NA	-0.13	NA	TRUE	NA	TRUE	182.1	NA	95.5	NA	-0.001501	NA			
	9/10/2019			193.75			-			192.93	NA	-0.82	NA	TRUE	NA	TRUE	182.1	NA	95.5	NA	-0.009465	NA			
	12/10/2019			200.37			200.90			200.88	0.53	0.51	-0.02	TRUE	TRUE	TRUE	182.1	136.8	95.5	0.011687	0.005887	-0.000484			
ALF-213	12/26/2018	169.4	159.2	199.08	129.8	119.8	199.49	88.8	78.8	199.92	0.41	0.84	0.43	TRUE	TRUE	TRUE	164.3	124.8	83.8	0.010389	0.010436	0.010481	0.006	0.005	0.003
	4/9/2019			206.76			206.98			207.04	0.22	0.28	0.06	TRUE	TRUE	TRUE	164.3	124.8	83.8	0.005575	0.003479	0.001462			
	6/18/2019			207.65			207.91			207.97	0.27	0.32	0.05	TRUE	TRUE	TRUE	164.3	124.8	83.8	0.006842	0.003976	0.001219			
	9/10/2019			191.29			191.37			191.42	0.08	0.13	0.05	TRUE	TRUE	TRUE	164.3	124.8	83.8	0.002027	0.001615	0.001219			
	12/10/2019			200.41			200.67			200.71	0.27	0.3	0.03	TRUE	TRUE	TRUE	164.3	124.8	83.8	0.006842	0.003727	0.000731			

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Table 3b
Alluvial Aquifer Vertical Hydraulic Gradients in Co-Located Monitoring Wells: Sandy Zone (Shallow), Intermediate, Deep
TVA Allen Fossil Plant
Memphis, Tennessee

Co-Located Well Group	Gauging Date	Sandy Zone of Shallow Well Details			Intermediate Well Details			Deep Well Details			Delta H (ft)			Submerged			Calculation Point (ft NAVD29)			Vertical Gradient (ft/ft)			Average Vertical Gradient (ft/ft)		
		TOS (ft NAVD29)	BOS (ft NAVD29)	GWE (ft NAVD29)	TOS (ft NAVD29)	BOS (ft NAVD29)	GWE (ft NAVD29)	TOS (ft NAVD29)	BOS (ft NAVD29)	GWE (ft NAVD29)	S-I	S-D	I-D	S	I	D	S	I	D	S-I	S-D	I-D	S-I	S-D	I-D
ALF-214	9/20/2017	186.8	166.8	187.53	138.3	128.3	187.28	98.7	88.7	187.22	-0.25	-0.31	-0.06	TRUE	TRUE	TRUE	176.8	133.3	93.7	-0.005747	-0.00373	-0.001515	-0.005	-0.002	0.000
	10/16/2017			185.16			185.02			184.94	-0.14	-0.22	-0.08	FALSE	TRUE	TRUE	176.0	133.3	93.7	-0.00328	-0.002674	-0.00202			
	11/13/2017			188.99			188.77			188.93	-0.22	-0.06	0.16	TRUE	TRUE	TRUE	176.8	133.3	93.7	-0.005057	-0.000722	0.00404			
	12/26/2018			199.51			199.11			-	-0.4	NA	NA	TRUE	TRUE	NA	176.8	133.3	NA	-0.009195	NA	NA			
	4/9/2019			207.77			207.41			207.40	-0.36	-0.37	-0.01	TRUE	TRUE	TRUE	176.8	133.3	93.7	-0.008276	-0.004452	-0.000253			
	6/18/2019			207.58			207.43			207.44	-0.15	-0.14	0.01	TRUE	TRUE	TRUE	176.8	133.3	93.7	-0.003448	-0.001685	0.000253			
	9/10/2019			193.81			193.60			193.58	-0.21	-0.23	-0.02	TRUE	TRUE	TRUE	176.8	133.3	93.7	-0.004828	-0.002768	-0.000505			
	12/10/2019			199.33			199.27			199.25	-0.06	-0.08	-0.02	TRUE	TRUE	TRUE	176.8	133.3	93.7	-0.001379	-0.000963	-0.000505			
ALF-218	12/10/2019	189.1	168.5	202.76	138.1	128.3	202.61	84.2	74.4	201.76	-0.15	-1	-0.85	TRUE	TRUE	TRUE	178.8	133.2	79.3	-0.003293	-0.010057	-0.015776	-0.003	-0.010	-0.016
ALF-219	12/10/2019	203.7	183.1	200.20	139.7	129.9	201.63	96.2	86.4	200.91	1.43	0.71	-0.72	FALSE	TRUE	TRUE	191.6	134.8	91.3	0.025143	0.007077	-0.016573	0.025	0.007	-0.017
ALF-P-4	9/20/2017	186.2	166.2	181.49	149.5	139.4	180.70	-	-	-	-0.79	NA	NA	FALSE	TRUE	NA	173.8	144.4	NA	-0.026873	NA	NA	-0.028	-	-
	10/16/2017			183.06			182.26			-	-0.8	NA	NA	FALSE	TRUE	NA	174.6	144.4	NA	-0.026506	NA	NA			
	11/13/2017			191.08			190.78			-	-0.3	NA	NA	TRUE	TRUE	NA	176.2	144.4	NA	-0.009448	NA	NA			
	12/26/2018			201.30			200.31			-	-0.99	NA	NA	TRUE	TRUE	NA	176.2	144.4	NA	-0.031179	NA	NA			
	6/18/2019			210.48			209.35			-	-1.13	NA	NA	TRUE	TRUE	NA	176.2	144.4	NA	-0.035588	NA	NA			
	12/10/2019			203.03			201.80			-	-1.23	NA	NA	TRUE	TRUE	NA	176.2	144.4	NA	-0.038738	NA	NA			
ACC-5	9/20/2017	170.1	160.1	187.71	-	-	-	86.8	76.8	187.91	NA	0.2	NA	TRUE	NA	TRUE	165.1	NA	81.8	NA	0.002401	NA	-	0.001	-
	10/16/2017			185.55			-			185.55	NA	0	NA	TRUE	NA	TRUE	165.1	NA	81.8	NA	0	NA			
	11/13/2017			188.21			-			188.30	NA	0.09	NA	TRUE	NA	TRUE	165.1	NA	81.8	NA	0.00108	NA			
	12/26/2018			198.29			-			198.07	NA	-0.22	NA	TRUE	NA	TRUE	165.1	NA	81.8	NA	-0.002641	NA			
	4/9/2019			206.58			-			206.73	NA	0.15	NA	TRUE	NA	TRUE	165.1	NA	81.8	NA	0.001801	NA			
	6/18/2019			206.23			-			206.40	NA	0.17	NA	TRUE	NA	TRUE	165.1	NA	81.8	NA	0.002041	NA			
	9/10/2019			193.95			-			194.02	NA	0.07	NA	TRUE	NA	TRUE	165.1	NA	81.8	NA	0.00084	NA			
	12/10/2019			198.14			-			198.29	NA	0.15	NA	TRUE	NA	TRUE	165.1	NA	81.8	NA	0.001801	NA			

Notes:

Co-Located Well Group	Generalized name of wells completed in close proximity with different screened intervals.
TOS	Elevation of Top of Screen
BOS	Elevation of Bottom of Screen
GWE	Groundwater Elevation
ft	feet
NAVD29	North American Vertical Datum of 1929
S	Shallow Well
I	Intermediate Well
D	Deep Well
S-I	Comparison between Shallow and Intermediate Well
S-D	Comparison between Shallow and Deep Well
I-D	Comparison between Intermediate and Deep Well
Delta H	Difference in groundwater elevation between wells
Calculation Point	For submerged screens the calculation point is equal to the mid point elevation of the screen. For partially submerged wells the calculation point is mid point of the wetted screen interval.
Vertical Gradient	Calculated as Delta H / (Calculation Point for Shallower Well - Calculation Point for Deeper well)
ft/ft	Feet per foot
-	Not applicable or not available

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Table 4a
Groundwater Field Parameter Data (ALF and ACC Monitoring Wells) - April 2019
TVA Allen Fossil Plant
Memphis, Tennessee

Well ID	Screened Interval (ft btoc)	Pump Inlet Depth (ft btoc)	Date	Turbidity (NTU)	pH (SU)	Temperature (C)	Specific Conductance (µS/cm)	DO (mg/L)	ORP (mV)
ACC-1A	156.2 - 166.2	165.5	4/10/19	0.57	6.64	18.7	604	0.41	-86.8
ACC-3A	120.4 - 130.4	126.0	4/10/19	0.69	6.77	18.3	853	0.46	-96.4
ACC-5A	133.5 - 143.5	139.0	4/10/19	3.28	6.59	20.1	704	0.41	-65.9
ACC-5B	50.2 - 60.2	55.5	4/10/19	1.01	6.79	19.9	854	0.54	-76.7
ALF-201	23.3 - 49.9	49.0	4/15/19	3.08	6.97	20.1	804	0.78	90.5
ALF-201A	120.3 - 130.3	126.0	4/15/19	1.02	7.16	20.0	594	0.46	93.5
ALF-201B	83.9 - 93.9	89.0	4/15/19	1.03	6.99	20.4	821	2.68	-98.9
ALF-202	23.4 - 44.6	43.0	4/10/19	6.35	7.44	18.3	558.2	0.39	135.4
ALF-202A	140.1 - 150.1	145.5	4/10/19	0.37	6.66	19.9	492.6	0.44	23.3
ALF-202B	84.1 - 94.1	89.5	4/10/19	4.12	6.93	19.0	621	0.42	-1.4
ALF-203	33.1 - 54.1	52.0	4/15/19	0.44	9.40	19.3	994	0.52	99.1
ALF-203A	112.3 - 122.3	118.0	4/15/19	2.01	6.73	17.8	352.9	0.19	92.8
ALF-203B	83.9 - 93.9	89.0	4/15/19	1.95	6.70	17.5	449.7	0.22	156.9
ALF-204	49.0 - 59.2	49.0	4/16/19	2.61	6.68	19.1	510.7	0.76	77.9
ALF-204A	110.3 - 120.3	116.0	4/16/19	1.45	7.06	16.1	383.8	2.70	-62.3
ALF-204B	83.7 - 93.7	89.0	4/16/19	5.32	7.02	16.2	314.3	0.41	-38.1
ALF-205	34.5 - 55.5	54.0	4/12/19	1.27	6.95	15.8	929	0.99	110.9
ALF-205A	102.0 - 112.0	107.0	4/12/19	6.33	6.60	15.6	338.3	0.22	93.7
ALF-205B	76.1 - 86.1	81.5	4/12/19	2.17	6.98	15.6	351.9	0.28	52.1
ALF-206	54.0 - 64.2	54.0	4/9/19	4.36	6.92	17.0	369.7	0.38	-70.4
ALF-210	27.2 - 48.1	47.0	4/9/19	22.1	6.60	18.6	799	1.07	22.0
ALF-210A	120.0 - 130.0	125.0	4/9/19	0.56	6.77	19.3	1269	0.26	-101.7
ALF-212	71.0 - 81.2	67.0	4/11/19	5.91	6.98	21.0	715	0.78	-46.4
ALF-212A	159.4 - 169.4	165.0	4/11/19	1.29	6.79	19.7	606	0.92	-103.0
ALF-213	71.0 - 81.2	71.0	4/11/19	0.57	7.11	17.6	388.8	0.64	-159.7
ALF-213A	152.8 - 162.8	157.75	4/11/19	0.73	7.02	17.9	338.4	0.53	-133.4
ALF-213B	111.75 - 121.8	116.75	4/11/19	2.17	7.01	18.5	869	0.76	-143.0
ALF-214	34.5 - 54.5	45.0	4/12/19	0.75	7.12	17.8	531.3	0.54	49.1
ALF-214A	122.6 - 132.6	130.0	4/12/19	1.92	6.54	17.9	1108	0.45	-43.1
ALF-214B	82.9 - 92.9	88.0	4/12/19	2.79	6.79	17.6	896	0.63	-98.1
ALF-215	20.0 - 30.0	25.0	4/9/19	0.32	6.72	17.4	531.7	0.47	102.5
ALF-216	39.6 - 59.6	50.0	4/10/19	7.53	6.72	19.0	1020	0.37	-107.6
ALF-217	49.8 - 71.8	60.8	4/11/19	0.48	7.10	18.9	680	0.60	-125.9
ALF-217A	182.8 - 192.8	187.8	4/11/19	0.63	6.87	18.7	685	0.56	-136.7
ALF-217B	121.8 - 131.8	126.8	4/11/19	5.98	6.94	18.5	1033	1.10	-132.8
ALF-P4	71.7 - 81.8	77.0	4/16/19	3.86	7.25	18.4	230.2	0.61	-111.5
ALF-P4S	29.7 - 49.7	41.0	4/16/19	3.46	7.03	15.2	350.3	0.46	11.9
ALF-PMW02A	19.43 - 40.43	29.0	4/16/19	18.7	10.42	18.0	888	0.36	103.5
ALF-PMW02B	48.8 - 58.8	54.0	4/16/19	7.16	6.86	18.9	511.7	0.54	115.8
ALF-PMW02C	119.7 - 129.7	124.0	4/15/19	5.47	6.85	16.9	349	0.25	348.8

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Table 4a
Groundwater Field Parameter Data (ALF and ACC Monitoring Wells) - April 2019
TVA Allen Fossil Plant
Memphis, Tennessee

Well ID	Screened Interval (ft btoc)	Pump Inlet Depth (ft btoc)	Date	Turbidity (NTU)	pH (SU)	Temperature (C)	Specific Conductance (µS/cm)	DO (mg/L)	ORP (mV)
ALF-PMW04A	19.7 - 40.7	29.0	4/16/19	1.67	7.62	18.1	870	0.46	-14.1
ALF-PMW04B	52.4 - 62.4	57.0	4/16/19	1.22	7.15	17.7	693	0.37	-146.3
ALF-PMW04C	119.7 - 129.7	124.0	4/16/19	1.74	7.13	17.2	366.6	0.42	-96.5
ALF-PMW07A	19.3 - 29.3	24.0	4/16/19	6.03	9.44	17.5	804	0.53	114.3
ALF-PMW07B	49.9 - 59.9	55.0	4/16/19	4.06	6.44	17.1	561.2	0.73	113.7
ALF-PMW07C	108.0 - 118.0	117.0	4/16/19	3.42	6.69	16.4	351.3	0.42	3.4
ALF-PMW10A	142.4 - 152.4	32.0	4/10/19	4.08	7.18	19.1	536.9	0.35	94.9
ALF-PMW10B	63.3 - 73.28	68.0	4/10/19	3.56	7.44	20.8	875	0.55	9.6
ALF-PMW10C	142.4 - 152.4	148.0	4/10/19	1.36	6.85	19.5	442.4	0.40	23.6
ALF-PMW11A	17.0 - 38.0	27.0	4/11/19	9.78	7.10	19.2	576	0.39	9.3
ALF-PMW11B	142.4 - 152.4	63.0	4/11/19	1.11	7.07	19.8	673.0	0.42	-26.0
ALF-PMW11C	139.4 - 149.4	144.0	4/11/19	1.16	6.80	19.4	512.8	0.55	26.2
ALF-PMW14A	38.9 - 59.9	49.0	4/11/19	1.05	6.94	20.0	649	0.62	6.5
ALF-PMW14B	79.9 - 89.0	85.0	4/11/19	2.9	6.88	18.9	688	0.28	-22.3
ALF-PMW14C	152.3 - 162.3	156.0	4/11/19	1.03	6.75	18.6	398.2	0.34	-9.4

Notes:
Data reported reflects the last reading collected during purging.
C - Celsius
ft - Feet
ft btoc - Feet below top of casing
mg/L - Milligrams per liter
mV - Millivolts
NTUs - Nephelometric Turbidity Units
SU - Standard Units
µS/cm - Micro-siemens per centimeter

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Table 4b
Groundwater Field Parameter Data (ALF and ACC Monitoring Wells) - June 2019
TVA Allen Fossil Plant
Memphis, Tennessee

Well ID	Screened Interval (ft btoc)	Pump Inlet Depth (ft btoc)	Date	Turbidity (NTU)	pH (SU)	Temperature (C)	Specific Conductance (µS/cm)	DO (mg/L)	ORP (mV)
ACC-3A	120.4 - 130.4	126.0	6/21/2019	1.13	6.78	19.2	879	0.21	-69.5
ACC-5A	133.5 - 143.5	139.0	6/26/2019	4.36	6.21	20.8	754	0.46	-27.3
ACC-5B	50.2 - 60.2	55.5	6/26/2019	1.56	6.51	19.9	909	0.15	-67
ALF-201	23.3 - 49.9	49.0	6/20/2019	2.09	6.53	21.5	765	0.5	16.0
ALF-201A	120.3 - 130.3	126.0	6/20/2019	0.56	6.48	21.3	642	0.17	-62.4
ALF-201B	83.9 - 93.9	89.0	6/21/2019	2.43	6.78	21.6	906	0.62	-71.7
ALF-202	23.4 - 44.6	43.0	6/26/2019	1.02	7.17	19.7	615	0.09	-167.4
ALF-202A	140.1 - 150.1	145.5	6/26/2019	0.81	6.57	20.3	585	0.17	-82.5
ALF-202B	84.1 - 94.1	89.5	6/26/2019	2.35	6.68	19.5	646	0.12	-115.5
ALF-203	33.1 - 54.1	52.0	6/21/2019	2.90	9.34	20.1	1072	0.06	-122.1
ALF-203A	112.3 - 122.3	118.0	6/24/2019	1.85	6.43	18.6	350.1	1.15	-68.9
ALF-203B	83.9 - 93.9	89.0	6/24/2019	0.85	6.76	18.9	543	0.14	-114.0
ALF-204	49.0 - 59.2	49.0	6/25/2019	1.43	7.20	19.1	551.6	0.20	-166.1
ALF-204A	110.3 - 120.3	116.0	6/25/2019	1.02	7.06	18.6	391.7	0.11	-81.7
ALF-204B	83.7 - 93.7	89.0	6/25/2019	3.59	7.14	17.3	315.0	0.12	-75.4
ALF-205	34.5 - 55.5	54.0	6/25/2019	0.94	7.14	19.8	926	0.14	-44.2
ALF-205A	102.0 - 112.0	107.0	6/25/2019	1.70	7.22	17.7	327.7	0.07	-96.0
ALF-205B	76.1 - 86.1	81.5	6/25/2019	3.70	7.45	18.1	307.3	0.07	-122.5
ALF-206	54.0 - 64.2	54.0	6/24/2019	1.46	7.41	17.1	360.3	0.10	-160.7
ALF-210	27.2 - 48.1	47.0	6/19/2019	17.5	6.53	20.4	846	0.17	0.3
ALF-210A	120.0 - 130.0	125.0	6/19/2019	7.28	6.63	20.6	1279	1.60	-83.0
ALF-212	71.0 - 81.2	67.0	6/20/2019	1.17	7.03	20.7	721	0.29	-130.4
ALF-212A	159.4 - 169.4	165.0	6/21/2019	1.31	6.87	20.6	588	0.21	-102.5
ALF-213	71.0 - 81.2	71.0	6/24/2019	0.87	7.31	18.6	398.3	0.16	-159.2
ALF-213A	152.8 - 162.8	157.8	6/24/2019	0.70	6.92	17.7	324.4	0.16	-115.3
ALF-213B	111.75 - 121.8	116.8	6/24/2019	1.42	7.03	20.3	856	0.19	-118.8
ALF-214	34.5 - 54.5	45.0	6/20/2019	2.61	6.80	18.8	481.2	1.63	144.6
ALF-214A	122.6 - 132.6	130.0	6/20/2019	2.07	6.12	19.8	1131	1.14	-50.2
ALF-214B	82.9 - 92.9	88.0	6/20/2019	4.57	6.42	19.2	859	0.80	-86.4
ALF-215	20.0 - 30.0	25.0	6/19/2019	1.01	6.84	17.8	497.5	2.54	14.6
ALF-217	49.8 - 71.8	60.8	6/21/2019	0.39	6.71	19.7	732	0.56	-102.1
ALF-217A	182.8 - 192.8	187.8	6/21/2019	2.47	6.51	19.2	697	0.26	-116.9
ALF-217B	121.8 - 131.8	126.8	6/25/2019	1.34	6.42	19.3	1089	0.24	-95.0
ALF-P4	71.7 - 81.8	75.0	6/24/2019	2.16	6.79	18.2	297.0	0.22	-31.0
ALF-P4S	29.7 - 49.7	41.0	6/24/2019	1.15	6.73	18.6	430	0.30	36.3
ALF-PMW02A	19.43 - 40.43	29.0	6/26/2019	14.9	10.35	18.8	930	0.03	27.5
ALF-PMW02B	48.8 - 58.8	54.0	6/26/2019	3.51	7.30	20.1	620	0.19	-138.5
ALF-PMW02C	119.7 - 129.7	124.0	6/26/2019	3.02	7.10	17.7	338.3	0.08	-102.2
ALF-PMW04A	19.7 - 40.7	29.0	6/25/2019	0.64	7.42	19.0	948	0.20	30.3
ALF-PMW04B	52.4 - 62.4	57.0	6/25/2019	1.05	6.83	18.2	737	0.16	-138.1

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Table 4b
Groundwater Field Parameter Data (ALF and ACC Monitoring Wells) - June 2019
TVA Allen Fossil Plant
Memphis, Tennessee

Well ID	Screened Interval (ft btoc)	Pump Inlet Depth (ft btoc)	Date	Turbidity (NTU)	pH (SU)	Temperature (C)	Specific Conductance (µS/cm)	DO (mg/L)	ORP (mV)
ALF-PMW04C	119.7 - 129.7	124.0	6/25/2019	1.71	6.49	18.8	415.1	0.14	-40.3
ALF-PMW07A	19.3 - 29.3	24.0	6/26/2019	5.26	9.10	19.3	872	0.07	-53.0
ALF-PMW07B	49.9 - 59.9	55.0	6/26/2019	2.04	7.13	18.5	719	0.25	-135.9
ALF-PMW07C	108.0 - 118.0	117.0	6/26/2019	5.14	7.43	18.2	348.6	0.19	-94.4
ALF-PMW10A	142.4 - 152.4	32.0	6/19/2019	0.27	7.46	19.8	529.6	0.95	-142.2
ALF-PMW10B	63.3 - 73.28	68.0	6/19/2019	1.41	7.41	20.6	871	0.09	-198.7
ALF-PMW10C	142.4 - 152.4	148.0	6/20/2019	0.55	6.92	18.9	441.1	0.12	-98.7
ALF-PMW11A	17.0 - 38.0	27.0	6/21/2019	1.70	7.04	20.4	643	0.64	57.0
ALF-PMW11B	142.4 - 152.4	63.0	6/21/2019	4.41	7.14	21.2	754	0.15	-145.8
ALF-PMW11C	139.4 - 149.4	144.0	6/21/2019	4.15	7.18	21.7	494.5	0.16	-99.9
ALF-PMW14A	38.9 - 59.9	49.0	6/20/2019	0.74	7.01	19.4	627	0.21	-125.6
ALF-PMW14B	79.9 - 89.0	85.0	6/20/2019	2.80	7.01	19.5	688	0.07	-161.0
ALF-PMW14C	152.3 - 162.3	156.0	6/20/2019	1.11	6.96	18.8	384.8	0.16	-115.5

Notes:
Data reported reflects the last reading collected during purging.
C - Celsius
ft - Feet
ft btoc - Feet below top of casing
mg/L - Milligrams per liter
mV - Millivolts
NTUs - Nephelometric Turbidity Units
SU - Standard Units
µS/cm - Micro-siemens per centimeter

Table 4c
Groundwater Field Parameter Data (ALF and ACC Monitoring Wells) - September 2019
TVA Allen Fossil Plant
Memphis, Tennessee

Well ID	Screened Interval (ft btoc)	Pump Inlet Depth (ft btoc)	Date	Turbidity (NTU)	pH (SU)	Temperature (C)	Specific Conductance (µS/cm)	DO (mg/L)	ORP (mV)
ACC-1A	160.1-170.1	165.5	9/11/2019	1.55	6.30	20.5	566	0.41	-89.9
ACC-3A	120.4 - 130.4	126.0	9/11/2019	2.63	6.54	19.8	794	0.32	-93.5
ACC-5A	133.6 - 143.6	139.0	9/11/2019	3.09	6.37	21.8	629	0.37	-52.9
ACC-5B	50.2 - 60.2	55.5	9/11/2019	1.01	6.55	20.3	802	0.33	-53.7
ALF-201	23.3 - 49.9	49.0	9/12/2019	7.16	6.72	24.4	773	0.94	15.7
ALF-201A	120.3 - 130.3	126.0	9/12/2019	3.92	6.95	22.6	644	0.39	-110.1
ALF-201B	83.9 - 93.9	89.0	9/13/2019	6.05	6.68	21.1	735	0.23	-123.9
ALF-202	23.4 - 44.6	43.0	9/18/2019	1.06	7.88	20.2	558	0.34	-173.8
ALF-202A	140.1 - 150.1	145.5	9/18/2019	3.76	6.92	24.9	564	0.62	-95.0
ALF-202B	84.1 - 94.1	89.5	9/18/2019	1.50	7.14	19.8	616	0.13	-136.0
ALF-203	33.1 - 54.1	52.0	9/13/2019	1.18	10.03	23.4	1074	0.71	-76.8
ALF-203A	112.3 - 122.3	118.0	9/13/2019	5.10	6.31	19.9	346.6	0.25	-59.1
ALF-203B	83.9 - 93.9	89.0	9/16/2019	6.50	7.11	21.3	458.9	0.29	-139.2
ALF-204	49.0 - 59.2	49.0	9/17/2019	3.70	6.73	21.7	465.5	0.50	-129.5
ALF-204A	110.3 - 120.3	116.0	9/17/2019	4.27	6.74	17.9	356.7	0.36	-74.4
ALF-204B	83.7 - 93.7	89.0	9/18/2019	1.03	6.45	16.7	293.7	0.28	5.8
ALF-205	34.5 - 55.5	54.0	9/18/2019	0.40	6.81	21.3	897	0.76	-25.2
ALF-205A	102.0 - 112.0	107.0	9/18/2019	1.31	6.57	18.0	300.2	0.28	-55.9
ALF-205B	76.1 - 86.1	81.5	9/18/2019	1.78	6.77	18.3	273.6	0.31	-65.3
ALF-206	54.0 - 64.2	54.0	9/18/2019	0.65	6.85	18.4	312.1	0.43	-89.8
ALF-210	27.2 - 48.1	47.0	9/11/2019	69.0	6.74	23.2	799	0.85	-25.2
ALF-210A	120.0 - 130.0	125.0	9/11/2019	3.97	6.94	22.5	1078	0.20	-114.7
ALF-212	51.8 - 67.8	67.0	9/13/2019	2.43	6.84	22.9	652	0.46	-121.3
ALF-212A	159.4 - 169.4	165.0	9/13/2019	1.83	6.50	18.8	571	0.27	-103.4
ALF-213	71.0 - 81.2	71.0	9/20/2019	0.56	6.71	19.9	482.2	0.39	-99.8
ALF-213A	152.4 - 162.4	157.8	9/20/2019	1.35	6.56	18.1	295.8	0.33	-50.0
ALF-213B	111.4 - 121.4	116.8	9/20/2019	4.10	6.78	18.8	779	0.40	-86.6
ALF-214	34.5 - 54.5	45.0	9/11/2019	3.01	7.19	21.4	463.4	0.57	-5.0
ALF-214A	122.6 - 132.6	130.0	9/12/2019	2.15	6.41	20.6	1129	0.36	-71.9
ALF-214B	82.9 - 92.9	88.0	9/12/2019	6.63	6.63	22.2	785	0.83	-95.6
ALF-215	20.0 - 30.0	25.0	9/12/2019	0.58	6.50	19.6	417.0	0.37	-54.0
ALF-216	39.6 - 59.6	50.0	9/11/2019	2.64	6.47	20.4	837	0.32	-113.7
ALF-217	49.4 - 71.4	60.8	9/20/2019	1.09	7.08	19.6	675	0.28	-116.6
ALF-217A	182.4 - 192.4	187.8	9/20/2019	2.61	6.88	19.2	698	0.19	-142.4
ALF-217B	121.4 - 131.4	126.8	9/20/2019	7.02	6.79	19.8	761	0.28	-112.7
ALF-P4	71.7 - 81.8	75.0	9/16/2019	2.70	7.12	17.7	230.3	0.18	-109.9
ALF-P4S	29.7 - 49.7	41.0	9/16/2019	3.98	7.22	17.8	375.3	0.34	-34.2
ALF-PMW02A	19.43 - 40.43	29.0	9/17/2019	27.7	10.39	20.6	992	0.18	-76.1
ALF-PMW02B	48.4 - 58.4	54.0	9/17/2019	8.14	6.47	23.0	393.0	0.79	-101.9
ALF-PMW02C	119.3 - 129.3	124.0	9/17/2019	3.81	6.13	19.0	329.7	0.22	-50.4

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Table 4c
Groundwater Field Parameter Data (ALF and ACC Monitoring Wells) - September 2019
TVA Allen Fossil Plant
Memphis, Tennessee

Well ID	Screened Interval (ft btoc)	Pump Inlet Depth (ft btoc)	Date	Turbidity (NTU)	pH (SU)	Temperature (C)	Specific Conductance (µS/cm)	DO (mg/L)	ORP (mV)
ALF-PMW04A	19.3 - 40.3	29.0	9/17/2019	1.49	7.24	20.5	740	0.33	-62.2
ALF-PMW04B	52.4 - 62.4	57.0	9/17/2019	4.28	6.71	18.0	684	0.15	-170.1
ALF-PMW04C	119.3 - 129.3	124.0	9/17/2019	3.08	6.60	18.8	339.9	0.37	-124.0
ALF-PMW07A	18.8 - 28.9	24.0	9/18/2019	1.96	8.44	19.8	912	0.10	-176.3
ALF-PMW07B	49.5 - 59.5	55.0	9/18/2019	6.31	7.16	18.2	531.2	0.18	-128.0
ALF-PMW07C	112.5 - 122.5	117.0	9/18/2019	2.48	6.90	20.4	336.6	0.27	-65.5
ALF-PMW10A	22.6-43.6	32.0	9/12/2019	0.74	7.19	21.1	510.0	0.41	-83.1
ALF-PMW10B	62.9 - 72.9	68.0	9/12/2019	2.38	7.01	23.5	797	0.42	-163.2
ALF-PMW10C	142.4 - 152.4	148.0	9/12/2019	1.18	6.61	20.4	482.6	0.33	-99.6
ALF-PMW11A	16.6 - 37.6	27.0	9/17/2019	0.49	6.66	21.8	577	0.31	-82.0
ALF-PMW11B	57.3 - 67.3	63.0	9/17/2019	1.01	6.88	21.1	517.0	0.28	-134.1
ALF-PMW11C	139.4 - 149.4	144.0	9/17/2019	6.59	6.74	24.4	556.0	0.31	-104.1
ALF-PMW14A	38.5 - 59.5	49.0	9/16/2019	0.78	6.81	20.8	640	0.39	-100.7
ALF-PMW14B	79.5 - 89.5	85.0	9/16/2019	2.77	6.54	19.5	653	0.32	-119.3
ALF-PMW14C	151.9 - 161.9	156.0	9/16/2019	3.20	6.45	19.2	364.4	0.29	-96.9

Notes:
Data reported reflects the last reading collected during purging.
C - Celsius
ft - Feet
ft btoc - Feet below top of casing
mg/L - Milligrams per liter
mV - Millivolts
NTUs - Nephelometric Turbidity Units
SU - Standard Units
µS/cm - Micro-siemens per centimeter

Table 4d
Groundwater Field Parameter Data (ALF and ACC Monitoring Wells) - December 2019
TVA Allen Fossil Plant
Memphis, Tennessee

Well ID	Screened Interval (ft btoc)	Pump Inlet Depth (ft btoc)	Date	Turbidity (NTU)	pH (SU)	Temperature (C)	Specific Conductance (µS/cm)	DO (mg/L)	ORP (mV)
ACC-1A	160.1-170.1	165.5	12/11/2019	1.39	6.69	17.2	560.2	0.23	-67.5
ACC-3A	120.4 - 130.4	126.0	12/11/2019	2.45	6.81	18.1	820	0.14	-73.6
ACC-5A	133.6 - 143.6	139.0	12/11/2019	1.77	6.60	18.6	640	0.13	-45.2
ACC-5B	50.2 - 60.2	55.5	12/11/2019	1.45	6.82	18.6	842	0.19	-53.6
ALF-201	23.3 - 49.9	49.0	12/13/2019	4.77	7.07	19.3	701	0.27	-31.1
ALF-201A	120.3 - 130.3	126.0	12/13/2019	2.52	7.26	19.6	725	0.60	-73.1
ALF-201B	83.9 - 93.9	89.0	12/13/2019	1.04	7.17	19.8	747	0.13	-91.2
ALF-202	23.4 - 44.6	43.0	12/19/2019	0.77	7.86	18.6	553.9	0.07	-151.4
ALF-202A	140.1 - 150.1	145.5	12/19/2019	3.90	6.73	16.9	531.1	0.10	-27.6
ALF-202B	84.1 - 94.1	89.5	12/19/2019	0.88	7.71	17.9	657	0.11	-127.6
ALF-203	33.1 - 54.1	52.0	12/13/2019	1.24	10.45	17.6	866	0.22	-100.7
ALF-203A	112.3 - 122.3	118.0	12/13/2019	1.71	8.19	17.4	354.2	0.12	-75.5
ALF-203B	83.9 - 93.9	89.0	12/13/2019	3.94	7.38	17.2	468	0.58	-121.1
ALF-204	49.0 - 59.2	49.0	12/18/2019	3.19	6.84	15.4	438.9	0.24	-70.1
ALF-204A	110.3 - 120.3	116.0	12/18/2019	3.89	6.82	15.3	370.2	0.13	-53.7
ALF-204B	83.7 - 93.7	89.0	12/18/2019	1.10	6.75	15.5	288.2	0.07	-35.8
ALF-205	34.5 - 55.5	54.0	12/19/2019	0.93	7.22	15.4	862	0.24	147.7
ALF-205A	102.0 - 112.0	107.0	12/19/2019	2.56	7.26	16.0	307.7	0.13	-15.6
ALF-205B	76.1 - 86.1	81.5	12/19/2019	1.51	7.36	16.2	271.6	0.06	-78.1
ALF-206	54.0 - 64.2	54.0	12/18/2019	0.69	6.83	15.2	316.1	0.18	-41.6
ALF-210	27.2 - 48.1	47.0	12/12/2019	21.4	6.75	16.7	787	0.81	-27.9
ALF-210A	120.0 - 130.0	125.0	12/11/2019	3.60	7.06	18.3	1152	0.41	-87.1
ALF-212	51.8 - 67.8	67.0	12/13/2019	3.53	6.91	17.9	564.8	0.16	-114.2
ALF-212A	159.4 - 169.4	165.0	12/13/2019	1.26	6.72	17.3	530.7	0.06	-93.6
ALF-213	71.0 - 81.2	71.0	12/12/2019	1.12	6.98	16.9	373.0	0.26	-134.7
ALF-213A	152.4 - 162.4	157.8	12/12/2019	1.23	6.79	16.6	302.9	0.15	-98.2
ALF-213B	111.4 - 121.4	116.8	12/12/2019	2.89	6.89	16.7	791	0.16	-120.5
ALF-214	34.5 - 54.5	45.0	12/12/2019	0.88	7.37	18.1	676	0.43	34.1
ALF-214A	122.6 - 132.6	130.0	12/12/2019	1.62	6.81	18.0	1089	0.15	-30.0
ALF-214B	82.9 - 92.9	88.0	12/12/2019	2.09	6.78	17.8	797	0.14	-80.9
ALF-215	20.0 - 30.0	25.0	12/17/2019	0.85	6.97	15.4	351.6	0.57	-77.7
ALF-216	39.6 - 59.6	50.0	12/11/2019	0.62	6.74	18.0	871	0.16	-100.8
ALF-217	49.4 - 71.4	60.8	12/12/2019	0.51	7.00	17.5	633	0.22	-102.1
ALF-217A	182.4 - 192.4	187.8	12/12/2019	2.40	6.71	16.7	605	0.27	-117.1
ALF-217B	121.4 - 131.4	126.8	12/12/2019	2.08	6.77	16.8	890	0.13	-115.6
ALF-P4	71.7 - 81.8	75.0	12/17/2019	0.94	7.56	15.9	467.5	0.17	-60.8
ALF-P4S	29.7 - 49.7	41.0	12/17/2019	0.59	7.26	17.6	528.8	0.14	-13.8
ALF-PMW02A	19.43 - 40.43	29.0	12/18/2019	8.02	10.58	18.8	936	0.16	-21.4
ALF-PMW02B	48.4 - 58.4	54.0	12/18/2019	3.73	7.37	16.1	703	0.26	-119.0
ALF-PMW02C	119.3 - 129.3	124.0	12/18/2019	3.81	7.49	15.6	392.5	0.17	-76.6

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Table 4d
Groundwater Field Parameter Data (ALF and ACC Monitoring Wells) - December 2019
TVA Allen Fossil Plant
Memphis, Tennessee

Well ID	Screened Interval (ft btoc)	Pump Inlet Depth (ft btoc)	Date	Turbidity (NTU)	pH (SU)	Temperature (C)	Specific Conductance (µS/cm)	DO (mg/L)	ORP (mV)
ALF-PMW04A	19.3 - 40.3	29.0	12/17/2019	0.98	7.38	18.5	888	0.18	21.1
ALF-PMW04B	52.4 - 62.4	57.0	12/17/2019	1.01	7.43	16.3	676	0.08	-142.6
ALF-PMW04C	119.3 - 129.3	124.0	12/17/2019	4.88	7.27	15.9	405.5	0.13	-79.6
ALF-PMW07A	18.8 - 28.9	24.0	12/19/2019	2.81	8.96	17.8	902	0.49	-39.4
ALF-PMW07B	49.5 - 59.5	55.0	12/19/2019	3.78	7.31	16.2	758	0.22	-101.5
ALF-PMW07C	112.5 - 122.5	117.0	12/18/2019	2.55	7.43	16.8	389.2	0.13	-63.2
ALF-PMW10A	22.6-43.6	32.0	12/13/2019	0.55	7.10	18.3	422.5	0.28	-60.3
ALF-PMW10B	62.9 - 72.9	68.0	12/13/2019	1.93	6.97	17.1	787	0.24	-134.4
ALF-PMW10C	142.4 - 152.4	148.0	12/13/2019	0.95	6.86	18.0	464.5	0.11	-105
ALF-PMW11A	16.6 - 37.6	27.0	12/17/2019	8.63	7.06	18.7	555.8	0.11	-108.1
ALF-PMW11B	57.3 - 67.3	63.0	12/17/2019	0.83	7.01	17.4	578.6	0.19	-111.0
ALF-PMW11C	139.4 - 149.4	144.0	12/17/2019	3.89	6.78	18.4	566.6	0.10	-101.2
ALF-PMW14A	38.5 - 59.5	49.0	12/17/2019	0.89	6.84	15.9	682	0.25	-39.5
ALF-PMW14B	79.5 - 89.5	85.0	12/17/2019	1.28	6.92	16.5	677	0.09	-119.7
ALF-PMW14C	151.9 - 161.9	156.0	12/17/2019	1.07	6.86	16.8	366.7	0.08	-88.6

Notes:
Data reported reflects the last reading collected during purging.
C - Celsius
ft - Feet
ft btoc - Feet below top of casing
mg/L - Milligrams per liter
mV - Millivolts
NTUs - Nephelometric Turbidity Units
SU - Standard Units
µS/cm - Micro-siemens per centimeter

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Table 5a
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - April 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ACC1	ACC3	ACC5B	ACC5A	ALF201	ALF201B	ALF201A	ALF202	ALF202B	ALF202A	ALF203
		Sampling Date	10-Apr-19	10-Apr-19	10-Apr-19	10-Apr-19	15-Apr-19	15-Apr-19	15-Apr-19	10-Apr-19	10-Apr-19	10-Apr-19	15-Apr-19
		Depth (ft toc)	**165.5**	**126**	**55.5**	**139**	**49**	**89**	**126**	**43**	**89.5**	**145.5**	**52**
Speciated Arsenic (ug/L)	**MCL**	**Background**											
Arsenic III	-	NC	1.36 J	0.400 U	0.400 U	1.57 J	0.400 U	2.18	0.400 U	5.43	2.16	0.400 U	1340
Arsenic V	-	NC	0.953 J	0.400 U	0.400 U	0.463 J	0.567 U*	0.695 U*	0.400 U	281	0.650 J	0.506 J	194
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U
General Chemistry (mg/L)													
Alkalinity, Total as CaCO3	-	560	313	469	465	269	377 J	285 J	210 J	96.6	229	209	177 J
Alkalinity, Bicarbonate (CaCO3)	-	5.0	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	95.2 J
Alkalinity, Carbonate (CaCO3)	-	560	313	469	465	269	377 J	285 J	210 J	96.6	229	209	272 J
Chloride	-	23	5.7	6.5	4.5	16.8	6.6	15.4	20.2	15.0	15.3	15.9	15.0
Fluoride	4	0.23	0.12	0.094 J	0.15 J	0.074 J	0.72	0.44	0.25	3.3 J	0.19 J	0.19 J	3.2
Sulfate	-	130	1.9	20.2	29.9	94.3	48.6	113	69.6	107	69.2	28.4	209
Total Dissolved Solids	-	620	311	497	508	434	488	524	350	386	372	283	708
pH (standard units)	-	6.0 - 7.7	6.8 J	6.9 J	7.0 J	6.8 J	7.7 J	7.6 J	7.6 J	7.4 J	7.0 J	7.1 J	9.1 J
Metals (ug/L)													
Antimony	6	2.5	2.5 U	2.5 U	2.5 U	2.5 U	0.12 J	5.0 U	0.50 U	2.5 U	2.5 U	2.5 U	5.0 U
Arsenic	10	9.8	1.9	0.38 J	0.32 J	1.7	0.55	2.1	0.34	**287**	2.5	0.60	**1340**
Barium	2000	1100	476	869	598	78.0	190 J	118 J	127 J	47.6	405	259	91.8 J
Beryllium	4	0.5	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	5.0 U	1.0 U	0.50 U	0.50 U	0.50 U	5.0 U
Boron	-	240	112 J	210 J	158 J	48.4 J	1160	5190	411	5520 J	2380 J	2110 J	4750
Cadmium	5	0.4	0.40 U	0.40 U	0.40 U	0.40 U	0.080 U	0.80 U	0.080 U	0.40 U	0.40 U	0.40 U	1.1
Calcium	-	160000	64200	119000	134000	83000	96800	67000	47200	21000	76200	53300	35600
Chromium	100	2.5	2.5 U	2.5 U	2.5 U	2.5 U	0.50 UJ	5.0 UJ	0.50 UJ	2.5 U	2.5 U	2.5 U	5.0 UJ
Cobalt	6 (a)	7.1	0.52	0.50 U	3.3	0.50 U	0.14	1.0 U	0.051 J	0.50 U	0.50 U	0.50 U	1.0 U
Copper	1300 (b)	1.7	2.5 U	2.5 U	2.5 U	2.5 U	0.38 U*	5.0 U	1.2 U*	2.5 U	2.5 U	2.5 U	27.1
Lead	15	0.5	0.50 U	0.50 U	0.50 U	0.50 U	0.10 U	1.0 U	0.10 U	0.35 J	0.50 U	0.50 U	**25.6**
Lithium	40 (a)	34	12.5 U	6.7 J	16.2	12.5 U	13.9	18.4 J	3.5	6.0 J	5.7 J	3.3 J	4.9 J
Magnesium	-	47000	30800	37200	31500	29700	22800	19000	13100	4970	20000	18900	9460
Mercury	2	0.2	0.11 U*	0.11 U*	0.20 U	0.11 U*	0.20 U	0.20 U	0.20 U	0.11 U*	0.12 U*	0.15 U*	0.20 U
Molybdenum	100 (a)	2.0	2.5 U	2.5 U	2.5 U	2.5 U	94.1	272	13.4	357	137	197	306
Nickel	100 (c)	12.0	1.2 J	2.5 U	6.8	2.5 U	0.94	5.0 U	0.24 J	0.68 J	2.5 U	2.5 U	4.4 J
Potassium	-	3500	2580	3140	2120	2520	2010	3860	2440	1830	2970	2520	1460
Selenium	50	2.5	2.5 U	2.5 U	2.5 U	2.5 U	2.0	5.0 U	0.50 U	2.5 U	2.5 U	2.5 U	3.5 J
Silver	-	2.0	2.0 U	2.0 U	2.0 U	2.0 U	0.40 U	4.0 U	0.40 U	2.0 U	2.0 U	2.0 U	4.0 U
Sodium	-	21000	10300	11300	7790	12400	20900	52300	36100	91800	16800	19500	131000
Thallium	2	0.5	0.50 U	0.50 U	0.50 U	0.50 U	0.10 U	1.0 U	0.10 U	0.50 U	0.50 U	0.50 U	1.0 U
Vanadium	-	1.5	1.5 U	1.5 U	1.5 U	1.5 U	0.30 U	3.0 U	0.30 U	1.8	1.5 U	1.5 U	9.8
Zinc	-	10	25.0 U	25.0 U	25.0 U	25.0 U	5.0 U	50.0 U	5.0 U	25.0 U	25.0 U	25.0 U	50.0 U
Radium (pCi/L)													
Radium-226	-	NC	0.647+-0.605 U	1.77+-0.639	0.729+-0.468 U*	0.255+-0.400 U	2.39+-1.03	0.555+-0.520 U	0.220+-0.382 U	0.160+-0.482 U	0.203+-0.520 U	0.504+-0.521 U	1.24+-0.865
Radium-228	-	NC	0.337+-0.392 U	0.645+-0.302	1.09+-0.502	0.588+-0.415 U	0.697+-0.467 U	0.956+-0.500	-0.0116+-0.334 U	0.143+-0.427 U	0.547+-0.413 U	0.0110+-0.325 U	0.798+-0.605 U
Total Radium	5	3.8	0.984+-0.721 U	2.42+-0.707	1.82+-0.686 U*	0.843+-0.576 U	3.09+-1.13 J	1.51+-0.721 J	0.220+-0.507 U	0.303+-0.644 U	0.750+-0.664 U	0.515+-0.614 U	2.04+-1.06 J

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Table 5a
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - April 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ALF203B	ALF203A	ALF204	ALF204B	ALF204A	ALF205	ALF205B	ALF205A	ALF206	ALF210	ALF210-F
		Sampling Date	15-Apr-19	15-Apr-19	16-Apr-19	16-Apr-19	16-Apr-19	12-Apr-19	12-Apr-19	12-Apr-19	09-Apr-19	09-Apr-19	09-Apr-19
		Depth (ft toc)	**89**	**118**	**49**	**89**	**116**	**54**	**81.5**	**107**	**54**	**47**	**47**
Speciated Arsenic (ug/L)	**MCL**	**Background**											
Arsenic III	-	NC	7.90	0.400 U	6.24	5.06	0.492 J	0.694 J	4.18	0.400 U	4.75	0.432 J	NA
Arsenic V	-	NC	3.85	0.400 U	3.80	0.664 U*	0.400 U	0.400 U	0.775 J	0.400 U	1.39 J	0.400 U	NA
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	NA
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	NA
General Chemistry (mg/L)													
Alkalinity, Total as CaCO3	-	560	173 J	123 J	219	107	172	401 J	129 J	125 J	135	466	NA
Alkalinity, Bicarbonate (CaCO3)	-	5.0	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	NA
Alkalinity, Carbonate (CaCO3)	-	560	173 J	123 J	219	107	172	401 J	129 J	125 J	135	466	NA
Chloride	-	23	12.3	16.1	13.3	14.3	15.6	15.6	14.3	16.6	13.6	0.96 J	NA
Fluoride	4	0.23	0.43	0.12	0.099 J	0.20	0.15	1.3	0.15	0.15	0.29	0.21	NA
Sulfate	-	130	36.6	30.3	32.6	31.0	8.7	90.6	18.7	16.4	30.9	12.9	NA
Total Dissolved Solids	-	620	269	190	306	185 J	214 J	603	190	180	205	472	NA
pH (standard units)	-	6.0 - 7.7	7.7 J	7.4 J	7.7 J	7.1 J	7.2 J	7.6 J	7.2 J	7.1 J	7.1 J	6.8 J	NA
Metals (ug/L)													
Antimony	6	2.5	2.5 U	0.50 U	0.50 U	0.50 U	0.50 U	25.0 U	5.0 U	5.0 U	0.50 U	0.50 U	0.50 U
Arsenic	10	9.8	9.8	0.17	**10.6**	5.7	0.65	5.0 U	5.0	0.67 J	5.6	1.3	0.68
Barium	2000	1100	108 J	189 J	182	105	291	165	221	308	222	291	280
Beryllium	4	0.5	2.0 U	0.50 U	0.10 U	0.10 U	0.10 U	5.0 U	1.0 U	1.0 U	0.10 UJ	0.10 U	0.10 UJ
Boron	-	240	925	255	421	410	103	6790	207 J	75.4 J	60.6	63.5	63.0
Cadmium	5	0.4	0.40 U	0.080 U	0.080 U	0.080 U	0.080 U	4.0 U	0.80 U	0.80 U	0.080 U	0.080 U	0.080 U
Calcium	-	160000	42500	28100	65600	34200	41100	101000	36100	30800	44300	141000	126000
Chromium	100	2.5	2.5 UJ	0.50 UJ	0.50 U	0.50 U	0.50 U	25.0 U	5.0 U	5.0 U	0.50 U	4.5	0.50 U
Cobalt	6 (a)	7.1	0.50 U	0.10 U	0.42	0.46	0.067 J	5.0 U	1.0 U	1.0 U	0.061 J	2.3	2.4
Copper	1300 (b)	1.7	2.5 U	0.50 U	0.70	0.70	0.50 U	25.0 U	5.0 U	5.0 U	0.50 U	0.35 U*	0.62 U*
Lead	15	0.5	0.50 U	0.10 U	0.055 J	0.22	0.10 U	5.0 U	1.0 U	1.0 U	0.10 U	0.10 U	0.10 U
Lithium	40 (a)	34	6.3 J	1.4 J	3.9	3.1	2.7	22.0 J	4.2 J	25.0 U	4.1 J	18.1 J	17.5
Magnesium	-	47000	9480	10700	14800	8360	12100	17700	9530	10400	8470	29300	29000
Mercury	2	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Molybdenum	100 (a)	2.0	88.5	0.74	10.5	53.8	2.6	135	1.0 J	1.4 J	2.1	1.7	1.7
Nickel	100 (c)	12.0	2.5 U	0.13 J	1.2	1.5	0.21 J	6.0 J	5.0 U	5.0 U	0.24 J	5.1 J	7.1 J
Potassium	-	3500	1170	1180	3080	2140	2120	2740	2400	2080	2220	2370	2340
Selenium	50	2.5	2.5 U	0.50 U	0.11 J	0.50 U	0.50 U	25.0 U	5.0 U	5.0 U	0.50 U	1.3	1.0
Silver	-	2.0	2.0 U	0.40 U	0.40 U	0.40 U	0.40 U	20.0 U	4.0 U	4.0 U	0.40 U	0.40 U	0.40 U
Sodium	-	21000	15400	12800	11400	13900	13500	80800	13000	14700	12900	3950	3860
Thallium	2	0.5	0.50 U	0.10 U	0.10 U	0.10 U	0.10 U	5.0 U	1.0 U	1.0 U	0.10 U	0.10 U	0.10 U
Vanadium	-	1.5	1.5 U	0.30 U	0.28 J	0.51	0.30 U	15.0 U	3.0 U	3.0 U	0.30 U	0.30 U	0.30 U
Zinc	-	10	25.0 U	5.0 U	44.6	9.7	2.3 J	250 U	50.0 U	50.0 U	5.0 U	1.7 J	4.2 J
Radium (pCi/L)													
Radium-226	-	NC	0.225+-0.441 U	0.722+-0.607 U	0.556+-0.391 J	0.533+-0.452 U	0.753+-0.492	1.23+-0.694 U*	0.0719+-0.546 U	0.483+-0.502 U	0.198+-0.389 U	0.503+-0.501 U	NA
Radium-228	-	NC	0.408+-0.404 U	0.595+-0.384 U	0.650+-0.339	0.210+-0.287 U	0.592+-0.321	0.531+-0.387 U	0.752+-0.467 U	0.732+-0.436 U	0.705+-0.426 U	0.355+-0.405 U	NA
Total Radium	5	3.8	0.633+-0.598 U	1.32+-0.718 U	1.21+-0.517 J	0.743+-0.535 U	1.35+-0.587	1.76+-0.795 U*	0.824+-0.718 U	1.22+-0.665 U	0.903+-0.577 U	0.858+-0.644 U	NA

Table 5a
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - April 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ALF210A	ALF212	ALF212A	ALF213	ALF213B	ALF213A	ALF214	ALF214B	ALF214A	ALF215	ALF216
		Sampling Date	09-Apr-19	11-Apr-19	11-Apr-19	11-Apr-19	11-Apr-19	11-Apr-19	12-Apr-19	12-Apr-19	12-Apr-19	09-Apr-19	10-Apr-19
		Depth (ft toc)	**125**	**67**	**165**	**71**	**117**	**158**	**45**	**88**	**130**	**30.4**	**50**
Speciated Arsenic (ug/L)	**MCL**	**Background**											
Arsenic III	-	NC	0.530 J	11.0	2.63	5.34	1.92 J	2.75	0.400 U	3.46	0.838 J	0.400 U	2.92
Arsenic V	-	NC	0.400 U	2.59	0.870 J	1.87 J	0.672 J	0.758 J	0.400 U	0.765 J	0.400 U	0.625 J	2.45
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U
General Chemistry (mg/L)													
Alkalinity, Total as CaCO3	-	560	307	376	258	149	398	122	286	204	199 J	286	532
Alkalinity, Bicarbonate (CaCO3)	-	5.0	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Alkalinity, Carbonate (CaCO3)	-	560	307	376	258	149	398	122	286	204	199 J	286	532
Chloride	-	23	78.5	17.0	41.5	15.7	54.7	18.8	1.8	36.8	59.8	1.2	3.8
Fluoride	4	0.23	0.084 J	1.3	0.16	0.43	0.10 U	0.20	0.26	0.11	0.083 J	0.21	0.068 J
Sulfate	-	130	239	6.2 J	1.0 U	14.1	1.0 U	20.5 J	17.1	199	315	17.3	48.2
Total Dissolved Solids	-	620	865	416	304	197	451	177	319	572	785	299	593
pH (standard units)	-	6.0 - 7.7	6.9 J	7.3 J	7.1 J	7.1 J	7.3 J	7.1 J	7.5 J	6.8 J	7.1 J	7.0 J	6.8 J
Metals (ug/L)													
Antimony	6	2.5	5.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.0 U	5.0 U	5.0 U	0.50 U	2.5 U
Arsenic	10	9.8	1.0 U	**12.7**	3.2	6.3	2.4	3.0	0.61 J	3.9	1.2	0.40	5.1
Barium	2000	1100	129	233	387	269	525	279	124	137	36.4	182	657
Beryllium	4	0.5	0.10 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	1.0 U	0.10 UJ	0.50 U
Boron	-	240	1890	1920	61.5 U*	159	35.4 U*	53.0 U*	359	167 J	131 J	149	201 J
Cadmium	5	0.4	0.80 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.80 U	0.80 U	0.80 U	0.080 U	0.40 U
Calcium	-	160000	155000	79500	65500	35800	103000	29000	79600	89400	127000	75100	156000
Chromium	100	2.5	5.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.0 U	5.0 U	5.0 U	0.50 U	2.5 U
Cobalt	6 (a)	7.1	1.0 U	0.31 J	0.50 U	0.50 U	0.28 J	0.50 U	1.0 U	1.0 U	1.0 U	0.34	0.62
Copper	1300 (b)	1.7	5.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.0 U	5.0 U	5.0 U	0.43 U*	2.5 U
Lead	15	0.5	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	1.0 U	0.053 J	0.50 U
Lithium	40 (a)	34	7.0 J	12.2 J	3.1 J	5.8 J	8.2 J	2.6 J	10.2 J	10.5 J	7.1 J	6.2 J	18.4
Magnesium	-	47000	33700	18600	23400	10600	26800	10400	16200	25400	37600	19300	40300
Mercury	2	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.11 U*
Molybdenum	100 (a)	2.0	5.0 U	35.7	1.3 J	3.5	2.4 J	0.96 J	1.8 J	5.0 U	5.0 U	3.0	2.5 U
Nickel	100 (c)	12.0	5.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	3.6 J	5.0 U	5.0 U	2.8	2.5 U
Potassium	-	3500	4240	2290	2610	2750	3410	2310	1050	2640	3220	682	2870
Selenium	50	2.5	5.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.0 U	5.0 U	5.0 U	1.5	2.5 U
Silver	-	2.0	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	4.0 U	4.0 U	4.0 U	0.40 U	2.0 U
Sodium	-	21000	59100	36300	11900	12900	17600	12000	8460 J	45600	43600	9210	8230
Thallium	2	0.5	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	1.0 U	0.10 U	0.50 U
Vanadium	-	1.5	3.0 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.2 J	3.0 U	3.0 U	0.38	1.5 U
Zinc	-	10	50.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	50.0 U	50.0 U	50.0 U	1.1 J	25.0 U
Radium (pCi/L)													
Radium-226	-	NC	0.517+-0.545 U	0.393+-0.557 U	0.459+-0.389 U	0.714+-0.646 U	1.04+-0.728	1.34+-0.852	0.218+-0.473 U	0.307+-0.563 U	0.284+-0.394 U	0.576+-0.513 U	0.330+-0.383 U
Radium-228	-	NC	0.512+-0.442 U	0.326+-0.326 U	0.752+-0.342 U*	0.444+-0.339 U	0.618+-0.368 U	0.372+-0.298 U	0.427+-0.355 U	0.640+-0.426 U	0.220+-0.379 U	0.433+-0.414 U	0.588+-0.445 U
Total Radium	5	3.8	1.03+-0.702 U	0.719+-0.645 U	1.21+-0.518 U*	1.16+-0.730 U	1.66+-0.816 J	1.71+-0.903 J	0.645+-0.591 U	0.947+-0.706 U	0.504+-0.547 U	1.01+-0.659 U	0.918+-0.587 U

Table 5a
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - April 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ALF217	ALF217B	ALF217A	P4S	P4	PMW02A	PMW02A-F	PMW02B	PMW02C	PMW04A	PMW04B
		Sampling Date	11-Apr-19	11-Apr-19	11-Apr-19	16-Apr-19	16-Apr-19	16-Apr-19	16-Apr-19	16-Apr-19	15-Apr-19	16-Apr-19	16-Apr-19
		Depth (ft toc)	**61**	**127**	**188**	**41**	**77**	**29**	**29**	**57**	**124**	**29**	**57**
Speciated Arsenic (ug/L)	**MCL**	**Background**											
Arsenic III	-	NC	35.4	10.2	5.46	1.06 J	1.51 J	11.0	NA	11.5	0.400 U	30.7	28.4
Arsenic V	-	NC	5.32	4.30	2.49	0.553 U*	0.414 U*	3620	NA	1.95 U*	0.400 U	2420	6.66
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	2.50 U	NA	0.500 U	0.500 U	2.50 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	4.50 U	NA	0.900 U	0.900 U	4.50 U	0.900 U
General Chemistry (mg/L)													
Alkalinity, Total as CaCO3	-	560	371	400	324	148 J	86.2 J	5.4	NA	207	124 J	218 J	254 J
Alkalinity, Bicarbonate (CaCO3)	-	5.0	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	187	NA	5.0 U	5.0 U	5.0 J	5.0 U
Alkalinity, Carbonate (CaCO3)	-	560	371	400	324	148 J	86.2 J	192	NA	207	124 J	218	254 J
Chloride	-	23	15.2	102	30.4	9.0	7.1	17.1	NA	14.9	15.5	14.9	18.8
Fluoride	4	0.23	2.3	0.12	0.10 U	0.39	0.29	3.0	NA	0.093 J	0.12	3.9	0.17
Sulfate	-	130	1.0 U	1.0 U	1.0 U	26.1	17.2	186	NA	46.0	29.0	162	83.7
Total Dissolved Solids	-	620	368	528	372	789 J	132 J	646 J	NA	315 J	195	586 J	443 J
pH (standard units)	-	6.0 - 7.7	7.4 J	7.0 J	7.0 J	8.0 J	7.9 J	10.0 J	NA	7.5 J	7.4 J	8.0 J	7.7 J
Metals (ug/L)													
Antimony	6	2.5	5.0 U	5.0 U	2.5 U	0.50 U	0.50 U	10.0 U	10.0 U	0.50 U	0.50 U	2.5 U	2.5 U
Arsenic	10	9.8	**36.8**	**13.4**	7.4	1.6	1.9	**3840**	**3660**	**12.9**	0.24	**2260**	**33.8**
Barium	2000	1100	218	967	459	53.9	101	46.9	26.7	119	211 J	59.6	348
Beryllium	4	0.5	1.0 U	1.0 U	0.50 U	0.10 U	0.10 U	2.0 U	2.0 U	0.10 U	0.10 U	0.50 U	0.50 U
Boron	-	240	1320	77.4 U*	31.8 U*	85.5	28.6	6950	7120	991	116	6850	4370
Cadmium	5	0.4	0.80 U	0.80 U	0.40 U	0.080 U	0.080 U	2.3	1.6 U	0.080 U	0.080 U	0.40 U	0.40 U
Calcium	-	160000	78200	127000	90800	41700	25000	6970	6290	63800	34000	38600	90900
Chromium	100	2.5	5.0 U	5.0 U	2.5 U	0.50 U	0.50 U	10.0 U	10.0 U	0.50 U	0.50 UJ	2.5 U	2.5 U
Cobalt	6 (a)	7.1	1.0 U	1.0 U	0.94	0.84	0.065 J	3.3	1.6 J	1.8	0.077 J	0.92	0.50 U
Copper	1300 (b)	1.7	5.0 U	5.0 U	2.5 U	0.36 J	0.50 U	59.9	14.7	0.66	0.50 U	3.6	2.5 U
Lead	15	0.5	1.0 U	1.0 U	0.50 U	0.072 J	0.17	**22.7**	8.1	0.21	0.095 J	0.50 U	0.50 U
Lithium	40 (a)	34	12.0 J	5.3 J	7.9 J	1.8 J	2.1 J	50.0 U	50.0 U	5.2	2.2 J	6.8 J	13.8
Magnesium	-	47000	17100	35900	20500	9700	5980	564	366	13400	7720	8080	21800
Mercury	2	0.2	0.20 U	0.20 U	0.20 U	0.20	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	0.20 U
Molybdenum	100 (a)	2.0	21.4	5.0 U	2.7	5.3	2.3	440	398	58.7	2.3	891	250
Nickel	100 (c)	12.0	5.0 U	1.1 J	0.93 J	2.1	0.34 J	20.7	15.8	2.3	0.22 J	9.1	2.5 U
Potassium	-	3500	4340	2990	2160	2160	1590	1670	1500	3100	1400	4170	2430
Selenium	50	2.5	5.0 U	5.0 U	2.5 U	0.50 U	0.50 U	6.3 J	3.9 J	0.14 J	0.50 U	0.46 J	2.5 U
Silver	-	2.0	4.0 U	4.0 U	2.0 U	0.40 U	0.40 U	8.0 U	8.0 U	0.40 U	0.40 U	2.0 U	2.0 U
Sodium	-	21000	34600	11000	10900	13000	9820	179000	169000	14400	11700 J	142000	13500
Thallium	2	0.5	1.0 U	1.0 U	0.50 U	0.10 U	0.10 U	2.0 U	2.0 U	0.10 U	0.10 U	0.50 U	0.50 U
Vanadium	-	1.5	3.0 U	3.0 U	1.5 U	0.29 J	0.33	71.1	65.9	0.91	0.30 U	5.0	1.5 U
Zinc	-	10	50.0 U	50.0 U	25.0 U	10.2	1.4 J	100 U	100 U	62.9	3.4 J	25.0 U	25.0 U
Radium (pCi/L)													
Radium-226	-	NC	0.383+-0.583 U	1.78+-0.849	1.36+-0.899	0.500+-0.392 J	0.478+-0.409 UJ	0.566+-0.443 J	NA	0.122+-0.379 UJ	0.712+-0.715 U	0.137+-0.312 UJ	0.782+-0.596 UJ
Radium-228	-	NC	0.354+-0.310 U	1.03+-0.388 U*	1.43+-0.458 U*	1.21+-0.525	0.663+-0.429 U	1.10+-0.892 U	NA	0.264+-0.429 U	0.218+-0.334 U	1.32+-0.523	0.693+-0.450 U
Total Radium	5	3.8	0.737+-0.660 U	2.81+-0.933 J	2.79+-1.01 J	1.71+-0.655 J	1.14+-0.593 UJ	1.67+-0.996 J	NA	0.386+-0.572 UJ	0.930+-0.789 U	1.46+-0.609 J	1.48+-0.747 UJ

Table 5a
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - April 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	PMW04C	PMW07A	PMW07B	PMW07C	PMW10A	PMW10B	PMW10C	PMW11A	PMW11B	PMW11C	PMW14A
		Sampling Date	16-Apr-19	16-Apr-19	16-Apr-19	16-Apr-19	10-Apr-19	10-Apr-19	10-Apr-19	11-Apr-19	11-Apr-19	11-Apr-19	11-Apr-19
		Depth (ft toc)	**124**	**24**	**55**	**117**	**32**	**68**	**148**	**27**	**63**	**144**	**45**
Speciated Arsenic (ug/L)	**MCL**	**Background**											
Arsenic III	-	NC	0.400 U	21.6	12.7	2.28	108	35.4	0.448 J	122	15.9	2.06	53.8
Arsenic V	-	NC	0.400 U	796	3.74	0.403 U*	138	2.64	0.400 U	14.8	3.36	0.519 J	9.36
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U
General Chemistry (mg/L)													
Alkalinity, Total as CaCO3	-	560	135	104	236	122	109	491	169	127	299	181	253
Alkalinity, Bicarbonate (CaCO3)	-	5.0	5.0 U	57.8	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Alkalinity, Carbonate (CaCO3)	-	560	135	162	236	122	109	491	169	127	299	181	253
Chloride	-	23	16.9	16.2	13.9	17.2	16.1	14.5	17.4	14.7	15.7	19.8	15.2
Fluoride	4	0.23	0.14	3.0	0.073 J	0.18	**4.6 J**	0.092 J	0.21 J	3.9	1.3	0.43	1.1
Sulfate	-	130	28.7	187	69.6	29.7	110	1.0 U	38.4	119 J	46.6 J	65.5 J	70.9 J
Total Dissolved Solids	-	620	215 J	563 J	376 J	203 J	368	551	264	382	417	317	411
pH (standard units)	-	6.0 - 7.7	7.6 J	9.1 J	7.3 J	7.8 J	7.4 J	7.7 J	7.1 J	7.4 J	7.3 J	7.2 J	7.3 J
Metals (ug/L)													
Antimony	6	2.5	0.50 U	0.80 J	0.50 U	0.50 U	2.5 U	2.5 U	2.5 U	0.50 U	2.5 U	2.5 U	25.0 U
Arsenic	10	9.8	0.14	**816**	**16.6**	2.8	**222**	**41.4**	0.51	**126 J**	**16.8**	2.5	**67.0**
Barium	2000	1100	269	43.6	109	174	75.3	95.5	179	94.5 J	332	127	114
Beryllium	4	0.5	0.10 U	0.50 U	0.10 U	0.10 U	0.50 U	0.50 U	0.50 U	0.10 U	0.50 U	0.50 U	5.0 U
Boron	-	240	100	9790	1170	191	6030 J	1490 J	2280 J	4540	3540	1450	6580
Cadmium	5	0.4	0.080 U	0.40 U	0.080 U	0.080 U	0.40 U	0.40 U	0.40 U	0.080 U	0.40 U	0.40 U	4.0 U
Calcium	-	160000	42800	23800	74500	38100	29500	106000	43200	32250 J	73400	44100	57600
Chromium	100	2.5	0.50 U	2.5 U	0.50 U	0.61	2.5 U	2.5 U	2.5 U	0.50 U	2.5 U	2.5 U	25.0 U
Cobalt	6 (a)	7.1	0.058 J	0.52	3.1	1.7	0.78	0.34 J	0.50 U	0.385 J	0.50 U	0.50 U	3.6 J
Copper	1300 (b)	1.7	0.50 U	14.7	0.94	0.32 J	2.5 U	2.5 U	2.5 U	0.50 U	2.5 U	2.5 U	25.0 U
Lead	15	0.5	0.10 U	2.6	0.19	0.13	0.50 U	0.50 U	0.50 U	0.10 U	0.50 U	0.50 U	5.0 U
Lithium	40 (a)	34	2.8	12.5 U	3.2	2.8	8.1 J	40.7	12.5 U	6 J	12.6	2.6 J	125 U
Magnesium	-	47000	9850	2980	16700	9220	6540	14900	15000	7150 J	18700	14600	13900
Mercury	2	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.14 U*	0.12 U*	0.12 U*	0.20 U	0.20 U	0.20 U	0.20 U
Molybdenum	100 (a)	2.0	2.0	918	61.0	12.5	479	40.4	287	226.5 J	217	176	75.8
Nickel	100 (c)	12.0	0.15 J	4.5	2.7	4.3	2.8	2.5 U	2.5 U	0.20 J	0.86 J	2.5 U	6.8 J
Potassium	-	3500	1580	2840	3100	1740	3510	4180	1900	1905 J	3190	2070	1320 J
Selenium	50	2.5	0.50 U	1.2 J	0.24 J	0.50 U	2.5 U	2.5 U	2.5 U	0.50 U	2.5 U	2.5 U	25.0 U
Silver	-	2.0	0.40 U	2.0 U	0.40 U	0.40 U	2.0 U	2.0 U	2.0 U	0.40 U	2.0 U	2.0 U	20.0 U
Sodium	-	21000	13200	143000	14600	15100	68900	78500	23400	78000	32800	35300	66800
Thallium	2	0.5	0.10 U	0.50 U	0.10 U	0.10 U	0.50 U	0.50 U	0.50 U	0.10 U	0.50 U	0.50 U	5.0 U
Vanadium	-	1.5	0.30 U	23.7	0.82	0.29 J	4.7	0.74 J	1.5 U	1.4 J	0.76 J	1.5 U	15.0 U
Zinc	-	10	5.0 U	25.0 U	53.5	3.0 J	25.0 U	25.0 U	25.0 U	5.0 U	25.0 U	25.0 U	250 U
Radium (pCi/L)													
Radium-226	-	NC	0.297+-0.462 UJ	0.472+-0.400 UJ	0.549+-0.634 UJ	0.452+-0.662 UJ	0.261+-0.343 U	0.665+-0.384 U*	0.795+-0.559 U*	0.596+-0.467	0.562+-0.526 U	0.569+-0.482 U	0.371+-0.438 U
Radium-228	-	NC	0.243+-0.438 U	-0.149+-0.483 U	0.785+-0.492 U	0.808+-0.415	0.239+-0.361 U	0.366+-0.454 U	0.930+-0.529 U	0.355+-0.327 U	0.790+-0.386 U*	0.529+-0.343 U	0.747+-0.415 U
Total Radium	5	3.8	0.540+-0.637 UJ	0.472+-0.627 UJ	1.33+-0.803 UJ	1.26+-0.781 J	0.500+-0.498 U	1.03+-0.595 U*	1.73+-0.770 U*	0.951+-0.570 J	1.35+-0.652 U*	1.10+-0.592 U	1.12+-0.603 U

Table 5a
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - April 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	PMW14B	PMW14C	SW-Outfall
		Sampling Date	11-Apr-19	11-Apr-19	16-Apr-19
		Depth (ft toc)	**75**	**148**	
Speciated Arsenic (ug/L)	**MCL**	**Background**			
Arsenic III	-	NC	40.9	0.400 U	0.400 U
Arsenic V	-	NC	10.4	0.400 U	1.47 U*
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U
General Chemistry (mg/L)					
Alkalinity, Total as CaCO3	-	560	290	163	112
Alkalinity, Bicarbonate (CaCO3)	-	5.0	5.0 U	5.0 U	4.4 J
Alkalinity, Carbonate (CaCO3)	-	560	290	163	116
Chloride	-	23	14.0	14.3	6.8
Fluoride	4	0.23	0.12	0.14	0.95
Sulfate	-	130	50.3 J	25.8 J	32.3
Total Dissolved Solids	-	620	363	221	205
pH (standard units)	-	6.0 - 7.7	7.1 J	7.0 J	8.8 J
Metals (ug/L)					
Antimony	6	2.5	2.5 U	2.5 U	0.55
Arsenic	10	9.8	**48.1**	0.50 U	**11.2**
Barium	2000	1100	702	208	176
Beryllium	4	0.5	1.0 U	0.50 U	0.10 U
Boron	-	240	1620	289	927
Cadmium	5	0.4	0.40 U	0.40 U	0.080 U
Calcium	-	160000	80600	39700	27000
Chromium	100	2.5	2.5 U	2.5 U	0.50 U
Cobalt	6 (a)	7.1	0.50 U	0.50 U	0.17
Copper	1300 (b)	1.7	2.5 U	2.5 U	1.9
Lead	15	0.5	0.50 U	0.50 U	0.30
Lithium	40 (a)	34	6.4 J	3.5 J	5.9
Magnesium	-	47000	21900	13400	6330
Mercury	2	0.2	0.20 U	0.20 U	0.20 U
Molybdenum	100 (a)	2.0	1.9 J	9.3	11.9
Nickel	100 (c)	12.0	2.5 U	2.5 U	1.1
Potassium	-	3500	4660	1770	5880
Selenium	50	2.5	2.5 U	2.5 U	2.6
Silver	-	2.0	2.0 U	2.0 U	0.40 U
Sodium	-	21000	12100	11700	24000
Thallium	2	0.5	0.50 U	0.50 U	0.10 U
Vanadium	-	1.5	1.5 U	1.5 U	10.6
Zinc	-	10	25.0 U	25.0 U	1.4 J
Radium (pCi/L)					
Radium-226	-	NC	0.678+-0.581 U	0.869+-0.610	0.370+-0.437 U
Radium-228	-	NC	0.393+-0.399 U	0.397+-0.344 U	0.772+-0.365
Total Radium	5	3.8	1.07+-0.705 U	1.27+-0.700 J	1.14+-0.569 J

Notes:
Analysis of filtered samples are displayed as "-F"
MCL - Maximum Contaminant Level
(a) No MCL established. EPA has recognized Regional Screening Levels (RSLs) as Groundwater Protection Standards in the federal CCR Rule at 40 C.F.R. 257.95(h)(2) (see 83 Fed. Reg. 36435 (July 30, 2018))
(b) No MCL established. Copper concentrations were compared to the EPA Maximum Contaminant Level Goal (MCLG), Action Level, and Treatment Technique goal value as established in 40 C.F.R. Part 141
(c) The MCL for nickel was remanded in 1995. TDEC Rule 0400-40-03-.03 established the state ambient water quality criteria (AWQC) for nickel to protect groundwater and receiving surface water bodies.
Other constituents with no MCL value are depicted with a dash "-"
Background - site-specific background concentrations calculated as 95% Upper Tolerance Limits (UTLs) in accordance with USEPA Unified Guidance
(see Technical Memorandum: 2019 Statistical Evaluation of Background Groundwater Quality for Allen Fossil Plant, February 2020).
J - The result is estimated.
mg/L - milligrams per liter; ug/L - micrograms per liter; pCi/L - picocuries per liter
NA - Constituent was not analyzed
NC - Background value was not calculated
U - The analyte was not detected above the indicated reporting limit.
U* - The analyte was detected in an associated blank.
Sample analytical results that exceed the **MCL** are shaded YELLOW

Table 5b
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - June 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ACC3A	ACC5A	ACC5B	ALF201	ALF201A	ALF201B	ALF202	ALF202A	ALF202B
		Sampling Date	21-Jun-19	26-Jun-19	26-Jun-19	20-Jun-19	20-Jun-19	21-Jun-19	26-Jun-19	26-Jun-19	26-Jun-19
		Depth (ft toc)	**126**	**144**	**56**	**49**	**126**	**89**	**43**	**146**	**90**
Speciated Arsenic (ug/L)	**MCL**	**Background**									
Arsenic III	-	NC	2.00 U	1.85 J	2.00 U	0.597 J	2.00 U	2.60	378	0.617 J	2.39
Arsenic V	-	NC	2.00 U	0.466 U*	2.00 U	2.00 U	2.00 U	0.710 U*	25.4	2.00 U	0.598 U*
Dimethylarsinic	-	NC	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U
Monomethylarsonic	-	NC	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U
General Chemistry (mg/L)											
Alkalinity, Total as CaCO3	-	560	410	255	451	307 J	224 J	278 J	94.5	208	211
Alkalinity, Bicarbonate (CaCO3)	-	5.0	410	255	451	307 J	224 J	278 J	94.5	208	211
Alkalinity, Carbonate (CaCO3)	-	560	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloride	-	23	9.1	17.4	3.9 J	14.6	18.8	17.7	15.0 J	16.6 J	15.1 J
Fluoride	4	0.23	0.13	0.090	0.19	0.39	0.38	0.56	**4.3**	0.25	0.25
Sulfate	-	130	70.6	96.6	30.8	79.5 J	68.1 J	176 J	135	34.4	64.6
Total Dissolved Solids	-	620	506	414	500	438	347	571	375	294	345
pH (standard units)	-	6.0 - 7.7	7.1 J	6.4 J	6.8 J	6.7 J	6.9 J	7.0 J	7.5 J	7.1 J	7.2 J
Metals (ug/L)											
Antimony	6	2.5	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Arsenic	10	9.8	0.36 J	2.1	0.39 J	1.1	0.36 J	2.9	**378**	0.67	2.9
Barium	2000	1100	1010	81.1	672	220	151	152	93.3	278	402
Beryllium	4	0.5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.083 U*	0.20 U	0.20 U
Boron	-	240	264	36.5	129 U*	2140	418	5500	5380	1550	2310
Cadmium	5	0.4	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.058 U*	0.080 U	0.080 U
Calcium	-	160000	122000	78000	130000	86400	58000	76100	21400	51800	68500
Chromium	100	2.5	0.50 U	0.50 U	0.50 U	0.49 U*	0.50 U	0.50 U	0.25 U*	0.50 U	0.50 U
Cobalt	6 (a)	7.1	0.50 U	0.50 U	3.2	1.7	0.50 U	0.50 U	0.14 U*	0.50 U	0.50 U
Copper	1300 (b)	1.7	1.3	1.2	1.0 U	1.0 U	1.2	0.60 J	9.8	0.77 J	1.0 U
Lead	15	0.5	0.064 J	0.080 U*	0.072 U*	0.10 U	0.10 U	0.10 U	0.56 U*	0.10 U	0.10 U
Lithium	40 (a)	34	7.2	2.4	16.2	19.9	4.6	21.1	6.5	3.2	5.4
Magnesium	-	47000	37200	32100	33200	23000	16400	24500	5060	19400	18800
Mercury	2	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Molybdenum	100 (a)	2.0	0.39 J	0.37 J	0.23 J	42.2	15.1	329	357	185	138
Nickel	100 (c)	12.0	0.25 U*	0.40 U*	6.2	4.5	0.25 U*	0.16 U*	0.87 U*	0.50 U	0.16 U*
Potassium	-	3500	3240	2510	1960	2770	2630	4390	1660	2340	2570
Selenium	50	2.5	0.50 U	0.50 U	0.50 U	0.26 J	0.50 U	0.50 U	0.28 J	0.50 U	0.50 U
Silver	-	2.0	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U
Sodium	-	21000	11800	13300	7040	33400	36800	67400	86500	18700	15200
Thallium	2	0.5	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Vanadium	-	1.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.8	1.0 U	1.0 U
Zinc	-	10	5.3	12.6	5.6	5.0 U	5.0 U	5.0 U	2.9 J	2.7 J	5.0 U
Radium (pCi/L)											
Radium-226	-	NC	1.42+-0.775 U*	0.255+-0.688 UJ	1.27+-0.971 UJ	0.402+-0.341 U	0.462+-0.427 U	0.738+-0.508	0.358+-0.498 UJ	1.42+-0.754 J	1.06+-0.740 J
Radium-228	-	NC	1.72+-0.514	0.306+-0.324 U	1.36+-0.497	0.260+-0.550 U	0.893+-0.441	0.645+-0.365 U	0.167+-0.393 U	0.375+-0.324 U	0.458+-0.364 U
Total Radium	5	3.8	3.14+-0.930 J	0.561+-0.760 UJ	2.63+-1.09 J	0.662+-0.647 U	1.36+-0.614 J	1.38+-0.626 J	0.525+-0.634 UJ	1.80+-0.821 J	1.52+-0.825 J

Stantec

Table 5b
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - June 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ALF203	ALF203A	ALF203B	ALF204	ALF204A	ALF204B	ALF205	ALF205A	ALF205B
		Sampling Date	21-Jun-19	24-Jun-19	24-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19
		Depth (ft toc)	**52**	**118**	**89**	**49**	**116**	**89**	**54**	**107**	**81.5**
Speciated Arsenic (ug/L)	**MCL**	**Background**									
Arsenic III	-	NC	1710	2.00 U	5.72	39.0	2.00 U	3.69	0.924 J	0.412 J	4.51
Arsenic V	-	NC	83.2	2.00 U	2.29 U*	11.4	2.00 U	0.596 U*	0.415 U*	2.00 U	1.01 U*
Dimethylarsinic	-	NC	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U
Monomethylarsonic	-	NC	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U
General Chemistry (mg/L)											
Alkalinity, Total as CaCO3	-	560	209 J	100	210	228	173	117	409	121	117
Alkalinity, Bicarbonate (CaCO3)	-	5.0	13.7 J	100	210	228	173	117	409	121	117
Alkalinity, Carbonate (CaCO3)	-	560	196 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloride	-	23	17.6	16.4	13.5	13.2 J	15.8 J	14.3 J	15.6 J	16.9 J	11.8 J
Fluoride	4	0.23	**4.9**	0.18	0.50	0.18	0.20	0.26	1.3	0.19	0.22
Sulfate	-	130	287 J	29.5 J	37.1 J	30.7	6.5	22.1	89.9	16.0	16.7
Total Dissolved Solids	-	620	696	171	301	304 J	212 J	175 J	606 J	180 J	183 J
pH (standard units)	-	6.0 - 7.7	9.5 J	6.9 J	7.0 J	7.0 J	6.5 J	6.2 J	7.0 J	6.5 J	7.0 J
Metals (ug/L)											
Antimony	6	2.5	1.4 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Arsenic	10	9.8	**2010**	0.18 J	8.1	**45.6**	0.24 J	4.0	1.2	0.48 J	5.0
Barium	2000	1100	38.0	180	157	320	320	228	197	302	210
Beryllium	4	0.5	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.058 J	0.20 U	0.20 U
Boron	-	240	6730	314	1320	481	87.1	402	6420	69.4	152
Cadmium	5	0.4	2.0	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.071 J	0.080 U	0.080 U
Calcium	-	160000	15200	24100	60700	62000	43300	34700	102000	30400	31200
Chromium	100	2.5	2.7	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Cobalt	6 (a)	7.1	0.66 J	0.50 U	0.50 U	0.24 J	0.50 U	0.14 J	1.4	0.50 U	0.50 U
Copper	1300 (b)	1.7	56.8	1.0 U	1.0 U	0.50 J	0.53 J	0.85 J	1.1	1.0 U	1.0 U
Lead	15	0.5	**47.7**	0.10 U	0.10 U	0.063 J	0.10 U	0.15	0.078 J	0.10 U	0.10 U
Lithium	40 (a)	34	2.1 J	2.0	7.9	5.3	2.9	3.3	19.0	3.1	4.0
Magnesium	-	47000	2700	11800	13600	17200	13400	9010	20200	11100	8940
Mercury	2	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Molybdenum	100 (a)	2.0	478	2.7	99.8	16.2	2.3	52.8	110	0.95	1.1
Nickel	100 (c)	12.0	9.1	0.50 U	0.17 U*	0.39 U*	0.50 U	0.75 U*	6.1	0.50 U	0.50 U
Potassium	-	3500	1390	1250	1510	3650	2340	2160	3200	2250	2720
Selenium	50	2.5	6.7	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Silver	-	2.0	2.5 UJ	0.50 UJ	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Sodium	-	21000	219000	14900	22300	12000	13800	14100	63900	14600	13100
Thallium	2	0.5	0.50 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Vanadium	-	1.5	23.1	1.0 U	1.0 U	0.94 J	1.0 U	1.0 U	0.56 J	1.0 U	1.0 U
Zinc	-	10	25.0 U	5.0 U	5.0 U	8.8	2.6 J	9.7	5.7	3.1 J	5.0 U
Radium (pCi/L)											
Radium-226	-	NC	0.280+-0.389 U	1.86+-0.961	0.338+-0.407 U	0.648+-0.550 UJ	1.33+-0.692 J	0.735+-0.623 UJ	0.431+-0.509 UJ	0.990+-0.693 J	0.481+-0.669 UJ
Radium-228	-	NC	0.313+-0.542 U	0.575+-0.372 U	0.352+-0.319 UJ	0.253+-0.421 U	0.361+-0.422 U	1.01+-0.464	1.17+-0.506	0.591+-0.360 U	0.976+-0.492
Total Radium	5	3.8	0.593+-0.667 U	2.44+-1.03 J	0.690+-0.517 UJ	0.901+-0.693 UJ	1.69+-0.811 J	1.75+-0.777 J	1.60+-0.718 J	1.58+-0.781 J	1.46+-0.830 J

Table 5b
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - June 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ALF206	ALF210	ALF210-F	ALF210A	ALF212	ALF212A	ALF213	ALF213A	ALF213B
		Sampling Date	24-Jun-19	19-Jun-19	19-Jun-19	19-Jun-19	20-Jun-19	21-Jun-19	24-Jun-19	24-Jun-19	24-Jun-19
		Depth (ft toc)	**54**	**47**	**47**	**125**	**67**	**165**	**71**	**158**	**117**
Speciated Arsenic (ug/L)	**MCL**	**Background**									
Arsenic III	-	NC	4.70	0.437 J	NA	0.419 J	11.1	2.87	5.24	3.54	2.18
Arsenic V	-	NC	1.49 U*	2.00 U	NA	2.00 U	2.82 U*	1.10 U*	1.88 U*	0.991 U*	0.676 U*
Dimethylarsinic	-	NC	2.10 U	2.10 U	NA	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U
Monomethylarsonic	-	NC	2.30 U	2.30 U	NA	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U
General Chemistry (mg/L)											
Alkalinity, Total as CaCO3	-	560	133	462	NA	295	343 J	225	160	105	366
Alkalinity, Bicarbonate (CaCO3)	-	5.0	133	462	NA	295	343 J	225	160	105	366
Alkalinity, Carbonate (CaCO3)	-	560	5.0 U	5.0 U	NA	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloride	-	23	12.2	1.1 J	NA	73.3	17.5	40.3	15.8	17.5	60.8
Fluoride	4	0.23	0.34	0.25	NA	0.095	1.4	0.21	0.52	0.24	0.13
Sulfate	-	130	29.7	11.1	NA	261	3.2 J	0.54 U*	7.6	24.1	0.60 J
Total Dissolved Solids	-	620	210	469	NA	806	416	288	215	173	450
pH (standard units)	-	6.0 - 7.7	6.5 J	6.6 J	NA	6.6 J	7.0 J	6.6 J	6.9 J	7.0 J	6.8 J
Metals (ug/L)											
Antimony	6	2.5	0.50 U	0.50 U	0.080 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Arsenic	10	9.8	6.0	1.2	0.83	0.51	**13.8**	3.7	6.9	4.4	2.9
Barium	2000	1100	246	363 J	324	117 J	311 J	396	323	292	573
Beryllium	4	0.5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Boron	-	240	70.4	68.8	69.1	2070	1980	52.9	133	46.0	24.2
Cadmium	5	0.4	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U
Calcium	-	160000	38100	139000	117000	143000	85600	54400	40700	26700	104000
Chromium	100	2.5	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Cobalt	6 (a)	7.1	0.50 U	1.9	1.8	0.50 U	0.28 J	0.16 J	0.50 U	0.50 U	0.13 J
Copper	1300 (b)	1.7	1.2	0.43 J	1.0 U	1.0 U	1.0 U	0.81 J	1.0 U	1.0 U	1.0 U
Lead	15	0.5	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.062 J	0.10 U	0.10 U	0.10 U
Lithium	40 (a)	34	4.2	20.9	20.6	8.1	11.7	2.9	6.6	2.5	7.2
Magnesium	-	47000	9500	30400	29600	37400	21400	22400	12200	10700	29100
Mercury	2	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Molybdenum	100 (a)	2.0	2.4	1.7	1.6	0.51	39.2	1.4	3.5	1.1	1.7
Nickel	100 (c)	12.0	0.50 U	3.2	3.0	0.28 U*	0.39 U*	0.30 U*	0.50 U	0.50 U	0.23 U*
Potassium	-	3500	2490	2460	2460	4370	2430	2680	3110	2620	3740
Selenium	50	2.5	0.50 U	0.78	0.59	0.50 U	0.22 J	0.50 U	0.50 U	0.50 U	0.50 U
Silver	-	2.0	0.50 U	0.50 U	0.16 U*	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U
Sodium	-	21000	13600	4100	4120	70900	37700	11400	14200	13100	17000
Thallium	2	0.5	0.10 U	0.10 U	0.071 J	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Vanadium	-	1.5	1.0 U	1.0 U	1.0 U	1.0 U	0.29 J	1.0 U	1.0 U	1.0 U	1.0 U
Zinc	-	10	5.0 U	2.8 J	3.0 J	2.5 J	2.4 U*	9.9	5.0 U	5.0 U	5.0 U
Radium (pCi/L)											
Radium-226	-	NC	0.847+-0.630	1.27+-0.575 U*	NA	1.09+-0.538 U*	0.302+-0.315 U	0.878+-0.696 U	0.162+-0.503 U	0.378+-0.537 U	1.96+-0.788
Radium-228	-	NC	0.955+-0.394 U*	1.21+-0.512 U*	NA	0.976+-0.497 U*	0.188+-0.374 UJ	0.600+-0.346 U	0.478+-0.352 U	0.517+-0.292 U*	0.885+-0.370 U*
Total Radium	5	3.8	1.80+-0.743 J	2.48+-0.770 U*	NA	2.07+-0.732 U*	0.490+-0.489 UJ	1.48+-0.777 U	0.640+-0.614 U	0.895+-0.611 U*	2.85+-0.871 J

Table 5b
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - June 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ALF214	ALF214A	ALF214B	ALF215	ALF217	ALF217A	ALF217B	P4	P4S
		Sampling Date	20-Jun-19	20-Jun-19	20-Jun-19	19-Jun-19	21-Jun-19	21-Jun-19	25-Jun-19	24-Jun-19	24-Jun-19
		Depth (ft toc)	**45**	**130**	**88**	**25**	**61**	**188**	**127**	**77**	**41**
Speciated Arsenic (ug/L)	**MCL**	**Background**									
Arsenic III	-	NC	2.00 U	0.820 J	3.25	1.06 J	40.0	5.47	10.5	1.50 J	0.869 J
Arsenic V	-	NC	0.407 U*	2.00 U	0.824 U*	2.00 U	4.79 U*	2.52 U*	4.45 U*	2.00 U	0.746 U*
Dimethylarsinic	-	NC	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U
Monomethylarsonic	-	NC	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U
General Chemistry (mg/L)											
Alkalinity, Total as CaCO3	-	560	251 J	189 J	184 J	260	351 J	304 J	370	79.8	161
Alkalinity, Bicarbonate (CaCO3)	-	5.0	251 J	189 J	184 J	260	351 J	304 J	370	79.8	161
Alkalinity, Carbonate (CaCO3)	-	560	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloride	-	23	1.4	64.3	35.5	1.3	16.0	26.1	103	11.5	10.2
Fluoride	4	0.23	0.35	0.095	0.14	0.29	2.2	0.050	0.13	0.31	0.44
Sulfate	-	130	12.5 J	318 J	198 J	21.4	0.58 U*	0.53 U*	0.50 J	21.3	21.1 J
Total Dissolved Solids	-	620	274	738	531	302	392	332	498 J	137	209
pH (standard units)	-	6.0 - 7.7	7.0 J	6.5 J	6.5 J	6.5 J	6.9 J	6.9 J	6.6 J	7.1 J	7.0 J
Metals (ug/L)											
Antimony	6	2.5	0.22 J	0.50 U	0.50 U	0.18 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Arsenic	10	9.8	0.43 J	1.0	4.0	1.3	**42.6**	8.5	**13.9**	1.7	1.4
Barium	2000	1100	111	26.8	135	226 J	230	472	994	111	60.4
Beryllium	4	0.5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Boron	-	240	259	102	161	248	1400	20.1	36.7	35.6	97.4
Cadmium	5	0.4	0.080	0.080 U	0.080 U	0.079 J	0.080 U	0.080 U	0.080 U	0.080 U	0.032 J
Calcium	-	160000	72100	137000	87800	73000	80800	78000	121000	25900	40100
Chromium	100	2.5	0.50 U	0.50 U	0.50 U	0.50 U	0.52 U*	0.50 U	0.50 U	0.50 U	0.50 U
Cobalt	6 (a)	7.1	0.16 J	0.50 U	0.50 U	9.7	0.25 J	0.69	0.21 J	0.50 U	0.59
Copper	1300 (b)	1.7	1.0 U	1.0 U	1.0 U	2.1	1.0 U	1.0 U	0.63 J	0.51 J	1.0 U
Lead	15	0.5	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11	0.10 U
Lithium	40 (a)	34	10.9	6.4	9.4	7.8	12.3	6.8	4.8	2.5	1.7
Magnesium	-	47000	15000	41200	25400	22400	18000	20500	34800	6730	11700
Mercury	2	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Molybdenum	100 (a)	2.0	2.4	0.37 J	0.24 J	10.9	22.9	1.8	0.59	2.0	7.4
Nickel	100 (c)	12.0	3.8	0.28 U*	0.50 U	5.8	0.23 U*	0.48 U*	0.62 U*	0.23 U*	2.3
Potassium	-	3500	1130	3500	2630	859	4330	2270	3320	1620	2440
Selenium	50	2.5	0.22 J	0.50 U	0.50 U	0.38 J	0.28 J	0.50 U	0.50 U	0.50 U	0.50 U
Silver	-	2.0	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ
Sodium	-	21000	8500 J	41900 J	36700	13500	34500	10400	12200	9340	12500
Thallium	2	0.5	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Vanadium	-	1.5	0.79 J	1.0 U	1.0 U	0.63 J	0.28 J	1.0 U	1.0 U	0.28 J	0.29 J
Zinc	-	10	5.0 U	3.2 J	5.0 U	4.0 J	5.0 U	3.0 J	5.0 U	5.0 U	5.0 U
Radium (pCi/L)											
Radium-226	-	NC	1.12+-0.538 J	0.160+-0.273 U	0.528+-0.450 U	0.921+-0.666 U	0.592+-0.743 U	0.617+-0.570 U	1.21+-0.847 J	0.789+-0.577	0.173+-0.537 U
Radium-228	-	NC	0.900+-0.506 U	0.527+-0.466 U	0.636+-0.453 U	0.383+-0.442 U	1.09+-0.431 U*	0.768+-0.365 U*	1.27+-0.481	0.316+-0.317 U	0.0415+-0.259 U
Total Radium	5	3.8	2.02+-0.739 J	0.687+-0.540 U	1.16+-0.639 U	1.30+-0.799 U	1.68+-0.859 U*	1.39+-0.677 U*	2.48+-0.974 J	1.11+-0.658 J	0.215+-0.596 U

Table 5b
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - June 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	PMW02A	PMW02A-F	PMW02B	PMW02C	PMW04A	PMW04B	PMW04C	PMW07A
		Sampling Date	26-Jun-19	26-Jun-19	26-Jun-19	26-Jun-19	25-Jun-19	25-Jun-19	25-Jun-19	26-Jun-19
		Depth (ft toc)	**29**	**29**	**54**	**124**	**29**	**57**	**124**	**24**
Speciated Arsenic (ug/L)	**MCL**	**Background**								
Arsenic III	-	NC	139	NA	26.8	2.00 U	498	29.7	2.00 U	463
Arsenic V	-	NC	3740	NA	3.81 U*	2.00 U	1150	4.93 U*	0.645 U*	52.1
Dimethylarsinic	-	NC	21.0 U	NA	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U
Monomethylarsonic	-	NC	23.0 U	NA	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U
General Chemistry (mg/L)										
Alkalinity, Total as CaCO3	-	560	217	NA	290	116	293	251	129	174
Alkalinity, Bicarbonate (CaCO3)	-	5.0	5.0 U	NA	290	116	293	251	129	94.2
Alkalinity, Carbonate (CaCO3)	-	560	157	NA	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	80.2
Chloride	-	23	15.7 J	NA	16.6 J	16.4 J	13.5	19.8 J	17.0 J	17.3 J
Fluoride	4	0.23	3.5	NA	0.14	0.16	3.9	0.21	0.16	**4.6**
Sulfate	-	130	206	NA	48.9	30.7	166	82.5	29.2	232
Total Dissolved Solids	-	620	666	NA	381	213	593	355 J	218	614
pH (standard units)	-	6.0 - 7.7	10.1 J	NA	7.0 J	7.2 J	7.7 J	7.3 J	6.4 J	8.8 J
Metals (ug/L)										
Antimony	6	2.5	1.8 J	1.7 J	0.50 U	0.50 U	0.32 J	0.50 U	0.50 U	0.40 J
Arsenic	10	9.8	**3700**	**3340**	**29.5**	0.50 U	**1430**	**34.4**	0.50 U	**520**
Barium	2000	1100	55.1	35.1	155	238	75.2	331	282	63.9
Beryllium	4	0.5	1.0 U	0.44 J	0.20 U	0.20 U	0.20 U	0.063 J	0.20 U	0.11 J
Boron	-	240	7020	7550	1670	134	5540	5100 J	85.8	12800
Cadmium	5	0.4	2.4	1.6	0.080 U	0.080 U	0.042 J	0.080 U	0.080 U	0.17
Calcium	-	160000	7680	6590	80400	38500	48900	87000	42500	39300
Chromium	100	2.5	3.4	2.5	0.44 J	0.24 J	0.50 U	0.50 U	0.37 U*	0.53
Cobalt	6 (a)	7.1	3.3	2.2 J	1.8	0.50 U	0.80	0.50 U	0.50 U	0.31 J
Copper	1300 (b)	1.7	53.6	36.8	1.0 U	1.0 U	2.8	1.0 U	1.0 U	8.3
Lead	15	0.5	**25.7**	**17.7**	0.10	0.073 J	0.068 J	0.048 J	0.10 U	2.4
Lithium	40 (a)	34	0.92 J	2.5 U	8.3	2.7	6.4	13.4	3.0	3.3
Magnesium	-	47000	216	105	17700	9280	13000	22200	10000	3830
Mercury	2	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Molybdenum	100 (a)	2.0	447	400	82.7	2.8	569	254	2.2	1020
Nickel	100 (c)	12.0	22.9	19.6	2.0	0.28 J	6.3	0.50 U	0.22 U*	3.2
Potassium	-	3500	1390	1250	3440	1400	5080	2170	1750	2660
Selenium	50	2.5	6.4	5.1	0.50 U	0.50 U	0.30 J	0.50 U	0.50 U	0.86
Silver	-	2.0	2.5 U	2.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Sodium	-	21000	191000 J	219000 J	19600	13700	122000	13300	13200	143000
Thallium	2	0.5	0.50 U	0.50 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Vanadium	-	1.5	85.2	75.8	1.6	1.0 U	3.7	1.0 U	1.0 U	8.0
Zinc	-	10	20.3 J	12.9 J	28.2	5.2	5.0 U	5.0 U	5.0 U	4.7 J
Radium (pCi/L)										
Radium-226	-	NC	0.110+-0.569 U	NA	0.431+-0.509 U	0.658+-0.563 U	2.27+-1.02 J	1.88+-0.998 J	1.68+-0.890 J	0.105+-0.480 U
Radium-228	-	NC	0.472+-0.348 U	NA	-0.101+-0.309 U	-0.0107+-0.335 U	0.357+-0.377 U	0.528+-0.452 U	0.709+-0.391	0.232+-0.402 U
Total Radium	5	3.8	0.582+-0.667 U	NA	0.431+-0.595 U	0.658+-0.655 U	2.63+-1.09 J	2.41+-1.10 J	2.39+-0.972 J	0.337+-0.626 U

Table 5b
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - June 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	PMW07B	PMW07C	PMW10A	PMW10B	PMW10C	PMW11A	PMW11B	PMW11C	PMW14A	PMW14B	PMW14C
		Sampling Date	26-Jun-19	26-Jun-19	19-Jun-19	19-Jun-19	20-Jun-19	21-Jun-19	21-Jun-19	21-Jun-19	20-Jun-19	20-Jun-19	20-Jun-19
		Depth (ft toc)	**55**	**117**	**32**	**68**	**148**	**27**	**63**	**144**	**49**	**85**	**156**
Speciated Arsenic (ug/L)	**MCL**	**Background**											
Arsenic III	-	NC	15.2	1.38 J	293	58.1	0.473 J	179	21.9	1.24 J	60.6	37.8	2.00 U
Arsenic V	-	NC	3.34 U*	0.556 U*	14.8	7.28 U*	0.414 U*	13.8	6.09 U*	2.00 U	11.3	14.6	2.00 U
Dimethylarsinic	-	NC	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U
Monomethylarsonic	-	NC	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U
General Chemistry (mg/L)													
Alkalinity, Total as CaCO3	-	560	286	126	124	430	156 J	194	361	165	225 J	272 J	147 J
Alkalinity, Bicarbonate (CaCO3)	-	5.0	286	126	124	430	156 J	194	361	165	225 J	272 J	147 J
Alkalinity, Carbonate (CaCO3)	-	560	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloride	-	23	16.0 J	17.4 J	14.7	10.4	18.3	12.7	13.5	19.8	15.6	14.3	14.8
Fluoride	4	0.23	0.12	0.22	**5.8**	0.16	0.28	3.7	0.96	0.55	1.3	0.14	0.16
Sulfate	-	130	76.5	23.9	102	0.68 J	43.4 J	116	10.1	59.7	75.2	54.8 J	26.9 J
Total Dissolved Solids	-	620	432	205	365	470	280	328	406	305	411	386	225
pH (standard units)	-	6.0 - 7.7	7.1 J	7.5 J	7.1 J	6.9 J	6.6 J	7.0 J	6.9 J	7.1 J	6.7 J	6.7 J	6.3 J
Metals (ug/L)													
Antimony	6	2.5	0.50 U	0.50 U	0.50 U	0.17 J	0.50 U	0.50 U	0.50 U	0.50 U	0.13 J	0.50 U	0.50 U
Arsenic	10	9.8	**19.4**	1.7	**328**	**61.6**	0.60	**184**	**26.0**	2.6	**70.9**	**52.2**	0.21 J
Barium	2000	1100	152	233	97.5 J	152 J	187 J	140	479	129	111 J	776 J	233 J
Beryllium	4	0.5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.069 J	0.20 U
Boron	-	240	2850	213	5140	947	1580	3810	1250	2030	6130	1620	354
Cadmium	5	0.4	0.080 U	0.080 U	0.057 J	0.080 U	0.031 J	0.080 U	0.080 U	0.080 U	0.098	0.080 U	0.080 U
Calcium	-	160000	86100	38500	31800	113000	40800	38100	95000	38100	51900	81900	46500
Chromium	100	2.5	0.24 J	0.46 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Cobalt	6 (a)	7.1	1.9	1.3	0.70	0.35 J	0.50 U	0.33 J	0.20 J	0.50 U	3.2	0.14 J	0.50 U
Copper	1300 (b)	1.7	0.44 J	0.84 J	1.0 U	1.0 U	1.0 U*	0.85 J	0.51 J	1.0 U	0.50 U*	3.2 U*	1.0 U
Lead	15	0.5	0.10	0.28	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.21 U*	0.10 U	0.10 U
Lithium	40 (a)	34	6.0	3.3	7.8	26.2	1.6	6.9	10.7	2.1	6.8	6.0	3.0
Magnesium	-	47000	19400	9820	6980	19600	15100	9640	24700	14200	13900	24400	14700
Mercury	2	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Molybdenum	100 (a)	2.0	188	11.3	441	24.4	253	218	60.6	148	78.4	2.1	7.5
Nickel	100 (c)	12.0	1.1	2.8	2.4	0.37 U*	0.50 U	0.68 U*	0.50 U	0.50 U	6.2	0.18 U*	0.23 U*
Potassium	-	3500	4340	1750	3710	4900	1970	2130	4590	2080	1160	4410	1970
Selenium	50	2.5	0.50 U	0.50 U	0.27 J	0.15 J	0.50 U	0.17 J	0.18 J	0.50 U	0.30 J	0.50 U	0.50 U
Silver	-	2.0	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 UJ	0.50 UJ	0.50 U	0.50 U	0.50 U
Sodium	-	21000	31000	14700	73500	46200	22900	83600	18400	39000	63500	12400	12700
Thallium	2	0.5	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.052 J	0.10 U	0.10 U
Vanadium	-	1.5	1.5	0.61 J	6.7	0.44 J	1.0 U	0.77 J	1.0 U	1.0 U	1.2	1.0 U	1.0 U
Zinc	-	10	7.5	6.8	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	3.2 U*
Radium (pCi/L)													
Radium-226	-	NC	0.693+-0.640 U	0.349+-0.728 U	0.744+-0.614 U	0.741+-0.494	0.834+-0.448	1.07+-0.711 U*	1.25+-0.594 U*	1.08+-0.683 U*	0.397+-0.371 U	0.742+-0.521	0.299+-0.353 U
Radium-228	-	NC	0.430+-0.389 U	0.188+-0.374 U	1.05+-0.438 U*	1.27+-0.455 U*	1.71+-0.628	0.422+-0.339 U	0.758+-0.350 U*	0.582+-0.348 U	1.22+-0.484	1.12+-0.479	0.465+-0.364 U
Total Radium	5	3.8	1.12+-0.749 U	0.537+-0.818 U	1.79+-0.754 U*	2.01+-0.672 J	2.54+-0.771	1.49+-0.788 U*	2.01+-0.689 U*	1.66+-0.767 U*	1.62+-0.610 J	1.86+-0.708	0.764+-0.507 U

Notes:
Analysis of filtered samples are displayed as "-F"
MCL - Maximum Contaminant Level
(a) No MCL established. EPA has recognized Regional Screening Levels (RSLs) as Groundwater Protection Standards in the federal CCR Rule at 40 C.F.R. 257.95(h)(2) (see 83 Fed. Reg. 36435 (July 30, 2018))
(b) No MCL established. Copper concentrations were compared to the EPA Maximum Contaminant Level Goal (MCLG), Action Level, and Treatment Technique goal value as established in 40 C.F.R. Part 141
(c) The MCL for nickel was remanded in 1995. TDEC Rule 0400-40-03-.03 established the state ambient water quality criteria (AWQC) for nickel to protect groundwater and receiving surface water bodies.
Other constituents with no MCL value are depicted with a dash "-"
Background - site-specific background concentrations calculated as 95% Upper Tolerance Limits (UTLs) in accordance with USEPA Unified Guidance
(see Technical Memorandum: 2019 Statistical Evaluation of Background Groundwater Quality for Allen Fossil Plant, February 2020).
J - The result is estimated.
mg/L - milligrams per liter; ug/L - micrograms per liter; pCi/L - picocuries per liter
NA - Constituent was not analyzed
NC - Background value was not calculated
U - The analyte was not detected above the indicated reporting limit.
U* - The analyte was detected in an associated blank.
Sample analytical results that exceed the MCL are shaded YELLOW

Table 5c
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - September 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ACC1A	ACC3A	ACC5A	ACC5B	ALF201	ALF201A	ALF201B	ALF202	ALF202A	ALF202B
		Sampling Date	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	12-Sep-19	12-Sep-19	13-Sep-19	18-Sep-19	18-Sep-19	18-Sep-19
		Depth (ft toc)	**165.5**	**126**	**139**	**55.5**	**49**	**126**	**89**	**43**	**150**	**94**
Speciated Arsenic (ug/L)	**MCL**	**Background**										
Arsenic III	-	NC	1.38 J	0.400 U	1.32 J	0.400 U	0.400 U	0.400 U	2.52	328 J	0.64 J	2.04 J
Arsenic V	-	NC	1.17 U*	0.400 U	0.400 U	0.400 U	0.423 J	0.400 U	0.402 J	13.3 J	0.40 UJ	0.74 J
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.50 UJ	0.50 UJ	0.50 UJ
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.90 UJ	0.90 UJ	0.90 UJ
General Chemistry (mg/L)												
Alkalinity, Total as CaCO3	-	560	298	428	242	450	352	209	228	92.6	219	218
Alkalinity, Bicarbonate (CaCO3)	-	5.0	298	428	242	450	352	209	228	92.6	219	218
Alkalinity, Carbonate (CaCO3)	-	560	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloride	-	23	6.0	7.6	17.5	4.1	7.3	18.7	16.0 J	14.9	17.4	15.2
Fluoride	4	0.23	0.18	0.15	0.12	0.20	0.98	0.42	0.73	**4.2**	0.30	0.32
Sulfate	-	130	1.4 U*	39.2	97.7	43.7	44.3	90.3	124	145 J	47.1 J	82.9 J
Total Dissolved Solids	-	620	300	498	427	530	441	402	472	383	337	371
pH (standard units)	-	6.0 - 7.7	6.2 J	6.7 J	6.5 J	6.6 J	7.4 J	6.8 J	7.1 J	7.4 J	7.1 J	7.0 J
Metals (ug/L)												
Antimony	6	2.5	0.077 U	0.077 U	0.077 U	0.077 U	0.12 J	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Arsenic	10	9.8	2.0	0.38 J	1.5	0.31 J	0.88	0.37 J	2.9	**339**	0.90	3.0
Barium	2000	1100	478	950	78.9	611	208	154	136	64.4 J	316 J	443
Beryllium	4	0.5	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U
Boron	-	240	8.2 J	108	31.3	86.5	761	372	5300	4990	1450	2410
Cadmium	5	0.4	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.11	0.030 U	0.030 U
Calcium	-	160000	60000	118000	74800	141000	87800	55300	65400	21700	62100	82200
Chromium	100	2.5	0.21 U	0.21 U	0.22 U*	0.21 U	6.7	0.21 U	0.21 U	0.34 U*	0.26 U*	0.47 U*
Cobalt	6 (a)	7.1	0.52	0.085 U	0.085 U	3.7	0.33 J	0.085 U	0.085 U	0.088 J	0.085 U	0.085 U
Copper	1300 (b)	1.7	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	1.7 U*	0.43 U	0.43 U
Lead	15	0.5	0.053 U*	0.062 U*	0.075 U*	0.046 U	0.046 U	0.046 U	0.046 U	0.66	0.10 U*	0.046 U
Lithium	40 (a)	34	1.1	6.0	2.3	16.4	13.1	3.9	17.8	6.1	3.2	5.4
Magnesium	-	47000	31500	42600	30400	37200	25100	15800	20500	4510	21300	22400
Mercury	2	0.2	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	0.52	0.27 J	0.46 J	0.13 J	87.3	14.5	357	326	178	150
Nickel	100 (c)	12.0	1.2	0.39 J	0.34 J	8.5	1.8	0.20 J	0.23 J	0.69	0.26 J	0.20 J
Potassium	-	3500	2500	3230	2690	2350	1790	2590	4290	1890	2740	3310
Selenium	50	2.5	0.14 U	0.14 U	0.14 U	0.14 U	3.0	0.14 U	0.14 U	0.28 J	0.14 U	0.14 U
Silver	-	2.0	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Sodium	-	21000	10000	11100	12800	6470	17000	44700	53800	89400	19500	18300
Thallium	2	0.5	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	1.3 U	1.8	0.27 U	0.27 U
Zinc	-	10	6.0	4.5 J	4.0 J	4.5 J	2.6 J	2.4 J	2.4 U	2.4 U	3.6 J	2.8 J
Radium (pCi/L)												
Radium-226	-	NC	0.994+-0.719 U	0.953+-0.698 U	0.403+-0.420 U	0.439+-0.610 U	0.471+-0.490 U	0.288+-0.529 U	0.215+-0.579 U	0.0892+-0.407 U	0.840+-0.761 U	0.240+-0.733 U
Radium-228	-	NC	0.425+-0.333 UJ	1.35+-0.473 J	0.455+-0.336 UJ	0.762+-0.406 J	0.704+-0.371 U*	0.527+-0.317 UJ	0.496+-0.325 UJ	0.734+-0.425 U	0.488+-0.389 U	1.09+-0.502
Total Radium	5	3.8	1.42+-0.792 UJ	2.30+-0.843 J	0.858+-0.538 UJ	1.20+-0.733 J	1.18+-0.615 U*	0.815+-0.617 UJ	0.711+-0.664 UJ	0.823+-0.588 U	1.33+-0.855 U	1.33+-0.888 J

Table 5c
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - September 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ALF203	ALF203A	ALF203B	ALF204	ALF204A	ALF204B	ALF205	ALF205A	ALF205B	ALF206
		Sampling Date	13-Sep-19	13-Sep-19	16-Sep-19	17-Sep-19	17-Sep-19	18-Sep-19	18-Sep-19	18-Sep-19	18-Sep-19	18-Sep-19
		Depth (ft toc)	**88**	**118**	**89**	**49**	**116**	**89**	**54**	**107**	**81.5**	**54**
Speciated Arsenic (ug/L)	**MCL**	**Background**										
Arsenic III	-	NC	1320	0.441 J	32.1	49.1	0.400 U	3.46	0.433 J	0.481 J	3.61	5.39
Arsenic V	-	NC	254	0.400 U	4.25	11.3	0.400 U	1.00 U*	0.706 U*	0.717 U*	1.00 U*	1.45 J
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U
General Chemistry (mg/L)												
Alkalinity, Total as CaCO3	-	560	190	116	178	210	172	115	443	120	109	136
Alkalinity, Bicarbonate (CaCO3)	-	5.0	2.0 U	116	178	210	172	115	443	120	109	136
Alkalinity, Carbonate (CaCO3)	-	560	123	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloride	-	23	16.6 J	15.1 J	13.6	13.7	16.1	13.6	13.9	17.4	11.6	12.1
Fluoride	4	0.23	**5.7**	0.19	0.92	0.18	0.24	0.32	1.7	0.24	0.27	0.46
Sulfate	-	130	271	27.4	39.4 J	22.1 J	8.4 J	28.2 J	89.6 J	15.9 J	19.0 J	27.2 J
Total Dissolved Solids	-	620	792	210	280	284	227	199	628	191	182	231
pH (standard units)	-	6.0 - 7.7	7.6 J	7.4 J	7.1 J	6.8 J	6.8 J	7.3 J	7.1 J	7.3 J	6.2 J	6.5 J
Metals (ug/L)												
Antimony	6	2.5	1.5	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Arsenic	10	9.8	**2150**	0.31 U*	**33.0**	**72.5 J**	0.50	4.3	0.91	0.53	4.4	7.1
Barium	2000	1100	20.2	254	120	361 J	287	213 J	206 J	309 J	210 J	234
Beryllium	4	0.5	0.11 J	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U
Boron	-	240	8890	286	1070	476	112	371	6570	70.6	150	88.4
Cadmium	5	0.4	0.75	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.12	0.030 U	0.030 U	0.030 U
Calcium	-	160000	6900	35100	42200	65000	48100	35000	128000	32500	30700	42800
Chromium	100	2.5	1.2 U*	0.37 U*	0.21 U	0.24 U*	0.34 U*	0.25 U*	0.26 U*	0.21 U	0.51 U*	0.21 U
Cobalt	6 (a)	7.1	0.43 U	0.097 J	0.085 U	0.11 J	0.085 U	0.085 U	1.6	0.085 U	0.085 U	0.085 U
Copper	1300 (b)	1.7	22.3	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U
Lead	15	0.5	**23.2**	0.12	0.046 U	0.046 U	0.11	0.085 J	0.046 U	0.046 U	0.066 J	0.046 U
Lithium	40 (a)	34	0.79	1.8	7.6	5.7	3.3	3.1	18.6	3.2	3.9	4.6
Magnesium	-	47000	614	12800	11100	17100	13700	10200	22100	11100	8480	10500
Mercury	2	0.2	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	435	1.4	138	8.8	2.0	38.2	112	1.0	0.99	2.4
Nickel	100 (c)	12.0	5.2	0.27 J	0.24 J	0.28 J	0.34 J	0.34 J	6.4	0.15 U	0.38 J	0.15 U
Potassium	-	3500	1020	1320	1370	4390 J	2330 J	2130	3170	2380	2690	2680
Selenium	50	2.5	3.5	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 J	0.14 U	0.14 U	0.14 U
Silver	-	2.0	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Sodium	-	21000	243000	15400	19200	13800 J	13900	14100	78800	15600	12700	14600
Thallium	2	0.5	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	15.8	0.27 U	0.27 U	1.5 J	0.33 J	0.29 J	0.62 J	0.27 U	0.27 U	0.27 U
Zinc	-	10	12.0 U	2.8 U*	2.4 U	9.1 J	11.3	6.1	2.4 U	2.7 J	3.7 J	2.4 U
Radium (pCi/L)												
Radium-226	-	NC	0.462+-0.431 U	0.966+-0.644	0.0867+-0.613 UJ	0.529+-0.414 J	1.29+-0.721 J	0.444+-0.377 UJ	0.418+-0.548 UJ	0.454+-0.420 UJ	0.192+-0.453 UJ	0.195+-0.525 UJ
Radium-228	-	NC	0.433+-0.415 UJ	0.319+-0.329 UJ	0.944+-0.451	0.259+-0.376 U	0.466+-0.348 U	0.318+-0.371 U	0.830+-0.547 U	1.05+-0.463	1.27+-0.595 J	1.64+-0.604 J
Total Radium	5	3.8	0.895+-0.598 UJ	1.29+-0.723 J	1.03+-0.761 J	0.788+-0.559 J	1.76+-0.801 J	0.762+-0.529 UJ	1.25+-0.774 UJ	1.50+-0.625 J	1.46+-0.748 J	1.84+-0.800 J

Table 5c
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - September 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ALF210	ALF210-F	ALF210A	ALF212	ALF212A	ALF213	ALF213A	ALF213B	ALF214	ALF214A
		Sampling Date	11-Sep-19	11-Sep-19	11-Sep-19	13-Sep-19	13-Sep-19	20-Sep-19	20-Sep-19	20-Sep-19	11-Sep-19	12-Sep-19
		Depth (ft toc)	**47**	**47**	**125**	**67**	**165**	**71**	**157.75**	**115.75**	**45**	**130**
Speciated Arsenic (ug/L)	**MCL**	**Background**										
Arsenic III	-	NC	0.727 J	NA	0.867 J	8.89	3.39	16.9 J	3.28 J	2.05 J	0.400 U	1.33 J
Arsenic V	-	NC	0.400 U	NA	0.400 U	2.62	1.50 J	7.48 J	1.00 J	1.15 J	0.400 U	0.400 U
Dimethylarsinic	-	NC	0.500 U	NA	0.500 U	0.500 U	0.500 U	0.50 UJ	0.50 UJ	0.50 UJ	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	NA	0.900 U	0.900 U	0.900 U	0.90 UJ	0.90 UJ	0.90 UJ	0.900 U	0.900 U
General Chemistry (mg/L)												
Alkalinity, Total as CaCO3	-	560	429	NA	299 J	343	233	229	100	340	227	175
Alkalinity, Bicarbonate (CaCO3)	-	5.0	429	NA	299 J	343	233	229	100	340	227	175
Alkalinity, Carbonate (CaCO3)	-	560	2.0 U	NA	2.0 UJ	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloride	-	23	1.1 U*	NA	58.9 J	15.8 J	41.3 J	14.6	18.2	63.1	1.5 U*	55.9
Fluoride	4	0.23	0.36	NA	0.15	1.6	0.22	0.48	0.30	0.19	0.41	0.099
Sulfate	-	130	11.8	NA	190 J	2.3 U*	0.28 U	7.1 J	26.5 J	0.52 U*	12.3 J	324
Total Dissolved Solids	-	620	459	NA	703	407	320	277	189	434	246	788
pH (standard units)	-	6.0 - 7.7	7.2 J	NA	6.6 J	7.1 J	7.0 J	6.6 J	7.0 J	6.8 J	6.8 J	6.2 J
Metals (ug/L)												
Antimony	6	2.5	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.19 J	0.21 J	0.077 U
Arsenic	10	9.8	1.2	0.32 J	1.1	**10.4**	4.1	**27.1**	4.7	3.8	0.40 J	1.3
Barium	2000	1100	321	299	127	249	418	389	303	621	121	29.8
Beryllium	4	0.5	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U
Boron	-	240	74.1	68.9	2220	1600	52.9	190	45.7	24.0	223	92.8
Cadmium	5	0.4	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.091	0.030 U
Calcium	-	160000	128000	132000	122000	75300	66700	56000	26600	112000	72000	122000
Chromium	100	2.5	0.21 U	0.21 U	0.21 U	0.22 U*	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Cobalt	6 (a)	7.1	2.1	2.0	0.085 U	0.24 J	0.25 J	0.085 U	0.085 U	0.33 J	0.21 J	0.085 U
Copper	1300 (b)	1.7	0.43 U	0.43 U	0.46 U*	0.43 U	0.43 U	0.43 U	0.43 U	1.1 U*	0.43 U	0.43 U
Lead	15	0.5	0.046 U	0.046 U	0.082 J	0.046 U	0.046 U	0.046 U	0.046 U	0.053 J	0.046 U	0.046 U
Lithium	40 (a)	34	21.4	20.5	8.1	12.0	3.0	7.9	2.7	9.8	9.6	5.3
Magnesium	-	47000	31300	29800	31800	19500	24000	17300	11000	30300	15500	38800
Mercury	2	0.2	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	1.6	1.7	1.2	37.6	1.1	3.1	1.1	2.1	2.4	0.48 J
Nickel	100 (c)	12.0	3.3	3.0	1.2 U*	0.22 J	0.62	0.16 J	0.15 U	0.65	3.8	0.15 U
Potassium	-	3500	2580	2600	4660	2180	2540	3500	2630	3930	1150	3010
Selenium	50	2.5	0.29 J	0.19 J	0.14 U	0.21 J	0.14 U	0.14 U	0.14 U	0.14 U	0.14 J	0.14 U
Silver	-	2.0	0.077 U	0.077 UJ	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Sodium	-	21000	3910	3690	58900	37400	12000	19600	13300	15100	7600	39100
Thallium	2	0.5	0.047 UJ	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	0.27 U	0.27 U	0.27 U	1.3 U	0.27 U	0.27 U	0.27 U	0.27 U	0.78 J	0.27 U
Zinc	-	10	2.4 U	2.5 J	2.5 J	2.4 U	13.2 U*	2.4 U	2.4 U	11.4	2.5 J	2.6 J
Radium (pCi/L)												
Radium-226	-	NC	0.281+-0.437 U	NA	0.000+-0.522 U	0.505+-0.582 U	0.0658+-0.486 U	0.597+-0.532 U	1.00+-0.631	0.717+-0.461	0.424+-0.394 U	0.280+-0.549 U
Radium-228	-	NC	0.561+-0.403 UJ	NA	0.847+-0.416 J	0.218+-0.310 U	0.679+-0.450 U	0.592+-0.352 U	0.359+-0.398 U	0.582+-0.356 U	0.0564+-0.290 UJ	0.532+-0.365 UJ
Total Radium	5	3.8	0.842+-0.594 UJ	NA	0.847+-0.667 J	0.723+-0.659 U	0.745+-0.662 U	1.19+-0.638 U	1.36+-0.746 J	1.30+-0.582 J	0.480+-0.489 UJ	0.812+-0.659 UJ

Table 5c
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - September 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ALF214B	ALF215	ALF216	ALF217	ALF217A	ALF217B	P4	P4S	PMW02A	PMW02A-F
		Sampling Date	12-Sep-19	12-Sep-19	11-Sep-19	20-Sep-19	20-Sep-19	20-Sep-19	16-Sep-19	16-Sep-19	17-Sep-19	17-Sep-19
		Depth (ft toc)	**88**	**25**	**50**	**60.8**	**187**	**126**	**77**	**41**	**29**	**29**
Speciated Arsenic (ug/L)	**MCL**	**Background**										
Arsenic III	-	NC	3.32	1.74 J	3.33	35.4 J	3.87 J	8.61 J	2.07	1.38 J	57.9	NA
Arsenic V	-	NC	1.00 J	0.400 U	3.11	5.56 J	2.30 J	3.13 J	0.400 U	0.400 U	3370	NA
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.50 UJ	0.50 UJ	0.50 UJ	0.500 U	0.500 U	5.00 U	NA
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.90 UJ	0.90 UJ	0.90 UJ	0.900 U	0.900 U	9.00 U	NA
General Chemistry (mg/L)												
Alkalinity, Total as CaCO3	-	560	182	236	437	332	304	270	80.5	149	232	NA
Alkalinity, Bicarbonate (CaCO3)	-	5.0	182	236	437	332	304	270	80.5	149	2.0 U	NA
Alkalinity, Carbonate (CaCO3)	-	560	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	156	NA
Chloride	-	23	27.4	0.75 U*	5.0	15.9	26.2	65.4	8.7	11.2	14.1	NA
Fluoride	4	0.23	0.16	0.34	0.12	2.6	0.085	0.19	0.42	0.55	4.0	NA
Sulfate	-	130	163	12.8	33.8	0.55 U*	3.1 J	0.56 U*	19.3	33.6 J	229 J	NA
Total Dissolved Solids	-	620	485	269	493	374	352	358	139	227	733	NA
pH (standard units)	-	6.0 - 7.7	6.3 J	7.1 J	6.5 J	7.0 J	7.0 J	7.0 J	7.2 J	7.5 J	10.0 J	NA
Metals (ug/L)												
Antimony	6	2.5	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	1.3	1.4
Arsenic	10	9.8	3.6	2.2	6.1	**43.3**	6.9	**12.3**	1.9	1.4	**3300**	**3160**
Barium	2000	1100	113	207	649	218	407	684	87.3	59.9	33.4	21.8
Beryllium	4	0.5	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.13 J	0.054 U
Boron	-	240	120	98.0	179	1430	18.1	40.7	43.3	186	8230	7510
Cadmium	5	0.4	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.062 J	1.3	0.86
Calcium	-	160000	75300	64800	135000	69800	82600	84400	22600	42800	4440	4360
Chromium	100	2.5	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.26 U*	0.21 U	2.3 U*	1.5
Cobalt	6 (a)	7.1	0.085 U	3.2	0.58	0.25 J	0.89	0.21 J	0.085 U	0.68	1.7	1.2
Copper	1300 (b)	1.7	0.49 U*	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	34.3	21.8
Lead	15	0.5	0.083 J	0.046 U	0.046 U	0.046 U	0.046 U	0.070 J	0.10	0.046 U	10.8	6.2
Lithium	40 (a)	34	7.7	7.0	15.9	11.0	10.4	3.8	2.1	2.1	1.7	0.77
Magnesium	-	47000	23100	19400	39500	16800	18600	25700	5590	10400	223	122
Mercury	2	0.2	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	0.31 J	2.8	0.22 J	23.5	2.5	0.83	2.3	5.3	303	306
Nickel	100 (c)	12.0	0.23 J	4.2	0.49 J	0.36 J	0.66	0.36 J	0.29 J	2.0	11.7	10.3
Potassium	-	3500	2320	733	2980	4300	2220	2710	1460	2350	1300 J	1310
Selenium	50	2.5	0.14 U	0.14 U	0.14 U	0.39 J	0.14 U	0.14 U	0.14 U	0.14 U	3.0	2.6
Silver	-	2.0	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.090 J	0.077 U
Sodium	-	21000	28200	8300	7830	36000	17600	10100	8620	14000	224000	210000
Thallium	2	0.5	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	0.27 U	0.41 J	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	50.1	48.3
Zinc	-	10	4.7 J	2.4 U	2.4 J	2.4 U	2.4 U	3.3 J	2.4 U	3.9 J	8.3	4.4 J
Radium (pCi/L)												
Radium-226	-	NC	0.379+-0.577 U	0.340+-0.452 UJ	0.957+-0.609	0.265+-0.272	0.991+-0.778 U	0.946+-0.536	0.0729+-0.378 UJ	0.331+-0.563 UJ	0.0717+-0.327 UJ	NA
Radium-228	-	NC	0.319+-0.338 UJ	0.764+-0.441 U	0.694+-0.393 UJ	0.327+-0.356 U	1.31+-0.446	0.572+-0.363 U	0.105+-0.426 U	0.366+-0.371 U	0.121+-0.688 U	NA
Total Radium	5	3.8	0.698+-0.669 UJ	1.10+-0.631 UJ	1.65+-0.725 J	0.592+-0.448 J	2.30+-0.897 J	1.52+-0.647 J	0.178+-0.570 UJ	0.697+-0.674 UJ	0.193+-0.762 UJ	NA

Table 5c
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - September 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	PMW02B	PMW02C	PMW04A	PMW04B	PMW04C	PMW07A	PMW07B	PMW07C	PMW10A	PMW10B
		Sampling Date	17-Sep-19	17-Sep-19	17-Sep-19	17-Sep-19	17-Sep-19	18-Sep-19	18-Sep-19	18-Sep-19	12-Sep-19	12-Sep-19
		Depth (ft toc)	**54**	**124**	**29**	**57**	**124**	**24**	**55**	**117**	**32**	**55**
Speciated Arsenic (ug/L)	**MCL**	**Background**										
Arsenic III	-	NC	30.0	0.400 U	17.6	44.4	0.400 U	71.4 J	7.75 J	2.31 J	200	67.4
Arsenic V	-	NC	4.23	0.400 U	1390	11.7 J	0.541 U*	139 J	2.45 J	0.61 J	28.4	5.33
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.50 UJ	0.50 UJ	0.50 UJ	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.90 UJ	0.90 UJ	0.90 UJ	0.900 U	0.900 U
General Chemistry (mg/L)												
Alkalinity, Total as CaCO3	-	560	187	104	136	276	115	220	220	109	121	394
Alkalinity, Bicarbonate (CaCO3)	-	5.0	187	104	136	276	115	220	220	109	121	394
Alkalinity, Carbonate (CaCO3)	-	560	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloride	-	23	13.6	16.5	15.2	17.0	16.2	16.3	15.3	17.1	14.9 J	14.0 J
Fluoride	4	0.23	0.20	0.23	3.7	0.29	0.21	3.5	0.15	0.31	**7.1**	0.34
Sulfate	-	130	9.6 J	35.3 J	204	54.5 J	33.3 J	237	47.6 J	36.9 J	95.4	1.4 U*
Total Dissolved Solids	-	620	258	194	506	419	191	659	330	199	382	496
pH (standard units)	-	6.0 - 7.7	6.7 J	6.3 J	7.2 J	6.9 J	7.3 J	7.8 J	7.2 J	7.2 J	7.3 J	7.0 J
Metals (ug/L)												
Antimony	6	2.5	0.077 U	0.077 U	0.34 J	0.077 U	0.077 U	0.41 J	0.077 U	0.077 U	0.079 J	0.13 J
Arsenic	10	9.8	**37.6**	0.43 J	**1460**	**59.9**	0.14 U	**218**	**12.5**	2.7	**225**	**76.5**
Barium	2000	1100	89.7	197	63.2	327	243	162 J	115 J	201 J	91.3	165
Beryllium	4	0.5	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.055 J	0.054 U	0.054 U	0.054 U	0.054 U
Boron	-	240	465	175	6930	3310	130	10100	1740	419	7080	748
Cadmium	5	0.4	0.030 U	0.030 U	0.13	0.030 U	0.030 U	0.24	0.030 U	0.030 U	0.073 J	0.030 U
Calcium	-	160000	42500	35400	45900	92600	39100	83400	73500	36900	35100	134000
Chromium	100	2.5	0.36 U*	0.94 U*	0.21 U	0.21 U	0.21 U	0.58 U*	0.50 U*	0.23 U*	0.21 U	0.21 U
Cobalt	6 (a)	7.1	0.43 J	0.087 J	1.4	0.11 J	0.085 U	0.59	0.39 J	0.92	1.3	0.42 J
Copper	1300 (b)	1.7	0.55 U*	0.43 U	3.6 U*	0.43 U	0.43 U	5.4	0.43 U	0.43 U	0.92 U*	0.43 U
Lead	15	0.5	0.14	0.061 J	0.074 J	0.081 J	0.057 J	1.5	0.10 U*	0.12 U*	0.12	0.046 U
Lithium	40 (a)	34	4.6	2.2	7.0	12.4	2.9	8.7	4.6	3.7	8.2	18.9
Magnesium	-	47000	9550	9340	10100	24000	9390	14100	15800	11200	7360	22200
Mercury	2	0.2	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	6.6	1.7	528	185	1.9	939	24.9	27.2	663	9.7
Nickel	100 (c)	12.0	0.62	0.53	11.5	0.21 J	0.18 J	2.7	0.66	2.6	4.3	0.50
Potassium	-	3500	2980 J	1280 J	5510 J	3040 J	1510 J	4040	3630	1950	4510	5700
Selenium	50	2.5	0.14 U	0.14 U	0.53	0.14 U	0.14 U	0.50	0.14 U	0.14 U	0.39 J	0.16 J
Silver	-	2.0	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Sodium	-	21000	25500	14200	101000	17700	14100	109000	15000	16100	83400	29200
Thallium	2	0.5	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	2.0	0.27 U	4.1	0.36 J	0.27 U	2.9	1.4	0.28 J	8.2	0.33 J
Zinc	-	10	117	5.3	2.4 U	9.3 J	2.4 U	5.5	9.2	3.0 J	3.5 J	2.4 U
Radium (pCi/L)												
Radium-226	-	NC	0.0597+-0.273 UJ	0.600+-0.378 J	0.849+-0.514 J	0.697+-0.553 UJ	0.813+-0.644 UJ	0.322+-0.492 UJ	0.394+-0.671 U	0.727+-0.680 U	-0.0891+-0.305 UJ	0.800+-0.620 UJ
Radium-228	-	NC	0.556+-0.702 U	1.91+-0.715 J	1.62+-0.694 J	2.13+-0.691 J	1.47+-0.632 J	0.991+-0.443	0.804+-0.425	0.169+-0.366 U	0.809+-0.435 U*	0.506+-0.423 U
Total Radium	5	3.8	0.616+-0.753 UJ	2.51+-0.809 J	2.47+-0.864 J	2.83+-0.885 J	2.28+-0.902 J	1.31+-0.662 J	1.20+-0.794 J	0.896+-0.772 U	0.809+-0.531 U*	1.31+-0.751 UJ

Table 5c
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - September 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	PMW10C	PMW11A	PMW11B	PMW11C	PMW14A	PMW14B	PMW14C
		Sampling Date	12-Sep-19	17-Sep-19	17-Sep-19	17-Sep-19	16-Sep-19	16-Sep-19	16-Sep-19
		Depth (ft toc)	**148**	**27**	**63**	**144**	**49**	**85**	**156**
Speciated Arsenic (ug/L)	**MCL**	**Background**							
Arsenic III	-	NC	0.522 J	110	11.9	1.47 J	76.9	53.5	0.448 J
Arsenic V	-	NC	0.400 U	6.06	1.84 U*	0.400 U	10.4	16.6	0.400 U
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U
General Chemistry (mg/L)									
Alkalinity, Total as CaCO3	-	560	190	173	182	187	297	284	148
Alkalinity, Bicarbonate (CaCO3)	-	5.0	190	173	182	187	297	284	148
Alkalinity, Carbonate (CaCO3)	-	560	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloride	-	23	16.6 J	12.9	17.9	19.1	14.6	13.7	15.0
Fluoride	4	0.23	0.29	3.8	2.8	0.47	1.6	0.20	0.21
Sulfate	-	130	57.1	118 J	88.8 J	94.7 J	48.6 J	48.1 J	25.4 J
Total Dissolved Solids	-	620	327	414	378	381	447	407	239
pH (standard units)	-	6.0 - 7.7	7.1 J	7.2 J	7.2 J	7.1 J	7.0 J	6.9 J	7.1 J
Metals (ug/L)									
Antimony	6	2.5	0.077 U	0.077 U	0.077 U	0.079 J	0.11 J	0.077 U	0.33 J
Arsenic	10	9.8	0.67	**120**	**14.6**	3.7	**76.1**	**58.4**	0.38 J
Barium	2000	1100	252	127	194	148	122	689	206
Beryllium	4	0.5	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U
Boron	-	240	2880	3830	6600	4320	5490	1760	338
Cadmium	5	0.4	0.030 U	0.030 U	0.030 U	0.030 U	0.081 J	0.030 U	0.030 U
Calcium	-	160000	54200	49400	45300	49100	58800	70100	39200
Chromium	100	2.5	0.21 U	0.21 U	0.22 U*	0.24 U*	0.21 U	0.47 U*	0.42 U*
Cobalt	6 (a)	7.1	0.085 U	1.3	0.085 U	0.085 U	4.1	0.18 J	0.11 J
Copper	1300 (b)	1.7	0.43 U	0.43 U	0.43 U	3.9	0.48 U*	0.43 U	0.55 U*
Lead	15	0.5	0.046 U	0.046 U	0.046 U	0.17	0.16	0.046 U	0.088 J
Lithium	40 (a)	34	2.3	6.8	14.8	3.8	6.3	6.0	3.2
Magnesium	-	47000	19300	11300	12400	15600	15100	21400	13000
Mercury	2	0.2	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	348	149	385	433	60.9	1.8	6.0
Nickel	100 (c)	12.0	0.19 J	2.3	0.27 J	0.22 J	6.7	0.19 J	0.42 J
Potassium	-	3500	2400	1930 J	2250 J	2360 J	1220	4370	1830
Selenium	50	2.5	0.14 U	0.18 J	0.14 J	0.14 U	0.30 J	0.14 U	0.14 U
Silver	-	2.0	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Sodium	-	21000	27600	76600	63800	54900	54800	11300	11600
Thallium	2	0.5	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	0.27 U	1.2	0.78 J	0.28 J	0.97 J	0.27 U	0.27 U
Zinc	-	10	2.4 U	2.4 U	2.4 U	5.4	2.4 U	2.4 U	5.9
Radium (pCi/L)									
Radium-226	-	NC	-0.145+-0.477 UJ	0.229+-0.449 UJ	0.674+-0.574 UJ	0.582+-0.741 UJ	0.000+-0.377 UJ	1.04+-0.657 J	0.468+-0.510 UJ
Radium-228	-	NC	0.657+-0.453 U	0.437+-0.447 U	0.185+-0.386 U	1.04+-0.496	0.373+-0.383 U	0.550+-0.598 U	0.896+-0.524 U
Total Radium	5	3.8	0.657+-0.658 UJ	0.666+-0.634 UJ	0.859+-0.692 UJ	1.62+-0.892 J	0.373+-0.537 UJ	1.59+-0.888 J	1.36+-0.731 UJ

Notes:
Analysis of filtered samples are displayed as "-F"
MCL - Maximum Contaminant Level
(a) No MCL established. EPA has recognized Regional Screening Levels (RSLs) as Groundwater Protection Standards in the federal CCR Rule at 40 C.F.R. 257.95(h)(2) (see 83 Fed. Reg. 36435 (July 30, 2018))
(b) No MCL established. Copper concentrations were compared to the EPA Maximum Contaminant Level Goal (MCLG), Action Level, and Treatment Technique goal value as established in 40 C.F.R. Part 141
(c) The MCL for nickel was remanded in 1995. TDEC Rule 0400-40-03-.03 established the state ambient water quality criteria (AWQC) for nickel to protect groundwater and receiving surface water bodies.
Other constituents with no MCL value are depicted with a dash "-"
Background - site-specific background concentrations calculated as 95% Upper Tolerance Limits (UTLs) in accordance with USEPA Unified Guidance
(see Technical Memorandum: 2019 Statistical Evaluation of Background Groundwater Quality for Allen Fossil Plant, February 2020).
J - The result is estimated.
mg/L - milligrams per liter; ug/L - micrograms per liter; pCi/L - picocuries per liter
NA - Constituent was not analyzed
NC - Background value was not calculated
U - The analyte was not detected above the indicated reporting limit.
U* - The analyte was detected in an associated blank.
Sample analytical results that exceed the MCL are shaded YELLOW

Stantec

Table 5d
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - December 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ACC1A	ACC3A	ACC5A	ACC5B	ALF201	ALF201A	ALF201B	ALF202	ALF202A
		Sampling Date	11-Dec-19	11-Dec-19	11-Dec-19	11-Dec-19	13-Dec-19	13-Dec-19	13-Dec-19	19-Dec-19	19-Dec-19
		Depth (ft toc)	**165.5**	**126**	**139**	**55.5**	**49**	**126**	**89**	**43**	**145.5**
Speciated Arsenic (ug/L)	**MCL**	**Background**									
Arsenic III	-	NC	0.889	0.197 J	1.47	0.208 J	1.56 J	0.400 U	2.49	366	0.798 J
Arsenic V	-	NC	1.22	0.123 J	0.390 J	0.141 J	0.400 U	0.400 U	0.444 J	16.6 J	0.400 UJ
Dimethylarsinic	-	NC	0.100 U	0.100 U	0.100 U	0.100 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.180 U	0.180 U	0.180 U	0.180 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U
General Chemistry (mg/L)											
Alkalinity, Total as CaCO3	-	560	311 J	427	258	460	269	236	240	83.7	226
Alkalinity, Bicarbonate (CaCO3)	-	5.0	311 J	427	258	460	269	236	240	83.7	226
Alkalinity, Carbonate (CaCO3)	-	560	2.0 UJ	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloride	-	23	8.6	11.3	23.7	5.4	19.2 J	31.0 J	24.8 J	20.3	24.6
Fluoride	4	0.23	0.18	0.14	0.12	0.22	0.66	0.48	0.85	**4.5**	0.31
Sulfate	-	130	2.6 U*	65.7 J	115 J	59.3 J	108 J	146 J	165 J	198 J	58.9 J
Total Dissolved Solids	-	620	302	498	404	534	432	403	468	249	337
pH (standard units)	-	6.0 - 7.7	6.9 J	6.5 J	7.0 J	6.6 J	6.9 J	7.2 J	7.1 J	7.1 J	6.7 J
Metals (ug/L)											
Antimony	6	2.5	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Arsenic	10	9.8	1.9	0.26 J	1.8	0.33 J	2.2	0.45 J	3.1	**367**	0.76
Barium	2000	1100	463	903	70.3	648	223	196	141	56.1	325
Beryllium	4	0.5	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U
Boron	-	240	8.9 J	159	31.6	84.2	1580	518	4890	5330	1410
Cadmium	5	0.4	0.030 U	0.030 U	0.030 U	0.030 U	0.047 J	0.030 U	0.030 U	0.035 J	0.030 U
Calcium	-	160000	63100	123000	80000	140000	93300	72600	75900	19900	64100
Chromium	100	2.5	0.21 U	0.32 U*	0.21 U	0.21 U	0.21 U	0.32 U*	0.21 U	0.32 U*	0.47 U*
Cobalt	6 (a)	7.1	0.56	0.085 U	0.085 U	3.8	2.3	0.085 U	0.085 U	0.093 J	0.085 U
Copper	1300 (b)	1.7	0.43 U	6.6	0.43 U	0.43 U	0.43 J	0.54 J	0.43 U	2.0	0.43 U
Lead	15	0.5	0.054 J	0.10	0.046 U	0.046 U	0.046 U	0.082 J	0.046 U	0.61	0.11
Lithium	40 (a)	34	1.2	6.6 J	2.6	15.1	17.2	4.9	18.8	5.1	3.0
Magnesium	-	47000	30600	38500	31600	34400	23000	20800	22800	4360	22900
Mercury	2	0.2	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	0.51	0.35 J	0.31 J	0.17 J	54.5	14.7	327	221	169
Nickel	100 (c)	12.0	1.3	0.34 J	0.30 J	6.7	3.8	0.29 J	0.22 J	0.77	0.26 J
Potassium	-	3500	2450	3120	2840	2100	2510	3380	5090	1880	2900
Selenium	50	2.5	0.14 U	0.14 U	0.14 U	0.14 U	0.32 J	0.14 U	0.14 U	0.30 J	0.14 U
Silver	-	2.0	0.077 UJ	0.077 UJ	0.077 UJ	0.077 UJ	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Sodium	-	21000	9770	11000	13300	6150	28900	62100	54200	90900	20300
Thallium	2	0.5	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	2.1	0.27 U
Zinc	-	10	5.1 U*	6.7 U*	2.8 U*	3.9 U*	4.2 U*	3.2 U*	2.4 U	2.4 U	2.4 U*
Radium (pCi/L)											
Radium-226	-	NC	0.892+-0.463 U*	1.26+-0.643 U*	0.338+-0.326 U*	0.694+-0.552 UJ	-0.293+-0.346 U	0.221+-0.405 U	0.000+-0.368 U	0.123+-0.396 U	0.0569+-0.569 U
Radium-228	-	NC	0.952+-0.460 J	0.983+-0.505 J	-0.0761+-0.337 UJ	0.363+-0.402 UJ	0.112+-0.352 UJ	0.191+-0.329 UJ	0.854+-0.452 J	0.110+-0.381 UJ	0.572+-0.458 UJ
Total Radium	5	3.8	1.84+-0.653 J	2.24+-0.818 J	0.338+-0.469 U*	1.06+-0.683 UJ	0.112+-0.494 UJ	0.412+-0.522 UJ	0.854+-0.583 J	0.233+-0.550 UJ	0.629+-0.730 UJ

Table 5d
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - December 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ALF202B	ALF203	ALF203A	ALF203B	ALF204	ALF204A	ALF204B	ALF205	ALF205A
		Sampling Date	19-Dec-19	13-Dec-19	13-Dec-19	13-Dec-19	18-Dec-19	18-Dec-19	18-Dec-19	19-Dec-19	19-Dec-19
		Depth (ft toc)	**89.5**	**52**	**118**	**89**	**49**	**116**	**89**	**54**	**107**
Speciated Arsenic (ug/L)	**MCL**	**Background**									
Arsenic III	-	NC	2.48	1350	0.400 U	9.19	36.2	0.400 U	4.42	0.807 J	0.400 U
Arsenic V	-	NC	0.883 J	86.2	0.400 U	1.52 J	8.50	0.400 U	0.813 J	0.607 J	0.400 UJ
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U
General Chemistry (mg/L)											
Alkalinity, Total as CaCO3	-	560	219	194	102	172	188	176	111	388	120
Alkalinity, Bicarbonate (CaCO3)	-	5.0	219	2.0 U	102	172	188	176	111	388	120
Alkalinity, Carbonate (CaCO3)	-	560	2.0 U	113	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloride	-	23	21.4	22.9 J	22.8 J	18.7 J	18.9	23.1	18.2	19.8	23.6
Fluoride	4	0.23	0.33	**6.4**	0.24	0.73	0.27	0.24	0.35	1.6	0.26
Sulfate	-	130	98.8 J	284 J	41.2 J	45.1 J	31.7 J	7.0 J	40.7 J	144 J	21.0 J
Total Dissolved Solids	-	620	404	678	113	267	290	236	216	592	186
pH (standard units)	-	6.0 - 7.7	6.7 J	9.6 J	7.4 J	7.3 J	6.8 J	6.4 J	6.6 J	6.9 J	6.1 J
Metals (ug/L)											
Antimony	6	2.5	0.077 U	1.5 J	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Arsenic	10	9.8	3.2	**2170**	0.20 J	**13.0**	**46.8**	0.34 J	5.2	1.0	0.40 J
Barium	2000	1100	434	24.4	194	132	246	335	212	177	305
Beryllium	4	0.5	0.054 U	0.27 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U
Boron	-	240	2240	7190	283	966	388	104	563	6780	70.8
Cadmium	5	0.4	0.030 U	1.3	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.083	0.030 U
Calcium	-	160000	75300	10000	27400	50500	58500	46600	36200	112000	33000
Chromium	100	2.5	0.21 U	1.3 U*	0.24 U*	0.23 U*	0.35 U*	0.30 U*	0.21 U	0.21 U	0.21 U
Cobalt	6 (a)	7.1	0.085 U	0.43 U	0.085 U	0.085 U	0.15 J	0.085 U	0.085 U	1.4	0.085 U
Copper	1300 (b)	1.7	0.43 U	47.3	0.43 U	0.43 U	0.62 J	0.43 U	0.44 J	0.43 U	0.43 U
Lead	15	0.5	0.046 U	32.8	0.046 U	0.086 J	0.046 U	0.10	0.046 U	0.046 U	0.046 U
Lithium	40 (a)	34	4.6	1.7 J	1.8	7.7	4.6	3.0	3.0	16.0	3.0
Magnesium	-	47000	20400	856	11900	12200	15100	14000	9030	18800	11300
Mercury	2	0.2	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	138	368	2.2	112	14.3	2.4	54.2	126	0.96
Nickel	100 (c)	12.0	0.22 J	6.5	0.15 J	0.35 J	0.34 J	0.24 J	0.35 J	5.8	0.15 J
Potassium	-	3500	3080	1170	1280	1440	3340	2540	2140	3200	2430
Selenium	50	2.5	0.14 U	5.7	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 J	0.14 U
Silver	-	2.0	0.077 U	0.38 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Sodium	-	21000	16900	208000	14100	18700	11900	16300	15200	85300	15500
Thallium	2	0.5	0.047 U	0.24 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	0.27 U	15.9	0.27 U	0.27 U	1.1	0.27 U	0.27 U	0.62 J	0.27 U
Zinc	-	10	2.4 U	12.0 U	2.4 U	2.4 U	14.0 U*	10.7 U*	7.0 U*	2.4 U	3.4 U*
Radium (pCi/L)											
Radium-226	-	NC	0.0594+-0.594 U	0.239+-0.520 U	0.000+-0.401 U	0.0593+-0.506 U	0.435+-0.599 U	0.325+-0.560 U	0.289+-0.714 U	-0.0511+-0.452 U	0.437+-0.509 U
Radium-228	-	NC	0.426+-0.385 UJ	0.729+-0.598 UJ	-0.145+-0.319 UJ	0.623+-0.385 UJ	0.353+-0.395 U	0.386+-0.374 U	0.732+-0.483 U	0.241+-0.400 UJ	0.252+-0.473 UJ
Total Radium	5	3.8	0.485+-0.708 UJ	0.968+-0.792 UJ	0.000+-0.512 UJ	0.682+-0.636 UJ	0.788+-0.718 U	0.711+-0.673 U	1.02+-0.862 U	0.241+-0.604 UJ	0.689+-0.695 UJ

Table 5d
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - December 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ALF205B	ALF206	ALF210	ALF210A	ALF212	ALF212A	ALF213	ALF213A	ALF213B
		Sampling Date	19-Dec-19	18-Dec-19	12-Dec-19	11-Dec-19	13-Dec-19	13-Dec-19	12-Dec-19	12-Dec-19	12-Dec-19
		Depth (ft toc)	**81.5**	**54**	**47**	**125**	**67**	**165**	**71**	**157.75**	**116.75**
Speciated Arsenic (ug/L)	**MCL**	**Background**									
Arsenic III	-	NC	3.55	4.94	0.898 J	0.400 U	9.63	2.93	6.31	3.51	2.15
Arsenic V	-	NC	1.04 J	1.22 J	0.501 J	0.400 U	2.04	1.13 J	2.18	0.953 J	0.698 J
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U
General Chemistry (mg/L)											
Alkalinity, Total as CaCO3	-	560	111	124	443	287	289	225	168	104	345
Alkalinity, Bicarbonate (CaCO3)	-	5.0	111	124	443	287	289	225	168	104	345
Alkalinity, Carbonate (CaCO3)	-	560	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloride	-	23	16.2	14.2	1.8 J	103 J	23.0 J	54.8 J	23.5 J	27.7 J	92.2 J
Fluoride	4	0.23	0.27	0.35	0.34 J	0.13 J	1.7	0.28	0.72 J	0.34 J	0.20 J
Sulfate	-	130	16.9 J	32.3 J	16.2 J	345 J	7.0 J	1.7 U*	9.3 J	36.5 J	0.62 U*
Total Dissolved Solids	-	620	170	202	457	817	361	291	199	177	442
pH (standard units)	-	6.0 - 7.7	5.7 J	6.4 J	7.0 J	6.9 J	7.1 J	7.2 J	7.4 J	6.6 J	7.0 J
Metals (ug/L)											
Antimony	6	2.5	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Arsenic	10	9.8	4.1	5.9	2.2	0.51	**12.4**	4.3	7.7	4.0	2.9
Barium	2000	1100	208	224	337	142	215	396	292	286	544
Beryllium	4	0.5	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U
Boron	-	240	119	76.2	69.1	1740	1690	52.3	118	41.9	26.2
Cadmium	5	0.4	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U
Calcium	-	160000	31400	35700	132000	152000	70200	63000	35600	25600	95800
Chromium	100	2.5	0.23 U*	0.21 U	0.21 U	0.21 U	0.32 U*	0.21 U	0.21 U	0.21 U	0.23 U*
Cobalt	6 (a)	7.1	0.085 U	0.085 U	2.3	0.085 U	0.33 J	0.21 J	0.085 U	0.085 U	0.16 J
Copper	1300 (b)	1.7	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U
Lead	15	0.5	0.046 U	0.046 U	0.046 U	0.051 J	0.089 J	0.046 U	0.046 U	0.046 U	0.046 U
Lithium	40 (a)	34	3.7	4.0	20.0	8.3	11.5	3.0	6.3	2.3	7.1
Magnesium	-	47000	8680	8940	29800	35900	17700	24200	11600	10300	27700
Mercury	2	0.2	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	1.0	2.4	1.6	0.68	48.5	1.5	3.2	1.0	1.5
Nickel	100 (c)	12.0	0.22 J	0.16 J	3.4	0.21 J	0.42 J	0.48 J	0.15 U	0.15 U	0.40 U*
Potassium	-	3500	2860	2430	2700	4890	2310	2760	2930	2560	3590
Selenium	50	2.5	0.14 U	0.14 U	0.22 J	0.14 U	0.25 J	0.14 U	0.14 U	0.14 U	0.14 U
Silver	-	2.0	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Sodium	-	21000	13600	14000	3770	68300	37500	12300	14400	12800	17400
Thallium	2	0.5	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	0.27 U	0.27 U	0.27 U	0.27 U	0.38 J	0.27 U	0.27 U	0.27 U	0.27 U
Zinc	-	10	2.4 U	2.4 U	2.4 U	2.4 U	3.8 U*	12.9 U*	2.4 U	2.4 U	2.4 U
Radium (pCi/L)											
Radium-226	-	NC	0.228+-0.518 U	-0.0813+-0.508 U	0.692+-0.653 U	1.39+-0.791 U*	0.0413+-0.329 U	0.444+-0.439 U	0.214+-0.487 U	0.222+-0.504 U	0.383+-0.575 U
Radium-228	-	NC	0.124+-0.327 UJ	0.217+-0.371 U	1.10+-0.497 J	0.967+-0.501 U*	-0.0778+-0.370 UJ	0.0717+-0.387 UJ	0.466+-0.465 UJ	0.112+-0.335 UJ	0.705+-0.437 UJ
Total Radium	5	3.8	0.352+-0.613 UJ	0.217+-0.629 U	1.79+-0.821 J	2.36+-0.936 U*	0.0413+-0.495 UJ	0.516+-0.585 UJ	0.680+-0.673 UJ	0.334+-0.605 UJ	1.09+-0.722 UJ

Table 5d
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - December 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	ALF214	ALF214A	ALF214B	ALF215	ALF216	ALF217	ALF217A	ALF217B	P4
		Sampling Date	12-Dec-19	12-Dec-19	12-Dec-19	17-Dec-19	11-Dec-19	12-Dec-19	12-Dec-19	12-Dec-19	17-Dec-19
		Depth (ft toc)	**45**	**130**	**88**	**25**	**50**	**60.75**	**187.75**	**126.75**	**77**
Speciated Arsenic (ug/L)	**MCL**	**Background**									
Arsenic III	-	NC	0.400 U	1.16 J	3.04	0.444 J	1.58	46.0 J	5.25	8.55	1.71 J
Arsenic V	-	NC	0.400 U	0.400 U	0.708 J	0.545 J	3.66	4.89 J	3.75	5.07	0.400 U
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.100 U	0.500 U	0.500 U	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.180 U	0.900 U	0.900 U	0.900 U	0.900 U
General Chemistry (mg/L)											
Alkalinity, Total as CaCO3	-	560	349	188	195	205	470	334	295	348	107
Alkalinity, Bicarbonate (CaCO3)	-	5.0	349	188	195	205	470	334	295	348	107
Alkalinity, Carbonate (CaCO3)	-	560	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chloride	-	23	8.3 J	61.5 J	42.1 J	0.76 J	8.0	23.2 J	30.2 J	122 J	13.1 J
Fluoride	4	0.23	0.38 J	0.11 J	0.20 J	0.40 J	0.13	3.1 J	0.16 J	0.19 J	0.42
Sulfate	-	130	31.7 J	505 J	237 J	5.2	44.7 J	0.65 U*	0.62 U*	0.58 U*	27.7
Total Dissolved Solids	-	620	400	771	480	222	516	361	339	454	173
pH (standard units)	-	6.0 - 7.7	7.4 J	6.8 J	7.0 J	7.4 J	6.7 J	7.5 J	6.8 J	7.0 J	7.2 J
Metals (ug/L)											
Antimony	6	2.5	0.12 J	0.077 U	0.077 U	0.12 J	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Arsenic	10	9.8	0.60	1.1	3.6	0.85	5.3	**33.7 J**	8.6	**13.3**	2.0
Barium	2000	1100	215	27.9	117	178	597	173	411	1020	124
Beryllium	4	0.5	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U
Boron	-	240	248	102	129	34.3	167	1150	18.0	37.9	48.6
Cadmium	5	0.4	0.16	0.030 U	0.030 U	0.032 J	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U
Calcium	-	160000	109000	120000	96800	53200	133000	78000	75300	117000	31000
Chromium	100	2.5	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.25 U*	1.1 U*
Cobalt	6 (a)	7.1	1.8	0.085 U	0.085 U	0.42 J	0.61	0.25 J	0.50	0.23 J	0.085 U
Copper	1300 (b)	1.7	0.59 U*	0.43 U	0.43 U	0.43 U	0.43 U	0.60 J	0.43 U	0.43 U	0.43 U
Lead	15	0.5	0.046 U	0.046 U	0.046 U	0.046 U	0.046 U	0.046 U	0.046 U	0.070 J	0.061 J
Lithium	40 (a)	34	14.8	5.8	7.9	6.1	16.4	10.4	7.1	4.8	2.6
Magnesium	-	47000	24100	41000	26900	16200 J	37100	16500	19500	32200	7670 J
Mercury	2	0.2	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	1.6	0.62	0.27 J	1.5	0.24 J	21.9	2.3	0.74	2.2
Nickel	100 (c)	12.0	7.0	0.15 U	0.27 J	1.8	0.31 J	0.28 U*	0.53 U*	0.72 U*	0.26 J
Potassium	-	3500	2190	3380	2620	611	2760	4270	2090	3490	1850
Selenium	50	2.5	0.14 U	0.14 U	0.14 U	0.28 J	0.14 U	0.29 J	0.14 U	0.14 U	0.14 U
Silver	-	2.0	0.077 U	0.077 U	0.077 U	0.077 U	0.077 UJ	0.077 U	0.077 U	0.077 U	0.077 U
Sodium	-	21000	11000	37700	26600	5450	7490	35700	11700	13300	10600
Thallium	2	0.5	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	0.69 J	0.27 U	0.27 U	1.0	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Zinc	-	10	2.4 U	2.5 U*	2.4 U	2.4 U	2.4 U	2.4 U	3.1 U*	3.0 U*	2.4 U
Radium (pCi/L)											
Radium-226	-	NC	-0.141+-0.453 U	0.0862+-0.483 U	-0.0610+-0.467 U	0.116+-0.639 U	0.353+-0.607 UJ	0.0540+-0.323 U	0.611+-0.466 U*	0.623+-0.593 U	0.119+-0.271 U
Radium-228	-	NC	0.491+-0.430 UJ	0.277+-0.389 UJ	0.668+-0.439 UJ	0.330+-0.303 U	-0.0967+-0.435 UJ	0.964+-0.514 U*	0.940+-0.459 U*	1.49+-0.553 U*	-0.0179+-0.353 U
Total Radium	5	3.8	0.491+-0.625 UJ	0.363+-0.620 UJ	0.668+-0.641 UJ	0.446+-0.707 U	0.353+-0.747 UJ	1.02+-0.607 U*	1.55+-0.654 U*	2.11+-0.811 U*	0.119+-0.445 U

Table 5d
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - December 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	P4S	PMW02A	PMW02A-F	PMW02B	PMW02C	PMW04A	PMW04B	PMW04C	PMW07A
		Sampling Date	17-Dec-19	18-Dec-19	18-Dec-19	18-Dec-19	18-Dec-19	17-Dec-19	17-Dec-19	17-Dec-19	19-Dec-19
		Depth (ft toc)	**41**	**29**	**29**	**54**	**124**	**29**	**59**	**124**	**24**
Speciated Arsenic (ug/L)	**MCL**	**Background**									
Arsenic III	-	NC	1.87 J	594	NA	50.0	0.400 U	4.00 UJ	34.0	0.400 U	4.36
Arsenic V	-	NC	0.400 U	2800	NA	8.44	0.400 U	2270 J	5.15	0.400 U	818 J
Dimethylarsinic	-	NC	0.500 U	5.00 U	NA	0.500 U	0.500 U	5.00 U	0.500 U	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	9.00 U	NA	0.900 U	0.900 U	9.00 U	0.900 U	0.900 U	0.900 U
General Chemistry (mg/L)											
Alkalinity, Total as CaCO3	-	560	176	261	NA	290	120	204	225	126	195
Alkalinity, Bicarbonate (CaCO3)	-	5.0	176	2.0 U	NA	290	120	204	225	126	128
Alkalinity, Carbonate (CaCO3)	-	560	2.0 U	219	NA	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	67.1
Chloride	-	23	13.9 J	20.1	NA	23.0	21.2	22.8	27.3 J	22.9 J	23.2
Fluoride	4	0.23	0.66 J	**4.2**	NA	0.20	0.20	**4.1 J**	0.60 J	0.24 J	**4.6**
Sulfate	-	130	92.4 J	261 J	NA	57.9 J	38.5	272 J	97.2 J	37.7 J	298 J
Total Dissolved Solids	-	620	371	692	NA	400	221	644	430	243	690
pH (standard units)	-	6.0 - 7.7	7.6 J	9.7 J	NA	7.3 J	6.3 J	7.6 J	7.3 J	6.7 J	8.4 J
Metals (ug/L)											
Antimony	6	2.5	0.077 U	1.2	1.2	0.077 U	0.077 U	0.35 J	0.077 U	0.077 U	0.85
Arsenic	10	9.8	2.1	**3310**	**3350**	**69.5**	0.27 J	**1430 J**	**38.7**	0.14 U	**797**
Barium	2000	1100	90.6	17.8	12.1	164	243	85.1	289	277	63.1
Beryllium	4	0.5	0.054 U	0.063 J	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U
Boron	-	240	1390	7090	6540	2170	146	6800	3810	123	11900
Cadmium	5	0.4	0.030 U	0.93	0.22	0.030 U	0.033 J	0.16	0.055 J	0.030 U	0.067 J
Calcium	-	160000	56700	5110	4940 J	81700	43000	75900	78500	41000	31800
Chromium	100	2.5	0.26 U*	1.2 U*	0.74 U*	0.54 U*	0.25 U*	0.48 U*	0.25 U*	0.35 U*	0.38 U*
Cobalt	6 (a)	7.1	0.97	1.1	0.66	0.70	0.085 U	0.42 J	0.085 U	0.091 J	0.45 J
Copper	1300 (b)	1.7	0.43 U	25.7	6.8	1.7	0.43 U	7.4	0.82 J	0.43 U	19.7
Lead	15	0.5	0.046 U	7.7	2.9	0.27	0.075 J	0.20	0.046 U	0.15	0.95
Lithium	40 (a)	34	2.2	0.84	0.49 J	8.3	2.5	11.3	11.7	2.8	3.4
Magnesium	-	47000	13800 J	179	102	18200	10000	16200 J	19200 J	9400 J	4040
Mercury	2	0.2	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	10.4	301	263 J	73.9	2.0	547	258	2.1	792
Nickel	100 (c)	12.0	2.9	9.2	7.9	0.77	0.23 J	9.7	0.21 J	0.26 J	4.4
Potassium	-	3500	3350	1260	1170	4130	1590	2540	2520	1710	2730
Selenium	50	2.5	0.14 U	2.5	1.9	0.14 U	0.14 U	0.89	0.14 U	0.14 U	1.6
Silver	-	2.0	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Sodium	-	21000	27500	232000	236000	31600	15200	97300	14200	12600	179000
Thallium	2	0.5	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	0.27 U	35.5	32.3	1.3	0.27 U	6.8	0.27 U	0.27 U	12.1
Zinc	-	10	2.4 U	3.7 U*	2.4 U	81.6	5.6 U*	2.4 U	2.4 U	2.5 U*	3.6 U*
Radium (pCi/L)											
Radium-226	-	NC	-0.195+-0.460 U	0.177+-0.492 U	NA	-0.168+-0.365 U	0.358+-0.304 U	0.0741+-0.436 U	0.000+-0.448 U	0.000+-0.416 U	0.0462+-0.369 U
Radium-228	-	NC	0.168+-0.363 U	0.580+-0.432 UJ	NA	0.180+-0.410 UJ	0.337+-0.414 UJ	-0.118+-0.386 U	-0.0283+-0.309 U	0.235+-0.355 U	0.357+-0.465 UJ
Total Radium	5	3.8	0.168+-0.586 U	0.757+-0.655 UJ	NA	0.180+-0.549 UJ	0.695+-0.514 UJ	0.0741+-0.582 U	0.000+-0.544 U	0.235+-0.547 U	0.403+-0.594 UJ

Table 5d
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - December 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	PMW07B	PMW07C	PMW10A	PMW10B	PMW10C	PMW11A	PMW11A-F	PMW11B	PMW11C
		Sampling Date	19-Dec-19	19-Dec-19	13-Dec-19	13-Dec-19	13-Dec-19	17-Dec-19	17-Dec-19	17-Dec-19	17-Dec-19
		Depth (ft toc)	**55**	**117**	**32**	**68**	**148**	**27**	**27**	**63**	**144**
Speciated Arsenic (ug/L)	**MCL**	**Background**									
Arsenic III	-	NC	7.31	1.97 J	247	66.1	0.696 J	113	NA	12.8	1.02 J
Arsenic V	-	NC	1.65 J	0.609 J	24.6	5.68	0.416 J	47.0	NA	2.61	0.400 U
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	NA	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	NA	0.900 U	0.900 U
General Chemistry (mg/L)											
Alkalinity, Total as CaCO3	-	560	292	119	68.7	442	191	163	NA	259	200
Alkalinity, Bicarbonate (CaCO3)	-	5.0	292	119	68.7	442	191	163	NA	259	200
Alkalinity, Carbonate (CaCO3)	-	560	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	NA	2.0 U	2.0 U
Chloride	-	23	22.4	25.2	17.3 J	17.1 J	23.3 J	18.0	NA	23.1	26.2
Fluoride	4	0.23	0.19	0.29	**6.3**	0.35	0.33	**4.6 J**	NA	1.9 J	0.52 J
Sulfate	-	130	86.7 J	43.8 J	146 J	0.80 U*	51.6 J	137 J	NA	62.6 J	0.28 U
Total Dissolved Solids	-	620	466	214	297	507	296	390	NA	393	399
pH (standard units)	-	6.0 - 7.7	6.5 J	7.2 J	7.9 J	7.4 J	7.4 J	6.7 J	NA	6.7 J	7.4 J
Metals (ug/L)											
Antimony	6	2.5	0.077 U	0.077 U	0.077 U	0.084 J	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Arsenic	10	9.8	**11.0**	1.9	**286**	**77.7**	0.84	**160**	**157**	**17.5**	1.9
Barium	2000	1100	169	226	68.6	145	237	100	77.8	293	161
Beryllium	4	0.5	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U
Boron	-	240	2910	232	3220	699	2450	4310	4130	4070	4530
Cadmium	5	0.4	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.030 U	0.042 J
Calcium	-	160000	93200	39100	27400	121000	53400	32000	32000	60500	46700
Chromium	100	2.5	0.38 U*	0.25 U*	0.27 U*	0.22 U*	0.29 U*	0.47 U*	0.54 U*	0.44 U*	0.21 U
Cobalt	6 (a)	7.1	0.19 J	0.51	0.74	0.33 J	0.085 U	0.57	0.60	0.12 J	0.085 U
Copper	1300 (b)	1.7	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U
Lead	15	0.5	0.089 J	0.066 J	0.046 U	0.046 U	0.046 U	0.046 U	0.046 U	0.046 U	0.046 U
Lithium	40 (a)	34	6.7	3.0	7.2	14.2	2.4	5.9	6.4	10.8	3.2
Magnesium	-	47000	20300	10400	5950	22000	19200	7160 J	7670	16200 J	15100 J
Mercury	2	0.2	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	125	11.9	263	5.0	360	207	216	229	301
Nickel	100 (c)	12.0	0.59 J	1.4	2.8	0.42 J	0.15 U	1.4	1.3	0.34 J	0.58
Potassium	-	3500	5290	2030	3690	5440	2390	1960	1980	3310	2470
Selenium	50	2.5	0.14 U	0.14 U	0.26 J	0.14 U	0.14 U	0.16 J	0.17 J	0.14 U	0.14 U
Silver	-	2.0	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U	0.077 U
Sodium	-	21000	29200	15900	54000	23400	26000	84900	88100	36900	56400
Thallium	2	0.5	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	1.2	0.27 U	1.2	0.34 J	0.27 U	0.98 J	0.96 J	0.54 J	0.27 U
Zinc	-	10	8.9 U*	2.4 U*	2.4 U	5.9 U*	3.3 U*	2.4 U	2.4 U	2.4 U	5.6 U*
Radium (pCi/L)											
Radium-226	-	NC	0.106+-0.452 U	0.363+-0.396 U	-0.0475+-0.420 U	0.454+-0.590 U	0.167+-0.438 U	0.248+-0.403 U	NA	0.0492+-0.702 U	0.0390+-0.557 U
Radium-228	-	NC	0.109+-0.402 UJ	0.702+-0.435 UJ	0.710+-0.524 UJ	0.826+-0.467 UJ	-0.257+-0.337 UJ	0.983+-0.532	NA	0.128+-0.335 U	0.859+-0.442
Total Radium	5	3.8	0.215+-0.605 UJ	1.07+-0.588 UJ	0.710+-0.672 UJ	1.28+-0.752 UJ	0.167+-0.553 UJ	1.23+-0.667 J	NA	0.177+-0.778 U	0.898+-0.711 J

Table 5d
Groundwater Analytical Data (ALF and ACC Monitoring Wells) - December 2019
TVA Allen Fossil Plant
Memphis, Tennessee

		Location	PMW14A	PMW14B	PMW14C
		Sampling Date	17-Dec-19	17-Dec-19	17-Dec-19
		Depth (ft toc)	**49**	**85**	**156**
Speciated Arsenic (ug/L)	**MCL**	**Background**			
Arsenic III	-	NC	84.7	46.4	0.400 U
Arsenic V	-	NC	13.1	15.4	0.400 U
Dimethylarsinic	-	NC	0.500 U	0.500 U	0.500 U
Monomethylarsonic	-	NC	0.900 U	0.900 U	0.900 U
General Chemistry (mg/L)					
Alkalinity, Total as CaCO3	-	560	334	296	149
Alkalinity, Bicarbonate (CaCO3)	-	5.0	334	296	149
Alkalinity, Carbonate (CaCO3)	-	560	2.0 U	2.0 U	2.0 U
Chloride	-	23	17.0	19.0	20.1
Fluoride	4	0.23	1.6 J	0.20 J	0.21 J
Sulfate	-	130	47.9 J	65.2 J	30.8
Total Dissolved Solids	-	620	470	410	236
pH (standard units)	-	6.0 - 7.7	7.3 J	7.0 J	7.3 J
Metals (ug/L)					
Antimony	6	2.5	0.11 J	0.077 U	0.077 U
Arsenic	10	9.8	**98.7**	**63.6**	0.22 J
Barium	2000	1100	136	729	239
Beryllium	4	0.5	0.054 U	0.054 U	0.054 U
Boron	-	240	5260	2000	428
Cadmium	5	0.4	0.074 J	0.030 U	0.030 U
Calcium	-	160000	68900	85700	40500
Chromium	100	2.5	0.31 U*	0.37 U*	0.21 U
Cobalt	6 (a)	7.1	3.7	0.14 J	0.085 U
Copper	1300 (b)	1.7	0.44 J	0.43 U	0.43 U
Lead	15	0.5	0.11	0.046 U	0.046 U
Lithium	40 (a)	34	6.7	6.4	2.9
Magnesium	-	47000	17200 J	23600 J	14000 J
Mercury	2	0.2	0.093 U	0.093 U	0.093 U
Molybdenum	100 (a)	2.0	53.7	1.8	4.0
Nickel	100 (c)	12.0	7.1	0.26 J	0.16 J
Potassium	-	3500	1380	5000	1960
Selenium	50	2.5	0.31 J	0.14 U	0.14 U
Silver	-	2.0	0.077 U	0.077 U	0.077 U
Sodium	-	21000	62600	12400	12200
Thallium	2	0.5	0.047 U	0.047 U	0.047 U
Vanadium	-	1.5	1.2	0.27 U	0.27 U
Zinc	-	10	2.4 U	2.7 U*	2.4 U
Radium (pCi/L)					
Radium-226	-	NC	0.0560+-0.335 U	0.781+-0.850 U	0.940+-0.734 U
Radium-228	-	NC	0.302+-0.382 U	0.715+-0.428 U	0.258+-0.412 U
Total Radium	5	3.8	0.358+-0.508 U	1.50+-0.952 U	1.20+-0.842 U

Notes:
Analysis of filtered samples are displayed as "-F"
MCL - Maximum Contaminant Level
(a) No MCL established. EPA has recognized Regional Screening Levels (RSLs) as Groundwater Protection Standards in the federal CCR Rule at 40 C.F.R. 257.95(h)(2) (see 83 Fed. Reg. 36435 (July 30, 2018))
(b) No MCL established. Copper concentrations were compared to the EPA Maximum Contaminant Level Goal (MCLG), Action Level, and Treatment Technique goal value as established in 40 C.F.R. Part 141
(c) The MCL for nickel was remanded in 1995. TDEC Rule 0400-40-03-.03 established the state ambient water quality criteria (AWQC) for nickel to protect groundwater and receiving surface water bodies.
Other constituents with no MCL value are depicted with a dash "-"
Background - site-specific background concentrations calculated as 95% Upper Tolerance Limits (UTLs) in accordance with USEPA Unified Guidance
(see Technical Memorandum: 2019 Statistical Evaluation of Background Groundwater Quality for Allen Fossil Plant, February 2020).
J - The result is estimated.
mg/L - milligrams per liter; ug/L - micrograms per liter; pCi/L - picocuries per liter
NA - Constituent was not analyzed
NC - Background value was not calculated
U - The analyte was not detected above the indicated reporting limit.
U* - The analyte was detected in an associated blank.
Sample analytical results that exceed the MCL are shaded YELLOW

Table 6
Groundwater Analytical Data (ALF and ACC Monitoring Wells) – Historical
TVA Allen Fossil Plant
Memphis, Tennessee

		Constituent:	Alkalinity (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	pH (SU)	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Lithium	Magnesium	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc	Total Radium
		MCL:	-	-	4	-	-	-	6	10	2000	4	-	5	-	100	6 (a)	1300 (b)	15	40 (a)	-	2	100 (a)	100 (c)	-	50	-	-	2	-	-	5
		Background:	560	23	0.23	130	620	6.0 - 7.7	2.5	9.8	1100	0.5	240	0.4	160000	2.5	7.1	1.7	0.5	34	47000	0.2	2.0	12.0	3500	2.5	2.0	21000	0.5	1.5	10	3.8
Well	**Date**	**Depth**																														
ALF 201																																
ALF-201	15-Nov-16	49	NA	7.29	1.01	89.3	484	6.94	0.269 U*	1.73 J	219	0.102 U	3870	0.152 U	90600	0.339 U	1.15	NA	0.0675 U	16.8	NA	0.0521 U	247	NA	NA	0.452 J	NA	NA	0.036 U	NA	NA	NA
ALF-201	30-Jan-17	49	NA	8.31	0.384	43.2	530	6.85	0.634 U*	3.37	386	0.131 U	1900 J	0.0781 U	127000	0.378 U	1.2	NA	0.318 U	24.4	NA	0.0521 U	31.7	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-201	28-Feb-17	49	NA	14.2	1.48	94.6	477	7.04	0.67 U*	3.92	200	0.131 U	5130	0.11 U*	74500	0.378 U	0.944	NA	0.318 U	16.8	NA	0.0653 U	396	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-201	28-Mar-17	49	NA	11	1.26	82.5	491	6.9	1.31 U*	3.44	206	0.131 U	3570	0.0781 U	79600	0.378 U	0.795	NA	0.318 U	15.7 U*	NA	0.0653 U	290	NA	NA	2.86 J	NA	NA	0.0531 U	NA	NA	NA
ALF-201	18-Apr-17	49	NA	8.04	0.569	32.8	514	6.88	0.443 U	3.65	319	0.131 U	1460	0.0781 U	114000	0.378 U	1.4	NA	0.318 U	20.7	NA	0.0653 U	37.3	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-201	10-May-17	49	NA	9.34	0.282	51.2	572	6.8	0.443 U	3.14	463	0.131 U	1650	0.0781 U	139000	0.378 U	0.635 U*	NA	0.318 U	22.5	NA	0.0653 U	23	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-201	31-May-17	49	NA	11.9	0.676 J	83.3	486	-	2.00 U	3.64	295	2.00 U	2590	1.00 U	99000	2.00 U	0.512 J	NA	2.00 U	17.5 J	NA	0.200 U	138	NA	NA	2.00 U	NA	NA	2.00 U	NA	NA	0.529
ALF-201	13-Jun-17	49	NA	10.8	1.29	77.5	497	6.95	0.443 U	2.67	190	0.131 U	2940	0.194 J	91000	0.378 UJ	0.852	NA	0.318 U	15.6	NA	0.0653 U	240	NA	NA	2.22 J	NA	NA	0.0531 U	NA	NA	NA
ALF-201	13-Jul-17	49	NA	10.6	1.42	75.2	508	7.55	1.43 U*	2.59	225	0.131 U	2820	0.0781 U	101000	0.381 J	0.648	NA	0.318 U	15.9	NA	0.0653 U	239	NA	NA	3.94 J	NA	NA	0.0531 U	NA	NA	NA
ALF-201	19-Jul-17	49	NA	11.7	1.12	79.1	533	6.91	0.443 U	2.47	224	0.131 U	3310	0.0781 U	108000	0.378 U	0.788	NA	0.318 U	15.9	NA	0.0653 U	244	NA	NA	2.12 J	NA	NA	0.0531 U	NA	NA	NA
ALF-201	24-Aug-17	49	NA	12.2	1.1	81	505	7.07	0.443 U	18.5	358	0.131 U	3680	0.0781 U	103000	0.562 J	0.769	NA	0.318 U	16	NA	0.0653 U	300	NA	NA	4.75 J	NA	NA	0.0531 U	NA	NA	NA
ALF-201	26-Sep-17	49	365	12.9	1.4	84.8 J	504	7.2 J	0.14 J	1.2	206	0.20 U	4110 J	0.080 U	99500	0.15 U*	0.40 J	0.61 U*	0.10 U	16.4	23700	0.20 U	309	2.4	3000	4.5	0.50 U	48700	0.10 U	0.53 J	3.7 U*	1.43
ALF-201	18-Oct-17	49	284	15.6	2.1	91.1	460	7.1 J	0.13 J	2.1	178	0.20 U	4650	0.080 U	82700	2.8	0.41 J	0.50 U*	0.10 U	14.5	19400	0.20 UJ	444	2.3	3110	1.2	0.50 U	60200	0.10 U	1.0 U	1.2 U*	ND
ALF-201	15-Nov-17	49	300	14.4	1.7	94.1	448 J	7.3 J	0.12 J	1.2	196 J	0.3	4180 J	0.40 U	80200	0.50 U	0.39 J	0.31 U*	0.10 U	14.5	20900	0.20 U	395	2.6	2900	0.50 U	0.50 U	47100	0.029 U*	1.0 U	1.3 U*	1.02
ALF-201	06-Jun-18	49	NA	7.86	1.59	58.1	487	6.73	1.12 U	3.04	231	0.057 U	2080	0.125 U	101000	1.68 U*	0.432 J	NA	0.094 U	18.2	NA	0.0653 U	204	NA	NA	4.5 J	NA	NA	0.063 U	NA	NA	NA
ALF-201	19-Jun-18	49	NA	7.64	1.59	55.6	491	6.87	1.12 U	1.85 U*	231	0.057 U	2100	0.125 U	110000	1.85 U*	0.281 J	NA	0.094 U	18	NA	0.0653 U	192	NA	NA	4.25 J	NA	NA	0.063 U	NA	NA	NA
ALF-201	17-Jul-18	49	NA	10	1.4	67.7	500	6.79	1.12 U	1.21	217	0.057 U	2150	0.125 U	104000	1.54 U*	0.191 J	NA	0.094 U	16.5 U*	NA	0.0653 U	176	NA	NA	3.84 J	NA	NA	0.063 U	NA	NA	NA
ALF-201	01-Aug-18	49	NA	11.5	1.37	79.1	532	6.84	1.12 U	0.7 U*	191	0.057 U	2840	0.125 U	102000	0.631 U	0.142 J	NA	0.094 U	15.9	NA	0.0653 U	180	NA	NA	5.25	NA	NA	0.063 U	NA	NA	NA
ALF-201	21-Aug-18	49	NA	6.53	1.52	73.4	544	6.82	1.12 U	0.958 J	219	0.057 U	2790	0.125 U	107000	2.46 U*	0.201 J	NA	0.094 U	15.9	NA	0.0653 U	184	NA	NA	7.65	NA	NA	0.063 U	NA	NA	NA
ALF-201	29-Nov-18	49	437	9	0.92	66.1	560	7.0 J	0.16 J	1.6	230	0.10 U	2110	0.080 U	123000	0.22 J	0.53	0.49 J	0.10 U	18.5	29900	0.20 U	121	6	2770	2.6	0.40 U	30900	0.10 U	0.20 J	5.0 U	ND
ALF-201	15-Apr-19	49	377	6.6	0.72	48.6	488	7.7	0.12 J	0.55	190	2.0 U	1160	0.080 U	96800	0.50 U	0.14	0.38 J	0.10 U	13.9	22800	0.20 U	94.1	0.94	2010	2	0.40 U	20900	0.10 U	0.30 U	5.0 U	3.09+-1.13 J
ALF-201	26-Jun-19	49	307 J	14.6	0.39	79.5	438	6.7 J	0.50 U	1.1	220	0.20 U	2140	0.080 U	86400	0.49 U*	1.7	1.0 U	0.10 U	19.9	23000	0.20 U	42.2	4.5	2770	0.26 J	0.50 U	33400	0.10 U	1.0 U	5.0 U	0.662+-0.647 U
ALF-201	12-Sep-19	49	352	7.3	0.98	44.3	441	7.4 J	0.12 J	0.88	208	0.054 U	761	0.030 U	87800	6.7	0.33 J	0.43 U	0.046 U	13.1	25100	0.093 U	87.3	1.8	1790	3.0	0.077 U	17000	0.047 U	0.27 U	2.6 J	1.18+-0.615
ALF-201	13-Dec-19	49	269	19.2 J	0.66	108 J	432	6.9 J	0.50 U	2.2	223	0.20 U	1580	0.047 J	93300	0.50 U	2.3	0.43 J	0.10 U	17.2	23000	0.20 U	54.5	3.8	2510	0.32 J	0.50 U	28900	0.10 U	1.0 U	4.2 U*	0.112+-0.494 UJ
ALF-201B	26-Sep-17	89	355	15.2	0.41	130 J	562	7.0 J	0.50 U	2.3	235	0.20 U	5310 J	0.080 U	109000	0.42 U*	0.50 U	1.0 U	0.040 U*	22.4	31100	0.20 U	189	0.30 U*	6050	0.50 U	0.50 U	51300	0.10 U	1.0 U	2.9 U*	1.35
ALF-201B	18-Oct-17	89	342	14.5	0.4	117	548	7.0 J	0.50 U	2.6	197 J	0.73	4730	0.080 U	90000	0.50 U	0.50 U	1.0 U	0.10 U	21.7	27600	0.20 U	201	0.50 U	5420	0.50 U	0.50 U	44000	0.10 U	1.0 U	1.6 U*	ND
ALF-201B	15-Nov-17	89	318	14.2	0.35	127	558 J	7.2 J	0.50 U	1.8	215 J	0.4	5860 J	0.080 U	88400	0.50 U	0.50 U	1.0 U	0.031 U*	21.7	26900	0.20 U	184	0.50 U	4860	0.50 U	0.50 U	45100	0.10 U	1.0 U	1.3 U*	1.08
ALF-201B	28-Nov-18	89	256	16.6	0.46	138	517	7.3	0.50 U	2.9	131	0.10 U	5910	0.080 U	74000	0.50 U	0.012 J	0.50 U	0.10 U	17.4	21200	0.20 U	348	0.50 U	4680	0.50 U	0.40 U	56200	0.10 U	0.077 J	5.0 U	ND
ALF-201B	15-Apr-19	89	285	15.4	0.44	113	524	7.6	5.0 U	2.1	118	5.0 U	5190	0.80 U	67000	5.0 U	1.0 U	5.0 U	1.0 U	18.4 J	19000	0.20 U	272	5.0 U	3860	5.0 U	4.0 U	52300	1.0 U	3.0 U	50.0 U	1.51+-0.721 J
ALF-201B	21-Jun-19	89	278 J	17.7	0.56	176	571	7.0 J	0.50 U	2.9	152	0.20 U	5500	0.080 U	76100	0.50 U	0.50 U	0.60 J	0.10 U	21.1	24500	0.20 U	329	0.16 J	4390	0.50 U	0.50 U	67400	0.10 U	1.0 U	5.0 U	1.38+-0.626 J
ALF-201B	13-Sep-19	89	228	16.0 J	0.73	124	472	7.1 J	0.077 U	2.9	136	0.054 U	5300	0.030 U	65400	0.21 U	0.085 U	0.43 U	0.046 U	17.8	20500	0.093 U	357	0.23 J	4290	0.14 U	0.077 U	53800	0.047 U	1.3 U	2.4 U	0.711+-0.664 U
ALF-201B	13-Dec-19	89	240	24.8	0.85	165	468	7.1 J	0.50 U	3.1	141	0.20 U	4890	0.080 U	75900	0.50 U	0.50 U	1.0 U	0.10 U	18.8	22800	0.20 U	327	0.22 J	5090	0.50 U	0.50 U	54200	0.10 U	1.0 U	5.0 U	0.854+-0.583 J
ALF-201A	26-Sep-17	126	203	32.3	0.31	70.2 J	337	7.2 J	0.50 U	0.50 U	205	0.20 U	437 J	0.080 U	57100	0.35 U*	0.50 U	1.0 U	0.10 U	5	15000	0.20 U	13.3	0.29 U*	2870	0.50 U	0.50 U	58700	0.10 U	1.0 U	1.8 U*	ND
ALF-201A	17-Oct-17	126	215	32.7	0.31	71.7	388	7.2 J	0.50 U	0.50 U	213	0.20 U	486	0.080 U	57000	0.14 U*	0.50 U	1.0 U	0.10 U	4.6	16300	0.20 U	12.2	0.18 J	2930 J	0.50 U	0.50 U	58000	0.10 U	1.0 U	1.5 U*	ND
ALF-201A	14-Nov-17	126	206	33.3	0.30 J	75.3	394	8.1 J	0.50 U	0.50 U	209	0.20 U	504	0.080 U	57500	0.18 U*	0.50 U	1.0 U	0.069 U*	4.6	15800	0.20 U	13.6	0.40 U*	3060	0.50 U	0.50 U	58700	0.10 U	1.0 U	1.7 U*	ND
ALF-201A	28-Nov-18	126	273	27	0.29	79.8	408	7.5	0.50 U	0.4	160	0.10 U	525	0.080 U	64800	0.50 U	0.010 J	0.14 J	0.10 U	4.7	18700	0.20 U	14.9	0.50 U	2940	0.50 U	0.40 U	50100	0.10 U	0.13 J	3.6 J	ND
ALF-201A	15-Apr-19	126	210	20.2	0.25	69.6	350	7.6	0.50 U	0.34	127	1.0 U	411	0.080 U	47200	0.50 U	0.051 J	1.2	0.10 U	3.5	13100	0.20 U	13.4	0.24 J	2440	0.50 U	0.40 U	36100	0.10 U	0.30 U	5.0 U	0.220+-0.507 U
ALF-201A	20-Jun-19	126	224 J	18.8	0.38	68.1	347	6.9 J	0.50 U	0.36 J	151	0.20 U	418	0.080 U	58000	0.50 U	0.50 U	1.2	0.10 U	4.6	16400	0.20 U	15.1	0.25 U*	2630	0.50 U	0.50 U	36800	0.10 U	1.0 U	5.0 U	1.36+-0.614 J
ALF-201A	12-Sep-19	126	209	18.7	0.42	90.3	402	6.8 J	0.077 U	0.37 J	154	0.054 U	372	0.030 U	55300	0.21 U	0.085 U	0.43 U	0.046 U	3.9	15800	0.093 U	14.5	0.20 J	2590	0.14 U	0.077 U	44700	0.047 U	0.27 U	2.4 J	0.815+-0.617 U
ALF-201A	13-Dec-19	126	236	31.0	0.48	146	403	7.2 J	0.50 U	0.45 J	196	0.20 U	518	0.080 U	72600	0.32 J	0.50 U	0.54 J	0.082 J	4.9	20800	0.20 U	14.7	0.29 J	3380	0.50 U	0.50 U	62100	0.10 U	1.0 U	3.2 U*	0.412+-0.522 UJ
ALF 202																																
ALF-202	14-Nov-16	43	NA	13.8	4.45	133	335	7.9	0.217 U*	177 J	70.3	0.102 U	5370	0.171 J	24800	0.339 U	0.22 J	NA	0.883 J	8.38	NA	0.0521 U	473	NA	NA	0.348 U	NA	NA	0.036 U	NA	NA	NA
ALF-202	30-Jan-17	43	NA	17	3.46	168	391	7.46	0.944 U*	176	75.1	0.131 UJ	6130	0.109 J	24200	0.378 U	0.109 J	NA	0.619 J	11.8 U*	NA	0.0521 U	313	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-202	28-Feb-17	43	NA	16.9	3.49	164	392	7.45	0.443 U*	199	66.5	0.131 U	6060	0.151 U*	22100	0.378 U	0.138 J	NA	0.908 J	9.29 U*	NA	0.0653 U	288	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-202	28-Mar-17	43	NA	13.5	3.63	137	392	7.29	1.07 U*	245	73.5	0.131 U	5510	0.098 J	20400	0.378 U	0.12 J	NA	0.924 J	8.03 U*	NA	0.0653 U	291	NA	NA	1.5 J	NA	NA	0.0531 U	NA	NA	NA
ALF-202	18-Apr-17	43	NA	16.4	3.5	153	373	7.45	0.443 U	197	63.7	0.131 U	4900	0.135 J	20900	0.378 U	0.105 J	NA	0.686 J	7.53	NA	0.0653 U	288	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-202	10-May-17	43	NA	15.5	3.09	153	386	7.34	0.443 U	234	71.2	0.131 U	7160	0.187 J	23400	0.378 U	0.129 U*	NA	0.563 J	7.65 U*	NA	0.0653 U	309	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-202	31-May-17	43	NA	15.8	3.52 J	158	381	-	4.00 U	246	78.9	5.00 U	5140	0.500 U	23100	2.50 U	0.500 U	NA	4.16 J	15.0 U	NA	0.100 U	280	NA	NA	1.50 U	NA	NA	4.00 U	NA	NA	ND
ALF-202	13-Jun-17	43	NA	16.2	3.6	147	371	7.23	0.443 U	228	74.5	0.131 U	6010	0.214 J	23100	0.378 UJ	0.0947 U	NA	0.481 J	7.87	NA	0.0653 U	329	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-202	13-Jul-17	43	NA	16.2	3.68	152	383	7.55	0.958 U*	221	71.6	0.131 U	5100	0.0781 U	24900	0.378 U	0.0947 U	NA	0.318 U	7.98	NA	0.0653 U	340	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-202	19-Jul-17	43	NA	15.3	3.67	136	391	7.54	0.443 U	298	82.5	0.131 U	5740	0.082 J	28300	0.378 U	0.0947 U	NA	0.318 U	8.12	NA	0.0653 U	349	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-202	23-Aug-17	43	NA	16.4	3.29	151	406		0.726 U*	281	76.9	0.157	6290	0.0781 U	25900	0.378 U	0.242 J	NA	0.81 J	7.19	NA	0.0653 U	478	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-202	27-Sep-17	43	108	16.1	3.7	109 J	369 J	7.4 J	0.50 U	266	72	0.36	5300	0.080 U	20500	0.31 U*	0.50 U	1.9	0.86	7	5310	0.20 U	439	0.92 U*	1860	0.23 J	0.50 U	81700	0.10 U	1.8	2.6 U*	ND
ALF-202	18-Oct-17	43	97	15.3	3.5	106	361	7.3 J	0.50 U	275	63.1 J	0.87	5230	0.80 U	21000	0.28 U*	0.50 U	1.8 U*	0.64	6.9	5010	0.20 U	401	0.83	1780	0.30 J	0.50 U	78400	0.10 U	1.7	0.88 U*	ND
ALF-202	16-Nov-17	43	85.8	14.6	3.1	117	369	7.7 J	0.50 U	282	58.1	0.41	5760	0.080 U	18800	0.26 J	0.50 U	2.3 U*	0.84	6.1	4350	0.20 U	314	0.83 U*	1600	0.33 J	0.50 U	78800	0.10 U	2.1	1.1 U*	ND
ALF-202	05-Jun-18	43	NA	14.4	3.09	139	397	7.2	1.12 U	399	62.4	0.057 U	6440	0.125 U	17400	1.38 U*	0.102 J	NA	0.533 U*	7.52 U*	NA	0.0653 U	276	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-202	19-Jun-18	43	NA	15	3.12	136	368	7.58	1.12 U	363	75.9	0.057 U	5960	0.125 U	23000	1.81 U*	0.162 J	NA	0.374 J	6.14 U*	NA	0.0653 U	269	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-202	17-Jul-18	43	NA	16.4	3.16	143	378	7.39	1.12 U	426	74.7	0.057 U	5550	0.125 U	24100	1.56 U*	0.094 J	NA	0.34 J	8.54 U*	NA	0.0653 U	355	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-202	31-Jul-18	43	NA	16.6	3.14	145	398	7.55	1.12 U	329	68.5	0.057 U	6770	0.188 J	28300	0.631 U	0.075 U	NA	0.293 J	8.21	NA	0.0653 U	486	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-202	21-Aug-18	43	NA	15.4	3.39	128	393	7.37	1.12 U	321	73.4	0.057 U	6180	0.125 U	23900	1.62 U*	0.086 J	NA	0.286 J	7.2	NA	0.0653 U	518	NA	NA	0.813 U	-	-	0.063 U	NA	NA	NA
ALF-202	29-Nov-18	43	90.4	15.4	3.3	147	391	7.6 J	0.50 U	336	68.6	0.022 J	5580	0.13	23400	0.52	0.16	1.9	0.74	5.8	5440	0.20 U	389	1.6	1950	0.50 U	0.40 U	121000	0.10 U	1.6	5.0 U	ND
ALF-202	15-Jan-19	43	83	14.9	3.3	133	384	7.9	0.50 U	324	65.5	0.10 U	5170	0.11	21500	0.50 U	0.088 J	1.7	0.6	5.9	5060	0.12 J	302	0.77	1940	0.32 J	0.40 U	87900	0.10 U	1.8	5.0 U	ND
ALF-202	10-Apr-19	43	96.6	15	3.3	107	386	7.4	2.5 U	287	47.6	0.50 U	5520	0.40 U	21000	2.5 U	0.50 U	2.5 U	0.35 J	6.0 J	4970	0.11 J	357	0.68 J	1830	2.5 U	2.0 U	91800	0.50 U	1.8	25.0 U	0.303+-0.644 U
ALF-202	26-Jun-19	43	94.5 J	15.0	4.3	135	375	7.5 J	0.50 U	378	93.3	0.083 U*	5380	0.058 U*	21400	0.25 J	0.14 U*	9.8	0.56 U*	6.5	5060	0.20 U	357	0.87 U*	1660	0.28 J	0.50 U	86500	0.10 U	1.8	2.9 J	0.525+-0.634 UJ
ALF-202	18-Sep-19	43	92.6	14.9	4.2	145 J	383	7.4 J	0.077 U	339	64.4 J	0.054 U	4990	0.11	21700	0.34 U*	0.088 J	1.7 U*	0.66	6.1	4510	0.093 U	326	0.69	1890	0.28 J	0.077 U	89400	0.047 U	1.8	2.4 U	0.823+-0.588 U
ALF-202	19-Dec-19	43	83.7	20.3	4.5	198	249	7.1 J	0.50 U	367	56.1	0.20 U	5330	0.035 J	19900	0.32 U*	0.093 J	2.0	0.61	5.1	4360	0.20 U	221	0.77	1880	0.30 J	0.50 U	90900	0.10 U	2.1	5.0 U	0.233+-0.550 UJ
ALF-202B	28-Sep-17	89.5	258	16	0.17	65.1	377	7.0 J	0.50 U	2.4	481	0.16 J	2440	0.080 U	72300	0.33 U*	0.50 U	1.0 U	0.10 U	5.9	21900	0.20 U	168	0.20 U*	3590	0.50 U	0.50 U	18400 J	0.10 U	1.0 U	3.1 U*	1.05
ALF-202B	18-Oct-17	89.5	258	16.6	0.17	87	365	7.0 J	0.50 U	2.6	518 J	0.52	2970	0.080 U	79100	0.16 U*	0.50 U	1.0 U	0.10 U	6.1	22300	0.20 U	160	0.23 J	3670	0.50 U	0.50 U	18000	0.10 U	1.0 U	2.7 U*	ND
ALF-202B	15-Nov-17	89.5	258	16.3	0.17	86.1	422 J	7.0 J	0.50 U	1.4	523 J	0.22	3170 J	0.080 U	75200	0.50 U	0.50 U	1.0 U	0.10 U	6	21600	0.20 U	150	0.50 U	3590	0.50 U	0.50 U	17600	0.10 U	1.0 U	1.5 U*	1.73
ALF-202B	29-Nov-18	89.5	267	18.2	0.2	60.1	400	7.0 J	0.50 U	2.8	422	0.10 U	2330	0.080 U	75400	0.16 J	0.050 J	0.50 U	0.10 U	4.6	20800	0.20 U	152	0.50 U	3230	0.50 U	0.40 U	17900	0.10 U	0.30 U	5.0 U	ND
ALF-202B	10-Apr-19	89.5	229	15.3	0.19	69.2	372	7	2.5 U	2.5	405	0.50 U	2380	0.40 U	76200	2.5 U	0.50 U	2.5 U	0.50 U	5.7 J	20000	0.12 J	137	2.5 U	2970	2.5 U	2.0 U	16800	0.50 U	1.5 U	25.0 U	0.750+-0.664 U
ALF-202B	26-Jun-19	89.5	211 J	15.1	0.25	64.6	345	7.2 J	0.50 U	2.9	402	0.20 U	2310	0.080 U	68500	0.50 U	0.50 U	1.0 U	0.10 U	5.4	18800	0.20 U	138	0.16 U*	2570	0.50 U	0.50 U	15200	0.10 U	1.0 U	5.0 U	1.52+-0.825 J
ALF-202B	18-Sep-19	89.5	218	15.2	0.32	82.9 J	371	7.0 J	0.077 U	3.0	443	0.054 U	2410	0.030 U	82200	0.47 U*	0.085 U	0.43 U	0.046 U	5.4	22400	0.093 U	150	0.20 J	3310	0.14 U	0.077 U	18300	0.047 U	0.27 U	2.8 J	1.33+-0.888
ALF-202B	19-Dec-19	89.5	219	21.4	0.33	98.8	404	6.7 J	0.50 U	3.2	434	0.20 U	2240	0.080 U	75300	0.50 U	0.50 U	1.0 U	0.10 U	4.6	20400	0.20 U	138	0.22 J	3080	0.50 U	0.50 U	16900	0.10 U	1.0 U	5.0 U	0.485+-0.708 UJ
ALF-202A	29-Sep-17	145.5	193	16.9	0.12	35.4	281	6.9 J	0.50 U	0.65	260	0.16 J	2280 J	0.080 U	49400	0.18 U*	0.50 U	1.0 U	0.046 U*	3.9	18800	0.20 U	166	0.19 U*	2710	0.50 U	0.50 U	22000	0.10 U	1.0 U	2.9 U*	ND
ALF-202A	18-Oct-17	145.5	201	18.6	0.11	37.5	296	6.9 J	0.50 U	0.66	254 J	0.33	1950	0.080 U	46900	0.15 U*	0.50 U	1.0 U	0.030 J	3.7	18800	0.20 U	156	0.17 J	2500	0.50 U	0.50 U	21300	0.10 U	1.0 U	2.0 U*	ND
ALF-202A	15-Nov-17	145.5	210	18.3	0.1	34.6	269 J	7.1 J	0.50 U	0.24 J	269 J	0.21	2110 J	0.080 U	50200	0.14 J	0.50 U	0.62 U*	0.060 U*	4.4	19400	0.20 U	76	0.19 U*	2660	0.50 U	0.50 U	23300	0.10 U	1.0 U	3.4 U*	1.38
ALF-202A	29-Nov-18	145.5	212	16.7	0.2	38.1	309	7.0 J	0.50 U	0.53	250	0.10 U	1670	0.080 U	51100	0.17 J	0.046 J	0.50 U	0.10 U	2.5	18700	0.20 U	207	0.50 U	2590	0.50 U	0.40 U	20100	0.10 U	0.097 J	5.0 U	ND
ALF-202A	15-Jan-19	145.5	205	16.2	0.18	34.9	303	8.1	0.50 U	0.56	251	0.10 U	1720	0.080 U	49000	0.50 U	0.10 U	0.6	0.089 J	2.7	18200	0.20 U	192	0.23 J	2470	0.50 U	0.40 U	19200	0.10 U	0.30 U	1.5 J	ND
ALF-202A	10-Apr-19	145.5	209	15.9	0.19	28.4	283	7.1	2.5 U	0.6	259	0.50 U	2110	0.40 U	53300	2.5 U	0.50 U	2.5 U	0.50 U	3.3 J	18900	0.15 J	197	2.5 U	2520	2.5 U	2.0 U	19500	0.50 U	1.5 U	25.0 U	0.515+-0.614 U
ALF-202A	26-Jun-19	146	208 J	16.6	0.25	34.4	294	7.1 J	0.50 U	0.67	278	0.20 U	1550	0.080 U	51800	0.50 U	0.50 U	0.77 J	0.10 U	3.2	19400	0.20 U	185	0.50 U	2340	0.50 U	0.50 U	18700	0.10 U	1.0 U	2.7 J	1.80+-0.821 J
ALF-202A	18-Sep-19	146	219	17.4	0.30	47.1 J	337	7.1 J	0.077 U	0.90	316 J	0.054 U	1450	0.030 U	62100	0.26 U*	0.085 U	0.43 U	0.10 U*	3.2	21300	0.093 U	178	0.26 J	2740	0.14 U	0.077 U	19500	0.047 U	0.27 U	3.6 J	1.33+-0.855 U
ALF-202A	19-Dec-19	146	226	24.6	0.31	58.9	337	6.7 J	0.50 U	0.76	325	0.20 U	1410	0.080 U	64100	0.47 J	0.50 U	1.0 U	0.11	3.0	22900	0.20 U	169	0.26 J	2900	0.50 U	0.50 U	20300	0.10 U	1.0 U	2.4 J	0.629+-0.730 UJ

Stantec

Table 6
Groundwater Analytical Data (ALF and ACC Monitoring Wells) – Historical
TVA Allen Fossil Plant
Memphis, Tennessee

	Constituent:		Alkalinity (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	pH (SU)	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Lithium	Magnesium	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc	Total Radium
		MCL:	-	-	4	-	-	-	6	10	2000	4	-	5	-	100	6 (a)	1300 (b)	15	40 (a)	-	2	100 (a)	100 (c)	-	50	-	-	2	-	-	5
	Background:		560	23	0.23	130	620	6.0 - 7.7	2.5	9.8	1100	0.5	240	0.4	160000	2.5	7.1	1.7	0.5	34	47000	0.2	2.0	12.0	3500	2.5	2.0	21000	0.5	1.5	10	3.8
Well	**Date**	**Depth**																														
ALF 203																																
ALF-203	16-Nov-16	52	NA	12.6	5.26	141	420	8.72	0.99 U*	3900	36.2	0.149 J	3870	2.56	16100	2.14	1.44	NA	36.2	4.05 U*	NA	0.0521 U	284	NA	NA	6.96	NA	NA	0.036 U	NA	NA	NA
ALF-203	31-Jan-17	52	NA	13.6	4.14	184	557	8.85	1.68 U*	3230	39.5	0.145	5250 J	2.74	15800	2.77	1.19	NA	42	6.69 U*	NA	0.0521 U	267	NA	NA	5.26	NA	NA	0.0531 U	NA	NA	NA
ALF-203	01-Mar-17	52	NA	13.8	4.97	188	533	9.07	1.4 U*	3220	34.8	0.228 J	5770	2.35	14000	1.93 U*	1.18	NA	36.3	4.88 U*	NA	0.0653 U	256	NA	NA	5.49	NA	NA	0.0531 U	NA	NA	NA
ALF-203	29-Mar-17	52	NA	11.9	5.01	143	506	9.1	1.97 U*	3620	32.9	0.131 U	5310	3.55	10100	2.53	1.49	NA	60.4	3.1 U*	NA	0.0653 U	270	NA	NA	10.8 J	NA	NA	0.0531 U	NA	NA	NA
ALF-203	19-Apr-17	52	NA	14.8	4.94	158	490	9.1	1.81 U*	2890	35.5	0.175 J	4080	3.72	13100	2.64	1.3	NA	61.3	3.19 J	NA	0.0653 U	254	NA	NA	7.23	NA	NA	0.0531 U	NA	NA	NA
ALF-203	09-May-17	52	NA	14.4	4.53	152	508	9.06	1.93 U*	3560	44.8	0.249 J	6830	3.61	14200	2.27	1.21	NA	63.9	3.41 U*	NA	0.0883 J	296	NA	NA	6.44	NA	NA	0.0531 U	NA	NA	NA
ALF-203	31-May-17	52	NA	14.4	5.41 J	160	496	-	1.61 J	4070	40.1	0.245 J	5260	3.66	12700	3.05	0.951 J	NA	70.2	50.0 U	NA	0.103 J	306	NA	NA	9.84	NA	NA	2.00 U	NA	NA	ND
ALF-203	14-Jun-17	52	NA	15.2	5.44	157	519	9.07	1.36 J	3370	36.8	0.256 J	5570	3.02	13200	2.7	1.12	NA	56.8	2.96 J	NA	0.0653 U	276	NA	NA	5.45	NA	NA	0.0531 U	NA	NA	NA
ALF-203	14-Jul-17	52	NA	16	5.53	164	524	9.29	2.47 U*	3520	33.3	0.191 J	5230	2.98	12200	3.28	1.27	NA	55.9	3.6 J	NA	0.0653 U	284	NA	NA	7.98	NA	NA	0.0531 U	NA	NA	NA
ALF-203	19-Jul-17	52	NA	15.2	5.26	153	529	9.36	1.97 U*	4140	33.6	0.151 J	5410	3.08	12400	2.99	1.35	NA	56.5	2.81 J	NA	0.0653 U	307	NA	NA	7.87	NA	NA	0.0531 U	NA	NA	NA
ALF-203	23-Aug-17	52	NA	17.7	4.34	187	627	10.1	2.18 U*	3550	31.2	0.189 J	5760	2.98	10400	2.15	0.848	NA	67.3	2.12 U	NA	0.0891 J	301	NA	NA	7.67	NA	NA	0.0531 U	NA	NA	NA
ALF-203	27-Sep-17	52	211	18.4	4.3	202 J	692 J	9.8 J	2	2780	28.7	0.47	5490	2.6	9740	1.8 U*	0.48 J	51.7	61.8	1.3	1000	0.20 U	304	7	1880	4.9	0.50 U	166000	0.10 U	19.6	2.7 U*	1.73
ALF-203	17-Oct-17	52	250	18.1	3.7	199	694	9.8 J	1.8	2160	26.9	0.10 J	6120	2.0 J	9920	1.7	10.0 U	71.3	66.1	1.3	952	0.20 U	283	6.2 J	1280 J	6.1 J	0.50 UJ	205000	0.10 U	19.3	100 U	ND
ALF-203	14-Nov-17	52	243	16.5	3.2 J	206	770	9.9 J	1.5	1800	25.4	0.13 U*	6270	2.8	9340	1.7	0.48 J	49.7 J	56.1	1.2	801	0.20 U	297	5.5 J	1700	4.8	0.50 U	210000	0.10 U	19.3	2.8 U*	ND
ALF-203	07-Jun-18	52	NA	17	4.16	195	638	9.46	1.76 J	2170	26.6	0.164 J	5510	2.33	7620	4.06 U*	0.723	NA	56.3	4.86 U*	NA	0.0653 U	366	NA	NA	7.1	NA	NA	0.063 U	NA	NA	NA
ALF-203	21-Jun-18	52	NA	18.4	4.59	214	637	9.95	1.88 J	2190	26.4	0.141 J	6240	2.25	7310	4.31 U*	0.813	NA	55.4	2.56 U	NA	0.0653 U	384	NA	NA	7.11	NA	NA	0.063 U	NA	NA	NA
ALF-203	18-Jul-18	52	NA	18.5	4.45	200	618	9.84	2.03	3260	25.3	0.1 J	5890	2.15	7230	3.81 U*	0.682	NA	51.6	2.56 U	NA	0.068 J	382	NA	NA	9.61	NA	NA	0.063 U	NA	NA	NA
ALF-203	01-Aug-18	52	NA	18.7	4.7	198	665	9.87	1.92 J	3130	19.6	0.104 J	7310	1.32	7510	1.37 J	0.358 J	NA	41.3	2.56 U	NA	0.0653 U	381	NA	NA	6.25	NA	NA	0.063 U	NA	NA	NA
ALF-203	22-Aug-18	52	NA	18.1	4.98	197	720	10.01	2.08	2950	19.1	0.057 J	5660	1.54	5530	4.6 U*	0.413 J	NA	40.9	4.95 U*	NA	0.0653 U	382	NA	NA	8.51	NA	NA	0.063 U	NA	NA	NA
ALF-203	28-Nov-18	52	246	18.1	4.3	212	756	10	1.8	2120	20.4	0.1	6950	1.4	6320	1.6	0.49	39.2	41.7	0.39 J	674	0.20 U	409	7.1	1190	4.9	0.090 J	210000	0.10 U	20.5	4.7 J	ND
ALF-203	15-Jan-19	52	194	18.1	4.5	251	387	9.8	1.4	1960	19	0.088 J	7040	1.2	6030	5.0 U	1.0 U	12.6	34.2	0.88 J	529	0.20 U	459	2.3	1160	4.1	0.084 J	216000	0.10 U	17.3	2.4 J	ND
ALF-203	15-Apr-19	52	272	15	3.2	209	708	9.1	5.0 U	1340	91.8	5.0 U	4750	1.1	35600	5.0 U	1.0 U	27.1	25.6	4.9 J	9460	0.20 U	306	4.4 J	1460	3.5 J	4.0 U	131000	1.0 U	9.8	50.0 U	2.04+-1.06 J
ALF-203	21-Jun-19	52	209 J	17.6	4.9	287	686	9.5 J	1.4 J	2010	38.0	1.0 U	6730	2.0	15200	2.7	0.66 J	56.8	47.7	2.1 J	2700	0.20 U	478	9.1	1390	6.7	2.5 U	219000	0.50 U	23.1	25.0 U	0.593+-0.667 U
ALF-203	13-Sep-19	52	190	16.6 J	5.7	271	792	7.6 J	1.5	2150	20.2	0.11 J	8890	0.75	6900	1.2 U*	0.43 U	22.3	23.2	0.79	614	0.093 U	435	5.2	1020	3.5	0.077 U	243000	0.047 U	15.8	12.0 U	0.895+-0.598 U
ALF-203	13-Dec-19	52	194	22.9	6.4	284	678	9.6 J	1.5 J	2170	24.4	1.0 U	7190	1.3	10000	1.3 J	2.5 U	47.3	32.8	1.7 J	856	0.20 U	368	6.5	1170	5.7	2.5 U	208000	0.50 U	15.9	25.0 U	0.968+-0.792 UJ
ALF-203B	27-Sep-17	89	163	18	2.6	84.9 J	357 J	7.1 J	0.50 U	226	110	0.4	6330	0.80 U	35900	0.25 U*	0.50 U	1.0 U	0.072 U*	12	8340	0.20 U	477	0.36 U*	2100	0.50 U	0.50 U	56600	0.10 U	0.40 J	2.1 U*	ND
ALF-203B	17-Oct-17	89	204	19.4	2	86.3	386	7.2 J	0.50 U	33	153	0.20 U	5270	0.080 U	55400	0.13 U*	0.50 U	1.0 U	0.028 J	12.5	12300	0.20 U	394	0.14 J	2570 J	0.50 U	0.50 U	63700	0.10 U	1.0 U	0.96 U*	ND
ALF-203B	14-Nov-17	89	187	17.4	1.6 J	71.8	381	7.5 J	0.50 U	22.2	145	0.20 U	4380	0.080 U	53000	0.50 U	0.50 U	0.21 U*	2.0 U	11.8	11800	0.20 U	345	0.24 U*	2470	0.50 U	0.50 U	54300	0.10 U	1.0 U	1.2 U*	ND
ALF-203B	28-Nov-18	89	225	16.6	0.94	64.3	346	7.7	0.50 U	44.7	168	0.10 U	2320	0.080 U	62200	0.29 J	0.1	0.34 J	0.16	10.7	14500	0.20 U	225	0.61	2040	0.50 U	0.40 U	30700	0.10 U	0.26 J	3.3 J	ND
ALF-203B	15-Jan-19	89	198	15.8	0.7	47.8	313	8.1	0.50 U	19.7	153	0.10 U	1400	0.080 U	58200	0.50 U	0.068 J	0.89	0.13	8.9	13700	0.20 U	153	0.37 J	1750	0.50 U	0.40 U	22100	0.10 U	0.20 J	1.9 J	ND
ALF-203B	15-Apr-19	89	173	12.3	0.43	36.6	269	7.7	2.5 U	9.8	108	2.0 U	925	0.40 U	42500	2.5 U	0.50 U	2.5 U	0.50 U	6.3 J	9480	0.20 U	88.5	2.5 U	1170	2.5 U	2.0 U	15400	0.50 U	1.5 U	25.0 U	0.633+-0.598 U
ALF-203B	24-Jun-19	89	210	13.5	0.50	37.1	301	7.0 J	0.50 U	8.1	157	0.20 U	1320	0.080 U	60700	0.50 U	0.50 U	1.0 U	0.10 U	7.9	13600	0.20 U	99.8	0.17 J	1510	0.50 U	0.50 U	22300	0.10 U	1.0 U	5.0 U	0.690+-0.517 UJ
ALF-203B	16-Sep-19	89	178	13.6	0.92	39.4 J	280	7.1 J	0.077 U	33.0	120	0.054 U	1070	0.030 U	42200	0.21 U	0.085 U	0.43 U	0.046 U	7.6	11100	0.093 U	138	0.24 J	1370	0.14 U	0.077 U	19200	0.047 U	0.27 U	2.4 U	1.03+-0.761
ALF-203B	13-Dec-19	89	172	18.7	0.73	45.1	267	7.3 J	0.50 U	13.0	132	0.20 U	966	0.080 U	50500	0.23 J	0.50 U	1.0 U	0.086 J	7.7	12200	0.20 U	112	0.35 J	1440	0.50 U	0.50 U	18700	0.10 U	1.0 U	5.0 U	0.682+-0.636 UJ
ALF-203A	28-Sep-17	118	160	20.3	0.13	28.5	202	6.9 J	0.50 U	0.33 J	305	0.20 U	340	0.080 U	37500	0.19 U*	0.50 U	1.0 U	0.10 U*	2.1	15600	0.20 U	0.99	0.28 U*	1650	0.50 U	0.50 U	17000 J	0.041 U*	1.0 U	4.9 U*	ND
ALF-203A	17-Oct-17	118	138	18.8	0.17	35.3	214	6.9 J	0.50 U	0.23 J	242	0.20 U	355	0.080 U	38300	0.15 U*	0.50 U	1.0 U	0.047 J	2.1	14900	0.20 U	2.2	0.50 U	1470 J	0.50 U	0.50 U	17700	0.10 U	1.0 U	1.3 U*	ND
ALF-203A	14-Nov-17	118	124	17.6	0.14 J	38.6	230	7.9 J	0.50 U	0.50 U	255	0.20 U	363	0.080 U	39200	0.14 U*	0.50 U	1.0 U	0.047 U*	2.6	14300	0.20 U	3.1	0.50 U	1590	0.50 U	0.50 U	17900	0.10 U	1.0 U	2.1 U*	ND
ALF-203A	28-Nov-18	118	148	19.3	0.14	31.1	218	7.1	0.11 J	0.45	239	0.10 U	397	0.080 U	34800	0.44 J	0.11	0.65	0.18	2.1 J	14600	0.20 U	4.2	0.5	1530	0.50 U	0.40 U	17100	0.10 U	0.20 J	4.7 J	ND
ALF-203A	15-Jan-19	118	108	16.6	0.14	33	195	8	0.50 U	0.21	174	0.10 U	321	0.080 U	27500	0.50 U	0.10 U	7.3	0.3	1.9 J	12700	0.20 U	3.1	0.20 J	1340	0.50 U	0.40 U	15800	0.10 U	0.14 J	7.5	1.66
ALF-203A	15-Apr-19	118	123	16.1	0.12	30.3	190	7.4	0.50 U	0.17	189	0.50 U	255	0.080 U	28100	0.50 U	0.10 U	0.50 U	0.10 U	1.4 J	10700	0.20 U	0.74	0.13 J	1180	0.50 U	0.40 U	12800	0.10 U	0.30 U	5.0 U	1.32+-0.718 U
ALF-203A	24-Jun-19	118	100	16.4	0.18	29.5	171	6.9 J	0.50 U	0.18 J	180	0.20 U	314	0.080 U	24100	0.50 U	0.50 U	1.0 U	0.10 U	2.0	11800	0.20 U	2.7	0.50 U	1250	0.50 U	0.50 U	14900	0.10 U	1.0 U	5.0 U	2.44+-1.03 J
ALF-203A	13-Sep-19	118	116	15.1 J	0.19	27.4	210	7.4 J	0.077 U	0.31 U*	254	0.054 U	286	0.030 U	35100	0.37 U*	0.097 J	0.43 U	0.12	1.8	12800	0.093 U	1.4	0.27 J	1320	0.14 U	0.077 U	15400	0.047 U	0.27 U	2.8 U*	1.29+-0.723
ALF-203A	13-Dec-19	118	102	22.8	0.24	41.2	113	7.4 J	0.50 U	0.20 J	194	0.20 U	283	0.080 U	27400	0.24 J	0.50 U	1.0 U	0.10 U	1.8	11900	0.20 U	2.2	0.15 J	1280	0.50 U	0.50 U	14100	0.10 U	1.0 U	5.0 U	0.000+-0.512 UJ
ALF 204																																
ALF-204	16-Nov-16	49	NA	11.4	0.249	9.72	398	7	0.164 U*	46 J	358	0.102 U	461	0.152 U	64600	0.339 U	0.132 J	NA	0.0675 U	9.92	NA	0.0521 U	5.25	NA	NA	0.348 U	NA	NA	0.036 U	NA	NA	NA
ALF-204	31-Jan-17	49	NA	18	0.224	2.25	458	7	0.82 U*	42.8	318	0.131 U	659 J	0.0781 U	78500	0.378 U	0.0947 U	NA	0.318 U	14 U*	NA	0.0521 U	6.93	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-204	01-Mar-17	49	NA	19	2.5	0.792 J	422	7.09	0.613 U*	36.8	332	0.131 U	598	0.0781 U	75800	0.378 U	0.0947 U	NA	0.318 U	12.7 U*	NA	0.0653 U	2.61 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-204	29-Mar-17	49	NA	15.4	0.283	1.33	400	7.1	0.84 U*	49.9	296	0.131 U	525	0.0781 U	61400	0.378 U	0.0947 U	NA	0.318 U	9.49 U*	NA	0.0653 U	6.24	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-204	19-Apr-17	49	NA	17.4	0.289	6.29	403	7.01	0.507 U*	49.1	300	0.131 U	467	0.0781 U	75200	0.378 U	0.0947 U	NA	0.318 U	8.94	NA	0.0653 U	8.61	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-204	09-May-17	49	NA	16.6	0.233	16.8	375	7.02	0.443 U	56.9	332	0.131 U	721	0.0781 U	78000	0.378 U	0.0947 U	NA	0.318 U	9.23 U*	NA	0.0653 U	9.63	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-204	01-Jun-17	49	NA	17.1	0.250 U*	13.1	361	-	2.00 U	53.0 J	295 J	2.00 U	582	1.00 U	70900 J	1.02 J	2.00 U	NA	2.00 U	7.95 J	NA	0.200 U	9.33 J	NA	NA	2.00 U	NA	NA	2.00 U	NA	NA	0.504
ALF-204	14-Jun-17	49	NA	17.3	0.31	13.8	380	7.07	0.443 U	45.5	285	0.131 U	534	0.0781 U	67100	0.378 U	0.0947 U	NA	0.318 U	8.52	NA	0.0653 U	9.08	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-204	14-Jul-17	49	NA	17.5	0.262	13	354	6.99	1.16 U*	38.7	257	0.131 U	551	0.0781 U	68200	0.405 J	0.0947 U	NA	0.318 U	9.09	NA	0.0653 U	7.67	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-204	19-Jul-17	49	NA	18.2	0.247	10	341	7.12	0.443 U	47.3	261	0.131 U	660	0.0781 U	72100	0.378 U	0.0947 U	NA	0.318 U	8.14	NA	0.0653 U	8.2	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-204	23-Aug-17	49	NA	18.3	0.22	12.1	366	7.25	0.443 U	36.4	242	0.131 U	543	0.0781 U	67400	0.378 U	0.0947 U	NA	0.318 U	7.55	NA	0.0653 U	7.72	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-204	29-Sep-17	49	305	16.8	0.18	13.4	356	7.2 J	0.50 U	24.4	260	0.20 U	507	0.080 U	67400	0.30 U*	0.50 U	0.70 U*	0.084 U*	8.5	19900	0.20 U	7.1	0.74 U*	4470	0.50 U	0.50 U	25900	0.10 U	0.58 J	8.6 U*	ND
ALF-204	18-Oct-17	49	309	16.6	0.18	16.5	357	7.0 J	0.50 U	52.6	293 J	0.10 J	533	0.080 U	65900	0.26 U*	0.50 U	1.0 U	0.10 U	8	20200	0.20 U	11.9	0.32 J	4040	0.50 U	0.50 U	22500	0.10 U	1.0 U	3.3 U*	ND
ALF-204	15-Nov-17	49	308	15.9	0.16	19	347 J	7.1 J	0.50 U	57.2	343 J	0.064 J	722 J	0.080 U	67500	0.19 J	0.50 U	0.20 U*	0.10 U	7.6	21500	0.20 U	20	0.15 U*	4220	0.50 U	0.50 U	21500	0.10 U	1.0 U	2.2 U*	ND
ALF-204	07-Jun-18	49	NA	15.3	0.198	25.5	351	6.71	1.12 U	80.8	400	0.057 U	479	0.125 U	67500	1.47 U*	0.075 U	NA	0.094 U	9.81 U*	NA	0.0653 U	10.2	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-204	20-Jun-18	49	NA	14.6	0.168	26.3	354	6.99	1.12 U	68.4	404	0.057 U	580	0.125 U	70700	1.41 U*	0.075 U	NA	0.094 U	8.34	NA	0.0653 U	10.5	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-204	19-Jul-18	49	NA	15	0.166	25.5	357	6.87	1.12 U	54.7	374	0.057 U	562	0.125 U	71900	1.5 U*	0.075 U	NA	0.094 U	8.4	NA	0.0653 U	10.8	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-204	01-Aug-18	49	NA	16	0.186	25.8	344	6.99	1.12 U	52.4	307	0.057 U	635	0.125 U	69700	0.631 U	0.075 U	NA	0.094 U	6.78	NA	0.0653 U	11.2	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-204	22-Aug-18	49	NA	11.4	0.149	21.3	322	7	1.12 U	46.9	350	0.057 U	516	0.125 U	66300	2.17 U*	0.146 J	NA	0.094 U	9.53 U*	NA	0.0653 U	10.1	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-204	28-Nov-18	49	264	14.9	0.16	23.6	327	7.5	0.50 U	52.2	297	0.10 U	594	0.080 U	62900	0.18 J	0.038 J	0.17 J	0.10 U	5.7	18400	0.20 U	14.5	0.50 U	3850	0.50 U	0.40 U	13000	0.10 U	0.11 J	5.0 U	ND
ALF-204	16-Apr-19	49	219	13.3	0.099 J	32.6	306	7.7	0.50 U	10.6	182	0.10 U	421	0.080 U	65600	0.50 U	0.42	0.7	0.055 J	3.9	14800	0.20 U	10.5	1.2	3080	0.11 J	0.40 U	11400	0.10 U	0.28 J	44.6	1.21+-0.517 J
ALF-204	25-Jun-19	49	228	13.2	0.18	30.7	304	7.0 J	0.50 U	45.6	320	0.20 U	481	0.080 U	62000	0.50 U	0.24 J	0.50 J	0.063 J	5.3	17200	0.20 U	16.2	0.39 J	3650	0.50 U	0.50 U	12000	0.10 U	0.94 J	8.8	0.901+-0.693 UJ
ALF-204	17-Sep-19	49	210	13.7	0.18	22.1 J	284	6.8 J	0.077 U	72.5 J	361 J	0.054 U	476	0.030 U	65000	0.24 U*	0.11 J	0.43 U	0.046 U	5.7	17100	0.093 U	8.8	0.28 J	4390 J	0.14 U	0.077 U	13800 J	0.047 U	1.5 J	9.1 J	0.788+-0.559
ALF-204	18-Dec-19	49	188	18.9	0.27	31.7	290	6.8 J	0.50 U	46.8	246	0.20 U	388	0.080 U	58500	0.35 J	0.15 J	0.62 J	0.10 U	4.6	15100	0.20 U	14.3	0.34 J	3340	0.50 U	0.50 U	11900	0.10 U	1.1	14.0	0.788+-0.718 U
ALF-204B	28-Sep-17	89	147	16.2	0.16	28	214	6.8 J	0.50 U	0.44 J	310	0.20 U	314	0.080 U	38800	0.50 U*	0.50 U	1.0 U	0.060 U*	3.4	13900	0.20 U	29.7	0.24 U*	2360	0.50 U	0.50 U	16800 J	0.10 U	1.0 U	7.7 U*	ND
ALF-204B	18-Oct-17	89	171	17.7	0.18	28.3	219	6.9 J	0.50 U	0.54	288 J	0.11 J	293	0.043 J	36700	0.18 U*	0.50 U	0.25 U*	0.086 J	3.4	14100	0.20 U	27.8	0.20 J	2140	0.50 U	0.50 U	16400	0.043 U*	1.0 U	2.2 U*	ND
ALF-204B	14-Nov-17	89	154	16.2	0.16 J	29.8	257	7.7 J	0.50 U	0.50 U	321	0.20 U	344	0.080 U	45100	0.50 U	0.50 U	1.0 U	0.098 U*	3.3	14700	0.20 U	33.4	0.50 U	2450	0.50 U	0.50 U	17400	0.10 U	1.0 U	3.0 U*	ND
ALF-204B	28-Nov-18	89	164	15.7	0.19	33.4	239	7	0.50 U	0.39	305	0.10 U	400	0.080 U	44900	0.19 J	0.11	0.21 J	0.14	3.6	11600	0.20 U	46.4	0.58	2370	0.50 U	0.40 U	16400	0.10 U	0.15 J	4.9 J	ND
ALF-204B	16-Apr-19	89	107	14.3	0.2	31	185	7.1	0.50 U	5.7	105	0.10 U	410	0.080 U	34200	0.50 U	0.46	0.7	0.22	3.1	8360	0.20 U	53.8	1.5	2140	0.50 U	0.40 U	13900	0.10 U	0.51	9.7	0.743+-0.535 U
ALF-204B	25-Jun-19	89	117	14.3	0.26	22.1	175	6.2 J	0.50 U	4.0	228	0.20 U	402	0.080 U	34700	0.50 U	0.14 J	0.85 J	0.15	3.3	9010	0.20 U	52.8	0.75	2160	0.50 U	0.50 U	14100	.010 U	1.0 U	9.7	1.75+-0.777 J
ALF-204B	18-Sep-19	89	115	13.6	0.32	28.2 J	199	7.3 J	0.077 U	4.3	213 J	0.054 U	371	0.030 U	35000	0.25 U*	0.085 U	0.43 U	0.085 J	3.1	10200	0.093 U	38.2	0.34 J	2130	0.14 U	0.077 U	14100	0.047 U	0.29 J	6.1	0.762+-0.529 U
ALF-204B	18-Dec-19	89	111	18.2	0.35	40.7	216	6.6 J	0.50 U	5.2	212	0.20 U	563	0.080 U	36200	0.50 U	0.50 U	0.44 J	0.10 U	3.0	9030	0.20 U	54.2	0.35 J	2140	0.50 U	0.50 U	15200	0.10 U	1.0 U	7.0	1.02+-0.862 U
ALF-204A	28-Sep-17	116	150	15.9	0.12	13.3	204	7.2 J	0.15 J	0.47 J	280	0.20 U	94.4	0.080 U	39100	0.23 U*	0.50 U	1.0 U	0.12 U*	5.6	13600	0.20 U	2.7	0.20 U*	2220	0.50 U	0.50 U	14000 J	0.10 U	1.0 U	4.4 U*	ND
ALF-204A	18-Oct-17	116	163	17	0.18	12	202	7.1 J	0.50 U	0.54	243 J	0.20 U	98.4	0.080 U	38900	0.50 U	0.50 U	1.0 U	0.10 U	4.8	13000	0.20 U	2.3	0.50 U	2160	0.50 U	0.50 U	13200	0.10 U	1.0 U	1.0 U*	ND
ALF-204A	15-Nov-17	116	147	16.7	0.16	13.8	201 J	7.2 J	0.50 U	0.39 J	254 J	0.20 U	104 J	0.080 U	35900	0.50 U	0.50 U	1.0 U	0.087 U*	5.1	12400	0.20 U	2.3	0.19 U*	2050	0.50 U	0.50 U	13300	0.10 U	1.0 U	8.6 U*	1.35
ALF-204A	28-Nov-18	116	159	16.2	0.18	14	211	7.3	0.50 U	0.17	269	0.10 U	95.5	0.080 U	37000	0.21 J	0.060 J	0.86	0.10 U	2.6	12100	0.20 U	2.9	0.50 U	2070	0.50 U	0.40 U	13300	0.10 U	0.30 U	5.0 U	ND
ALF-204A	16-Apr-19	116	172	15.6	0.15	8.7	214	7.2	0.50 U	0.65	291	0.10 U	103	0.080 U	41100	0.50 U	0.067 J	0.50 U	0.10 U	2.7	12100	0.20 U	2.6	0.21 J	2120	0.50 U	0.40 U	13500	0.10 U	0.30 U	2.3 J	1.35+-0.587
ALF-204A	25-Jun-19	116	173	15.8	0.20	6.5	212	6.5 J	0.50 U	0.24 J	320	0.20 U	87.1	0.080 U	43300	0.50 U	0.50 U	0.53 J	0.10 U	2.9	13400	0.20 U	2.3	0.50 U	2340	0.50 U	0.50 U	13800	0.10 U	1.0 U	2.6 J	1.69+-0.811 J
ALF-204A	17-Sep-19	116	172	16.1	0.24	8.4 J	227	6.8 J	0.077 U	0.50	287	0.054 U	112	0.030 U	48100	0.34 U*	0.085 U	0.43 U	0.11	3.3	13700	0.093 U	2.0	0.34 J	2330 J	0.14 U	0.077 U	13900	0.047 U	0.33 J	11.3	1.76+-0.801
ALF-204A	18-Dec-19	116	176	23.1	0.24	7.0	236	6.4 J	0.50 U	0.34 J	335	0.20 U	104	0.080 U	46600	0.30 J	0.50 U	1.0 U	0.10	3.0	14000	0.20 U	2.4	0.24 J	2540	0.50 U	0.50 U	16300	0.10 U	1.0 U	10.7	0.711+-0.673 U

Table 6
Groundwater Analytical Data (ALF and ACC Monitoring Wells) – Historical
TVA Allen Fossil Plant
Memphis, Tennessee

	Constituent:		Alkalinity (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	pH (SU)	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Lithium	Magnesium	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc	Total Radium
	MCL:		-	-	4	-	-	-	6	10	2000	4	-	5	-	100	6 (a)	1300 (b)	15	40 (a)	-	2	100 (a)	100 (c)	-	50	-	-	2	-	-	5
	Background:		560	23	0.23	130	620	6.0 - 7.7	2.5	9.8	1100	0.5	240	0.4	160000	2.5	7.1	1.7	0.5	34	47000	0.2	2.0	12.0	3500	2.5	2.0	21000	0.5	1.5	10	3.8
Well	**Date**	**Depth**																														
ALF 205																																
ALF-205	16-Nov-16	54	NA	15.1	1.9	94.8	401	7.17	0.303 U*	1.1 J	106	0.102 U	6990	0.152 U	61800	0.339 U	0.966	NA	0.088 J	14.8	NA	0.0521 U	252	NA	NA	0.816 J	NA	NA	0.036 U	NA	NA	NA
ALF-205	31-Jan-17	54	NA	23.1	2.54	123	461	7.21	0.751 U*	1.54	83.3	0.131 UJ	6720 J	0.0781 U	53300	0.424 J	1.32	NA	0.318 U	16.1 U*	NA	0.0521 U	279	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-205	01-Mar-17	54	NA	23	2.5	125	455	7.22	0.628 U*	1.22	88.5	0.131 U	7460	0.0781 U	54300	0.378 U	1.11	NA	0.318 U	14.1 U*	NA	0.0653 U	299	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-205	29-Mar-17	54	NA	20.3	2.68	91	436	7.32	1.33 U*	1.41	78.4	0.131 U	6290	0.0781 U	43900	0.378 U	1.01	NA	0.318 U	11.4 U*	NA	0.0653 U	325	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-205	18-Apr-17	54	NA	23.4	2.48	103	454	7.11	0.601 U*	1.95	103	0.131 U	5530	0.0781 U	61400	0.378 U	1.06	NA	0.318 U	12.7	NA	0.0653 U	292	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-205	09-May-17	54	NA	22.2	2.06	94.4	492	7.05	0.443 U	2.66	131	0.131 U	8810	0.126 J	74200	0.378 U	1.05	NA	0.318 U	14.5	NA	0.0653 U	314	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-205	01-Jun-17	54	NA	21.7	2.12 J	102	471	-	2.00 U	2.52 J	115 J	2.00 U	6210	1.00 U	70200 J	2.00 U	0.498 J	NA	0.162 J	12.9 J	NA	0.200 U	276 J	NA	NA	2.00 U	NA	NA	2.00 U	NA	NA	0.55
ALF-205	14-Jun-17	54	NA	23.3	2.55	107	469	7.08	0.443 U	1.6	110	0.131 U	7950	0.206 J	62300	0.378 U	0.903	NA	0.318 U	13.4	NA	0.0653 U	325	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-205	13-Jul-17	54	NA	23.1	2.57	108	462	7.24	0.856 U*	1.83	100	0.131 U	7470	0.0781 U	59400	0.378 U	1.13	NA	0.318 U	13.2	NA	0.0653 U	311	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-205	19-Jul-17	54	NA	23.9	2.53	94.7	455	7.27	0.443 U	1.59	91.3	0.131 U	7880	0.0781 U	58100	0.378 U	1.14	NA	0.318 U	12.4	NA	0.0653 U	337	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-205	24-Aug-17	54	NA	23.6	2.31	114	457	7.4	0.634 U*	2.03 U*	112	0.131 U	9140	0.17 J	58400	0.378 U	1.01	NA	0.318 U	12.4	NA	0.0653 U	365	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-205	28-Sep-17	54	325	21.3	1.5	93.4	505	7.1 J	0.50 U	0.62	164	0.45	6740	0.080 U	79800	0.14 U*	0.42 J	1.1 U*	0.10 U	17.7	15000	0.20 U	220	3.3	2830	0.27 J	0.50 U	63500 J	0.10 U	0.51 U*	2.1 U*	ND
ALF-205	19-Oct-17	54	371	20.8 J	0.99 J	81	522	6.8 J	0.19 J	0.34 J	195	1.1	6060	0.080 U	101000	0.19 U*	0.16 J	1.2 U*	0.10 U	19.1	19800	0.20 U	147	3.8	3000	0.31 J	0.50 U	55400	0.10 U	0.45 J	1.7 U*	ND
ALF-205	15-Nov-17	54	384	21.3	1.2	79.9	544 J	7.2 J	0.16 J	0.57	198 J	0.37	5280 J	0.080 U	103000	0.50 U	0.93	0.55 U*	0.10 U	18.4	20900	0.20 U	144	5	2890	0.50 U	0.50 U	49400	0.10 U	0.44 J	1.9 U*	ND
ALF-205	07-Jun-18	54	NA	17	1.77	77.4	645	6.98	1.12 U	1.15	167	0.057 U	6950	0.125 U	88400	1.57 U*	0.919	NA	0.094 U	22.1	NA	0.0653 U	197	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-205	20-Jun-18	54	NA	16.3	1.68	81	648	7.06	1.12 U	1.52 U*	181	0.057 U	8350	0.133 J	97100	1.41 U*	1.03	NA	0.094 U	20.3	NA	0.0653 U	215	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-205	19-Jul-18	54	NA	17.9	1.6	93.2	578	7.03	1.12 U	1.71	170	0.057 U	7120	0.272 J	86800	1.41 U*	0.86	NA	0.119 J	18.2	NA	0.0653 U	220	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-205	31-Jul-18	54	NA	1.15 J	0.205 J	13.8 J	532	7.05	1.12 U	0.95 U*	120	0.057 U	8010	0.144 J	80300	0.631 U	0.647	NA	0.094 U	15.8	NA	0.0714 J	231	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-205	22-Aug-18	54	NA	13.8	1.82	98	541	7.09	1.12 U	19.6	467	0.068 J	7670	0.476 J	81100	2.96 U*	1.01	NA	0.445 J	15.3 U*	NA	0.0653 U	217	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-205	29-Nov-18	54	294	19.7	2	123	525	7.4 J	0.50 U	1.1	114	0.10 U	6560	0.11	67300	0.14 J	0.67	1.1	0.10 U	11.5	12600	0.20 U	241	5.2	2620	0.50 U	0.40 U	123000	0.10 U	0.83	5.0 U	ND
ALF-205	12-Apr-19	54	401	15.6	1.3	90.6	603	7.6	25.0 U	5.0 U	165	5.0 U	6790	4.0 U	101000	25.0 U	5.0 U	25.0 U	5.0 U	22.0 J	17700	0.20 U	135	6.0 J	2740	25.0 U	20.0 U	80800	5.0 U	15.0 U	250 U	1.76+-0.795 U*
ALF-205	25-Jun-19	54	409	15.6	1.3	89.9	606	7.0 J	0.50 U	1.2	197	0.058 J	6420	0.071 J	102000	0.50 U	1.4	1.1	0.078 J	19.0	20200	0.20 U	110	6.1	3200	0.50 U	0.50 U	63900	0.10 U	0.56 J	5.7	1.60+-0.718 J
ALF-205	18-Sep-19	54	443	13.9	1.7	89.6 J	628	7.1 J	0.077 U	0.91	206 J	0.054 U	6570	0.12	128000	0.26 U*	1.6	0.43 U	0.046 U	18.6	22100	0.093 U	112	6.4	3170	0.14 J	0.077 U	78800	0.047 U	0.62 J	2.4 U	1.25+-0.774 U
ALF-205	19-Dec-19	54	388	19.8	1.6	144	592	6.9 J	0.50 U	1.0	177	0.20 U	6780	0.083	112000	0.50 U	1.4	1.0 U	0.10 U	16.0	18800	0.20 U	126	5.8	3200	0.14 J	0.50 U	85300	0.10 U	0.62 J	5.0 U	0.241+-0.604 UJ
ALF-205B	29-Sep-17	81.5	173	14.2	0.14	26.5	223	6.8 J	0.50 U	3.9	315	0.20 U	139	0.080 U	47000	0.14 U*	0.50 U	1.0 U	0.10 U	4.6	13700	0.20 U	1.5	0.20 U*	2860	0.50 U	0.50 U	14900	0.10 U	1.0 U	1.3 U*	ND
ALF-205B	19-Oct-17	81.5	171	15.2 J	0.12 J	25.5	228	6.7 J	0.50 U	2.7	329	0.20 U	123	0.080 U	47200	0.15 U*	0.50 U	1.0 U	0.10 U	4.5	13900	0.20 U	1.6	0.50 U	2720	0.50 U	0.50 U	14700	0.10 U	1.0 U	5.0 U	ND
ALF-205B	15-Nov-17	81.5	176	15.3	0.14	30.7	237 J	7.2 J	0.50 U	2	321 J	0.20 U	131 J	0.080 U	50000	0.50 U	0.50 U	1.0 U	0.10 U	4.5	13700	0.20 U	1.2	0.50 U	2650	0.50 U	0.50 U	14300	0.10 U	1.0 U	0.94 U*	0.91
ALF-205B	29-Nov-18	81.5	127	14.4	0.18	24.8	198	7.1 J	0.50 U	4	216	0.10 U	136	0.080 U	34900	0.16 J	0.080 J	0.20 J	0.081 J	3.8	9500	0.20 U	1.1	0.50 U	2360	0.50 U	0.40 U	13200	0.10 U	0.30 U	4.7 J	ND
ALF-205B	12-Apr-19	81.5	129	14.3	0.15	18.7	190	7.2	5.0 U	5	221	1.0 U	207 J	0.80 U	36100	5.0 U	1.0 U	5.0 U	1.0 U	4.2 J	9530	0.20 U	1.0 J	5.0 U	2400	5.0 U	4.0 U	13000	1.0 U	3.0 U	50.0 U	0.824+-0.718 U
ALF-205B	25-Jun-19	81.5	117	11.8	0.22	16.7	183	7.0 J	0.50 U	5.0	210	0.20 U	152	0.080 U	31200	0.50 U	0.50 U	1.0 U	0.10 U	4.0	8940	0.20 U	1.1	0.50 U	2720	0.50 U	0.50 U	13100	0.10 U	1.0 U	5.0 U	1.46+-0.830 J
ALF-205B	18-Sep-19	81.5	109	11.6	0.27	19.0 J	182	6.2 J	0.077 U	4.4	210 J	0.054 U	150	0.030 U	30700	0.51 U*	0.085 U	0.43 U	0.066 J	3.9	8480	0.093 U	0.99	0.38 J	2690	0.14 U	0.077 U	12700	0.047 U	0.27 U	3.7 J	1.46+-0.748
ALF-205B	19-Dec-19	81.5	111	16.2	0.27	16.9 J	170	5.7 J	0.50 U	4.1	208	0.20 U	119	0.080 U	31400	0.23 J	0.50 U	1.0 U	0.10 U	3.7	8680	0.20 U	1.0	0.22 J	2860	0.50 U	0.50 U	13600	0.10 U	1.0 U	5.0 U	0.352+-0.613 UJ
ALF-205A	29-Sep-17	107	109	17.2	0.15	22.8	157	6.9 J	0.50 U	0.48 J	283	0.20 U	80.1	0.080 U	28700	0.22 U*	0.50 U	0.36 U*	0.078 U*	3.2	10700	0.20 U	0.96	0.20 U*	2160	0.50 U	0.50 U	16000	0.10 U	1.0 U	4.7 U*	1.48
ALF-205A	18-Oct-17	107	114	18.4	0.16	25.6	176	6.6 J	0.50 U	0.40 J	264 J	0.20 U	74.1	0.080 U	27500	0.50 U	0.50 U	1.0 U	0.10 U	3.2	10800	0.20 U	1	0.50 U	1980	0.50 U	0.50 U	15000	0.10 U	1.0 U	1.6 U*	ND
ALF-205A	15-Nov-17	107	111	18	0.14	28.8	189 J	7.0 J	0.21 J	0.50 U	274 J	0.20 U	71.3 J	0.080 U	29100	0.50 U	0.50 U	0.37 U*	0.064 U*	3.2	10700	0.20 U	0.79	0.50 U	2020	0.50 U	0.50 U	14500	0.10 U	1.0 U	3.0 U*	1.28
ALF-205A	29-Nov-18	107	125	17.6	0.18	20.6	191	7.0 J	0.50 U	0.38	284	0.10 U	64.9	0.080 U	31000	0.35 J	0.079 J	0.12 J	0.11	2.9	11300	0.20 U	1.2	0.50 U	2100	0.50 U	0.40 U	15100	0.10 U	0.12 J	2.6 J	ND
ALF-205A	12-Apr-19	107	125	16.6	0.15	16.4	180	7.1	5.0 U	0.67 J	308	1.0 U	75.4 J	0.80 U	30800	5.0 U	1.0 U	5.0 U	1.0 U	25.0 U	10400	0.20 U	1.4 J	5.0 U	2080	5.0 U	4.0 U	14700	1.0 U	3.0 U	50.0 U	1.22+-0.665 U
ALF-205A	25-Jun-19	107	121	16.9	0.19	16.0	180	6.5 J	0.50 U	0.48 J	302	0.20 U	69.4	0.080 U	30400	0.50 U	0.50 U	1.0 U	0.10 U	3.1	11100	0.20 U	0.95	0.50 U	2250	0.50 U	0.50 U	14600	0.10 U	1.0 U	3.1 J	1.58+-0.781 J
ALF-205A	18-Sep-19	107	120	17.4	0.24	15.9 J	191	7.3 J	0.077 U	0.53	309 J	0.054 U	70.6	0.030 U	32500	0.21 U	0.085 U	0.43 U	0.046 U	3.2	11100	0.093 U	1.0	0.15 U	2380	0.14 U	0.077 U	15600	0.047 U	0.27 U	2.7 J	1.50+-0.625
ALF-205A	19-Dec-19	107	120	23.6	0.26	21.0	186	6.1 J	0.50 U	0.40 J	305	0.20 U	70.8	0.080 U	33000	0.50 U	0.50 U	1.0 U	0.10 U	3.0	11300	0.20 U	0.96	0.15 J	2430	0.50 U	0.50 U	15500	0.10 U	1.0 U	3.4 J	0.689+-0.695 UJ
ALF 206																																
ALF-206	16-Nov-16	54	NA	11.7	0.302	16.2	242	7.15	0.227 U*	3.22 J	241	0.102 U	121	0.152 U	50000	0.339 U	0.05 J	NA	0.0675 U	7.52 U*	NA	0.0521 U	2.77 J	NA	NA	0.348 U	NA	NA	0.036 U	NA	NA	NA
ALF-206	30-Jan-17	54	NA	17.8	0.315	17.1	220	7.07	0.691 U*	4.48	245	0.131 U	125 J	0.0781 U	50200	0.378 U	0.0947 U	NA	0.318 U	9.31 U*	NA	0.0521 U	2.03 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-206	28-Feb-17	54	NA	17.5	0.24	17.3	242	7.09	0.527 U*	5.36	232	0.131 U	118	0.0781 U	46000	0.378 U	0.0947 U	NA	0.318 U	7.68 U*	NA	0.0653 U	1.69 J	NA	NA	1.27 U	NA	NA	0.198 U*	NA	NA	NA
ALF-206	29-Mar-17	54	NA	16.9	0.361	18	236	7.03	0.91 U*	5.8	237	0.131 U	93.2	0.0781 U	42500	0.378 U	0.0947 U	NA	0.318 U	6.42 U*	NA	0.0653 U	1.7 U*	NA	NA	1.27 J	NA	NA	0.0531 U	NA	NA	NA
ALF-206	18-Apr-17	54	NA	18.3	0.355	21.8	215	7.06	0.762 U*	4.89	243	0.131 U	87.9	0.0781 U	44000	0.378 U	0.0947 U	NA	0.318 U	5.5	NA	0.0653 U	2.21 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-206	09-May-17	54	NA	17.3	0.331	23	229	7.12	0.443 U	6.44	281	0.131 U	131	0.0781 U	45400	0.378 U	0.0947 U	NA	0.318 U	5.85 U*	NA	0.0653 U	2.63 U*	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-206	01-Jun-17	54	NA	16.6	0.322 J	22.8	207	-	2.00 U	5.56 J	252 J	2.00 U	237 U*	1.00 U	41200 J	2.00 U	2.00 U	NA	2.00 U	4.78 J	NA	0.200 U	2.24 J	NA	NA	2.00 U	NA	NA	2.00 U	NA	NA	0.43
ALF-206	13-Jun-17	54	NA	16.4	0.401	24.3	218	7.21	0.443 U	5.31	238	0.131 U	103	0.0781 U	39800	0.378 UJ	0.0947 U	NA	0.318 U	5.84	NA	0.0653 U	2.33 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-206	13-Jul-17	54	NA	16.4	0.372	23.4	216	7.27	2.5 U*	5.55	229	0.131 U	113	0.0781 U	40000	0.378 U	0.0947 U	NA	0.318 U	6.86	NA	0.0653 U	2.46 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-206	19-Jul-17	54	NA	15.8	0.331	18.2	168	7.27	0.543 U*	7.5	233	0.131 U	178	0.0781 U	42900	0.378 U	0.0947 U	NA	0.318 U	5.5	NA	0.0653 U	2.3 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-206	23-Aug-17	54	NA	16.9	0.337	23	227	7.4	0.443 U	4.71	197	0.131 U	141 U*	0.0781 U	43400	0.378 U	0.0947 U	NA	0.318 U	5.32	NA	0.0653 U	3.4 U*	NA	NA	1.27 U	NA	NA	0.163 U*	NA	NA	NA
ALF-206	28-Sep-17	54	149	16.6	0.26	22.3	236 J	6.9 J	0.50 U	8.2	244	0.20 U	108	0.080 U	44900	0.13 U*	0.50 U	1.0 U	0.10 U	5.3	11400	0.20 U	2.4	0.13 U*	2670	0.50 U	0.50 U	14200	0.10 U	1.0 U	1.1 U*	ND
ALF-206	18-Oct-17	54	179	18.4	0.31	23.1	240	6.7 J	0.50 U	10.9	263 J	0.20 U	114	0.080 U	45200	0.50 U	0.50 U	1.0 U	0.10 U	5.7	12900	0.20 U	2.5	0.50 U	2630	0.50 U	0.50 U	15100	0.10 U	1.0 U	2.3 U*	ND
ALF-206	16-Nov-17	54	173	18	0.24	23.7	251	7.1 J	0.50 U	8.3	281	0.20 U	121	0.080 U	52600	0.50 U	0.50 U	1.0 U	0.10 U	5.7	13000	0.20 U	2.3	0.50 U	2620	0.50 U	0.50 U	14400	0.10 U	1.0 U	1.8 U*	ND
ALF-206	06-Jun-18	54	NA	16.1	0.336	29.5	236	6.87	1.12 U	7.79	324	0.057 U	107	0.125 U	48500	1.61 U*	0.075 U	NA	0.094 U	7.5 U*	NA	0.0653 U	2.45 J	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-206	20-Jun-18	54	NA	15.8	0.318	26.2	267	7.16	1.12 U	8.27	299	0.057 U	121	0.125 U	51000	1.44 U*	0.115 J	NA	0.094 U	7.7	NA	0.0653 U	2.45 J	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-206	19-Jul-18	54	NA	16.4	0.262	27.8	250	7.03	1.12 U	7.59	294	0.057 U	92.4	0.125 U	49700	1.74 U*	0.077 J	NA	0.094 U	5.09	NA	0.0653 U	2.25 J	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-206	01-Aug-18	54	NA	17.5	0.326	28.8	244	7.16	1.12 U	8.58	240	0.057 U	114	0.125 U	49900	0.631 U	0.075 U	NA	0.094 U	5.79	NA	0.0653 U	2.08 U*	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-206	22-Aug-18	54	NA	13.7	0.311	24.1	257	7.05	1.12 U	9.13	284	0.057 U	114	0.125 U	48700	2.39 U*	0.075 U	NA	0.094 U	5.89 U*	NA	0.0653 U	2.43 U*	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-206	04-Dec-18	54	154	16.4	0.29	26.1	228	7.1	0.50 U	6.3	262	0.10 U	86	0.080 U	42800	0.94	0.092 J	0.25 J	0.10 U	4.8	11200	0.20 U	2.5	2.6	2590	0.50 U	0.40 U	14800	0.10 U	0.20 J	2.8 J	ND
ALF-206	09-Apr-19	54	135	13.6	0.29	30.9	205	7.1	0.50 U	5.6	222	0.10 U	60.6	0.080 U	44300	0.50 U	0.061 J	0.50 U	0.10 U	4.1	8470	0.20 U	2.1	0.24 J	2220	0.50 U	0.40 U	12900	0.10 U	0.30 U	5.0 U	0.903+-0.577 U
ALF-206	24-Jun-19	54	133	12.2	0.34	29.7	210	6.5 J	0.50 U	6.0	246	0.20 U	70.4	0.080 U	38100	0.50 U	0.50 U	1.2	0.10 U	4.2	9500	0.20 U	2.4	0.50 U	2490	0.50 U	0.50 U	13600	0.10 U	1.0 U	5.0 U	1.80+-0.743 J
ALF-206	18-Sep-19	54	136	12.1	0.46	27.2 J	231	6.5 J	0.077 U	7.1	234	0.054 U	88.4	0.030 U	42800	0.21 U	0.085 U	0.43 U	0.046 U	4.6	10500	0.093 U	2.4	0.15 U	2680	0.14 U	0.077 U	14600	0.047 U	0.27 U	2.4 U	1.84+-0.800
ALF-206	18-Dec-19	54	124	14.2	0.35	32.3	202	6.4 J	0.50 U	5.9	224	0.20 U	76.2	0.080 U	35700	0.50 U	0.50 U	1.0 U	0.10 U	4.0	8940	0.20 U	2.4	0.16 J	2430	0.50 U	0.50 U	14000	0.10 U	1.0 U	5.0 U	0.217+-0.629 U
ALF 210																																
ALF-210	15-Nov-16	47	NA	1.14	0.189	5.49	488	6.67	0.33 U*	9.57 J	298	0.102 U	80.3	0.152 U	133000	0.339 U	2.46	NA	0.0675 U	23.1	NA	0.0521 U	2.37 J	NA	NA	0.687 J	NA	NA	0.036 U	NA	NA	NA
ALF-210	30-Jan-17	47	NA	1.28	0.169	0.876 J	488	6.78	0.998 U*	3.46	323	0.131 U	84	0.0781 U	137000	0.378 U	0.212 J	NA	0.318 U	24.6	NA	0.0521 U	1.54 J	NA	NA	1.27 U	NA	NA	0.135 J	NA	NA	NA
ALF-210	28-Feb-17	47	NA	1.11 J	0.183	5.14	506	6.73	0.565 U*	10.6	328	0.131 U	79.4 J	0.0781 U	137000	0.378 U	1.82	NA	0.318 U	23.3	NA	0.0653 U	2.58 J	NA	NA	1.27 U	NA	NA	0.11 U*	NA	NA	NA
ALF-210	28-Mar-17	47	NA	1.18	0.216	1.62	503	6.73	1.42 U*	9.24	313	0.131 U	67.5 J	0.0781 U	123000	0.378 U	0.726	NA	0.318 U	21	NA	0.0653 U	1.41 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-210	18-Apr-17	47	NA	1.5	0.261	0.97 J	491	6.76	0.478 U*	3.51	339	0.131 U	69.4 J	0.0781 U	132000	0.378 U	0.164 J	NA	0.318 U	20.4	NA	0.0653 U	1.37 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-210	09-May-17	47	NA	1.4	0.227	3.08	537	6.83	0.443 U	2.93	424	0.131 U	83.1	0.0781 U	158000	0.378 U	0.096 U*	NA	0.318 U	23	NA	0.0653 U	1.08 U*	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-210	13-Jun-17	47	NA	1.34	0.287	7.54	524	6.73	0.443 U	6.71	361	0.131 U	69.1 J	0.0781 U	131000	0.378 UJ	0.97	NA	0.318 U	20.6	NA	0.0653 U	1.22 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-210	13-Jul-17	47	NA	1.45	0.279	11.1	495	6.72	1.03 U*	6.37	335	0.131 U	83 U*	0.0781 U	136000	0.378 U	1.05	NA	0.318 U	21.1	NA	0.0653 U	1.22 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-210	18-Jul-17	47	NA	1.56	0.208	8.47	496	6.72	0.669 U*	7.03	324	0.131 U	80.7	0.0781 U	135000	0.378 U	1.81	NA	0.318 U	20.7	NA	0.0653 U	1.61 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-210	23-Aug-17	47	NA	1.21	0.212	12.5	481	6.78	0.918 U*	4.74	311	0.131 U	80.5	0.0781 U	132000	0.378 U	1.24	NA	0.318 U	20.3	NA	0.0653 U	1.76 U*	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-210	26-Sep-17	47	437	0.98 J	0.2	13.0 J	463	6.8 J	0.50 U	4.6	347	0.20 U	70.0 J	0.080 U	136000	0.16 U*	1.1	1.0 U	0.10 U	20.1	30000	0.20 U	1.8	2.6	2980	0.20 J	0.50 U	3420	0.10 U	1.0 U	5.0 U	ND
ALF-210	16-Oct-17	47	473	0.82 J	0.2	11.8	416	7.0 J	0.50 U	1.8	308	0.20 U	76.2	0.080 U	128000	0.13 J	0.75	0.29 J	0.062 U*	21.6	28100 J	0.20 U	1.7	2.1	2890	0.40 J	0.50 U	3190	0.036 U*	1.0 U	1.7 J	ND
ALF-210	13-Nov-17	47	459	0.81 J	0.2	10.7	460	8.2 J	0.50 U	4.9	371	0.20 U	69.5	0.080 U	136000	0.50 U	0.48 J	1.0 U	0.061 U*	21.1	29700	0.20 U	1.3	0.97	3060	0.25 J	0.50 U	3410	0.029 J	1.0 U	1.3 U*	ND
ALF-210	05-Jun-18	47	NA	0.98 J	0.253	11.6	508	6.61	1.12 U	1.18	339	0.057 U	69.4 J	0.125 U	115000	1.01 U*	2.14	NA	0.094 U	23.8	NA	0.0653 U	1.77 J	NA	NA	2.18 J	NA	NA	0.063 U	NA	NA	NA
ALF-210	19-Jun-18	47	NA	1.13	0.243	14.1	490	6.59	1.12 U	1.14 U*	349	0.057 U	74.1 J	0.125 U	134000	1.79 U*	2.74	NA	0.094 U	25.9	NA	0.0653 U	1.73 J	NA	NA	13.8	NA	NA	0.063 U	NA	NA	NA
ALF-210	17-Jul-18	47	NA	1.17	0.227	13.7	495	6.65	1.12 U	1.7	343	0.057 U	63 J	0.125 U	133000	1.47 U*	2.72	NA	0.094 U	22.4	NA	0.0653 U	1.67 J	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-210	31-Jul-18	47	NA	19.1 J	1.71 J	102 J	491	6.56	1.12 U	1.4 U*	305	0.057 U	72.6 J	0.125 U	133000	0.631 U	2.29	NA	0.094 U	23.1	NA	0.0653 U	1.82 U*	NA	NA	1.85 J	NA	NA	0.063 U	NA	NA	NA
ALF-210	21-Aug-18	47	NA	0.955 J	0.217	10.3	491	6.63	1.12 U	2.74	337	0.057 U	76 J	0.125 U	130000	1.79 U*	2.5	NA	0.094 U	21.3	NA	0.0653 U	1.71 U*	NA	NA	0.991 J	NA	NA	0.063 U	NA	NA	NA
ALF-210	27-Nov-18	47	497	0.98 J	0.22	12.6	486	6.8 J	1.0 U	3.4	311	0.10 U	65	0.080 U	126000	0.50 U	1.2 J	0.50 U	0.10 U	19.8	30600	0.20 U	1.4	1.5	2640	0.32 J	0.40 U	4750	2.0 U	0.30 U	5.0 U	ND
ALF-210	09-Apr-19	47	466	0.96 J	0.21	12.9	472	6.8	0.50 U	1.3	291	0.10 U	63.5	0.080 U	141000	4.5	2.3	0.35 J	0.10 U	18.1	29300	0.20 U	1.7	5.1	2370	1.3	0.40 U	3950	0.10 U	0.30 U	1.7 J	0.858+-0.644 U
ALF-210	19-Jun-19	47	462	1.1 J	0.25	11.1	469	6.6 J	0.50 U	1.2	363	0.20 U	68.8	0.080 U	139000	0.50 U	1.9	0.43 J	0.10 U	20.9	30400	0.20 U	1.7	3.2	2460	0.78	0.50 U	4100	0.10 U	1.0 U	2.8 J	2.48+-0.770 U*
ALF-210	11-Sep-19	47	429	1.1 U*	0.36	11.8	459	7.2 J	0.077 U	1.2	321	0.054 U	74.1	0.030 U	128000	0.21 U	2.1	0.43 U	0.046 U	21.4	31300	0.093 U	1.6	3.3	2580	0.29 J	0.077 U	3910	0.047 UJ	0.27 U	2.4 U	0.842+-0.594 U
ALF-210	12-Dec-19	47	443	1.8	0.34	16.2	457	7.0 J	0.50 U	2.2	337	0.20 U	69.1	0.080 U	132000	0.50 U	2.3	1.0 U	0.10 U	20.0	29800	0.20 U	1.6	3.4	2700	0.22 J	0.50 U	3770	0.10 U	1.0 U	5.0 U	1.79+-0.821 J
ALF-210A	26-Sep-17	125	350	49.6	0.26	126 J	807	7.2 J	0.50 U	0.54	307	0.20 U	1890 J	0.080 U	133000	0.19 U*	0.50 U	1.0 U	0.10 U	19.8	36800	0.20 U	3.5	0.28 U*	5690	0.50 U	0.50 U	86200	0.10 U	1.0 U	2.6 U*	ND
ALF-210A	17-Oct-17	125	361	51.4	0.18	224	804	6.9 J	0.50 U	0.5	252	0.20 U	2110	0.080 U	139000	0.15 U*	0.50 U	1.0 U	0.10 U	13	40700	0.20 U	1.5	0.15 J	5410 J	0.50 U	0.50 U	71700	0.10 U	1.0 U	1.8 U*	ND
ALF-210A	14-Nov-17	125	365	63.8	0.13 J	215	816	7.8 J	0.50 U	0.7	238	0.20 U	2190	0.080 U	153000	0.50 U	0.50 U	0.30 U*	2.0 U	11.3	41100	0.20 U	1.3	0.24 U*	5230	0.50 U	0.50 U	63300	0.10 U	1.0 U	1.9 U*	ND
ALF-210A	28-Nov-18	125	354	67.7	0.089 J	205	782	7.2	0.50 U	0.58	150	0.10 U	2320	0.080 U	138000	0.50 U	0.035 J	0.16 J	0.10 U	9	39200	0.20 U	0.86	0.94	4700	0.50 U	0.40 U	66200	0.10 U	0.30 U	5.0 U	ND
ALF-210A	09-Apr-19	125	307	78.5	0.084 J	239	865	6.9	5.0 U	1.0 U	129	0.10 U	1890	0.80 U	155000	5.0 U	1.0 U	5.0 U	1.0 U	7.0 J	33700	0.20 U	5.0 U	5.0 U	4240	5.0 U	4.0 U	59100	1.0 U	3.0 U	50.0 U	1.03+-0.702 U
ALF-210A	19-Jun-19	125	295	73.3	0.095	261	806	6.6 J	0.50 U	0.51	117	0.20 U	2070	0.080 U	143000	0.50 U	0.50 U	1.0 U	0.10 U	8.1	37400	0.20 U	0.51	0.28 U*	4370	0.50 U	0.50 U	70900	0.10 U	1.0 U	2.5 J	2.07+-0.732 U*
ALF-210A	11-Sep-19	125	299 J	58.9 J	0.15	190 J	703	6.6 J	0.077 U	1.1	127	0.054 U	2220	0.030 U	122000	0.21 U	0.085 U	0.46 U*	0.082 J	8.1	31800	0.093 U	1.2	1.2 U*	4660	0.14 U	0.077 U	58900	0.047 U	0.27 U	2.5 J	0.847+-0.667
ALF-210A	11-Dec-19	125	287	103	0.13	345	817	6.9 J	0.50 U	0.51	142	0.20 U	1740	0.080 U	152000	0.50 U	0.50 U	1.0 U	0.051 U*	8.3	35900	0.20 U	0.68	0.21 J	4890	0.50 U	0.50 U	68300	0.10 U	1.0 U	5.0 U	2.36+-0.936 U*
ALF 212																																
ALF-212	15-Nov-16	67	NA	10.3	1.63	16	443	6.96	0.166 U*	11.6	273	0.102 U	2770	0.152 U	91600	0.339 U	0.283 J	NA	0.0675 U	14.6	NA	0.0521 U	38.5	NA	NA	0.348 U	NA	NA	0.036 U	NA	NA	NA
ALF-212	31-Jan-17	67	NA	20.2	1.42	18.9	522	6.94	0.611 U*	12.2	285	0.131 U	3270	0.0781 U	102000	0.378 U	0.239 U*	NA	0.318 U	17.7 U*	NA	0.0521 U	37.7	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-212	28-Feb-17	67	NA	20	1.42	17.9	491	6.97	0.834 U*	15.4	305	0.131 U	3060	0.0781 U	101000	0.378 U	0.393 J	NA	0.318 U	16.3	NA	0.0653 U	40.8	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-212	28-Mar-17	67	NA	17.5	1.19	13.8	495	6.89	0.663 U*	14.5	286	0.131 U	2210	0.0781 U	91900	0.378 U	0.216 J	NA	0.318 U	14.3 U*	NA	0.0653 U	38.8	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-212	18-Apr-17	67	NA	20.7	1.02	18.1	480	6.93	0.443 U	8.45	287	0.131 U	2390	0.0781 U	96300	0.378 U	0.254 J	NA	0.318 U	14.9	NA	0.0653 U	39.6	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-212	10-May-17	67	NA	20.3	0.656	22.2	502	6.86	0.443 U	5.56	324	0.131 U	3760	0.0781 U	109000	0.378 U	0.251 U*	NA	0.318 U	17.2	NA	0.0653 U	45.6	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-212	01-Jun-17	67	NA	19.7 J	0.653 J	17.5 J	481 J	-	2.00 U	7.92	332 J	2.00 U	3000	1.00 U	103000 J	2.00 U	2.00 U	NA	2.00 U	14.1 J	NA	0.200 UJ	41.7 J	NA	NA	2.00 U	NA	NA	2.00 U	NA	NA	ND
ALF-212	13-Jun-17	67	NA	21	0.842	19.4	488	6.99	0.443 U	7.93	303	0.131 U	3050	0.0781 U	99200	0.378 UJ	0.235 J	NA	0.318 U	15.8	NA	0.0653 U	40.8	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA

Table 6
Groundwater Analytical Data (ALF and ACC Monitoring Wells) – Historical
TVA Allen Fossil Plant
Memphis, Tennessee

		Constituent:	Alkalinity (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	pH (SU)	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Lithium	Magnesium	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc	Total Radium
		MCL:	-	-	4	-	-	-	6	10	2000	4	-	5	-	100	6 (a)	1300 (b)	15	40 (a)	-	2	100 (a)	100 (c)	-	50	-	-	2	-	-	5
		Background:	560	23	0.23	130	620	6.0 - 7.7	2.5	9.8	1100	0.5	240	0.4	160000	2.5	7.1	1.7	0.5	34	47000	0.2	2.0	12.0	3500	2.5	2.0	21000	0.5	1.5	10	3.8
Well	**Date**	**Depth**																														
ALF-212	13-Jul-17	67	NA	21.3	0.982	24.6	487	6.97	0.567 U*	8.85	305	0.131 U	2800	0.0781 U	105000	0.378 U	0.263 J	NA	0.318 U	14.7	NA	0.0653 U	43.9	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-212	19-Jul-17	67	NA	21.8	0.961	20.2	468	6.98	0.443 U	12.3	299	0.131 U	3300	0.0781 U	105000	0.378 U	0.322 J	NA	0.318 U	14.8	NA	0.0653 U	47.4	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-212	23-Aug-17	67	NA	18.5	2.22	9.26	402	7.26	0.535 U*	36.3	241	0.131 U	2210	0.0781 U	74500	0.406 J	0.192 J	NA	0.376 J	10.3	NA	0.0653 U	40.7	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-212	27-Sep-17	67	369	18.7	1.8	15.6 J	420 J	7.0 J	0.50 U	23.4	255	0.17 J	2650	0.080 U	78500	0.41 U*	0.24 J	0.24 J	0.058 U*	12.8	20200	0.20 U	39.1	0.54 U*	2700	0.50 U	0.50 U	41900	0.10 U	0.36 J	4.0 U*	ND
ALF-212	17-Oct-17	67	392	17.9	1.9	11.1	418	7.1 J	0.50 U	27	265	0.20 U	2640	0.080 U	88000	0.21 U*	0.24 J	1.0 U	0.10 U	11.8	22000	0.20 U	40.7	0.35 J	2990 J	0.19 J	0.50 U	45700	0.10 U	1.0 U	1.3 U*	ND
ALF-212	16-Nov-17	67	373	16.5	1.4	13.8	441	7.2 J	0.50 U	22.2	261	0.14 J	2040	0.080 U	85400	0.24 J	0.25 J	1.0 U	0.10 U	13.1	21900	0.20 U	37.4	0.37 U*	2590	0.20 J	0.50 U	40500	0.10 U	1.0 U	0.89 U*	ND
ALF-212	06-Jun-18	67	NA	15.9	1.12	2.87	369	6.59	1.12 U	14.7	247	0.057 U	1890	0.125 U	72400	1.68 U*	0.258 J	NA	0.094 U	15.1	NA	0.0653 U	51.8	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-212	19-Jun-18	67	NA	15	1.11	4.75	370	6.99	1.12 U	13.3	241	0.057 U	2220	0.125 U	74200	1.8 U*	0.334 J	NA	0.094 U	11.5 U*	NA	0.0653 U	54.7	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-212	18-Jul-18	67	NA	17.4	1.18	3.05	373	6.84	1.12 U	13	234	0.057 U	1820	0.125 U	75000	1.13 U*	0.249 J	NA	0.094 U	11.7	NA	0.0653 U	50.3	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-212	31-Jul-18	67	NA	16.5 J	0.99 J	3.75 J	376	7.08	1.12 U	11.7	189	0.057 U	2140	0.125 U	71400	0.631 U	0.155 J	NA	0.094 U	12.3	NA	0.0653 U	51.1	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-212	21-Aug-18	67	NA	11.6	1.37	3.49	378	7.1	1.12 U	15.5	196	0.057 U	2070	0.125 U	63400	2.29 U*	0.288 J	NA	0.094 U	11.1	NA	0.0653 U	50.1	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-212	29-Nov-18	67	311	16.5	1.5	7	358	7.2 J	0.50 U	15.4	210	0.10 U	1710	0.080 U	64100	0.39 J	0.32	0.44 J	0.24	9.9	16500	0.20 U	52.9	0.6	2310	0.50 U	0.40 U	39000	0.10 U	0.57	5.0 U	ND
ALF-212	11-Apr-19	67	376	17	1.3	6.2	416	7.3	2.5 U	12.7	233	0.50 U	1920	0.40 U	79500	2.5 U	0.31 J	2.5 U	0.50 U	12.2 J	18600	0.20 U	35.7	2.5 U	2290	2.5 U	2.0 U	36300	0.50 U	1.5 U	25.0 U	0.719+-0.645 U
ALF-212	20-Jun-19	67	343 J	17.5	1.4	3.2	416	7.0 J	0.50 U	13.8	311 J	0.20 U	1980	0.080 U	85600	0.50 U	0.28 J	1.0 U	0.10 U	11.7	21400	0.20 U	39.2	0.39 J	2430	0.22 J	0.50 U	37700	0.10 U	0.29 J	2.4 U*	0.490+-0.489 UJ
ALF-212	13-Sep-19	67	343	15.8 J	1.6	2.3 U*	407	7.1 J	0.077 U	10.4	249	0.054 U	1600	0.030 U	75300	0.22 U*	0.24 J	0.43 U	0.046 U	12.0	19500	0.093 U	37.6	0.22 J	2180	0.21 J	0.077 U	37400	0.047 U	1.3 U	2.4 U	0.723+-0.659 U
ALF-212	13-Dec-19	67	289	23.0	1.7	7.0	361	7.1 J	0.50 U	12.4	215	0.20 U	1690	0.080 U	70200	0.32 U*	0.33 J	1.0 U	0.089 J	11.5	17700	0.20 U	48.5	0.42 J	2310	0.25 J	0.50 U	37500	0.10 U	0.38 J	3.8 J	0.0413+-0.495 UJ
ALF-212A	29-Sep-17	165	280	37.1	0.14	1.0 U	307	6.8 J	0.50 U	4.9	454	0.20 U	52.8	0.080 U	68900	0.15 U*	0.76	1.7 U*	0.11 U*	3	25500	0.20 U	1.3	1.3	2680	0.50 U	0.50 U	12300	0.10 U	1.0 U	4.8 U*	1.17
ALF-212A	18-Oct-17	165	278	39.6	0.12	1.0 UJ	325	6.7 J	0.50 U	4.5	402 J	0.20 U	60.2	0.080 U	63300	0.16 U*	0.73	0.48 U*	0.056 J	3	23800	0.20 U	1.4	1.3	2480	0.50 U	0.50 U	12600	0.10 U	1.0 U	3.3 U*	ND
ALF-212A	15-Nov-17	165	254	36.6	0.16	1.0 U	310 J	6.9 J	0.50 U	2.7	409 J	0.20 U	68.3 J	0.080 U	60500	0.50 U	0.7	1.0 U	0.10 U	3	22800	0.20 U	1.5	0.82 U*	2500	0.50 U	0.50 U	13000	0.10 U	1.0 U	4.8 U*	1.49
ALF-212A	29-Nov-18	165	271	41.1	0.17	1.0 U	315	6.8 J	0.50 U	3.1	380	0.10 U	52.3	0.080 U	67900	0.12 J	0.21	0.12 J	0.10 U	2.6	25500	0.20 U	1.4	0.50 U	2540	0.50 U	0.40 U	13100	0.10 U	0.30 U	5.0 U	ND
ALF-212A	11-Apr-19	165	258	41.5	0.16	1.0 U	304	7.1	2.5 U	3.2	387	0.50 U	61.5 J	0.40 U	65500	2.5 U	0.50 U	2.5 U	0.50 U	3.1 J	23400	0.20 U	1.3 J	2.5 U	2610	2.5 U	2.0 U	11900	0.50 U	1.5 U	25.0 U	1.21+-0.518 U*
ALF-212A	21-Jun-19	165	225	40.3	0.21	0.54 U*	288	6.6 J	0.50 U	3.7	396	0.20 U	52.9	0.080 U	54400	0.50 U	0.16 J	0.81 J	0.062 J	2.9	22400	0.20 U	1.4	0.50 BF	2680	0.50 U	0.50 U	11400	0.10 U	1.0 U	9.9	1.48+-0.777 U
ALF-212A	13-Sep-19	165	233	41.3 J	0.22	0.28 U	320	7.0 J	0.077 U	4.1	418	0.054 U	52.9	0.030 U	66700	0.21 U	0.25 J	0.43 U	0.046 U	3.0	24000	0.093 U	1.1	0.62	2540	0.14 U	0.077 U	12000	0.047 U	0.27 U	13.2 U*	0.745+-0.662 U
ALF-212A	13-Dec-19	165	225	54.8	0.28	1.7 U*	291	7.2 J	0.50 U	4.3	396	0.20 U	52.3	0.080 U	63000	0.50 U	0.21 J	1.0 U	0.10 U	3.0	24200	0.20 U	1.5	0.48 J	2760	0.50 U	0.50 U	12300	0.10 U	1.0 U	12.9	0.516+-0.585 UJ
ALF 213																																
ALF-213	16-Nov-16	71	NA	11.7	0.239	2.48	300	6.98	0.184 U*	31.6	211	0.102 U	189	0.152 U	55100	0.339 U	0.265 J	NA	0.0675 U	10.3	NA	0.0521 U	5.18	NA	NA	0.348 U	NA	NA	0.036 U	NA	NA	NA
ALF-213	31-Jan-17	71	NA	15.8	0.422	20.1	267	6.98	0.694 U*	16.4	174	0.131 UJ	201	0.0781 U	46000	0.378 U	0.0947 U	NA	0.318 U	11.7 U*	NA	0.0521 U	4.68 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-213	28-Feb-17	71	NA	16.3	0.272	26	264	7.06	0.741 U*	15.1	172	0.131 U	199	0.0781 U	43000	0.378 U	0.0947 U	NA	0.318 U	10.3 U*	NA	0.0653 U	4.09 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-213	28-Mar-17	71	NA	13.5	0.479	22.5	221	6.98	0.645 U*	11.4	165	0.131 U	150	0.0781 U	35600	0.378 U	0.0947 U	NA	0.318 U	7.62 U*	NA	0.0653 U	3.76 J	NA	NA	1.79 J	NA	NA	0.0531 U	NA	NA	NA
ALF-213	18-Apr-17	71	NA	16.2	0.518	27.6	206	6.99	0.443 U	7.99	201	0.131 U	159	0.0781 U	37800	0.378 U	0.0947 U	NA	0.318 U	7.71	NA	0.0653 U	4.02 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-213	10-May-17	71	NA	15.6	0.474	29.8	221	6.92	0.443 U	7.53	259	0.131 U	207	0.0781 U	37900	0.378 U	0.0947 U	NA	0.318 U	8.19 U*	NA	0.0653 U	4.38 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-213	01-Jun-17	71	NA	15.6 J	0.277 J	36.9 J	208 J	-	2.00 U	7.36	274 J	2.00 U	199	1.00 U	36600 J	2.00 U	2.00 U	NA	2.00 U	6.45 J	NA	0.200 UJ	3.89 J	NA	NA	2.00 U	NA	NA	2.00 U	NA	NA	0.916
ALF-213	13-Jun-17	71	NA	16.1	0.555	31.4	231	7.05	0.443 U	7.03	255	0.131 U	189	0.0781 U	35500	0.378 UJ	0.0947 U	NA	0.318 U	7.57	NA	0.0653 U	4.02 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-213	13-Jul-17	71	NA	15.9	0.508	29.6	234	7.2	0.443 U	8.4	272	0.131 U	291	0.0781 U	37700	0.378 U	0.0947 U	NA	0.318 U	8.23	NA	0.0653 U	3.61 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-213	19-Jul-17	71	NA	15.5	0.444	23.7	228	7.18	0.443 U	12.7	279	0.131 U	189	0.0781 U	42800	0.378 U	0.0947 U	NA	0.318 U	7.35	NA	0.0653 U	3.92 J	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-213	23-Aug-17	71	NA	14.9	0.322	13.6	304	7.16	0.443 U	39.6	324	0.131 U	254	0.0781 U	58800	0.378 U	0.1 J	NA	0.318 U	8.27	NA	0.0653 U	3.5 U*	NA	NA	1.27 U	NA	NA	0.0531 U	NA	NA	NA
ALF-213	28-Sep-17	71	250	13.9	0.26	12.2	284	6.8 J	0.50 U	47	317	0.20 U	188	0.080 U	51700	0.25 U*	0.50 U	1.0 U	0.10 U	8.4	17700	0.20 U	3.5	0.50 U	3420	0.50 U	0.50 U	22100 J	0.10 U	1.0 U	3.7 U*	ND
ALF-213	19-Oct-17	71	234	14.5	0.22 J	9.6	275	6.4 J	0.50 U	45.7	254	0.20 U	193	0.080 U	48800	0.15 U*	0.50 U	0.32 U*	0.10 U	7.3	15600	0.20 U	3.2	0.93	3010	0.50 U	0.50 U	18600	0.10 U	1.0 U	5.0 U	ND
ALF-213	16-Nov-17	71	176	16.2	0.28	25.4	237	6.9 J	0.50 U	27.7	211	0.20 U	196	0.080 U	44000	0.22 J	0.50 U	1.0 U	0.10 U	7.4	13500	0.20 U	3.5	0.50 U	2740	0.50 U	0.50 U	17300	0.10 U	1.0 U	1.8 U*	ND
ALF-213	06-Jun-18	71	NA	15.5	0.466	28.5	229	6.78	1.12 U	9.92	307	0.057 U	177	0.125 U	39600	1.62 U*	0.075 U	NA	0.094 U	9.79 U*	NA	0.0653 U	4.01 J	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-213	20-Jun-18	71	NA	15.7	0.421	25.4	257	6.96	1.12 U	14.5	323	0.057 U	203	0.125 U	45200	1.24 U*	0.075 U	NA	0.094 U	9.29	NA	0.0653 U	3.56 J	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-213	19-Jul-18	71	NA	16.7	0.39	27.9	228	6.9	1.12 U	11.4	319	0.057 U	167	0.125 U	43400	1.6 U*	0.075 U	NA	0.094 U	6.53	NA	0.0653 U	3.81 J	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-213	01-Aug-18	71	NA	16	0.402	19.2	282	6.8	1.12 U	21.5	294	0.057 U	220	0.125 U	53700	0.631 U	0.075 U	NA	0.094 U	8.45	NA	0.0653 U	3.11 U*	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-213	22-Aug-18	71	NA	11	0.323	11.1	289	6.42	1.12 U	37.7	343	0.057 U	211	0.125 U	56700	1.82 U*	0.096 J	NA	0.094 U	8.39 U*	NA	0.0653 U	2.95 U*	NA	NA	0.813 U	NA	NA	0.063 U	NA	NA	NA
ALF-213	04-Dec-18	71	151	16.6	0.4	24.6	230	7.1	0.50 U	7.8	286	0.10 U	180	0.080 U	38300	0.19 J	0.049 J	0.16 J	0.10 U	6.8	11900	0.20 U	3.9	0.50 U	2970	0.50 U	0.40 U	16800	0.10 U	0.10 J	5.0 U	ND
ALF-213	11-Apr-19	71	149	15.7	0.43	14.1	197	7.1	2.5 U	6.3	269	0.50 U	159	0.40 U	35800	2.5 U	0.50 U	2.5 U	0.50 U	5.8 J	10600	0.20 U	3.5	2.5 U	2750	2.5 U	2.0 U	12900	0.50 U	1.5 U	25.0 U	1.16+-0.730 U
ALF-213	24-Jun-19	71	160	15.8	0.52	7.6	215	6.9 J	0.50 U	6.9	323	0.20 U	133	0.080 U	40700	0.50 U	0.50 U	1.0 U	0.10 U	6.6	12200	0.20 U	3.5	0.50 U	3110	0.50 U	0.50 U	14200	0.10 U	1.0 U	5.0 U	0.640+-0.614 U
ALF-213	20-Sep-19	71	229	14.6	0.48	7.1 J	277	6.6 J	0.077 U	27.1	389	0.054 U	190	0.030 U	56000	0.21 U	0.085 U	0.43 U	0.046 U	7.9	17300	0.093 U	3.1	0.16 J	3500	0.14 U	0.077 U	19600	0.047 U	0.27 U	2.4 U	1.19+-0.638 U
ALF-213	12-Dec-19	71	168	23.5	0.72	9.3	199	7.4 J	0.50 U	7.7	292	0.20 U	118	0.080 U	35600	0.50 U	0.50 U	1.0 U	0.10 U	6.3	11600	0.20 U	3.2	0.50 U	2930	0.50 U	0.50 U	14400	0.10 U	1.0 U	5.0 U	0.680+-0.673 UJ
ALF-213B	04-Dec-18	117	116	18.2	0.2	21.4	196	7	0.50 U	1.8	300	0.10 U	41.4	0.080 U	31000	0.28 J	0.083 J	0.50 U	0.10 U	2.6	11800	0.20 U	0.94	0.50 U	2340	0.50 U	0.40 U	13300	0.10 U	0.13 J	5.0 U	ND
ALF-213B	11-Apr-19	117	398	54.7	0.10 U	1.0 U	451	7.3	2.5 U	2.4	525	0.50 U	35.4 J	0.40 U	103000	2.5 U	0.28 J	2.5 U	0.50 U	8.2 J	26800	0.20 U	2.4 J	2.5 U	3410	2.5 U	2.0 U	17600	0.50 U	1.5 U	25.0 U	1.66+-0.816 J
ALF-213B	24-Jun-19	117	366	60.8	0.13	0.60 J	450	6.8 J	0.50 U	2.9	573	0.20 U	24.2	0.080 U	104000	0.50 U	0.13 J	1.0 U	0.10 U	7.2	29100	0.20 U	1.7	0.23 J	3740	0.50 U	0.50 U	17000	0.10 U	1.0 U	5.0 U	2.85+-0.871 J
ALF-213B	20-Sep-19	117	340	63.1	0.19	0.52 U*	434	6.8 J	0.19 J	3.8	621	0.054 U	24.0	0.030 U	112000	0.21 U	0.33 J	1.1 U*	0.053 J	9.8	30300	0.093 U	2.1	0.65	3930	0.14 U	0.077 U	15100	0.047 U	0.27 U	11.4	1.30+-0.582
ALF-213B	12-Dec-19	117	345	92.2	0.20	0.62 U*	442	7.0 J	0.50 U	2.9	544	0.20 U	26.2	0.080 U	95800	0.23 U*	0.16 J	1.0 U	0.10 U	7.1	27700	0.20 U	1.5	0.40 U*	3590	0.50 U	0.50 U	17400	0.10 U	1.0 U	5.0 U	1.09+-0.722 UJ
ALF-213A	04-Dec-18	158	378	35.9	0.10 U	62.6	557	7.2	0.11 J	3.7	547	0.10 U	32.9	0.080 U	103000	0.34 J	0.56	0.16 J	0.088 J	19.5	28900	0.20 U	10.6	0.5	4190	0.50 U	0.40 U	58200	0.10 U	0.18 J	2.5 J	ND
ALF-213A	11-Apr-19	158	122	18.8	0.2	20.5	177	7.1	2.5 U	3	279	0.50 U	53.0 J	0.40 U	29000	2.5 U	0.50 U	2.5 U	0.50 U	2.6 J	10400	0.20 U	0.96 J	2.5 U	2310	2.5 U	2.0 U	12000	0.50 U	1.5 U	25.0 U	1.71+-0.903 J
ALF-213A	24-Jun-19	158	105	17.5	0.24	24.1	173	7.0 J	0.50 U	4.4	292	0.20 U	46.0	0.080 U	26700	0.50 U	0.50 U	1.0 U	0.10 U	2.5	10700	0.20 U	1.1	0.50 U	2620	0.50 U	0.50 U	13100	0.10 U	1.0 U	5.0 U	0.895+-0.611 U*
ALF-213A	20-Sep-19	158	100	18.2	0.30	26.5 J	189	7.0 J	0.077 U	4.7	303	0.054 U	45.7	0.030 U	26600	0.21 U	0.085 U	0.43 U	0.046 U	2.7	11000	0.093 U	1.1	0.15 U	2630	0.14 U	0.077 U	13300	0.047 U	0.27 U	2.4 U	1.36+-0.746
ALF-213A	12-Dec-19	158	104	27.7	0.34	36.5	177	6.6 J	0.50 U	4.0	286	0.20 U	41.9	0.080 U	25600	0.50 U	0.50 U	1.0 U	0.10 U	2.3	10300	0.20 U	1.0	0.50 U	2560	0.50 U	0.50 U	12800	0.10 U	1.0 U	5.0 U	0.334+-0.605 UJ
ALF 214																																
ALF-214	26-Sep-17	45	288	6	0.26	52.6 J	389	7.3 J	0.26 J	0.37 J	165	0.20 U	405 J	0.1	104000	0.25 U*	0.25 J	0.43 U*	0.10 U	14	21100	0.20 U	2	5.3	1460	1.1	0.50 U	11100	0.10 U	0.70 J	2.5 U*	ND
ALF-214	17-Oct-17	45	316	5.1	0.26	45.1	389	7.2 J	0.22 J	0.48 J	144	0.20 U	360	0.1	106000	0.14 U*	0.18 J	0.26 U*	0.10 U	13.6	21000	0.20 U	1.8	5.6	1270 J	2	0.50 U	10100	0.10 U	0.74 J	1.6 U*	ND
ALF-214	14-Nov-17	45	366	4.4	0.23 J	41.2	474	7.1 J	0.50 U	0.87	198	0.20 U	343	0.052 J	119000	0.50 U	1.5	0.81 U*	0.036 U*	16.8	26700	0.20 U	1.6	4.2	2150	0.50 U	0.50 U	10200	0.10 U	0.48 J	2.0 U*	ND
ALF-214	28-Nov-18	45	293	2.5	0.27	21.8	328	7.6	0.21 J	0.44	129	0.10 U	260	0.11	83200	0.50 U	0.22	0.51	0.10 U	11.9	18000	0.20 U	1.9	3.8	1200	0.50 U	0.40 U	7700	0.10 U	0.67	4.7 J	ND
ALF-214	12-Apr-19	45	286	1.8	0.26	17.1	319	7.5	5.0 U	0.61 J	124	1.0 U	359	0.80 U	79600	5.0 U	1.0 U	5.0 U	1.0 U	10.2 J	16200	0.20 U	1.8 J	3.6 J	1050	5.0 U	4.0 U	8460 J	1.0 U	1.2 J	50.0 U	0.645+-0.591 U
ALF-214	20-Jun-19	45	251 J	1.4	0.35	12.5	274	7.0 J	0.22 J	0.43 J	111	0.20 U	259 J	0.080 J	72100	0.50 U	0.16 J	1.0 U	0.10 U	10.9 J	15000	0.20 U	2.4 J	3.8	1130	0.22 J	0.50 U	8500	0.10 U	0.79 J	5.0 U	2.02+-0.739 J
ALF-214	11-Sep-19	45	227	1.5 U*	0.41	12.3 J	246	6.8 J	0.21 J	0.40 J	121	0.054 U	223	0.091	72000	0.21 U	0.21 J	0.43 U	0.046 U	9.6	15500	0.093 U	2.4	3.8	1150	0.14 J	0.077 U	7600	0.047 U	0.78 J	2.5 J	0.480+-0.489 U
ALF-214	12-Dec-19	45	349	8.3	0.38	31.7	400	7.4 J	0.12 J	0.60	215	0.20 U	248	0.16	109000	0.50 U	1.8	0.59 U*	0.10 U	14.8	24100	0.20 U	1.6	7.0	2190	0.50 U	0.50 U	11000	0.10 U	0.69 J	5.0 U	0.491+-0.625 UJ
ALF-214B	27-Sep-17	88	304	22.1	0.12	159 J	586 J	6.7 J	0.50 U	1.2	166	0.20 U	161	0.080 U	100000	0.27 U*	0.50 U	1.0 U	0.10 U	12.8	30600	0.20 U	0.47 J	0.26 U*	2990	0.50 U	0.50 U	25500	0.10 U	1.0 U	1.3 U*	1.67
ALF-214B	17-Oct-17	88	343	18.5	0.11	133	586	6.8 J	0.50 U	0.94	155	0.20 U	154	0.080 U	120000	0.20 U*	0.50 U	1.0 U	0.053 J	11.8	35900	0.20 U	0.48 J	0.18 J	3130 J	0.50 U	0.50 U	25200	0.10 U	1.0 U	3.4 U*	ND
ALF-214B	14-Nov-17	88	290	25.4	0.11 J	206	680	7.1 J	0.50 U	1	168	0.20 U	150	0.080 U	132000	0.50 U	0.50 U	0.26 U*	0.051 U*	10.6	40700	0.20 U	0.40 J	0.20 U*	3340	0.50 U	0.50 U	36600	0.10 U	1.0 U	2.5 U*	ND
ALF-214B	28-Nov-18	88	218	34.3	0.12	202	599	7.1	0.50 U	3.7	123	0.10 U	141	0.080 U	103000	0.14 J	0.021 J	0.29 J	0.10 U	8.9	31500	0.20 U	0.27 J	0.50 U	2760	0.50 U	0.40 U	38400	0.10 U	0.30 U	5.0 U	ND
ALF-214B	12-Apr-19	88	204	36.8	0.11	199	572	6.8	5.0 U	3.9	137	1.0 U	167 J	0.80 U	89400	5.0 U	1.0 U	5.0 U	1.0 U	10.5 J	25400	0.20 U	5.0 U	5.0 U	2640	5.0 U	4.0 U	45600	1.0 U	3.0 U	50.0 U	0.947+-0.706 U
ALF-214B	20-Jun-19	88	184 J	35.5	0.14	198	531	6.5 J	0.50 U	4.0	135	0.20 U	161	0.080 U	87800	0.50 U	0.50 U	1.0 U	0.10 U	9.4	25400	0.20 U	0.24 J	0.50 U	2630	0.50 U	0.50 U	36700	0.10 U	1.0 U	5.0 U	1.16+-0.639 U
ALF-214B	12-Sep-19	88	182	27.4	0.16	163	485	6.3 J	0.077 U	3.6	113	0.054 U	120	0.030 U	75300	0.21 U	0.085 U	0.49 U*	0.083 J	7.7	23100	0.093 U	0.31 J	0.23 J	2320	0.14 U	0.077 U	28200	0.047 U	0.27 U	4.7 J	0.698+-0.669 U
ALF-214B	12-Dec-19	88	195	42.1	0.20	237	480	7.0 J	0.50 U	3.6	117	0.20 U	129	0.080 U	96800	0.50 U	0.50 U	1.0 U	0.10 U	7.9	26900	0.20 U	0.27 J	0.27 J	2620	0.50 U	0.50 U	26600	0.10 U	1.0 U	5.0 U	0.668+-0.641 UJ
ALF-214A	27-Sep-17	130	236	44.4	0.075 J	411 J	900 J	6.7 J	0.16 J	2.5	116	0.20 U	157	0.080 U	147000	0.26 U*	0.5	1.0 U	0.10 U	19.8	46800	0.20 U	8.4	0.25 U*	5800	0.50 U	0.50 U	47800	0.10 U	1.0 U	3.7 U*	2.37
ALF-214A	17-Oct-17	130	256	44.1	0.051 J	400	998	6.6 J	0.12 J	2.3	78.6	0.20 U	144	0.080 U	161000	0.50 U	0.17 J	1.0 U	0.034 J	13.6	52700	0.20 U	4.9	0.25 J	4950 J	0.50 U	0.50 U	47300	0.10 U	1.0 U	2.5 U*	ND
ALF-214A	14-Nov-17	130	241	42.4	0.11	372	976	7.3 J	0.50 U	2.8	82.8	0.20 U	143	0.080 U	162000	0.50 U	0.50 U	1.0 U	0.10 U	15.3	52400	0.20 U	4.3	0.22 U*	5390	0.50 U	0.50 U	48700	0.10 U	1.0 U	1.9 U*	ND
ALF-214A	28-Nov-18	130	221	43.4	0.083 J	390	902	6.5	0.50 U	1.6	32	0.10 U	134	0.080 U	148000	0.50 U	0.031 J	0.12 J	0.10 U	5.6	48200	0.20 U	1.1	0.50 U	3430	0.50 U	0.40 U	58400	0.10 U	0.30 U	5.0 U	ND
ALF-214A	12-Apr-19	130	199	59.8	0.083 J	315	785	7.1	5.0 U	1.2	36.4	1.0 U	131 J	0.80 U	127000	5.0 U	1.0 U	5.0 U	1.0 U	7.1 J	37600	0.20 U	5.0 U	5.0 U	3220	5.0 U	4.0 U	43600	1.0 U	3.0 U	50.0 U	0.504+-0.547 U
ALF-214A	20-Jun-19	130	189 J	64.3	0.095	318	738	6.5 J	0.50 U	1.0	26.8	0.20 U	102 J	0.080 U	137000	0.50 U	0.50 U	1.0 U	0.10 U	6.4 J	41200	0.20 U	0.37 J	0.28 U*	3500	0.50 U	0.50 U	41900	0.10 U	1.0 U	3.2 J	0.687+-0.540 U
ALF-214A	12-Sep-19	130	175	55.9	0.099	324	788	6.2 J	0.077 U	1.3	29.8	0.054 U	92.8	0.030 U	122000	0.21 U	0.085 U	0.43 U	0.046 U	5.3	38800	0.093 U	0.48 J	0.15 U	3010	0.14 U	0.077 U	39100	0.047 U	0.27 U	2.6 J	0.812+-0.659 U
ALF-214A	12-Dec-19	130	188	61.5	0.11	505	771	6.8 J	0.50 U	1.1	27.9	0.20 U	102	0.080 U	120000	0.50 U	0.50 U	1.0 U	0.10 U	5.8	41000	0.20 U	0.62	0.50 U	3380	0.50 U	0.50 U	37700	0.10 U	1.0 U	2.5 U*	0.363+-0.620 UJ
ALF 215																																
ALF-215	28-Sep-17	25	317	4.9	0.3	31.3	372	6.9 J	0.50 U	6.3	227	0.20 U	192	0.080 U	74500	0.23 U*	3.8	1.0 U	0.10 U	10.6	24700	0.20 U	16.9	2.6	998	0.50 U	0.50 U	23100 J	0.10 U	1.0 U	2.6 U*	ND
ALF-215	16-Oct-17	25	335	6.8	0.29	38.9	366	7.00 J	0.50 U	7.9	221	0.20 U	236 J	0.080 U	94200	0.33 U*	3.6	0.64 U*	0.044 J	9.7 J	30200	0.20 U	12.6	2.9	833	0.50 U	0.50 U	20700	0.10 U	1.0 U	3.5 U*	2.43
ALF-215	13-Nov-17	25	364	8.2	0.26	45.2	402	8.2 J	0.50 U	4.7	273	0.20 U	400	0.080 U	99700	0.50 U	3.9	1.0 U	0.10 U	11.2	33600	0.20 U	14.5	3.5	924	0.50 U	0.50 U	18200	0.10 U	1.0 U	6.0 U*	ND
ALF-215	03-Dec-18	25	331	3.3	0.24	31.9	366	7.1 U*	0.12 J	0.98	224 J	0.10 U	1120	0.062 J	70900	0.54	2.3	0.28 U*	0.10 U	9.3	22700	0.20 U	4.9	4.7	863 J	0.50 U	0.40 U	15500	0.10 U	1.1	2.8 J	ND
ALF-215	09-Apr-19	25	286	1.2	0.21	17.3	299	7	0.50 U	0.4	182	0.10 U	149	0.080 U	75100	0.50 U	0.34	0.43 J	0.053 J	6.2	19300	0.20 U	3	2.8	682	1.5	0.40 U	9210	0.10 U	0.38	1.1 J	1.01+-0.659 U
ALF-215	19-Jun-19	25	260	1.3	0.29	21.4	302	6.5 J	0.18 J	1.3	226	0.20 U	248	0.079 J	73000	0.50 U	9.7	2.1	0.10 U	7.8	22400	0.20 U	10.9	5.8	859	0.38 J	0.50 U	13500	0.10 U	0.63 J	4.0 J	1.30+-0.799 U
ALF-215	12-Sep-19	25	236	0.75 U*	0.34	12.8	269	7.1 J	0.077 U	2.2	207	0.054 U	98.0	0.030 U	64800	0.21 U	3.2	0.43 U	0.046 U	7.0	19400	0.093 U	2.8	4.2	733	0.14 U	0.077 U	8300	0.047 U	0.41 J	2.4 U	1.10+-0.631 U
ALF-215	17-Dec-19	25	205	0.76 J	0.40 J	5.2	222	7.4 J	0.12 J	0.85	178	0.20 U	34.3	0.032 J	53200	0.50 U	0.42 J	1.0 U	0.10 U	6.1	16200	0.20 U	1.5	1.8	611	0.28 J	0.50 U	5450	0.10 U	1.0	5.0 U	0.446+-0.707 U
ALF 216																																
ALF-216	28-Sep-17	50	489	3	0.063 J	43.9	1070 J	6.6 J	0.50 U	5.1	672	0.20 U	84.8	0.080 U	121000	0.13 U*	0.84	1.0 U	0.10 U	18.4	36800	0.20 U	0.26 J	0.79	2830	0.50 U	0.50 U	7120 J	0.10 U	1.0 U	2.3 U*	1.26
ALF-216	16-Oct-17	50	496	3.1	0.072 J	41.9	522	6.8 J	0.50 U	4.9	670	0.20 U	93.3 J	0.080 U	149000	0.13 U*	0.88	1.0 U	0.035 J	16.8 J	43200	0.20 U	0.23 J	0.86	2900	0.50 U	0.50 U	7490	0.10 U	1.0 U	1.2 U*	2.43
ALF-216	14-Nov-17	50	495	2.9	0.065 J	44.4	610	6.8 J	0.50 U	3.8	680	0.20 U	88.4	0.080 U	148000	0.22 U*	0.59	0.30 U*	0.20 U*	17.8	43000	0.20 U	0.33 J	0.38 U*	3050	0.50 U	0.50 U	8580	0.10 U	1.0 U	3.1 U*	ND
ALF-216	27-Nov-18	50	549	3.2	0.079 J	45.5	588	6.8 J	0.50 U	4.6	669	0.10 U	128	0.080 U	147000	0.12 U*	0.24	0.15 J	0.10 U	16.8	44100	0.20 U	0.33 J	0.50 U	2830	0.50 U	0.40 U	8790	0.10 U	0.30 U	5.0 U	ND
ALF-216	10-Apr-19	50	532	3.8	0.068 J	48.2	593	6.8	2.5 U	5.1	657	0.50 U	201	0.40 U	156000	2.5 U	0.62	2.5 U	0.50 U	18.4	40300	0.11 J	2.5 U	2.5 U	2870	2.5 U	2.0 U	8230	0.50 U	1.5 U	25.0 U	0.918+-0.587 U
ALF-216	11-Sep-19	50	437	5.0	0.12	33.8	493	6.5 J	0.077 U	6.1	649	0.054 U	179	0.030 U	135000	0.21 U	0.58	0.43 U	0.046 U	15.9	39500	0.093 U	0.22 J	0.49 J	2980	0.14 U	0.077 U	7830	0.047 U	0.27 U	2.4 J	1.65+-0.725
ALF-216	11-Dec-19	50	470	8.0	0.13	44.7 J	516	6.7 J	0.50 U	5.3	597	0.20 U	167	0.080 U	133000	0.50 U	0.61	1.0 U	0.10 U	16.4	37100	0.20 U	0.24 J	0.31 J	2760	0.50 U	0.50 U	7490	0.10 U	1.0 U	5.0 U	0.353+-0.747 UJ
ALF-217																																
ALF-217	04-Dec-18	61	362	16	2.4	0.81 J	405	7	0.50 U	44.4	229	0.10 U	1320	0.080 U	77400	0.12 J	0.28	2.2	0.10 U	11.1	18000	0.20 U	24.1	0.50 U	4400	0.38 J	0.40 U	38500	0.10 U	0.28 J	2.9 J	ND
ALF-217	11-Apr-19	61	371	15.2	2.3	1.0 U	368	7.4	5.0 U	36.8	218	1.0 U	1320	0.80 U	78200	5.0 U	1.0 U	5.0 U	1.0 U	12.0 J	17100	0.20 U	21.4	5.0 U	4340	5.0 U	4.0 U	34600	1.0 U	3.0 U	50.0 U	0.737+-0.660 U
ALF-217	21-Jun-19	61	351 J	16.0	2.2	0.58 U*	392	6.9 J	0.50 U	42.6	230	0.20 U	1400	0.080 U	80800	0.52	0.25 J	1.0 U	0.10 U	12.3	18000	0.20 U	22.9	0.23 J	4330	0.28 J	0.50 U	34500	0.10 U	0.28 J	5.0 U	1.68+-0.859 U*
ALF-217	20-Sep-19	61	332	15.9	2.6	0.55 U*	374	7.0 J	0.077 U	43.3	218	0.054 U	1430	0.030 U	69800	0.21 U	0.25 J	0.43 U	0.046 U	11.0	16800	0.093 U	23.5	0.36 J	4300	0.39 J	0.077 U	36000	0.047 U	0.27 U	2.4 U	0.592+-0.448
ALF-217	12-Dec-19	61	334	23.2	3.1	0.65 U*	361	7.5 J	0.50 U	33.7	173	0.20 U	1150	0.080 U	78000	0.50 U	0.25 J	0.60 J	0.10 U	10.4	16500	0.20 U	21.9	0.28 U*	4270	0.29 J	0.50 U	35700	0.10 U	1.0 U	5.0 U	1.02+-0.607 U*

Table 6
Groundwater Analytical Data (ALF and ACC Monitoring Wells) – Historical
TVA Allen Fossil Plant
Memphis, Tennessee

		Constituent:	Alkalinity (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	pH (SU)	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Lithium	Magnesium	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc	Total Radium
		MCL:	-	-	4	-	-	-	6	10	2000	4	-	5	-	100	6 (a)	1300 (b)	15	40 (a)	-	2	100 (a)	100 (c)	-	50	-	-	2	-	-	5
	Background:		560	23	0.23	130	620	6.0 - 7.7	2.5	9.8	1100	0.5	240	0.4	160000	2.5	7.1	1.7	0.5	34	47000	0.2	2.0	12.0	3500	2.5	2.0	21000	0.5	1.5	10	3.8
Well	**Date**	**Depth**																														
ALF-217B	04-Dec-18	127	325	76.4	0.098 J	1.0 U	457	6.9	0.50 U	9.5	765	0.10 U	36.4	0.080 U	103000	0.27 J	0.36	0.21 J	0.12	4.2	30600	0.20 U	0.75	0.64	2590	0.50 U	0.40 U	9120	0.10 U	0.27 J	3.9 J	ND
ALF-217B	11-Apr-19	127	400	102	0.12	1.0 U	528	7	5.0 U	13.4	967	1.0 U	77.4 J	0.80 U	127000	5.0 U	1.0 U	5.0 U	1.0 U	5.3 J	35900	0.20 U	5.0 U	1.1 J	2990	5.0 U	4.0 U	11000	1.0 U	3.0 U	50.0 U	2.81+-0.933 J
ALF-217B	25-Jun-19	127	370	103	0.13	0.50 J	498 J	6.6 J	0.50 U	13.9	994	0.20 U	36.7	0.080 U	121000	0.50 U	0.21 J	0.63 J	0.10 U	4.8	34800	0.20 U	0.59	0.62	3320	0.50 U	0.50 U	12200	0.10 U	1.0 U	5.0 U	2.48+-0.974 J
ALF-217B	20-Sep-19	127	270	65.4	0.19	0.56 U*	358	7.0 J	0.077 U	12.3	684	0.054 U	40.7	0.030 U	84400	0.21 U	0.21 J	0.43 U	0.070 J	3.8	25700	0.093 U	0.83	0.36 J	2710	0.14 U	0.077 U	10100	0.047 U	0.27 U	3.3 J	1.52+-0.647
ALF-217B	12-Dec-19	127	348	122 J	0.19 J	0.58 U*	454	7.0 J	0.50 U	13.3	1020	0.20 U	37.9	0.080 U	117000	0.25 U*	0.23 J	1.0 U	0.070 J	4.8	32200	0.20 U	0.74	0.72 U*	3490	0.50 U	0.50 U	13300	0.10 U	1.0 U	3.0 J	2.11+-0.811 U*
ALF-217A	04-Dec-18	188	345	30.2	0.10 U	6.6	403	7	0.34 J	3.5	379	0.10 U	23.1 J	0.080 U	80300	0.26 J	1.4	0.50 U	0.14	27.1	20700	0.20 U	4.8	1.3	3330	0.50 U	0.40 U	35400	0.021 J	0.16 J	5.5	ND
ALF-217A	11-Apr-19	188	324	30.4	0.10 U	1.0 U	372	7	2.5 U	7.4	459	0.50 U	31.8 J	0.40 U	90800	2.5 U	0.94	2.5 U	0.50 U	7.9 J	20500	0.20 U	2.7	0.93 J	2160	2.5 U	2.0 U	10900	0.50 U	1.5 U	25.0 U	2.79+-1.01 J
ALF-217A	21-Jun-19	188	304 J	26.1	0.050	0.53 U*	332	6.9 J	0.50 U	8.5	472	0.20 U	20.1	0.080 U	78000	0.50 U	0.69	1.0 U	0.10 U	6.8	20500	0.20 U	1.8	0.48 J	2270	0.50 U	0.50 U	10400	0.10 U	1.0 U	3.0 J	1.39+-0.677 U*
ALF-217A	20-Sep-19	188	304	26.2	0.085	3.1 J	352	7.0 J	0.077 U	6.9	407	0.054 U	18.1	0.030 U	82600	0.21 U	0.89	0.43 U	0.046 U	10.4	18600	0.093 U	2.5	0.66	2220	0.14 U	0.077 U	17600	0.047 U	0.27 U	2.4 U	2.30+-0.897
ALF-217A	12-Dec-19	188	295	30.2 J	0.16 J	0.62 U*	339	6.8 J	0.50 U	8.6	411	0.20 U	18.0	0.080 U	75300	0.50 U	0.50	1.0 U	0.10 U	7.1	19500	0.20 U	2.3	0.53 U*	2090	0.50 U	0.50 U	11700	0.10 U	1.0 U	3.1 J	1.55+-0.654 U*
P-04																																
P-04-S	27-Sep-17	41	170	15.4	0.33	55.9 J	286 J	7.0 J	0.50 U	1.6	114	0.20 U	159	0.080 U	49000	0.34 U*	0.91	0.48 J	0.10 U	3.7	13900	0.20 U	2.3	1.3	3300	0.50 U	0.50 U	19200	0.10 U	1.0 U	1.7 U*	ND
ALF-P-4S	16-Oct-17	41	171	16.8	0.32	53.2	290	7.3 J	0.50 U	2.6	141	0.20 U	183 J	0.080 U	53900	0.22 U*	0.19 J	1.0 U	0.034 J	4.6 J	13200	0.20 U	3.5	0.47 J	3590	0.50 U	0.50 U	24300	0.10 U	1.0 U	1.0 U*	ND
ALF-P-4S	13-Nov-17	41	210	15.7	0.29	64.6	344	8.2 J	0.22 J	0.99	142	0.20 U	140	0.073 J	68800	0.50 U	0.62	0.58 U*	0.065 U*	4.6	18200	0.20 U	4.5	2.9	4050	6.1	0.50 U	25000	0.034 J	0.73 J	1.8 U*	0.761
ALF-P-4S	27-Nov-18	41	164	13.2	0.38	34.3	247	7.1 J	0.13 J	1.9	68.6	0.10 U	183	0.070 J	45800	0.23 U*	0.6	0.48 J	0.085 J	2.9	11700	0.20 U	3.7	2.7	3130	0.50 U	0.40 U	19500	0.10 U	1	3.2 J	ND
ALF-P-4S	16-Apr-19	41	148	9	0.39	26.1	789	8	0.50 U	1.6	53.9	0.10 U	85.5	0.080 U	41700	0.50 U	0.84	0.36 J	0.072 J	1.8 J	9700	0.20 U	5.3	2.1	2160	0.50 U	0.40 U	13000	0.10 U	0.29 J	10.2	1.71+-0.655 J
ALF-P-4S	24-Jun-19	41	161	10.2	0.44	21.1 J	209	7.0 J	0.50 U	1.4	60.4	0.20 U	97.4	0.032 J	40100	0.50 U	0.59	1.0 U	0.10 U	1.7	11700	0.20 U	7.4	2.3	2440	0.50 U	0.50 U	12500	0.10 U	0.29 J	5.0 U	0.215+-0.596 U
ALF-P-4S	16-Sep-19	41	149	11.2	0.55	33.6 J	227	7.5 J	0.077 U	1.4	59.9	0.054 U	186	0.062 J	42800	0.21 U	0.68	0.43 U	0.046 U	2.1	10400	0.093 U	5.3	2.0	2350	0.14 U	0.077 U	14000	0.047 U	0.27 U	3.9 J	0.366+-0.371 U
ALF-P-4S	17-Dec-19	41	176	13.9	0.66	92.4	371	7.6 J	0.50 U	2.1	90.6	0.20 U	1390	0.080 U	56700	0.26 J	0.97	1.0 U	0.10 U	2.2	13800 J	0.20 U	10.4	2.9	3350	0.50 U	0.50 U	27500	0.10 U	1.0 U	5.0 U	0.168+-0.586 U
ALF-P-4	01-Jun-17	75	NA	15.9 J	0.327 J	22.4 J	204 J	-	2.00 U	4.21 J	175 J	2.00 U	126 U*	1.00 U	38700 J	1.23 J	2.00 U	-	1.22 J	4.23 J	-	0.200 UJ	2.42 J	-	-	2.00 U	-	-	2.00 U	-	-	0.44
ALF-P-4	28-Sep-17	75	168	18.7	0.31	41.5	245	7.0 J	0.50 U	4.2	201	0.20 U	148	0.080 U	47200	0.37 U*	0.50 U	0.44 U*	0.31	5.8	12800	0.20 U	2.8	0.57 U*	2920	0.50 U	0.50 U	20400 J	0.10 U	0.47 U*	3.2 U*	ND
ALF-P-4	17-Oct-17	75	168	18.1	0.3	39	271	6.9 J	0.50 U	3.6	170	0.20 U	171	0.080 U	63100	0.29 U*	0.50 U	1.0 U	0.15	5.4	12800	0.20 U	3.4	0.44 J	3020 J	0.50 U	0.50 U	27300	0.10 U	1.0 U	1.8 U*	ND
ALF-P-4	14-Nov-17	75	166	17.1	0.25 J	56.7	310	7.8 J	0.50 U	4.6	221	0.20 U	159	0.080 U	59700	0.47 U*	0.50 U	0.64 U*	0.48	5.9	14500	0.20 U	2.9	0.96	3330	0.50 U	0.50 U	23100	0.10 U	0.67 J	3.3 U*	ND
ALF-P-4	27-Nov-18	75	127	13.1	0.34	37	216	7.2 J	0.50 U	3.7	151	0.10 U	186	0.080 U	40100	0.13 U*	0.034 J	0.56	0.085 J	4.4	10100	0.20 U	4.2	1.9	2600	0.50 U	0.40 U	16800	0.10 U	0.24 J	3.4 J	ND
ALF-P-4	16-Apr-19	75	86.2	7.1	0.29	17.2	132	7.9	0.50 U	1.9	101	0.10 U	28.6	0.080 U	25000	0.50 U	0.065 J	0.50 U	0.17	2.1 J	5980	0.20 U	2.3	0.34 J	1590	0.50 U	0.40 U	9820	0.10 U	0.33	1.4 J	1.14+-0.593 UJ
ALF-P-4	24-Jun-19	77	79.8	11.5	0.31	21.3	137	7.1 J	0.50 U	1.7	111	0.20 U	35.6	0.080 U	25900	0.50 U	0.50 U	0.51 J	0.11	2.5	6730	0.20 U	2.0	0.23 J	1620	0.50 U	0.50 U	9340	0.10 U	0.28 J	5.0 U	1.11+-0.658 J
ALF-P-4	16-Sep-19	77	80.5	8.7	0.42	19.3	139	7.2 J	0.077 U	1.9	87.3	0.054 U	43.3	0.030 U	22600	0.26 U*	0.085 U	0.43 U	0.10	2.1	5590	0.093 U	2.3	0.29 J	1460	0.14 U	0.077 U	8620	0.047 U	0.27 U	2.4 U	0.105+-0.426 U
ALF-P-4	17-Dec-19	77	107	13.1 J	0.42	27.7	173	7.2 J	0.50 U	2.0	124	0.20 U	48.6	0.080 U	31000	1.1	0.50 U	1.0 U	0.061 J	2.6	7670 J	0.20 U	2.2	0.26 J	1850	0.50 U	0.50 U	10600	0.10 U	1.0 U	5.0 U	0.119+-0.445 U
ACC																																
ACC-1A	27-Sep-17	165.5	301	6.6	0.16	2.1	302 J	6.6 J	0.50 U	1.7	548	0.20 U	9.0 U*	0.080 U	56900	0.22 U*	0.93	1.0 U	0.062 U*	1.5	29600	0.20 U	0.81	1.7	2560	0.50 U	0.50 U	10300	0.10 U	1.0 U	6.1 U*	ND
ACC-1A	17-Oct-17	165.5	339	6.6	0.12	2.1	327	6.6 J	0.50 U	1.8	543	0.20 U	7.0 U*	0.080 U	64200	0.50 U	0.68	0.37 U*	0.064 J	1.3	33100	0.20 U	0.64	1.3	2560 J	0.50 U	0.50 U	10700	0.10 U	1.0 U	6.7	ND
ACC-1A	14-Nov-17	165.5	320	6.5	0.086 J	5.8	350	6.8 J	0.50 U	2.3	567	0.20 U	11.2 U*	0.080 U	66300	0.50 U	0.55	1.0 U	0.037 U*	1.5	33400	0.20 U	0.91	1.2	2660	0.50 U	0.50 U	14300	0.10 U	1.0 U	4.1 U*	ND
ACC-1A	27-Nov-18	165.5	337	6.2	0.13 J	2.8 J	325	7.2 J	0.50 U	2	454	0.10 U	9.3 U*	0.080 U	60900	0.50 U	0.38	0.50 U	0.10 U	1.0 J	31200	0.20 U	0.54	0.98 U*	2550	0.50 U	0.40 U	10600	0.10 U	0.30 U	2.8 U*	ND
ACC-1A	10-Apr-19	165.5	313	5.7	0.12	1.9	311	6.8	2.5 U	1.9	476	0.50 U	112 J	0.40 U	64200	2.5 U	0.52	2.5 U	0.50 U	12.5 U	30800	0.11 J	2.5 U	1.2 J	2580	2.5 U	2.0 U	10300	0.50 U	1.5 U	25.0 U	0.984+-0.721 U
ACC-1A	11-Sep-19	165.5	298	6.0	0.18	1.4 U*	300	6.2 J	0.077 U	2.0	478	0.054 U	8.2 J	0.030 U	60000	0.21 U	0.52	0.43 U	0.053 U*	1.1	31500	0.093 U	0.52	1.2	2500	0.14 U	0.077 U	10000	0.047 U	0.27 U	6.0	1.42+-0.792 U
ACC-1A	11-Dec-19	165.5	99.0	8.6	0.18	2.6 J	302	6.9 J	0.50 U	1.9	463	0.20 U	8.9 J	0.080 U	63100	0.50 U	0.56	1.0 U	0.054 J	1.2	30600	0.20 U	0.51	1.3	2450	0.50 U	0.50 U	9770	0.10 U	1.0 U	5.1	1.84+-0.653 J
ACC-3A	27-Sep-17	126	449	6.8	0.067 J	13.2	464 J	6.7 J	0.50 U	0.61	858	0.20 U	105	0.080 U	99300	0.39 U*	0.50 U	1.7	0.044 U*	6.9	35800	0.20 U	0.89	0.38 U*	3190	0.50 U	0.50 U	11500	0.10 U	1.0 U	6.9 U*	ND
ACC-3A	17-Oct-17	126	484	6.5	0.089 J	12	460	6.8 J	0.50 U	0.40 J	888	0.20 U	115	0.080 U	124000	0.24 U*	0.50 U	1.0 U	0.10 U	6.7	43400	0.20 U	0.59	0.25 J	3360 J	0.50 U	0.50 U	12000	0.10 U	1.0 U	4.7 J	ND
ACC-3A	14-Nov-17	126	493	6.7	0.096 J	23.1	556	6.8 J	0.50 U	0.82	872	0.20 U	115	0.080 U	119000	0.28 U*	0.50 U	0.23 U*	0.058 U*	7.2	42900	0.20 U	1	0.27 U*	3520	0.50 U	0.50 U	21400	0.10 U	1.0 U	6.6 U*	ND
ACC-3A	27-Nov-18	126	500	6.7	0.096 J	14.3 J	489	7.5 J	0.50 U	0.31	883	0.10 U	145	0.080 U	117000	0.50 U	0.10 U	0.25 J	0.10 U	6.6	40900	0.20 U	0.33 J	0.34 U*	3140	0.50 U	0.40 U	11900	0.10 U	0.30 U	4.0 U*	ND
ACC-3A	10-Apr-19	126	469	6.5	0.094 J	20.2	497	6.9	2.5 U	0.38 J	869	0.50 U	210	0.40 U	119000	2.5 U	0.50 U	2.5 U	0.50 U	6.7 J	37200	0.11 J	2.5 U	2.5 U	3140	2.5 U	2.0 U	11300	0.50 U	1.5 U	25.0 U	2.42+-0.707
ACC-3A	21-Jun-19	126	410	9.1	0.13	70.6	506	7.1 J	0.50 U	0.36 J	1010	0.20 U	264	0.080 U	122000	0.50 U	0.50 U	1.3	0.064 J	7.2	37200	0.20 U	0.39 J	0.25 U*	3240	0.50 U	0.50 U	11800	0.10 U	1.0 U	5.3	3.14+-0.930 J
ACC-3A	11-Sep-19	126	428	7.6	0.15	39.2	498	6.7 J	0.077 U	0.38 J	950	0.054 U	108	0.030 U	118000	0.21 U	0.085 U	0.43 U	0.062 U*	6.0	42600	0.093 U	0.27 J	0.39 J	3230	0.14 U	0.077 U	11100	0.047 U	0.27 U	4.5 J	2.30+-0.843
ACC-3A	11-Dec-19	126	427	11.3	0.14	65.7	498	6.5 J	0.50 U	0.26 J	903	0.20 U	159	0.080 U	123000	0.32 J	0.50 U	6.6	0.10	6.6	38500	0.20 U	0.35 J	0.34 J	3120	0.50 U	0.50 U	11000	0.10 U	1.0 U	6.7	2.24+-0.818 J
ACC-5B	20-Sep-17	55.5	226	12.5	0.19	65.3	353	6.7 J	0.14 J	0.52	150	0.20 U	19.3	0.080 U	61900	0.23 U*	0.73	1.0 U	0.12 U*	6	23000	0.20 U	3.3	1.5	1590	0.50 U	0.50 U	19400	0.10 U	1.0 U	52.2	ND
ACC-5B	17-Oct-17	55.5	493	3	0.12	27.8	486	6.7 J	0.50 U	1.1	484	0.20 U	73.1	0.080 U	141000	0.22 U*	2.9	0.62 U*	0.092 J	19.2	35300	0.20 U	0.41 J	6	2300 J	0.50 U	0.50 U	6670	0.10 U	1.0 U	2.8 U*	ND
ACC-5B	13-Nov-17	55.5	433	4.6	0.13	19.8	446	8.1 J	0.50 U	1.6	581	0.20 U	91.6	0.080 U	130000	0.50 U	2.2	1.0 U	0.065 U*	18.6	33200	0.20 U	0.64	3.8	2210	0.50 U	0.50 U	6650	0.10 U	1.0 U	2.9 U*	ND
ACC-5B	27-Nov-18	55.5	258	17.2	0.081 J	80.2 J	397	7.2 J	0.50 U	0.29	480	0.10 U	96.2	0.080 U	130000	0.50 U	3.2	0.50 U	0.10 U	17.3	33900	0.20 U	0.18 J	7	2270	0.50 U	0.40 U	7760	0.10 U	0.30 U	2.7 U*	ND
ACC-5B	10-Apr-19	55.5	465	4.5	0.15	29.9	508	7	2.5 U	0.32 J	598	0.50 U	158	0.40 U	134000	2.5 U	3.3	2.5 U	0.50 U	16.2	31500	0.20 U	2.5 U	6.8	2120	2.5 U	2.0 U	7790	0.50 U	1.5 U	25.0 U	1.82+-0.686 U*
ACC-5B	26-Jun-19	55.5	451 J	3.9	0.19	30.8	500	6.8 J	0.50 U	0.39 J	672	0.20 U	129	0.080 U	130000	0.50 U	3.2	1.0 U	0.072 U*	16.2	33200	0.20 U	0.23 J	6.2	1960	0.50 U	0.50 U	7040	0.10 U	1.0 U	5.6	2.63+-1.09 J
ACC-5B	11-Sep-19	55.5	450	4.1	0.20	43.7	530	6.6 J	0.077 U	0.31 J	611	0.054 U	86.5	0.030 U	141000	0.21 U	3.7	0.43 U	0.046 U	16.4	37200	0.093 U	0.13 J	8.5	2350	0.14 U	0.077 U	6470	0.047 U	0.27 U	4.5 J	1.20+-0.733
ACC-5B	11-Dec-19	56	460	5.4	0.22	59.3	534	6.6 J	0.50 U	0.33 J	648	0.20 U	84.2	0.080 U	140000	0.50 U	3.8	1.0 U	0.10 U	15.1	34400	0.20 U	0.17 J	6.7	2100	0.50 U	0.50 U	6150	0.10 U	1.0 U	3.9 J	0.338+-0.469 U*
ACC-5A	21-Sep-17	139	485	2.6	0.1	32	519	6.9 J	0.50 U	1.6	446	0.20 U	64	0.080 U	143000	0.33 U*	2.9	1.0 U	0.074 U*	19.8	35300	0.20 U	1.2	5.2	2490	0.50 U	0.50 U	7410	0.10 U	1.0 U	3.9 U*	ND
ACC-5A	17-Oct-17	139	261	15.8	0.066 J	64.7	405	6.7 J	0.50 U	0.39 J	174	0.20 U	23.3	0.080 U	70400	0.21 U*	0.50 U	1.0 U	0.036 J	3.5	29600	0.20 U	0.6	0.34 J	2650 J	0.50 U	0.50 U	16900	0.10 U	1.0 U	8.9	ND
ACC-5A	13-Nov-17	136	274	15.8	0.085 J	62.1	405	7.6 J	0.50 U	0.69	185	0.20 U	22.7	0.080 U	70400	0.50 U	0.50 U	1.0 U	0.031 U*	3.8	29500	0.20 U	0.94	0.20 U*	3040	0.50 U	0.50 U	15200	0.10 U	1.0 U	8.1 U*	ND
ACC-5A	27-Nov-18	139	519	3.1	0.15 J	19.8 J	512	7.1 J	0.50 U	1.5	99.4	0.10 U	25.9 U*	0.080 U	71600	0.50 U	0.10 U	0.50 U	0.10 U	2.9	29600	0.20 U	0.26 J	0.28 U*	2640	0.50 U	0.40 U	12900	0.10 U	0.30 U	1.4 U*	ND
ACC-5A	10-Apr-19	139	269	16.8	0.074 J	94.3	434	6.8	2.5 U	1.7	78	0.50 U	48.4 J	0.40 U	83000	2.5 U	0.50 U	2.5 U	0.50 U	12.5 U	29700	0.11 J	2.5 U	2.5 U	2520	2.5 U	2.0 U	12400	0.50 U	1.5 U	25.0 U	0.843+-0.576 U
ACC-5A	26-Jun-19	144	255 J	17.4	0.090	96.6	414	6.4 J	0.50 U	2.1	81.1	0.20 U	36.5	0.080 U	78000	0.50 U	0.50 U	1.2	0.080 U*	2.4	32100	0.20 U	0.37 J	0.40 U*	2510	0.50 U	0.50 U	13300	0.10 U	1.0 U	12.6	0.561+-0.760 UJ
ACC-5A	11-Sep-19	144	242	17.5	0.12	97.7	427	6.5 J	0.077 U	1.5	78.9	0.054 U	31.3	0.030 U	74800	0.22 U*	0.085 U	0.43 U	0.075 U*	2.3	30400	0.093 U	0.46 J	0.34 J	2690	0.14 U	0.077 U	12800	0.047 U	0.27 U	4.0 J	0.858+-0.538 U
ACC-5A	11-Dec-19	144	258	23.7	0.12	115	404	7.0 J	0.50 U	1.8	70.3	0.20 U	31.6	0.080 U	80000	0.50 U	0.50 U	1.0 U	0.10 U	2.6	31600	0.20 U	0.31 J	0.30 J	2840	0.50 U	0.50 U	13300	0.10 U	1.0 U	2.8 J	1.06+-0.683 UJ
Pre-Design Wells - North																																
EW-N02	29-Nov-18	30	244	13.4	3.1	210	646	10 J	0.99	2400	27.1	0.12	6090 J	1.2	4020	1.2	1.1	23.3	11.7	6.2	221	0.20 U	327	7.2	1350	1.3	0.050 J	202000	0.10 U	21.6	4.0 J	ND
EW-N02	15-Jan-19	30	206	13.5	2.2	204	321	9.9 J	0.98	1420	23.1	0.12	5430	1.2	3670	1.1	0.89	19.4	11	2.0 J	72.1	0.15 J	356 J	6	1470	1.5	0.40 U	194000	0.10 U	19.7	19.8	ND
PMW-02A	29-Nov-18	29	248	15.2	2.9	210	674	10.0 J	1.5	3450	28.2	0.095 J	6430 J	2.2	4270	1.4	1.9	34.4	23.4	0.58 J	96.7	0.20 U	339	13.3	1410	3.2	0.079 J	200000	0.10 U	38.4	8.8	ND
PMW-02A	16-Jan-19	29	252	16.2	3	191	686	10.1	1.6	3650	41	0.15	7350	3.3	5270	25.0 U	3.7 J	58.6	32.7	0.76 J	123	0.10 J	406	24.6 J	1430	5.7	0.11 J	215000	0.064 J	67.2	6.4	ND
PMW-02A	16-Apr-19	29	192	17.1	3	186	646	10	10.0 U	3840	46.9	2.0 U	6950	2.3	6970	10.0 U	3.3	59.9	22.7	50.0 U	564	0.20 U	440	20.7	1670	6.3 J	8.0 U	179000	2.0 U	71.1	100 U	1.67+-0.996 J
PMW-02A	26-Jun-19	29	217	15.7	3.5	206	666	10.1	1.8 J	3700	55.1	1.0 U	7020	2.4	7680	3.4	3.3	53.6	25.7	0.92 J	216	0.20 U	447	22.9	1390	6.4	2.5 U	191000	0.50 U	85.2	20.3 J	0.582+-0.667 U
PMW-02A	17-Sep-19	29	232	14.1	4.0	229 J	733	10.0 J	1.3	3300	33.4	0.13 J	8230	1.3	4440	2.3 U*	1.7	34.3	10.8	1.7	223	0.093 U	303	11.7	1300 J	3.0	0.090 J	224000	0.047 U	50.1	8.3	0.193+-0.762 U
PMW-02A	18-Dec-19	29	261	20.1	4.2	261	692	9.7 J	1.2	3310	17.8	0.063 J	7090	0.93	5110	1.2	1.1	25.7	7.7	0.84	179	0.20 U	301	9.2	1260	2.5	0.50 U	232000	0.10 U	35.5	3.7 J	0.757+-0.655 UJ
PMW-02B	29-Nov-18	54	370	23.3	0.13	372	1010	7.4 J	0.50 U	71	236	0.10 U	1700 J	0.080 U	83300	0.50 U	0.76	0.50 U	0.075 J	19	19100	0.20 U	81	0.83	4220	0.14 J	0.40 U	276000	0.10 U	0.68	5.0 U	ND
PMW-02B	16-Jan-19	54	486	20.1	0.69	278	978	7.5	0.50 U	92.5	206	0.10 U	2320	0.080 U	78600	0.50 U	0.49	0.51	0.14	17.3	17500	0.20 U	57.2	0.74	4230	0.15 J	0.40 U	233000	0.10 U	7.5 J	1.2 J	ND
PMW-02B	16-Apr-19	54	207	14.9	0.093 J	46	315	7.5	0.50 U	12.9	119	0.10 U	991	0.080 U	63800	0.50 U	1.8	0.66	0.21	5.2	13400	0.20 U	58.7	2.3	3100	0.14 J	0.40 U	14400	0.10 U	0.91	62.9	0.386+-0.572 UJ
PMW-02B	26-Jun-19	54	290	16.6 J	0.14	48.9	381	7.0 J	0.50 U	29.5	155	0.20 U	1670	0.080 U	80400	0.44 J	1.8	1.0 U	0.10	8.3	17700	0.20 U	82.7	2.0	3440	0.50 U	0.50 U	19600	0.10 U	1.6	28.2	0.431+-0.595 U
PMW-02B	17-Sep-19	54	187	13.6	0.20	9.6 J	258	6.7 J	0.077 U	37.6	89.7	0.054 U	465	0.030 U	42500	0.36 U*	0.43 J	0.55 U*	0.14	4.6	9550	0.093 U	6.6	0.62	2980 J	0.14 U	0.077 U	25500	0.047 U	2.0	117	0.616+-0.753 U
PMW-02B	18-Dec-19	54	290	23.0	0.20	57.9	400	7.3 J	0.50 U	69.5	164	0.20 U	2170	0.080 U	81700	0.54	0.70	1.7	0.27	8.3	18200	0.20 U	73.9	0.77	4130	0.50 U	0.50 U	31600	0.10 U	1.3	81.6	0.180+-0.549 UJ
PMW-02C	29-Nov-18	124	158	16.2	0.089 J	22.9	225	7.1 J	0.50 U	0.25	260	0.10 U	119 J	0.080 U	45600	0.50 U	0.10 U	0.50 U	0.10 U	2.7	11400	0.20 U	1.5	0.24 J	1480	0.50 U	0.40 U	14000	0.10 U	0.30 U	1.5 J	ND
PMW-02C	16-Jan-19	124	145	16.8	0.11	27.3	210	7.6	0.50 U	0.12	259	0.10 U	337 J	0.080 U	44800	0.50 U	0.10 U	0.50 U	0.10 U	2.8	11200	0.20 U	1.9	0.17 J	1570	0.50 U	0.40 U	15100	0.10 U	0.30 U	5.0 U	ND
PMW-02C	15-Apr-19	124	124	15.5	0.12	29	195	7.4	0.50 U	0.24	211	0.10 U	116	0.080 U	34000	0.50 U	0.077 J	0.50 U	0.095 J	2.2 J	7720	0.20 U	2.3	0.22 J	1400	0.50 U	0.40 U	11700 J	0.10 U	0.30 U	3.4 J	0.930+-0.789 U
PMW-02C	26-Jun-19	124	116	16.4	0.16	30.7	213	7.2	0.50 U	0.50 U	238	0.20 U	134	0.080 U	38500	0.24 J	0.50 U	1.0 U	0.073 J	2.7	9280	0.20 U	2.8	0.28 J	1400	0.50 U	0.50 U	13700	0.10 U	1.0 U	5.2	0.658+-0.655 U
PMW-02C	17-Sep-19	124	104	16.5	0.23	35.3 J	194	6.3 J	0.077 U	0.43 J	197	0.054 U	175	0.030 U	35400	0.94 U*	0.087 J	0.43 U	0.061 J	2.2	9340	0.093 U	1.7	0.53	1280 J	0.14 U	0.077 U	14200	0.047 U	0.27 U	5.3	2.51+-0.809
PMW-02C	18-Dec-19	124	120	21.2	0.20	38.5	221	6.3 J	0.50 U	0.27 J	243	0.20 U	146	0.033 J	43000	0.25 J	0.50 U	1.0 U	0.075 J	2.5	10000	0.20 U	2.0	0.23 J	1590	0.50 U	0.50 U	15200	0.10 U	1.0 U	5.6	0.695+-0.514 UJ
PMW-04A	29-Nov-18	29	186	15.6	4.4	184	561	7.6 J	0.47 J	3050	55.8 J	0.10 U	7380 J	0.15	39300	0.50 U	1.3	7.5	0.19	6.8	6880 J	0.20 U	679 J	12.2	3770 J	0.78	0.40 U	166000	0.10 U	6.8	2.6 J	ND
PMW-04A	15-Jan-19	29	182	15.3	4.4	165	540	7.9 J	0.46 J	2440	53.3	0.10 U	7100	0.25	34100	0.50 U	1.1	7.5	0.23	6.5	7550	0.20 U	740 J	11.7	3740	0.71	0.40 U	129000	0.10 U	5.3	5.0 U	ND
PMW-04A	16-Apr-19	29	218	14.9	3.9	162	586	8	2.5 U	2260	59.6	0.50 U	6850	0.40 U	38600	2.5 U	0.92	3.6	0.50 U	6.8 J	8080	0.20 U	891	9.1	4170	0.46 J	2.0 U	142000	0.50 U	5	25.0 U	1.46+-0.609 J
PMW-04A	25-Jun-19	29	293	13.5	3.9	166	593 J	7.7 J	0.32 J	1430	75.2	0.20 U	5540	0.042 J	48900	0.50 U	0.80	2.8	0.068 J	6.4	13000	0.20 U	569	6.3	5080	0.30 J	0.50 U	122000	0.10 U	3.7	5.0 U	2.63+-1.09 J
PMW-04A	17-Sep-19	29	136	15.2	3.7	204	506	7.2 J	0.34 J	1460	63.2	0.054 U	6930	0.13	45900	0.21 U	1.4	3.6 U*	0.074 J	7.0	10100	0.093 U	528	11.5	5510 J	0.53	0.077 U	101000	0.047 U	4.1	2.4 U	2.47+-0.864
PMW-04A	17-Dec-19	29	204	22.8	4.1	272	644	7.6 J	0.35 J	1430	85.1	0.20 U	6800	0.16	75900	0.48 J	0.42 J	7.4	0.20	11.3	16200 J	0.20 U	547	9.7	2540	0.89	0.50 U	97300	0.10 U	6.8	5.0 U	0.0741+-0.582 U
PMW-04B	29-Nov-18	57	260	17.2	0.2	37.9	372	7.1 J	0.50 U	45.1	256	0.10 U	2870 J	0.080 U	75300	0.50 U	0.14	0.50 U	0.10 U	10.7	18900	0.20 U	245	0.27 J	2250	0.50 U	0.40 U	12800	0.10 U	0.24 J	5.0 U	ND
PMW-04B	15-Jan-19	57	258	18	0.18	55.1	390	8.0 J	0.50 U	34.2	300	0.10 U	3160	0.080 U	76900	0.50 U	0.092 J	1.7 U*	0.10 U	13.1	19700	0.20 U	259 J	0.29 J	2360	0.12 J	0.40 U	12900	0.10 U	0.14 J	5.0 U	ND
PMW-04B	16-Apr-19	57	254	18.8	0.17	83.7	443	7.7	2.5 U	33.8	348	0.50 U	4370	0.40 U	90900	2.5 U	0.50 U	2.5 U	0.50 U	13.8	21800	0.20 U	250	2.5 U	2430	2.5 U	2.0 U	13500	0.50 U	1.5 U	25.0 U	1.48+-0.747 UJ
PMW-04B	25-Jun-19	57	251	19.8 J	0.21	82.5	355 J	7.3 J	0.50 U	34.4	331	0.063 J	5100	0.080 U	87000	0.50 U	0.50 U	1.0 U	0.048 J	13.4	22200	0.20 U	254	0.50 U	2170	0.50 U	0.50 U	13300	0.10 U	1.0 U	5.0 U	2.41+-1.10 J
PMW-04B	17-Sep-19	57	276	17.0	0.29	54.5 J	419	6.9 J	0.077 U	59.9	327	0.054 U	3310	0.030 U	92600	0.21 U	0.11 J	0.43 U	0.081 J	12.4	24000	0.093 U	185	0.21 J	3040 J	0.14 U	0.077 U	17700	0.047 U	0.36 J	9.3 J	2.83+-0.885
PMW-04B	17-Dec-19	57	225	27.3	0.60	97.2	430	7.3 J	0.50 U	38.7	289	0.20 U	3810	0.055 J	78500	0.25 J	0.50 U	0.82 J	0.10 U	11.7	19200 J	0.20 U	258	0.21 J	2520	0.50 U	0.50 U	14200	0.10 U	1.0 U	5.0 U	0.000+-0.544 U
PMW-04C	29-Nov-18	124	167	16.6	0.13	19.7	239	7.2 J	0.50 U	0.22	295	0.10 U	93.2 J	0.080 U	48500	0.50 U	0.078 J	0.30 J	0.10 U	3.5	11900	0.20 U	1.3	0.25 J	1730	0.50 U	0.40 U	14000	0.10 U	0.30 U	2.1 J	ND
PMW-04C	15-Jan-19	124	148	16.6	0.1	24.9	221	8.1 J	0.50 U	0.15	301	0.10 U	113 J	0.080 U	45500	0.50 U	0.12	0.38 U*	0.083 J	3	11400	0.20 U	1.7	0.16 U*	1690	0.50 U	0.40 U	13800	0.10 U	0.30 U	1.4 J	1.67
PMW-04C	16-Apr-19	124	135	16.9	0.14	28.7	215	7.6	0.50 U	0.14	269	0.10 U	100	0.080 U	42800	0.50 U	0.058 J	0.50 U	0.10 U	2.8	9850	0.20 U	2	0.15 J	1580	0.50 U	0.40 U	13200	0.10 U	0.30 U	5.0 U	0.540+-0.637 UJ
PMW-04C	25-Jun-19	125	129	17.0	0.16	29.2	218	6.4 J	0.50 U	0.50 U	282	0.20 U	85.8	0.080 U	42500	0.37 J	0.50 U	1.0 U	0.10 U	3.0	10000	0.20 U	2.2	0.22 J	1750	0.50 U	0.50 U	13200	0.10 U	1.0 U	5.0 U	2.39+-0.972 J
PMW-04C	17-Sep-19	125	115	16.2	0.21	33.3 J	191	7.3 J	0.077 U	0.14 U	243	0.054 U	130	0.030 U	39100	0.21 U	0.085 U	0.43 U	0.057 J	2.9	9390	0.093 U	1.9	0.18 J	1510 J	0.14 U	0.077 U	14100	0.047 U	0.27 U	2.4 U	2.28+-0.902
PMW-04C	17-Dec-19	124	126	22.9	0.24	37.7	243	6.7 J	0.50 U	0.50 U	277	0.20 U	123	0.080 U	41000	0.35 J	0.091 J	1.0 U	0.15	2.8	9400 J	0.20 U	2.1	0.26 J	1710	0.50 U	0.50 U	12600	0.10 U	1.0 U	2.5 J	0.235+-0.547 U
PMW-07A	03-Dec-18	24	241	17	3.5	178 J	696	9.4 J	0.98	1590	49.7	0.18	8660 J	0.72	18500	2.8	1.8	24.9 J	8.4	125 U	2010 J	0.20 U	990 J	7.3 J	1960	0.93	0.057 J	179000 J	0.10 U	24.3	9.6	ND
PMW-07A	16-Jan-19	24	219	16.9	3.5	184	630	9.4	1	1190	40.7	0.14	10100	1.2	13100	2.2	1.2	32.6	11.4	1.9 J	774	0.20 U	881	6.2	1890	1.4	0.083 J	188000	0.10 U	22.6	7.2	ND
PMW-07A	16-Apr-19	24	162	16.2	3	187	563	9.1	0.80 J	816	43.6	0.50 U	9790	0.40 U	23800	2.5 U	0.52	14.7	2.6	12.5 U	2980	0.20 U	918	4.5	2840	1.2 J	2.0 U	143000	0.50 U	23.7	25.0 U	0.472+-0.627 UJ
PMW-07A	26-Jun-19	24	174	17.3	4.6	232	614	8.8	0.40 J	520	63.9	0.11 J	12800	0.17	39300	0.53	0.31 J	8.3	2.4	3.3	3830	0.20 U	1020	3.2	2660	0.86	0.50 U	143000	0.10 U	8	4.7 J	0.337+-0.626 U
PMW-07A	18-Sep-19	24	220	16.3	3.5	237	659	7.8 J	0.41 J	218	162 J	0.055 J	10100	0.24	83400	0.58 U*	0.59	5.4	1.5	8.7	14100	0.093 U	939	2.7	4040	0.50	0.077 U	109000	0.047 U	2.9	5.5	1.31+-0.662
PMW-07A	19-Dec-19	24	195	23.2	4.6	298	690	8.4 J	0.85	797	63.1	0.20 U	11900	0.067 J	31800	0.38 U*	0.45 J	19.7	0.95	3.4	4040	0.20 U	792	4.4	2730	1.6	0.50 U	179000	0.10 U	12.1	3.6 J	0.403+-0.594 UJ
PMW-07B	03-Dec-18	55	279	19.7	0.24	52.1 J	395	7.1 J	0.50 U	67.9	316 J	0.10 U	3380	0.080 U	69200	0.50 U	0.72	0.36 U*	0.059 J	9.4	20200	0.20 U	368	0.41 J	4420 J	0.50 U	0.40 U	23600 J	0.10 U	0.30 U	2.3 U*	ND
PMW-07B	16-Jan-19	55	302	19.2	0.18	72.6	419	7	0.50 U	78.1	375	0.10 U	4470	0.11	81100	0.52	0.26	0.50 U	0.10 U	8.4	25500	0.20 U	417	0.62	4870	0.50 U	0.40 U	29800	0.10 U	7.6 J	5.0 U	ND

Table 6
Groundwater Analytical Data (ALF and ACC Monitoring Wells) – Historical
TVA Allen Fossil Plant
Memphis, Tennessee

		Constituent:	Alkalinity (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	pH (SU)	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Lithium	Magnesium	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc	Total Radium
		MCL:	-	-	4	-	-	-	6	10	2000	4	-	5	-	100	6 (a)	1300 (b)	15	40 (a)	-	2	100 (a)	100 (c)	-	50	-	-	2	-	-	5
		Background:	560	23	0.23	130	620	6.0 - 7.7	2.5	9.8	1100	0.5	240	0.4	160000	2.5	7.1	1.7	0.5	34	47000	0.2	2.0	12.0	3500	2.5	2.0	21000	0.5	1.5	10	3.8
Well	**Date**	**Depth**																														
PMW-07B	16-Apr-19	55	236	13.9	0.073 J	69.6	376	7.3	0.50 U	16.6	109	0.10 U	1170	0.080 U	74500	0.50 U	3.1	0.94	0.19	3.2	16700	0.20 U	61	2.7	3100	0.24 J	0.40 U	14600	0.10 U	0.82	53.5	1.33+-0.803 UJ
PMW-07B	26-Jun-19	55	286	16	0.12	76.5	432	7.1	0.50 U	19.4	152	0.20 U	2850	0.080 U	86100	0.24 J	1.9	0.44 J	0.1	6	19400	0.20 U	188	1.1	4340	0.50 U	0.50 U	31000	0.10 U	1.5	7.5	1.12+-0.749 U
PMW-07B	18-Sep-19	55	220	15.3	0.15	47.6 J	330	7.2 J	0.077 U	12.5	115 J	0.054 U	1740	0.030 U	73500	0.50 U*	0.39 J	0.43 U	0.10 U*	4.6	15800	0.093 U	24.9	0.66	3630	0.14 U	0.077 U	15000	0.047 U	1.4	9.2	1.20+-0.794
PMW-07B	19-Dec-19	55	292	22.4	0.19	86.7	466	6.5 J	0.50 U	11.0	169	0.20 U	2910	0.080 U	93200	0.38 U*	0.19 J	1.0 U	0.089 J	6.7	20300	0.20 U	125	0.59	5290	0.50 U	0.50 U	29200	0.10 U	1.2	8.9	0.215+-0.605 UJ
PMW-07C	03-Dec-18	117	136	17.9	0.12	32.9 J	222	7.2 J	0.50 U	0.26	222 J	0.10 U	248	0.080 U	41700	0.50 U	0.10 U	0.50 U	0.10 U	3.2	9730	0.20 U	12	0.16 J	1640 J	0.50 U	0.40 U	16400 J	0.10 U	0.30 U	2.0 U*	ND
PMW-07C	16-Jan-19	117	142	16.9	0.15	30.7	209	7.2	0.50 U	0.14	246	0.10 U	502 J	0.080 U	39700	0.43 J	0.10 U	3.6	0.10 U	2.8	10900	0.20 U	12.4	0.29 J	1810	0.50 U	0.40 U	16200	0.10 U	0.30 U	5.0 U	ND
PMW-07C	16-Apr-19	117	122	17.2	0.18	29.7	203	7.8	0.50 U	2.8	174	0.10 U	191	0.080 U	38100	0.61	1.7	0.32 J	0.13	2.8	9220	0.20 U	12.5	4.3	1740	0.50 U	0.40 U	15100	0.10 U	0.29 J	3.0 J	1.26+-0.781 J
PMW-07C	26-Jun-19	117	126	17.4	0.22	23.9	205	7.5	0.50 U	1.7	233	0.20 U	213	0.080 U	38500	0.46 J	1.3	0.84 J	0.28	3.3	9820	0.20 U	11.3	2.8	1750	0.50 U	0.50 U	14700	0.10 U	0.61 J	6.8	0.537+-0.818 U
PMW-07C	18-Sep-19	117	109	17.1	0.31	36.9 J	199	7.2 J	0.077 U	2.7	201 J	0.054 U	419	0.030 U	36900	0.23 U*	0.92	0.43 U	0.12 U*	3.7	11200	0.093 U	27.2	2.6	1950	0.14 U	0.077 U	16100	0.047 U	0.28 J	3.0 J	0.896+-0.772 U
PMW-07C	19-Dec-19	117	119	25.2	0.29	43.8	214	7.2 J	0.50 U	1.9	226	0.20 U	232	0.080 U	39100	0.25 J	0.51	1.0 U	0.066 J	3.0	10400	0.20 U	11.9	1.4	2030	0.50 U	0.50 U	15900	0.10 U	1.0 U	2.4 J	1.07+-0.588 UJ
Pre-Design Wells - South																																
EW-S03	29-Nov-18	30	97	16.5	3.1	143	388	7.6 J	0.19 J	557	47.1 J	0.065 J	4710 J	0.24	15800	1.1	0.71	6.5	3.9	4.9	3460 J	0.20 U	270 J	4.5	1240 J	0.45 J	0.40 U	130000	0.10 U	7.3	4.5 J	ND
EW-S03	15-Jan-19	30	94.3	15.8	3.3	135	387	7.7 J	0.50 U	355	62.2	0.10 U	4450	0.23	18300	0.46 J	0.26	5.1	2.2	5.4	4150	0.20 U	285 J	2	2260	0.48 J	0.40 U	91700	0.10 U	3	9.5	ND
PMW-10A	04-Dec-18	32	102	14.9	2.9	129	374	7.6 J	0.50 U	234	70.9	0.10 U	4640	0.091	26300 J	0.50 U	0.8	0.30 U*	0.073 J	6.9	5810	0.20 U	414	2.7	3550	0.26 J	0.40 U	108000 J	0.10 U	0.92	1.9 J	ND
PMW-10A	15-Jan-19	32	96.5	15.6	3.9	115	357	7.8 J	0.50 U	238	72.5	0.10 U	4770	0.1	26600	0.50 U	0.74	0.57 U*	0.10 U	7.5	5700	0.20 U	474 J	2.6	3500	0.24 J	0.40 U	74400	0.10 U	1.1	5.0 U	ND
PMW-10A	10-Apr-19	32	109	16.1	4.6	110	368	7.4	2.5 U	222	75.3	0.50 U	6030	0.40 U	29500	2.5 U	0.78	2.5 U	0.50 U	8.1 J	6540	0.14 J	479	2.8	3510	2.5 U	2.0 U	68900	0.50 U	4.7	25.0 U	0.500+-0.498 U
PMW-10A	19-Jun-19	32	124	14.7	5.8	102	365	7.1 J	0.50 U	328	97.5	0.20 U	5140	0.057 J	31800	0.50 U	0.70	1.0 U	0.10 U	7.8	6980	0.20 U	441	2.4	3710	0.27 J	0.50 U	73500	0.10 U	6.7	5.0 U	1.79+-0.754 U*
PMW-10A	12-Sep-19	32	121	14.9 J	7.1	95.4	382	7.3 J	0.079 J	225	91.3	0.054 U	7080	0.073 J	35100	0.21 U	1.3	0.92 U*	0.12	8.2	7360	0.093 U	663	4.3	4510	0.39 J	0.077 U	83400	0.047 U	8.2	3.5 J	0.809+-0.531
PMW-10A	13-Dec-19	32	68.7	17.3	6.3	146	297	7.9 J	0.50 U	286	68.6	0.20 U	3220	0.080 U	27400	0.27 U*	0.74	1.0 U	0.10 U	7.2	5950	0.20 U	263	2.8	3690	0.26 J	0.50 U	54000	0.10 U	1.2	5.0 U	0.710+-0.672 UJ
PMW-10B	03-Dec-18	68	378	22.8	0.34	14.1	448	7.7 J	0.38 J	43	89.5 J	0.10 U	1560	0.080 U	58500	0.50 U	0.42	0.50 U	0.086 J	21.7	10400	0.20 U	45	1	4560 J	0.24 J	0.40 U	69100 J	0.10 U	1.3	1.9 J	ND
PMW-10B	15-Jan-19	68	393	18.3	0.18	1.6	487	8.0 J	0.16 J	42.2	102	0.10 U	1500	0.080 U	82200	0.50 U	0.37	0.50 U*	0.050 J	22.7	14200	0.20 U	33.0 J	0.68	4420	0.21 J	0.40 U	69900	0.10 U	0.58	5.0 U	ND
PMW-10B	10-Apr-19	68	491	14.5	0.092 J	1.0 U	551	7.7	2.5 U	41.4	95.5	0.50 U	1490	0.40 U	106000	2.5 U	0.34 J	2.5 U	0.50 U	40.7	14900	0.12 J	40.4	2.5 U	4180	2.5 U	2.0 U	78500	0.50 U	0.74 J	25.0 U	1.03+-0.595 U*
PMW-10B	19-Jun-19	68	430	10.4	0.16	0.68 U*	470	6.9 J	0.17 J	61.6	152	0.20 U	947	0.080 U	113000	0.50 U	0.35 J	1.0 U	0.10 U	26.2	19600	0.20 U	24.4	0.37 U*	4900	0.15 J	0.50 U	46200	0.10 U	0.44 J	5.0 U	2.01+-0.672 J
PMW-10B	12-Sep-19	68	394	14.0 J	0.34	1.4 U*	496	7.0 J	0.13 J	76.5	165	0.054 U	748	0.030 U	134000	0.21 U	0.42 J	0.43 U	0.046 U	18.9	22200	0.093 U	9.7	0.50	5700	0.16 J	0.077 U	29200	0.047 U	0.33 J	2.4 U	1.31+-0.751 U
PMW-10B	13-Dec-19	68	442	17.1	0.35	0.80 U*	507	7.4 J	0.084 J	77.7	145	0.20 U	699	0.080 U	121000	0.22 U*	0.33 J	1.0 U	0.10 U	14.2	22000	0.20 U	5.0	0.42 J	5440	0.50 U	0.50 U	23400	0.10 U	0.34 J	5.9	1.28+-0.752 UJ
PMW-10C	03-Dec-18	148	198	18.5	0.23	45.6 J	311	7.2 J	0.50 U	0.78	227 J	0.10 U	2500	0.080 U	46800	0.50 U	0.067 J	0.50 U	0.10 U	3	16300	0.20 U	332	0.24 J	2320 J	0.50 U	0.40 U	26200 J	0.10 U	0.30 U	2.2 J	ND
PMW-10C	16-Jan-19	148	197	17.8	0.2	37.1	272	7.3	0.50 U	0.74	185	0.10 U	2130	0.080 U	44100	0.50 U	0.057 J	0.45 J	0.10 U	2.6	15900	0.20 U	268	0.33 J	2050	0.50 U	0.40 U	27900	0.10 U	7.4 J	5.0 U	ND
PMW-10C	10-Apr-19	148	169	17.4	0.21	38.4	264	7.1	2.5 U	0.51	179	0.50 U	2280	0.40 U	43200	2.5 U	0.50 U	2.5 U	0.50 U	12.5 U	15000	0.12 J	287	2.5 U	1900	2.5 U	2.0 U	23400	0.50 U	1.5 U	25.0 U	1.73+-0.770 U*
PMW-10C	20-Jun-19	148	156 J	18.3	0.28	43.4 J	280	6.6 J	0.50 U	0.60	187 J	0.20 U	1580	0.031 J	40800	0.50 U	0.50 U	1.0 U*	0.10 U	1.6	15100	0.20 U	253	0.50 U	1970	0.50 U	0.50 U	22900	0.10 U	1.0 U	5.0 U	2.54+-0.771
PMW-10C	12-Sep-19	148	190	16.6 J	0.29	57.1	327	7.1 J	0.077 U	0.67	252	0.054 U	2880	0.030 U	54200	0.21 U	0.085 U	0.43 U	0.046 U	2.3	19300	0.093 U	348	0.19 J	2400	0.14 U	0.077 U	27600	0.047 U	0.27 U	2.4 U	0.657+-0.658 U
PMW-10C	13-Dec-19	148	191	23.3	0.33	51.6	296	7.4 J	0.50 U	0.84	237	0.20 U	2450	0.080 U	53400	0.29 U*	0.50 U	1.0 U	0.10 U	2.4	19200	0.20 U	360	0.50 U	2390	0.50 U	0.50 U	26000	0.10 U	1.0 U	3.3 J	0.167+-0.553 UJ
PMW-11A	29-Nov-18	27	136	15.6	3.4	118	406	7.2 J	0.50 U	111	87.3	0.10 U	4530 J	0.080 U	37900	0.50 U	0.87	0.31 J	0.10 U	5.6	7810	0.20 U	259	1.8	1920	0.24 J	0.40 U	87700	0.10 U	1.2	5.0 U	ND
PMW-11A	16-Jan-19	27	141	15	3.9	113	382	7.4	0.50 U	122	103	0.10 U	5060	0.072 J	35700	0.65	0.65	0.54	0.053 J	6.3	8040	0.20 U	297	1.5	2090	0.23 J	0.40 U	86300	0.10 U	15.0 U	5.0 U	ND
PMW-11A	11-Apr-19	27	127	14.7	3.9	119	417	7.4	0.50 U	126 J	94.5 J	0.10 U	4540	0.080 U	32250 J	0.50 U	0.385 J	0.50 U	0.10 U	6 J	7150 J	0.20 U	226.5 J	1 J	1905 J	0.50 U	0.40 U	78000	0.10 U	1.4 J	5.0 U	0.951+-0.570 J
PMW-11A	21-Jun-19	27	194 J	12.7	3.7	116	328	7.0 J	0.50 U	184	140	0.20 U	3810	0.080 U	38100	0.50 U	0.33 J	0.85 J	0.10 U	6.9	9640	0.20 U	218	0.68	2130	0.17 J	0.50 U	83600	0.10 U	0.77 J	5.0 U	1.49+-0.788 U*
PMW-11A	17-Sep-19	27	173	12.9	3.8	118 J	414	7.2 J	0.077 U	120	127	0.054 U	3830	0.030 U	49400	0.21 U	1.3	0.43 U	0.046 U	6.8	11300	0.093 U	149	2.3	1930 J	0.18 J	0.077 U	76600	0.047 U	1.2	2.4 U	0.666+-0.634 U
PMW-11A	17-Dec-19	27	163	18.0	4.6	137	390	6.7 J	0.50 U	160	100	0.20 U	4310	0.080 U	32000	0.47 U*	0.57	1.0 U	0.10 U	5.9	7160	0.20 U	207	1.4	1960	0.16 J	0.50 U	84900	0.10 U	0.98 J	5.0 U	1.23+-0.667 J
PMW-11B	04-Dec-18	63	130	17.5	2.3	122	404	7.4 J	0.50 U	12.1	189	0.10 U	6490	0.1	39700 J	0.50 U	0.15	0.50 U	0.10 U	11.6	11100	0.20 U	490	0.40 J	2460	0.16 J	0.40 U	63400 J	0.10 U	2.8	4.3 J	ND
PMW-11B	16-Jan-19	63	235	19.9	1.8	71.5	385	7.6	0.50 U	14.6	255	0.10 U	5740	0.082	52700	0.50 U	0.13	0.50 U	0.10 U	11.7	14300	0.20 U	349	0.26 J	3080	0.12 J	0.40 U	61900	0.10 U	15.0 U	5.0 U	1.89
PMW-11B	11-Apr-19	63	299	15.7	1.3	46.6	317	7.3	2.5 U	16.8	332	0.50 U	3540	0.40 U	73400	2.5 U	0.50 U	2.5 U	0.50 U	12.6	18700	0.20 U	217	0.86 J	3190	2.5 U	2.0 U	32800	0.50 U	0.76 J	25.0 U	1.35+-0.652 U*
PMW-11B	21-Jun-19	63	361 J	13.5	0.96	10.1	406	6.9 J	0.50 U	26.0	479	0.20 U	1250	0.080 U	95000	0.50 U	0.20 J	0.51 J	0.10 U	10.7	24700	0.20 U	60.6	0.50 U	4590	0.18 J	0.50 U	18400	0.10 U	1.0 U	5.0 U	2.01+-0.689 U*
PMW-11B	17-Sep-19	63	182	17.9	2.8	88.8 J	378	7.2 J	0.077 U	14.6	194	0.054 U	6600	0.030 U	45300	0.22 U*	0.085 U	0.43 U	0.046 U	14.8	12400	0.093 U	385	0.27 J	2250 J	0.14 J	0.077 U	63800	0.047 U	0.78 J	2.4 U	0.859+-0.692 U
PMW-11B	17-Dec-19	63	259	23.1	1.9	62.6	393	6.7 J	0.50 U	17.5	293	0.20 U	4070	0.080 U	60500	0.44 U*	0.12 J	1.0 U	0.10 U	10.8	16200	0.20 U	229	0.34 J	3310	0.50 U	0.50 U	36900	0.10 U	0.54 J	5.0 U	0.177+-0.778 U
PMW-11C	04-Dec-18	144	212	22.4	0.18 J	61.4	373	7.3 J	0.50 U	1	140	0.10 U	3210	0.080 U	44200 J	0.50 U	0.071 J	0.50 U	0.10 U	3.3	14600	0.20 U	293	0.25 J	2430	0.50 U	0.40 U	59900 J	0.10 U	0.16 J	2.0 J	ND
PMW-11C	16-Jan-19	144	194	20.9	0.29	63.4	313	7.3	0.50 U	1.5	130	0.10 U	1980	0.080 U	47500	0.50 U	0.10 U	0.50 U	0.10 U	2.1 J	16100	0.20 U	292	0.21 J	2280	0.50 U	0.40 U	45600	0.10 U	15.0 U	5.0 U	ND
PMW-11C	11-Apr-19	144	181	19.8	0.43	65.5	298	7.2	2.5 U	2.5	127	0.50 U	1450	0.40 U	44100	2.5 U	0.50 U	2.5 U	0.50 U	2.6 J	14600	0.20 U	176	2.5 U	2070	2.5 U	2.0 U	35300	0.50 U	1.5 U	25.0 U	1.10+-0.592 U
PMW-11C	21-Jun-19	144	165 J	19.8	0.55	59.7	305	7.1 J	0.50 U	2.6	129	0.20 U	2030	0.080 U	38100	0.50 U	0.50 U	1.0 U	0.10 U	2.1	14200	0.20 U	148	0.50 U	2080	0.50 U	0.50 U	39000	0.10 U	1.0 U	5.0 U	1.66+-0.767 U*
PMW-11C	17-Sep-19	144	187	19.1	0.47	94.7 J	381	7.1 J	0.079 J	3.7	148	0.054 U	4320	0.030 U	49100	0.24 U*	0.085 U	3.9	0.17	3.8	15600	0.093 U	433	0.22 J	2360 J	0.14 U	0.077 U	54900	0.047 U	0.28 J	5.4	1.62+-0.892
PMW-11C	17-Dec-19	144	200	26.2	0.52	1.2 U	399	7.4 J	0.50 U	1.9	161	0.20 U	4530	0.042 J	46700	0.50 U	0.50 U	1.0 U	0.10 U	3.2	15100	0.20 U	301	0.58	2470	0.50 U	0.50 U	56400	0.10 U	1.0 U	5.6	0.898+-0.711 J
PMW-14A	03-Dec-18	49	252	15.4	1.4	92.8 J	429	7.5 J	0.12 J	68.8	105 J	0.10 U	5400	0.080 U	52900	0.50 U	2.8	0.99	0.28	6.1	14000	0.20 U	86.3	6.4	1350 J	0.31 J	0.40 U	94100 J	0.10 U	1	2.2 J	ND
PMW-14A	16-Jan-19	49	280	14.8	1.1	74.6	442	7.5	0.12 J	66.9	108	0.10 U	5660	0.080 U	54900	0.50 U	3	0.74	0.28	6.9	14700	0.20 U	81.9	6.4	1420	0.27 J	0.40 U	79000	0.10 U	15.0 U	5.0 U	4.24
PMW-14A	11-Apr-19	49	253	15.2	1.1	70.9	411	7.3	25.0 U	67	114	5.0 U	6580	4.0 U	57600	25.0 U	3.6 J	25.0 U	5.0 U	125 U	13900	0.20 U	75.8	6.8 J	1320 J	25.0 U	20.0 U	66800	5.0 U	15.0 U	250 U	1.12+-0.603 U
PMW-14A	20-Jun-19	49	225 J	15.6	1.3	75.2	411	6.7 J	0.13 J	70.9	111 J	0.20 U	6130	0.098	51900	0.50 U	3.2	0.50 U*	0.21 U*	6.8	13900	0.20 U	78.4	6.2	1160	0.30 J	0.50 U	63500	0.052 J	1.2	5.0 U	1.62+-0.610 J
PMW-14A	16-Sep-19	49	297	14.6	1.6	48.6 J	447	7.0 J	0.11 J	76.1	122	0.054 U	5490	0.081 J	58800	0.21 U	4.1	0.48 U*	0.16	6.3	15100	0.093 U	60.9	6.7	1220	0.30 J	0.077 U	54800	0.047 U	0.97 J	2.4 U	0.373+-0.383 U
PMW-14A	17-Dec-19	49	334	17.0	1.6	47.9 J	470	7.3 J	0.11 J	98.7	136	0.20 U	5260	0.074 J	68900	0.31 U*	3.7	0.44 J	0.11	6.7	17200	0.20 U	53.7	7.1	1380	0.31 J	0.50 U	62600	0.10 U	1.2	5.0 U	0.358+-0.508 U
PMW-14B	03-Dec-18	85	328	14.6	0.077 J	37.8 J	403	7.0 J	0.50 U	36.8	635 J	0.10 U	1340	0.080 U	75800	0.50 U	0.22	0.50 U	0.10 U	6.4	19900	0.20 U	2	0.24 J	4200 J	0.50 U	0.40 U	11500 J	0.10 U	0.30 U	1.6 J	ND
PMW-14B	16-Jan-19	85	310	13.9	0.11	43.6	391	7.3	0.50 U	50.8	746	0.10 U	1490	0.080 U	83300	0.50 U	0.15	0.42 J	0.23	6.2	23700	0.20 U	2	0.22 J	4650	0.50 U	0.40 U	13300	0.10 U	15.0 U	5.0 U	ND
PMW-14B	11-Apr-19	85	290	14	0.12	50.3	363	7.1	2.5 U	48.1	702	1.0 U	1620	0.40 U	80600	2.5 U	0.50 U	2.5 U	0.50 U	6.4 J	21900	0.20 U	1.9 J	2.5 U	4660	2.5 U	2.0 U	12100	0.50 U	1.5 U	25.0 U	1.07+-0.705 U
PMW-14B	20-Jun-19	85	272 J	14.3	0.14	54.8	386	6.7 J	0.50 U	52.2	776 J	0.069 J	1620	0.080 U	81900	0.50 U	0.14 J	3.2 U*	0.10 U	6.0	24400	0.20 U	2.1	0.18 J	4410	0.50 U	0.50 U	12400	0.10 U	1.0 U	5.0 U	1.86+-0.708
PMW-14B	16-Sep-19	85	284	13.7	0.20	48.1 J	407	6.9 J	0.077 U	58.4	689	0.054 U	1760	0.030 U	70100	0.47 U*	0.18 J	0.43 U	0.046 U	6.0	21400	0.093 U	1.8	0.19 J	4370	0.14 U	0.077 U	11300	0.047 U	0.27 U	2.4 U	0.550+-0.598 U
PMW-14B	17-Dec-19	85	296	19.0	0.20 J	65.2	410	7.0 J	0.50 U	63.4	729	0.20 U	2000	0.080 U	85700	0.37 U*	0.14 J	1.0 U	0.10 U	6.4	23400	0.20 U	1.8	0.26 J	5000	0.50 U	0.50 U	12400	0.10 U	1.0 U	2.7 J	1.50+-0.952 U
PMW-14C	04-Dec-18	156	156	15.4	0.063 J	27.8	246	7.0 J	0.50 U	0.23	218	0.10 U	326	0.080 U	40500 J	0.50 U	0.069 J	0.50 U	0.10 U	3.8	14100	0.20 U	6.3	0.19 J	1930	0.50 U	0.40 U	15300 J	0.10 U	0.30 U	1.5 U*	ND
PMW-14C	16-Jan-19	156	154	14.3	0.13	25.4	222	7.6	0.50 U	0.32	220	0.10 U	306 J	0.080 U	40100	0.50 U	0.10 U	0.33 J	0.10 U	3	14500	0.20 U	8.7	0.50 J	1870	0.50 U	0.40 U	13300	0.10 U	1.5 U	2.3 J	ND
PMW-14C	11-Apr-19	156	163	14.3	0.14	25.8	25.0 U	7	2.5 U	0.50 U	208	0.50 U	289	0.40 U	39700	2.5 U	0.50 U	2.5 U	0.50 U	3.5 J	13400	0.20 U	9.3	2.5 U	1770	2.5 U	2.0 U	11700	0.50 U	1.5 U	25.0 U	1.27+-0.700 J
PMW-14C	20-Jun-19	156	147 J	14.8	0.16	26.9	225	6.3 J	0.50 U	0.21 J	233 J	0.20 U	354	0.080 U	46500	0.50 U	0.50 U	1.0 U	0.10 U	3.0	14700	0.20 U	7.5	0.23 J	1970	0.50 U	0.50 U	12700	0.10 U	1.0 U	3.2 U*	0.764+-0.507 U
PMW-14C	16-Sep-19	156	148	15.0	0.21	25.4 J	239	7.1 J	0.33 J	0.38 J	206	0.054 U	338	0.030 U	39200	0.42 U*	0.11 J	0.55 U*	0.088 J	3.2	13000	0.093 U	6.0	0.42 J	1830	0.14 U	0.077 U	11600	0.047 U	0.27 U	5.9	0.896+-0.524 U
PMW-14C	17-Dec-19	156	149	20.1	0.21 J	30.8	236	7.3 J	0.50 U	0.22 J	239	0.20 U	428	0.080 U	40500	0.50 U	0.50 U	1.0 U	0.10 U	2.9	14000	0.20 U	4.0	0.16 J	1960	0.50 U	0.50 U	12200	0.10 U	1.0 U	5.0 U	1.20+-0.842 U

Notes:
Depths reported in feet below ground surface (ft bgs).
MCL - Maximum Contaminant Level
(a) No MCL established. EPA has recognized Regional Screening Levels (RSLs) as Groundwater Protection Standards in the federal CCR Rule at 40 C.F.R. 257.95(h)(2) (see 83 Fed. Reg. 36435 (July 30, 2018))
(b) No MCL established. Copper concentrations were compared to the EPA Maximum Contaminant Level Goal (MCLG), Action Level, and Treatment Technique goal value as established in 40 C.F.R. Part 141
(c) The MCL for nickel was remanded in 1995. TDEC Rule 0400-40-03-.03 established the state ambient water quality criteria (AWQC) for nickel to protect groundwater and receiving surface water bodies.
Other constituents with no MCL value are depicted with a dash "-"
Background - site-specific background concentrations calculated as 95% Upper Tolerance Limits (UTLs) in accordance with USEPA Unified Guidance
(see Statistical Evaluation of Background Groundwater Quality for Allen Fossil Plant Technical Memo, February 2020).
J - The result is estimated.
mg/L - milligrams per liter; ug/L - micrograms per liter; pCi/L - picocuries per liter
NA - Constituent was not analyzed
ND - The analyte was not detected.
S.U. - Standard Units
U - The analyte was not detected above the indicated reporting limit.
U* - The analyte was detected in an associated blank.
UJ - The analyte was not detected above the estimated reporting limit.
Sample analytical results that exceed the MCL are shaded YELLOW

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Table 7
Background Groundwater Quality Tolerance Limits and Tolerance Intervals
TVA Allen Fossil Plant
Memphis, Tennessee

Constituent	Unit	Sample Size (n)	Percent Non-Detects	Distribution	Tolerance Limit Method	Confidence	95% LTL	95% UTL
CCR Rule Appendix III Constituents								
Boron	mg/L	33	21%	Normal	Parametric	0.95	NA	0.24
Calcium	mg/L	33	0%	Cube	Parametric	0.95	NA	160
Chloride	mg/L	33	0%	Log	Parametric	0.95	NA	23
Fluoride	mg/L	33	0%	Log	Parametric	0.95	NA	0.23
pH	SU	33	0%	Log	Parametric	0.95	6	7.7
Sulfate	mg/L	33	3%	Square Root	Parametric	0.95	NA	130
Total Dissolved Solids (TDS)	mg/L	32	0%	Square	Parametric	0.95	NA	620
CCR Rule Appendix IV Constituents								
Antimony	mg/L	33	97%	Non-parametric	Non-parametric	0.82	NA	0.0025
Arsenic	mg/L	33	0%	Log	Parametric	0.95	NA	0.0098
Barium	mg/L	33	0%	Normal	Parametric	0.95	NA	1.1
Beryllium	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0005
Cadmium	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0004
Chromium	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0025
Cobalt	mg/L	33	39%	Log	Parametric	0.95	NA	0.0071
Fluoride	mg/L	33	0%	Log	Parametric	0.95	NA	0.23
Lead	mg/L	33	85%	Non-parametric	Non-parametric	0.82	NA	0.0005
Lithium	mg/L	33	6%	Cube Root	Parametric	0.95	NA	0.034
Mercury	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0002
Molybdenum	mg/L	33	15%	Log	Parametric	0.95	NA	0.002
Rad226+228	pCi/L	33	0%	Tenth Root	Parametric	0.95	NA	3.8
Selenium	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0025
Thallium	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0005
TDEC Metals Appendix I Constituents								
Copper	mg/L	33	88%	Cube Root	Parametric	0.95	NA	0.0017
Nickel	mg/L	33	39%	Log	Parametric	0.95	NA	0.012
Silver	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.002
Vanadium	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0015
Zinc	mg/L	32	63%	Cube Root	Parametric	0.95	NA	0.01
Additional Constituents								
Magnesium	mg/L	33	0%	Normal	Parametric	0.95	NA	47
Potassium	mg/L	33	0%	Square	Parametric	0.95	NA	3.5
Sodium	mg/L	33	0%	Log	Parametric	0.95	NA	21
Alkalinity, Bicarbonate (as CaCO3)	mg/L	33	0%	Cube	Parametric	0.95	NA	560
Alkalinity, Carbonate (as CaCO3)	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	5

NOTES:
mg/L - milligrams per liter
SU - standard unit

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FIGURES

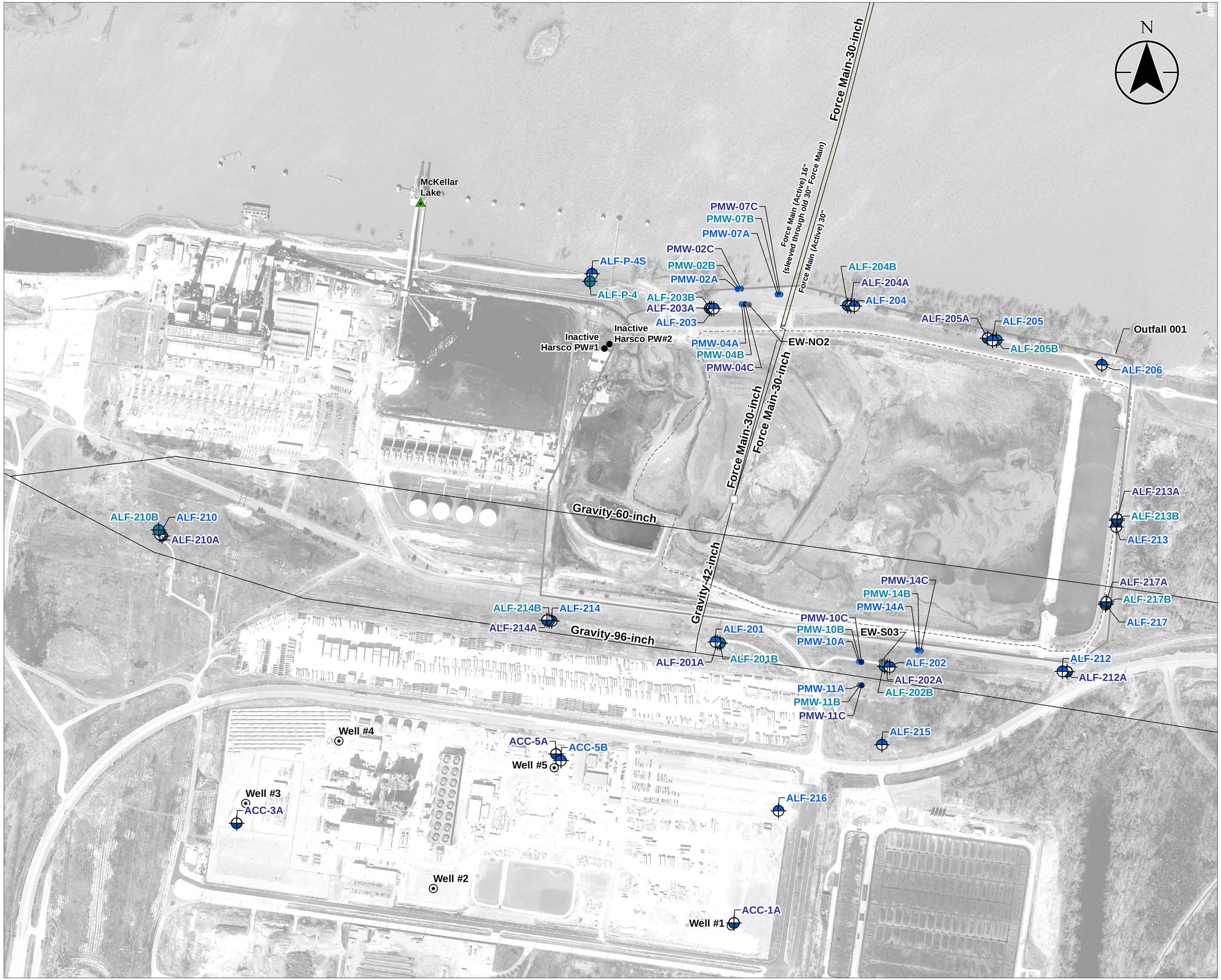


Figure No.
1

Title
Allen Fossil Plant and ACC Plant Well Locations

Client/Project
Tennessee Valley Authority
Allen Fossil Plant

Project Location
Memphis, Tennessee

175577013
Prepared by LT on 2020-02-24
Technical Review by JJ on 2020-02-24

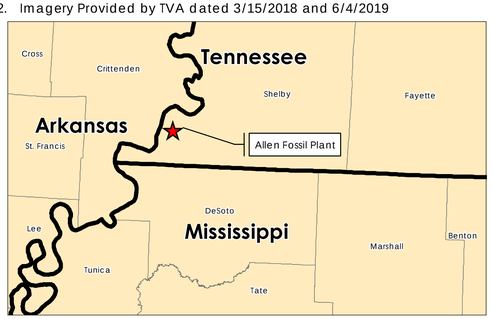
0 250 500 750 1,000 Feet
1:3,000 (At original document size of 22x34)

Legend

- Inactive Harsco Production Wells (PW)
- McKellar Lake Gauging Station
- Performance Monitoring Well (PMW) (Shallow)
- Performance Monitoring Well (PMW) (Intermediate)
- Performance Monitoring Well (PMW) (Deep)
- IRA Extraction Well (EW)
- Monitoring Well (Shallow)
- Monitoring Well (Intermediate)
- Monitoring Well (Deep)
- Production Well (Memphis Sand)
- Sewer Manhole Location of Force Main Transition to Gravity
- Sanitary Sewer Pipes
- East Ash Pond Boundary
- 2019 Imagery Boundary

Wells are screened in the Alluvial Aquifer unless otherwise noted.

Notes
1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Imagery Provided by TVA dated 3/15/2018 and 6/4/2019



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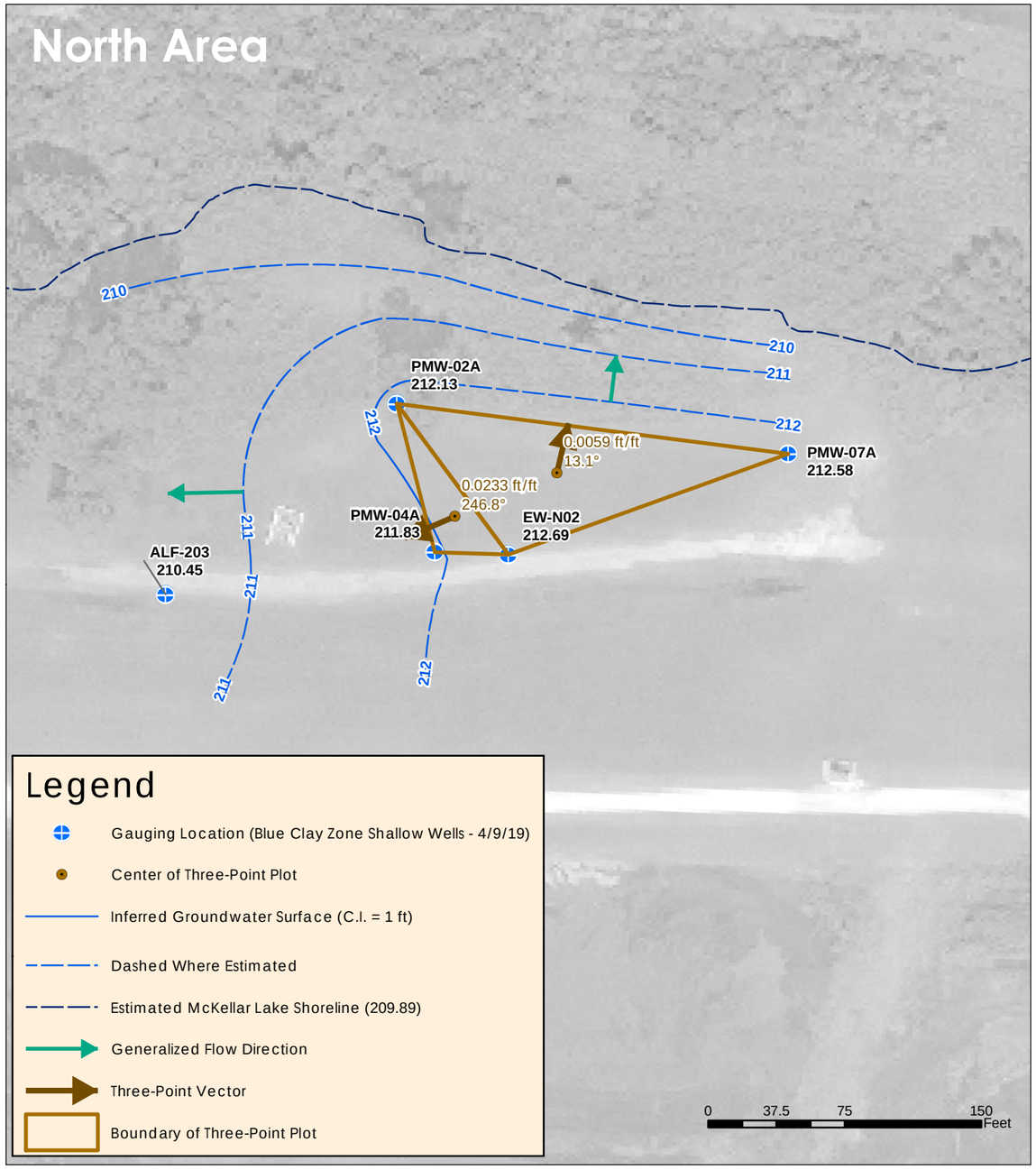

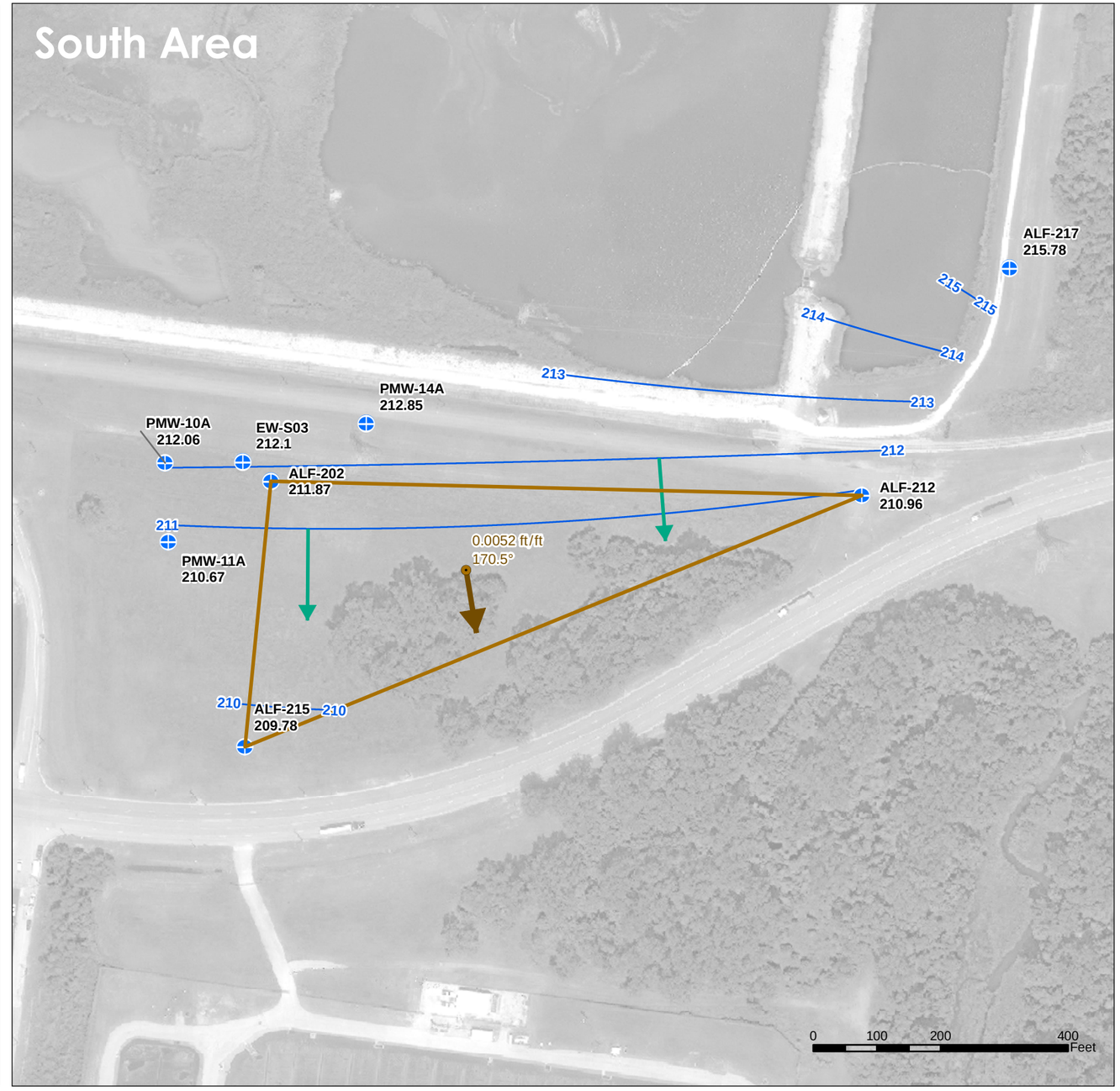

Q:\active\TVA\ALF\03_data\gis_cad\gis\process_features\20190522_Q1_2019_GWE_Contour_Maps\FIG 2a GWE BC2_201904_20190522_.mxd
Revised: 2019-05-24 By: prbell

May 2019

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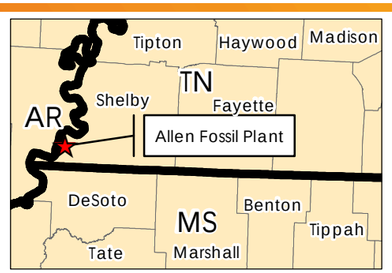
Notes

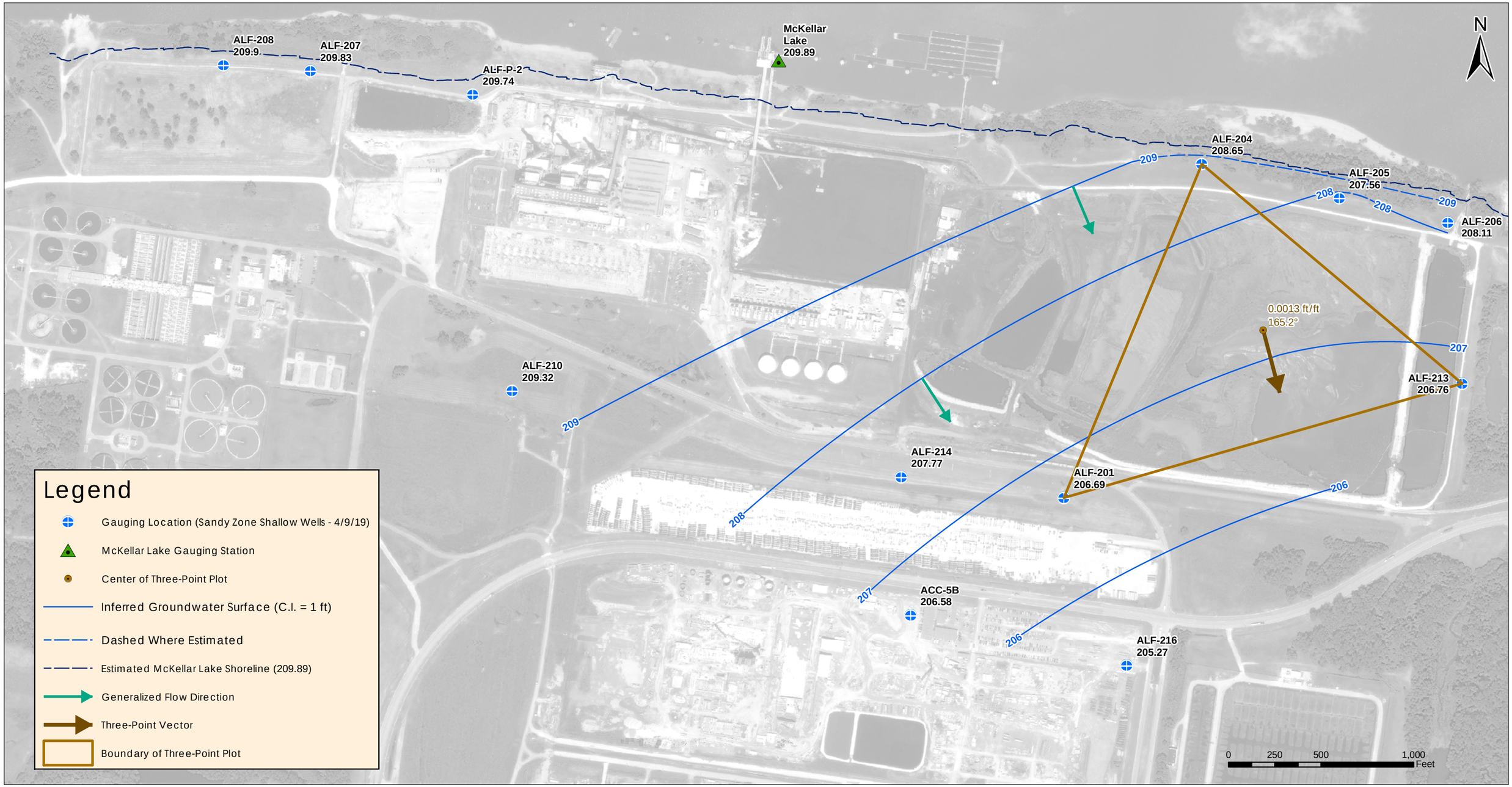
1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
2. Imagery provided by client (dated 2015)
3. The McKellar Lake elevation listed corresponds to the value measured during the median time between the first and last well gauged on the date listed. The estimated shoreline indicated is based on interpretation of the United States Geological Survey (USGS) National Elevation Dataset (NED).
4. Water table surface contours were inferred based on gauging results at the locations indicated and estimated surface water elevation of McKellar Lake as indicated at 00:00 on April 9, 2019.
5. Groundwater elevations from the wells shown on this figure were interpolated separately from the shallow Alluvial aquifer wells. Review of hydrographs and lithology indicate that the water levels in these wells may be mounded above a semi-confining layer, and thus, are not well correlated with the water levels in the other unconfined shallow wells.



Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
2a

Title
Alluvial Aquifer
Groundwater Elevation Map
Blue Clay Zone Shallow Wells
(April 2019)



Q:\active\TVA\ALF\03_data\gis_cad\gis\process_features\20190522_Q1_2019_GWE_Contour_Maps\FIG 2b GWE SHALLOW_201904_20190522.mxd
Revised: 2019-05-24 By: pribell

May 2019

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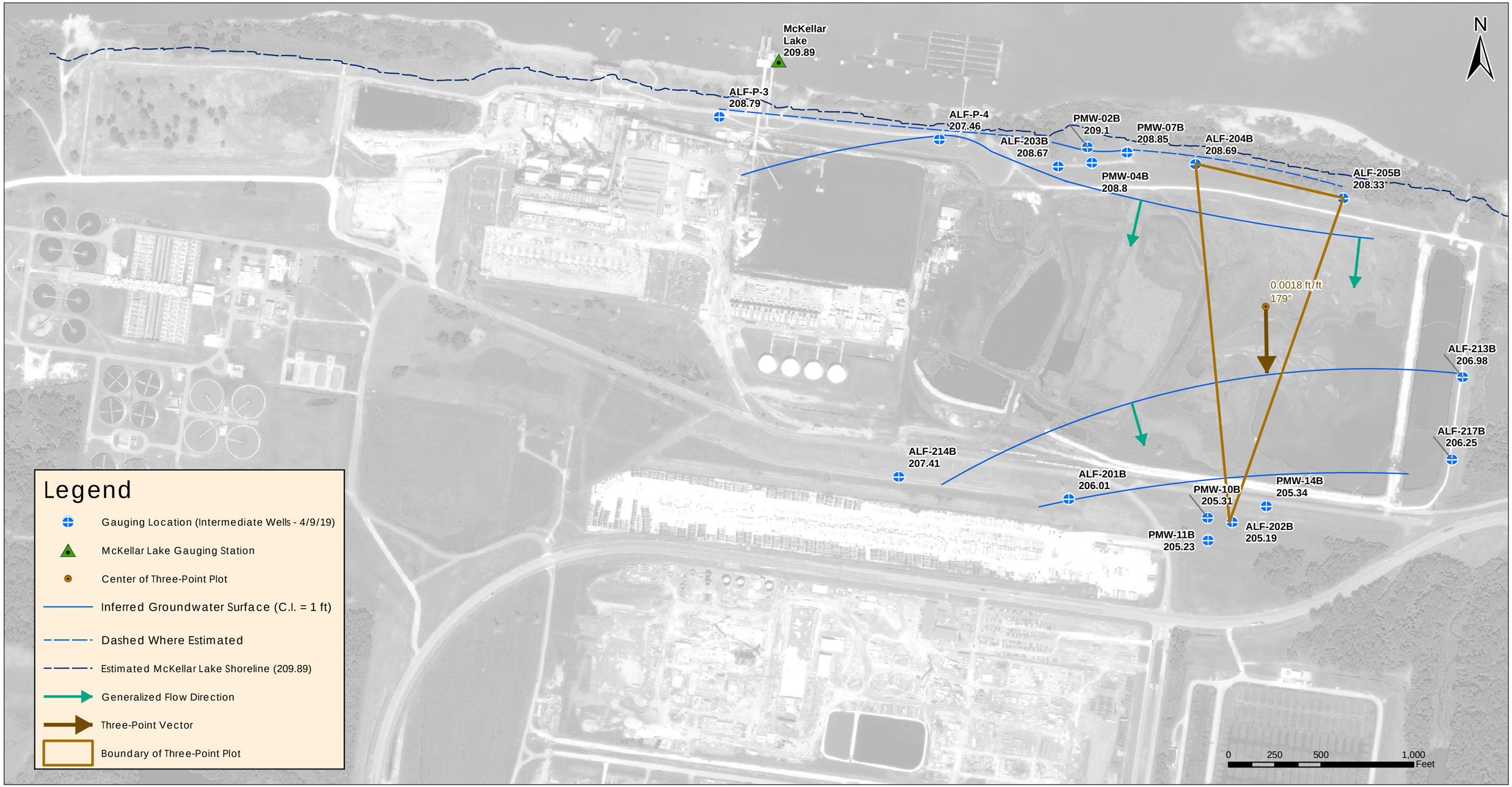
Notes

1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
2. Imagery provided by client (dated 2015)
3. The McKellar Lake elevation listed corresponds to the value measured during the median time between the first and last well gauged on the date listed. The estimated shoreline indicated is based on interpretation of the United States Geological Survey (USGS) National Elevation Dataset (NED).
4. Water table surface contours were inferred based on gauging results at the locations indicated and estimated surface water elevation of McKellar Lake as indicated.
5. Groundwater elevations from ALF-202, ALF-203, and ALF-212, and the EW-series and PMW-series wells were excluded from interpolation of the sandy zone shallow Alluvial aquifer water table surface. Review of hydrographs and lithology indicate that the water levels in these wells may be mounded above a semi-confining layer, and thus, are not well correlated with the water levels in the other unconfined shallow wells. April 2019 groundwater elevations from these wells are included in Figure 2a.

Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
3a

Title
Alluvial Aquifer Groundwater Elevation Map Sandy Zone Shallow Wells (April 2019)



Q:\active\TVA\ALF103_data\gis_cad\gis\process_features\20190522_Q1_2019_GWE_Contour_Maps\FIG 2c GWE INTERMEDIATE_201904_20190522.mxd
Revised: 2019-05-24 By: pribell

May 2019

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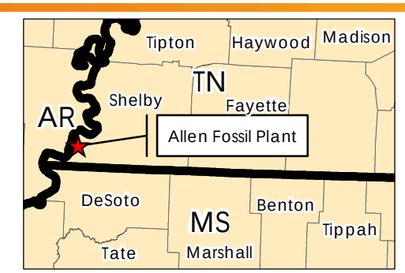
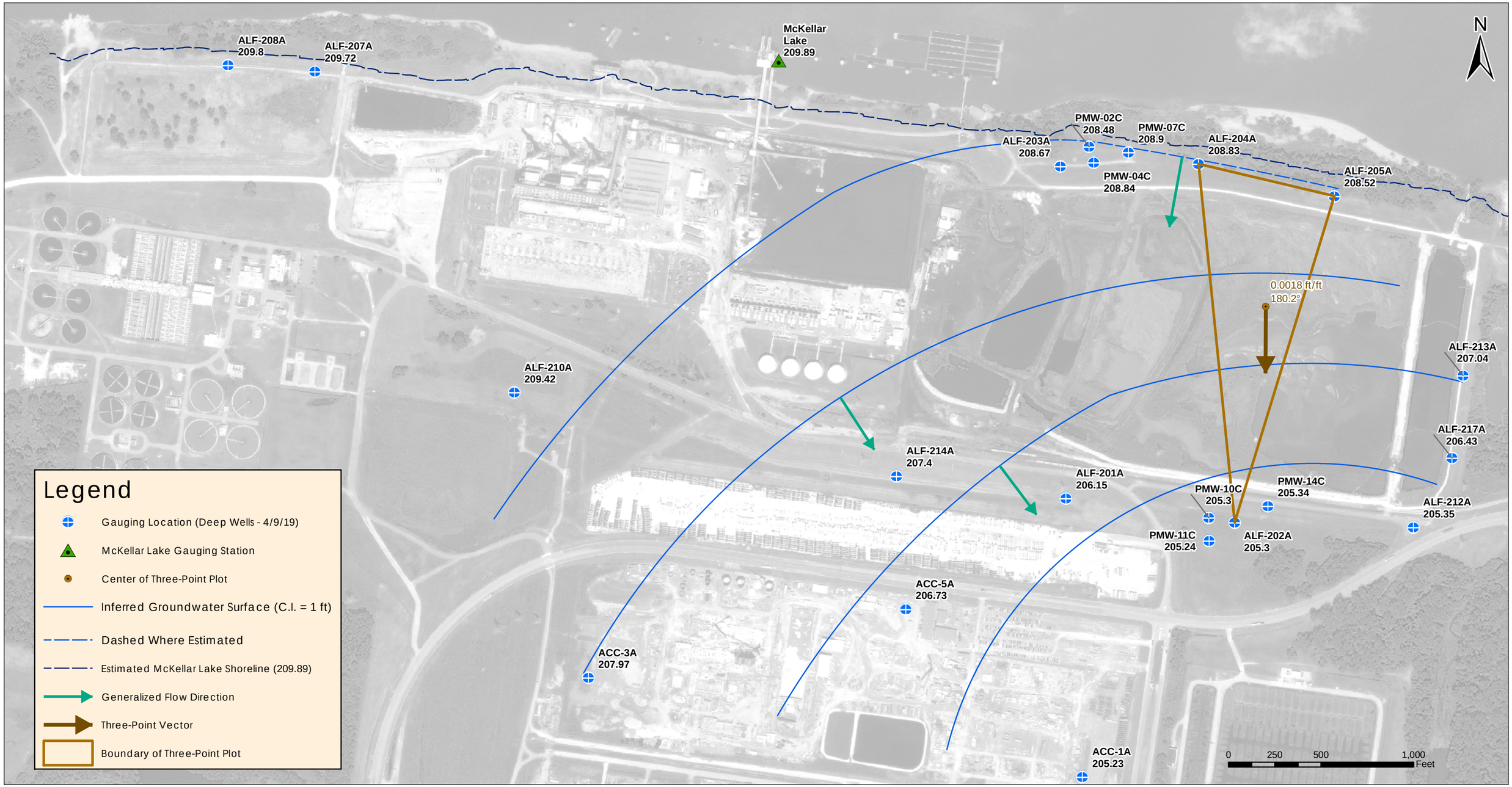
Notes
1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
2. Imagery provided by client (dated 2015)
3. The McKellar Lake elevation listed corresponds to the value measured during the median time between the first and last well gauged on the date listed. The estimated shoreline indicated is based on interpretation of the United States Geological Survey (USGS) National Elevation Dataset (NED).
4. Water table surface contours were inferred based on gauging results at the locations indicated and estimated surface water elevation of McKellar Lake as indicated.



Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
4a

Title
Alluvial Aquifer Groundwater Elevation Map Intermediate Wells (April 2019)



Q:\active\TVA\ALF103_data\gis_cad\gis\process_features\20190522_Q1_2019_GWE_Contour_Maps\FIG 2d GWE DEEP_201904_20190522.mxd
Revised: 2019-05-24 By: prbell

May 2019

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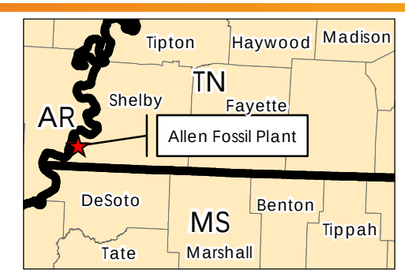
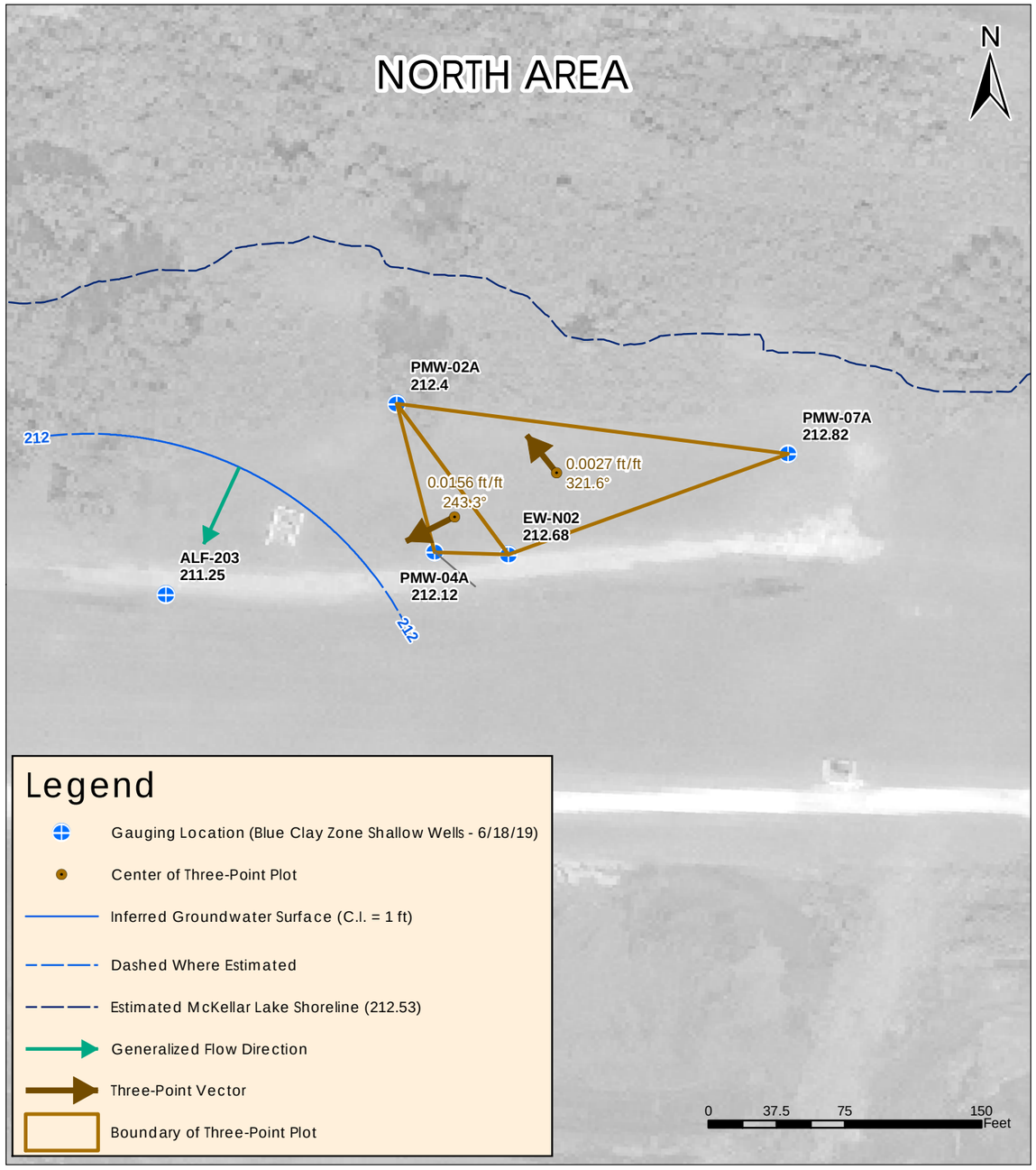
Notes
1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
2. Imagery provided by client (dated 2015)
3. The McKellar Lake elevation listed corresponds to the value measured during the median time between the first and last well gauged on the date listed. The estimated shoreline indicated is based on interpretation of the United States Geological Survey (USGS) National Elevation Dataset (NED).
4. Water table surface contours were inferred based on gauging results at the locations indicated and estimated surface water elevation of McKellar Lake as indicated.

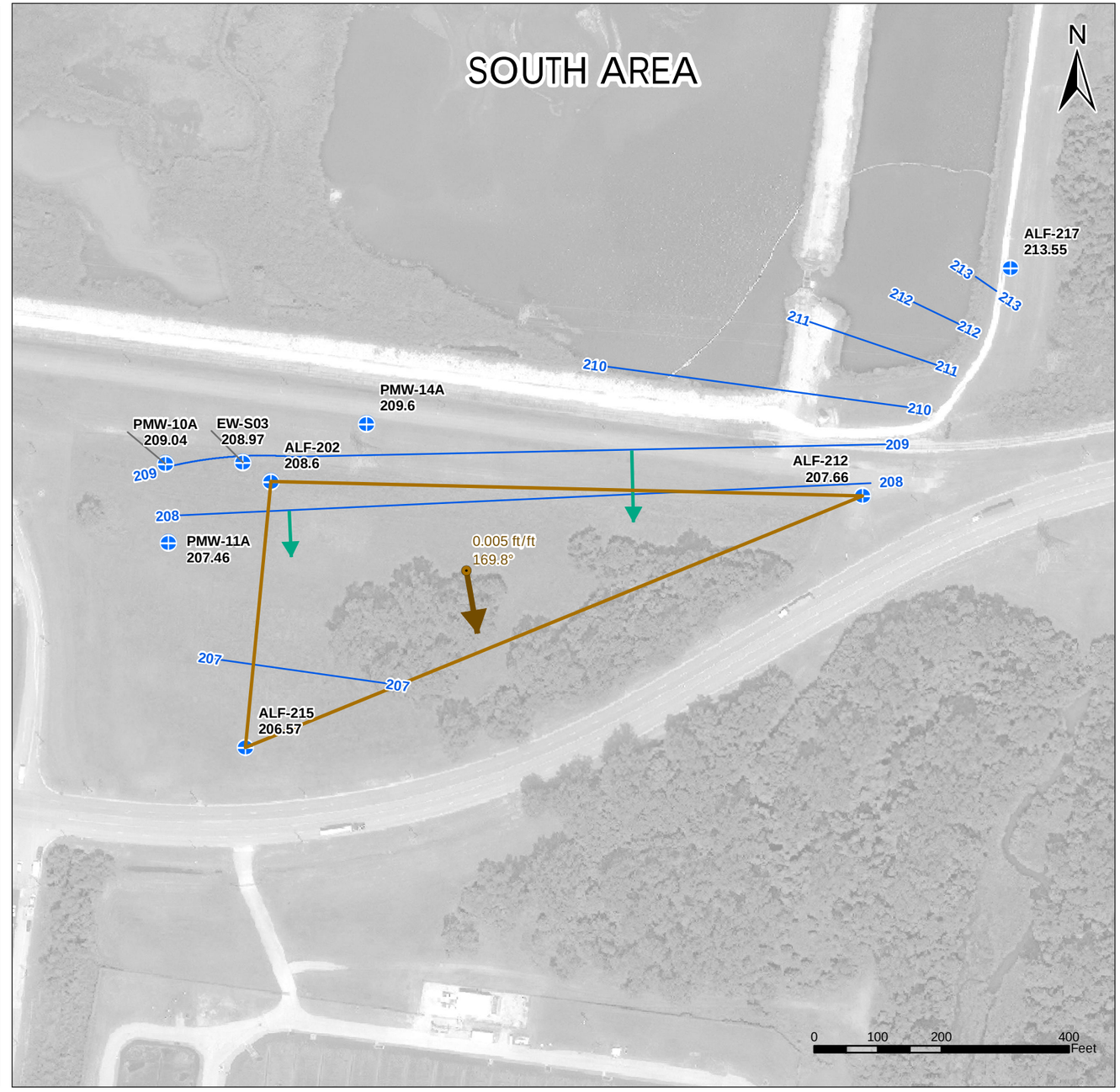


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
5a

Title
Alluvial Aquifer
Groundwater Elevation Map
Deep Wells
(April 2019)





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Revised: 2019-08-19 By: prbell

August 2019

Stantec

Notes

1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
2. Imagery provided by client (dated 2015)
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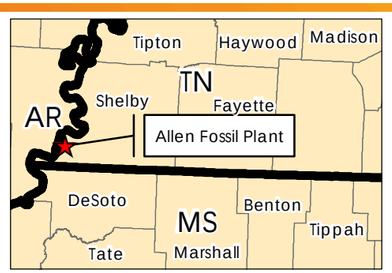
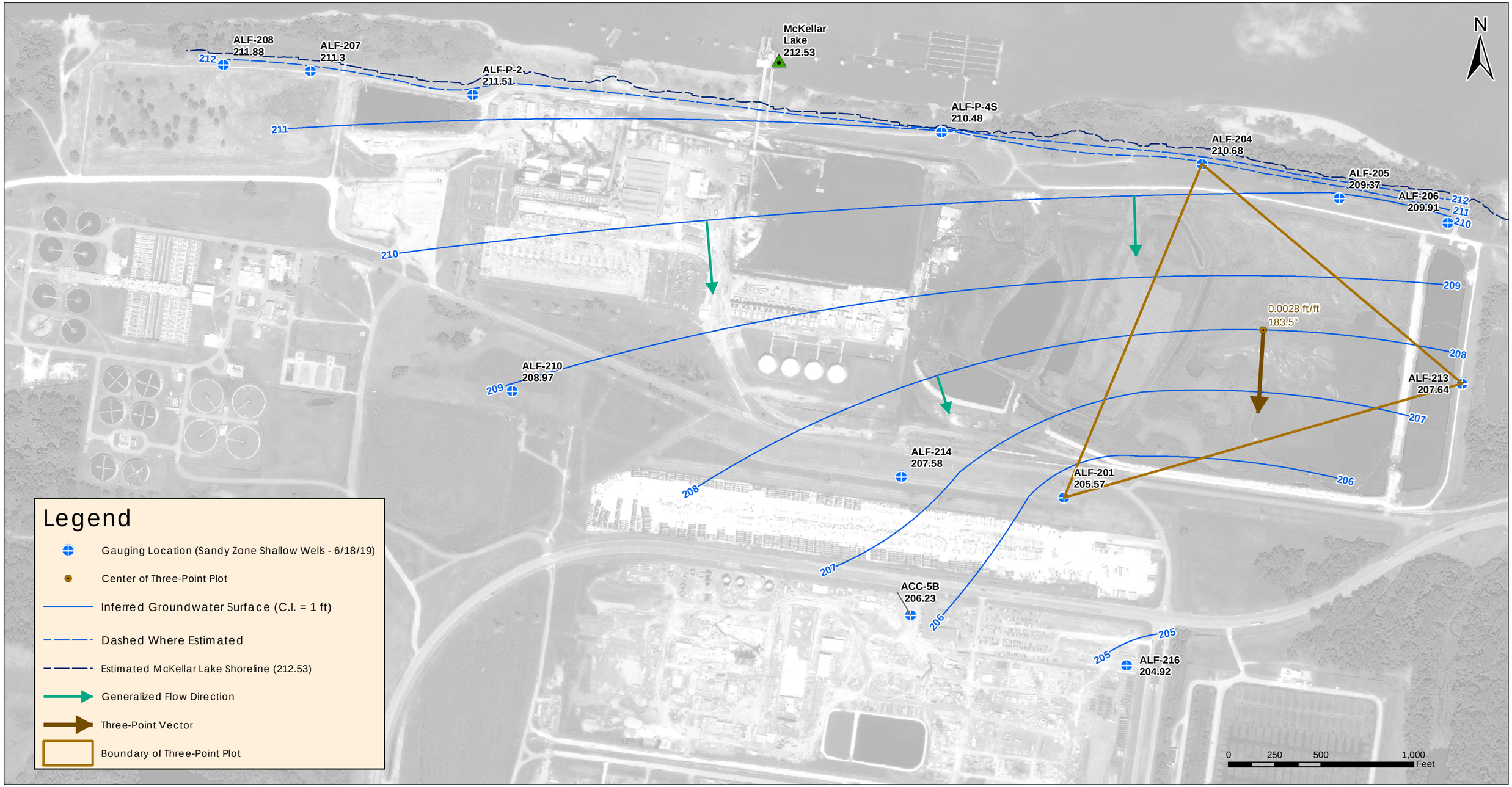


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
2b

Title
Alluvial Aquifer
Groundwater Elevation Map
Blue Clay Zone Shallow Wells
(June 2019)



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Revised: 2019-07-29 By: prbell

July 2019

Stantec

Notes

1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
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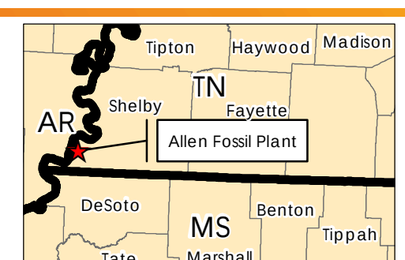
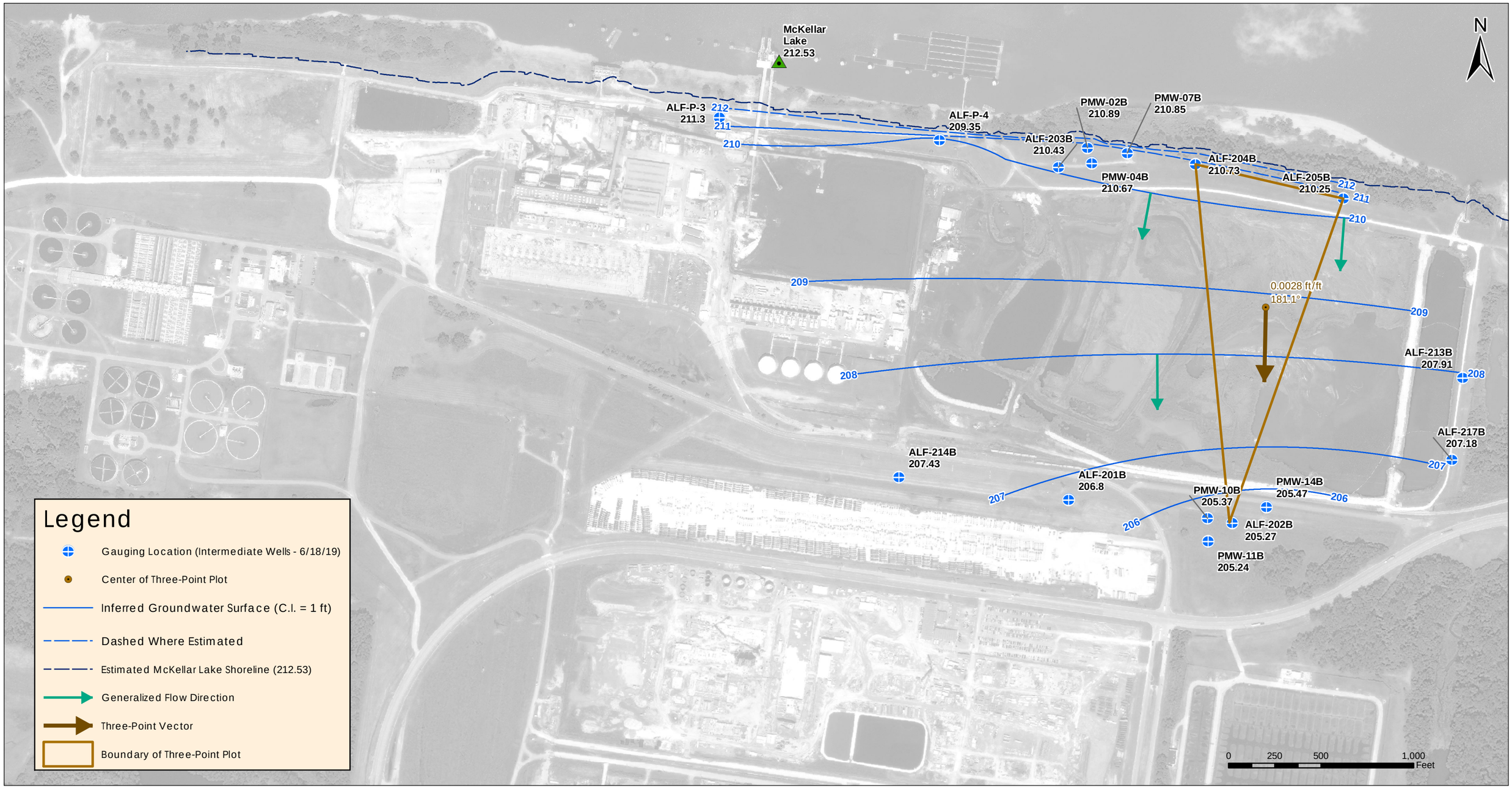


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
3b

Title
Alluvial Aquifer Groundwater Elevation Map Sandy Zone Shallow Wells (June 2019)



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Revised: 2019-07-29 By: prbell

July 2019

Stantec

Notes
1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
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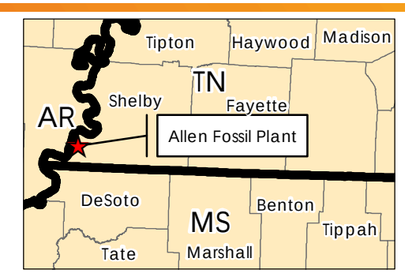
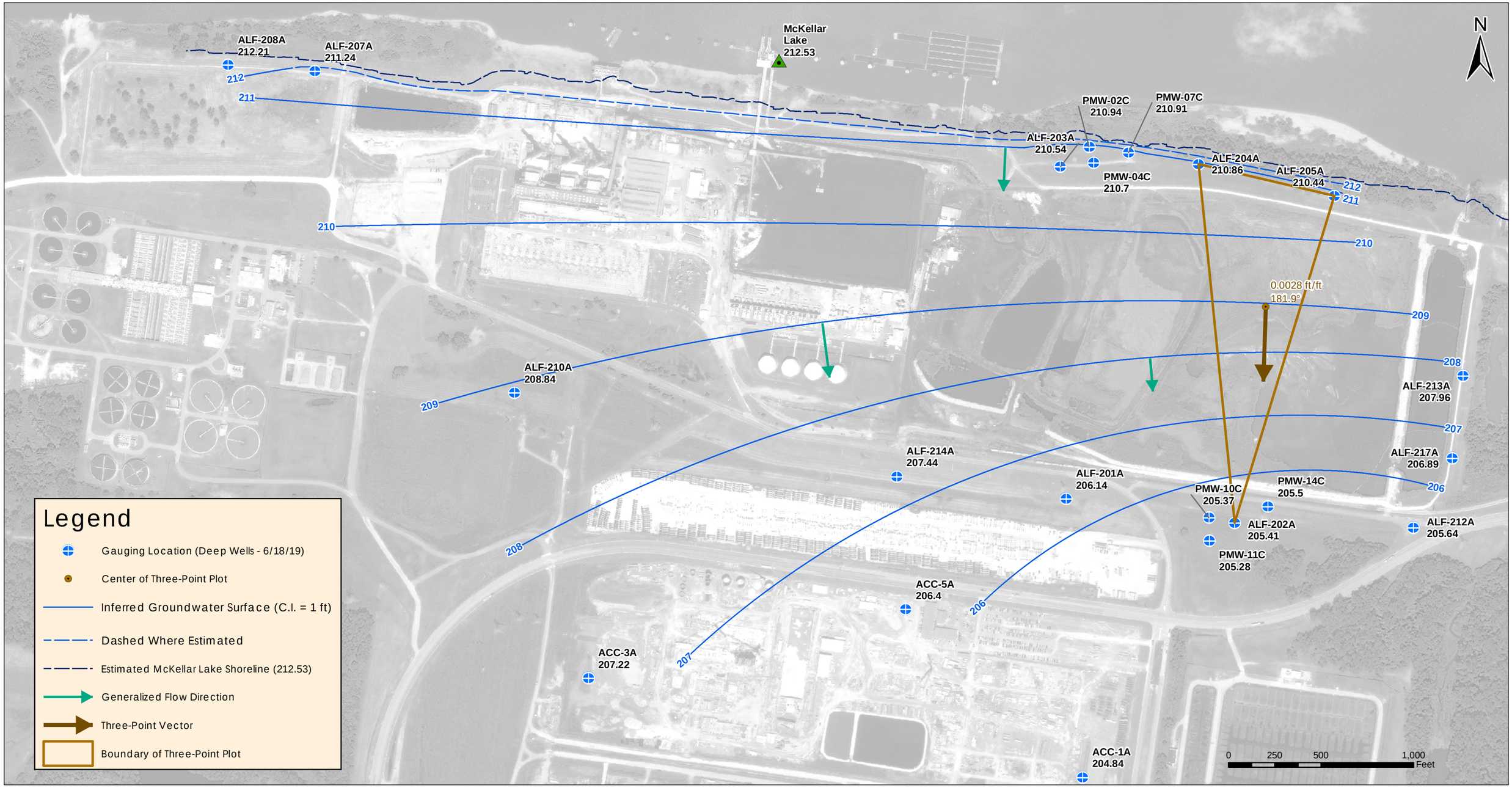


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
4b

Title
Alluvial Aquifer
Groundwater Elevation Map
Intermediate Wells
(June 2019)



Q:\active\TVA\ALF103_data\gis_cad\gis\process_features\20190719_Q2_2019_GWE_Contour_Maps\FIG 2d GWE DEEP_201906_20190722.mxd
Revised: 2019-07-29 By: prbell

July 2019

Stantec

Notes
1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
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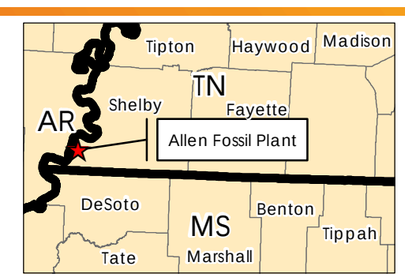
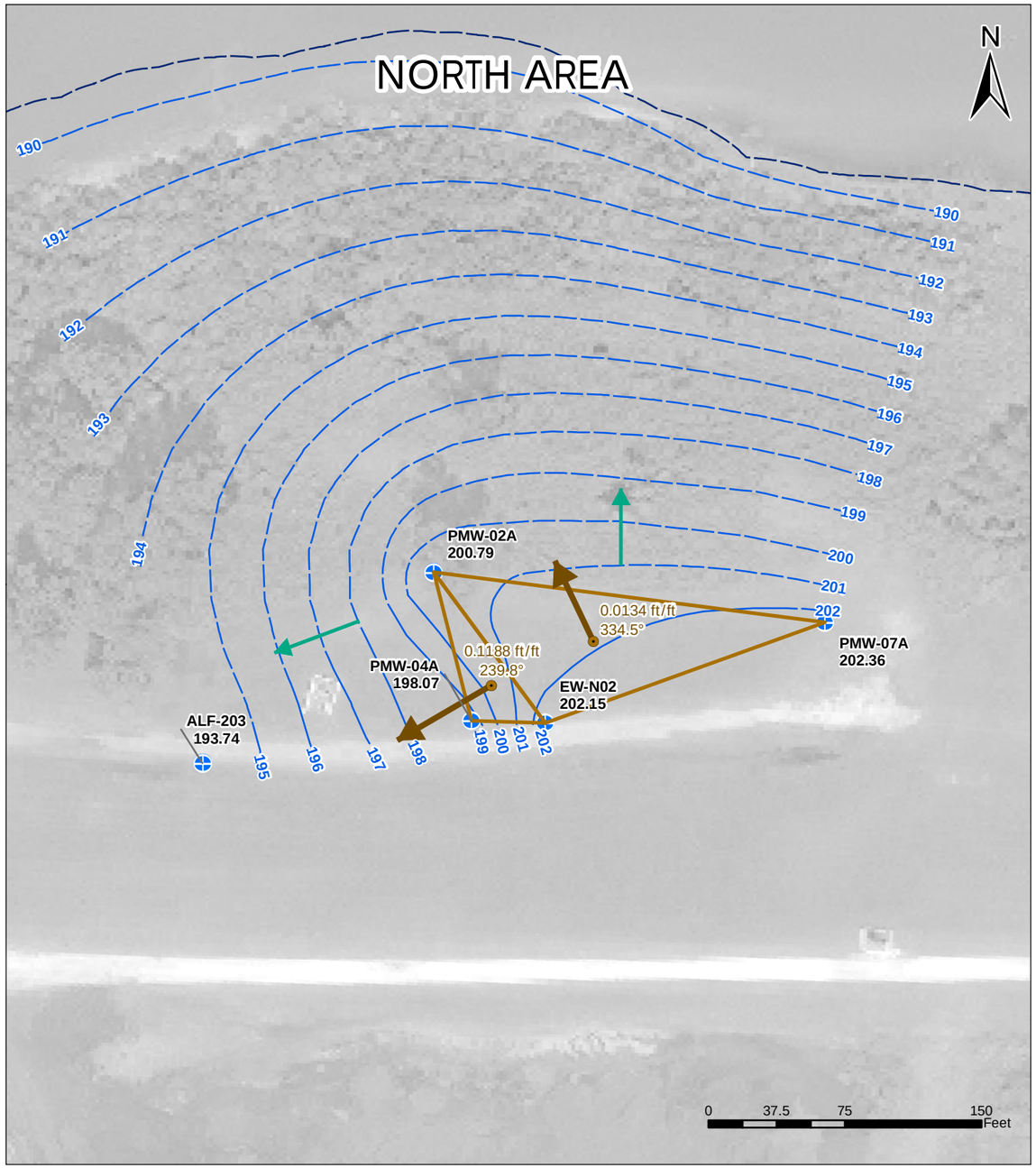
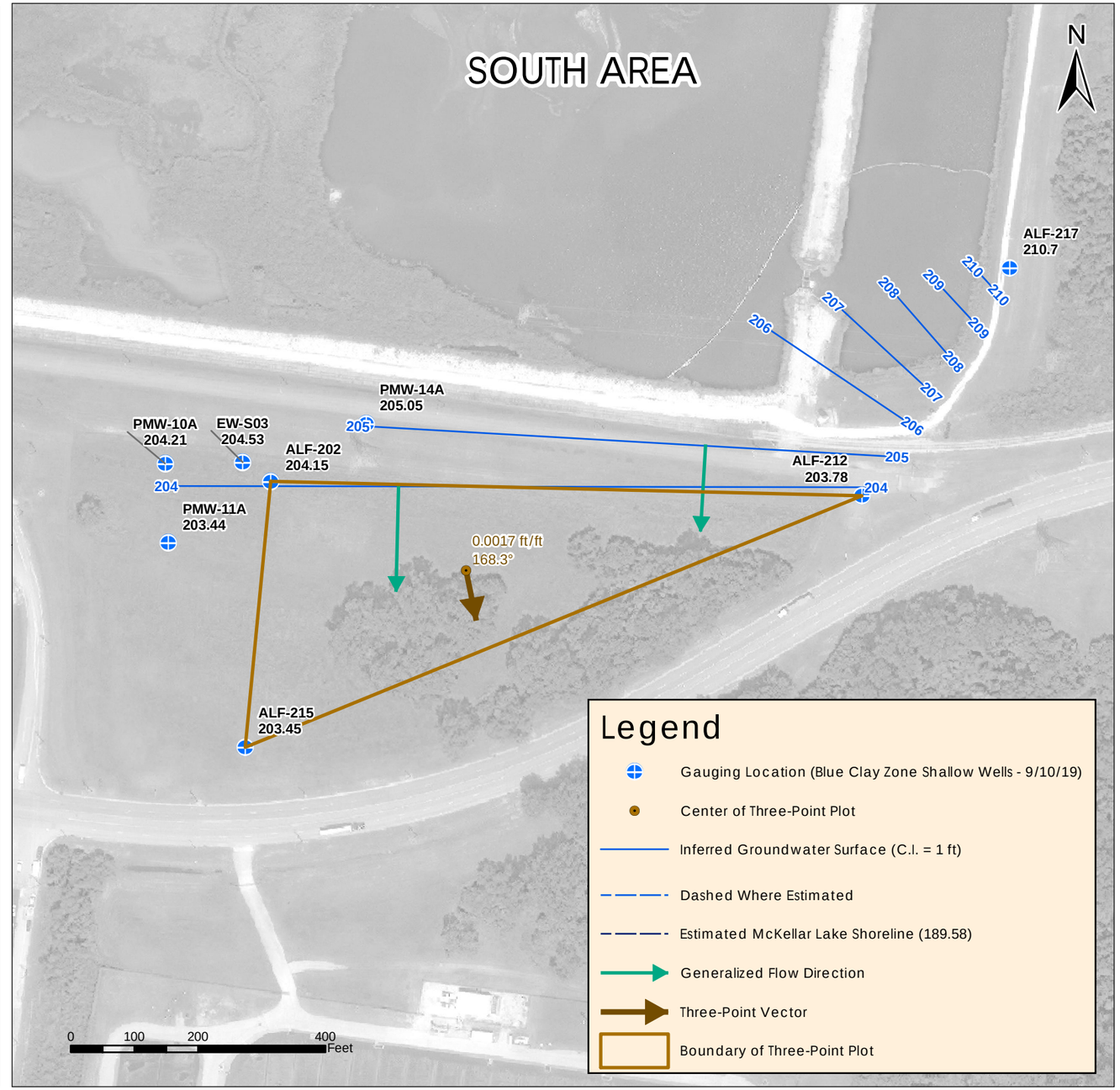


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
5b

Title
Alluvial Aquifer
Groundwater Elevation Map
Deep Wells
(June 2019)





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Revised: 2019-10-21 By: prbell

October 2019

Stantec

Notes

1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
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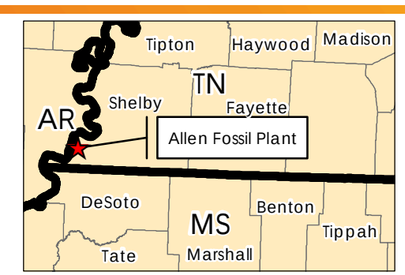
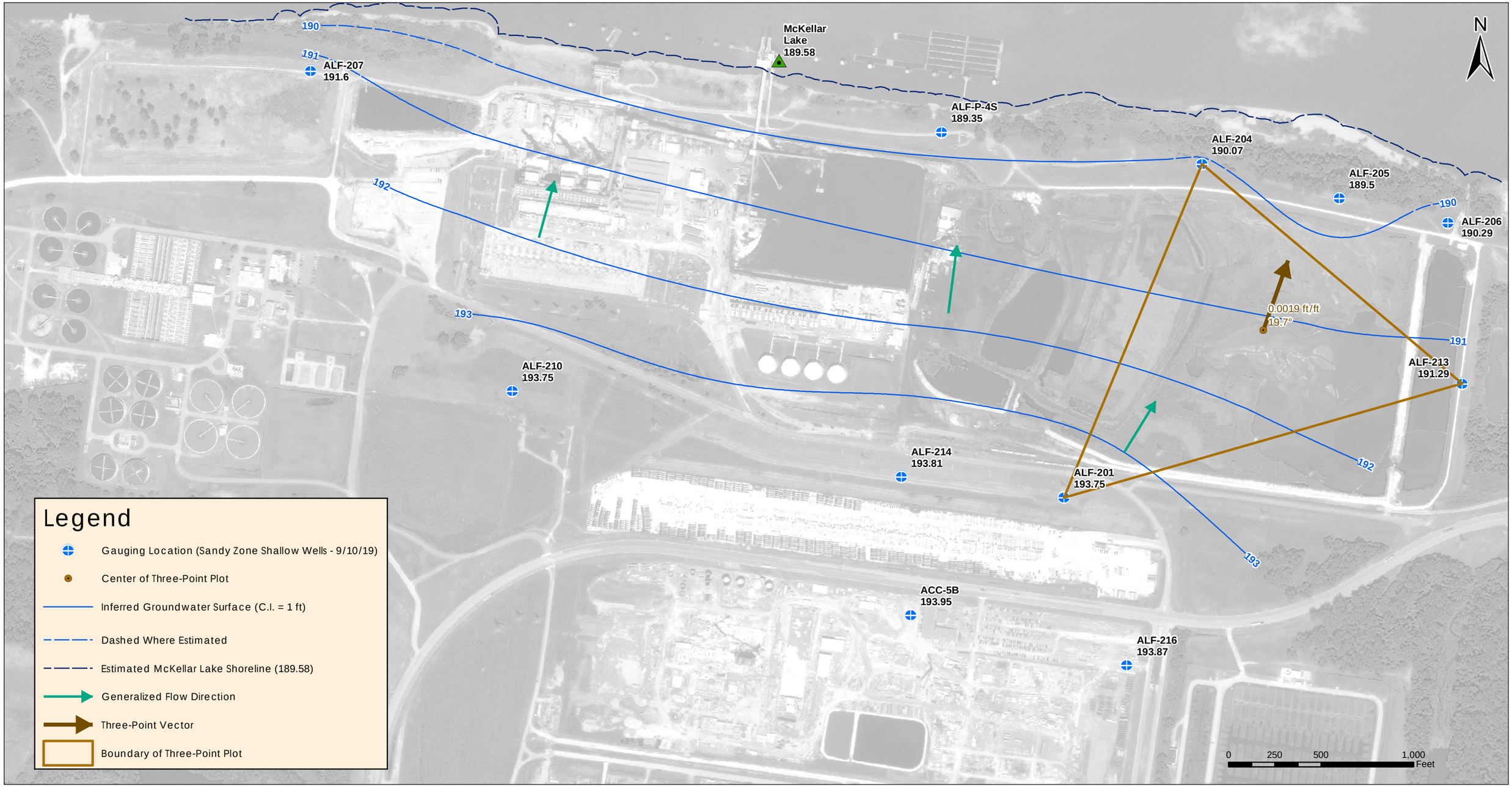


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
2c

Title
Alluvial Aquifer
Groundwater Elevation Map
Blue Clay Zone Shallow Wells
(September 2019)



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Revised: 2019-10-25 By: pribell

October 2019

Stantec

Notes

1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
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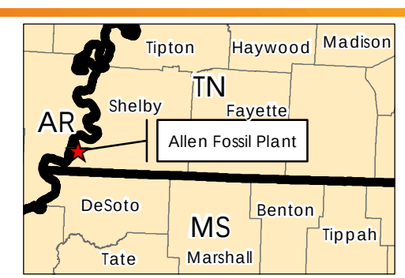
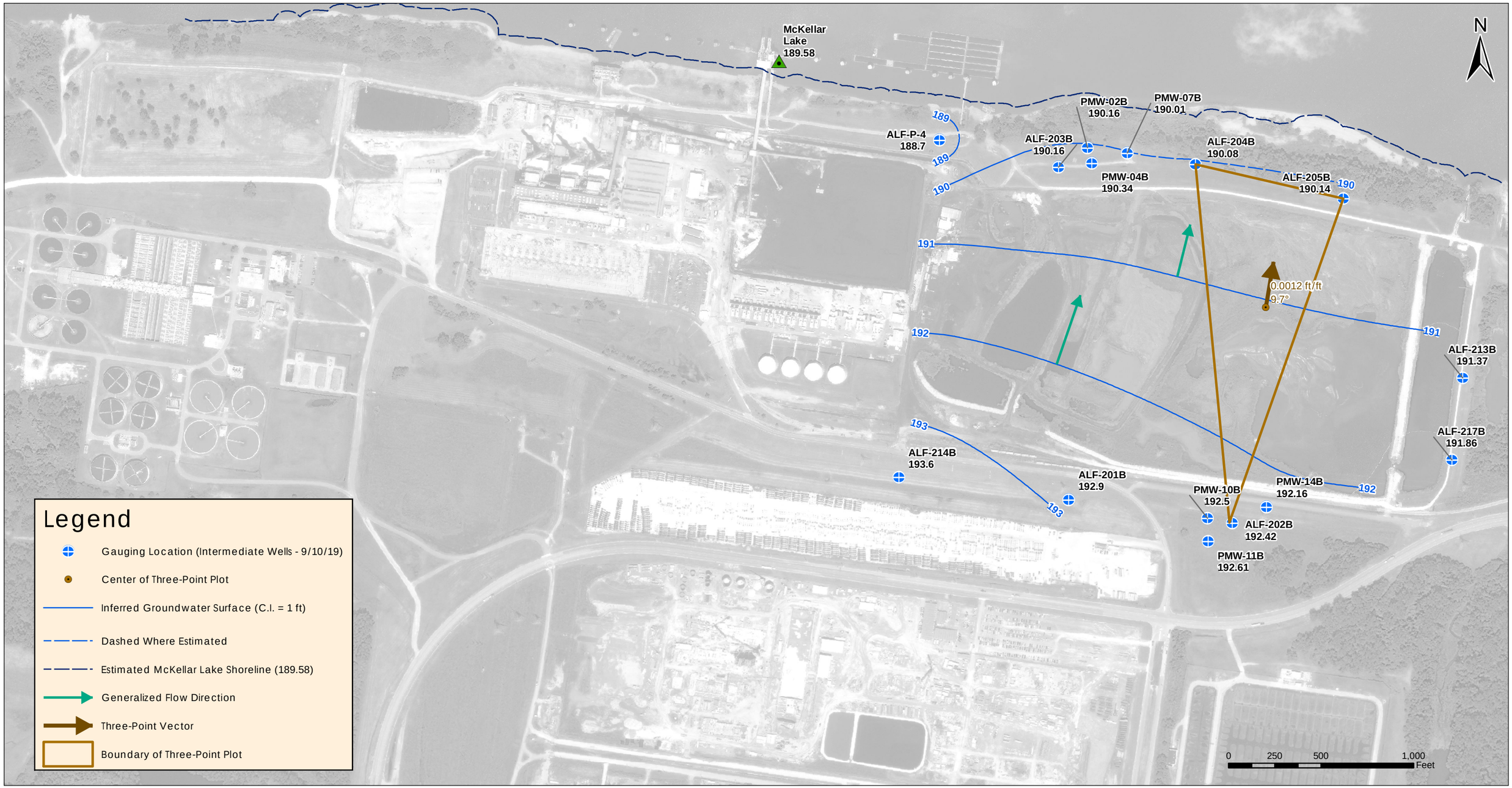


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
3c

Title
Alluvial Aquifer
Groundwater Elevation Map
Sandy Zone Shallow Wells
(September 2019)



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Revised: 2019-10-25 By: prbell

October 2019

Stantec

Notes
1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
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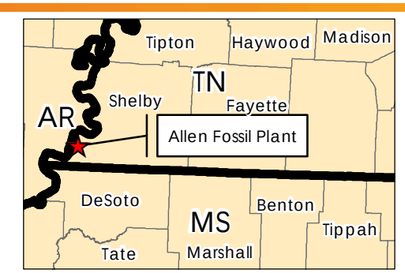
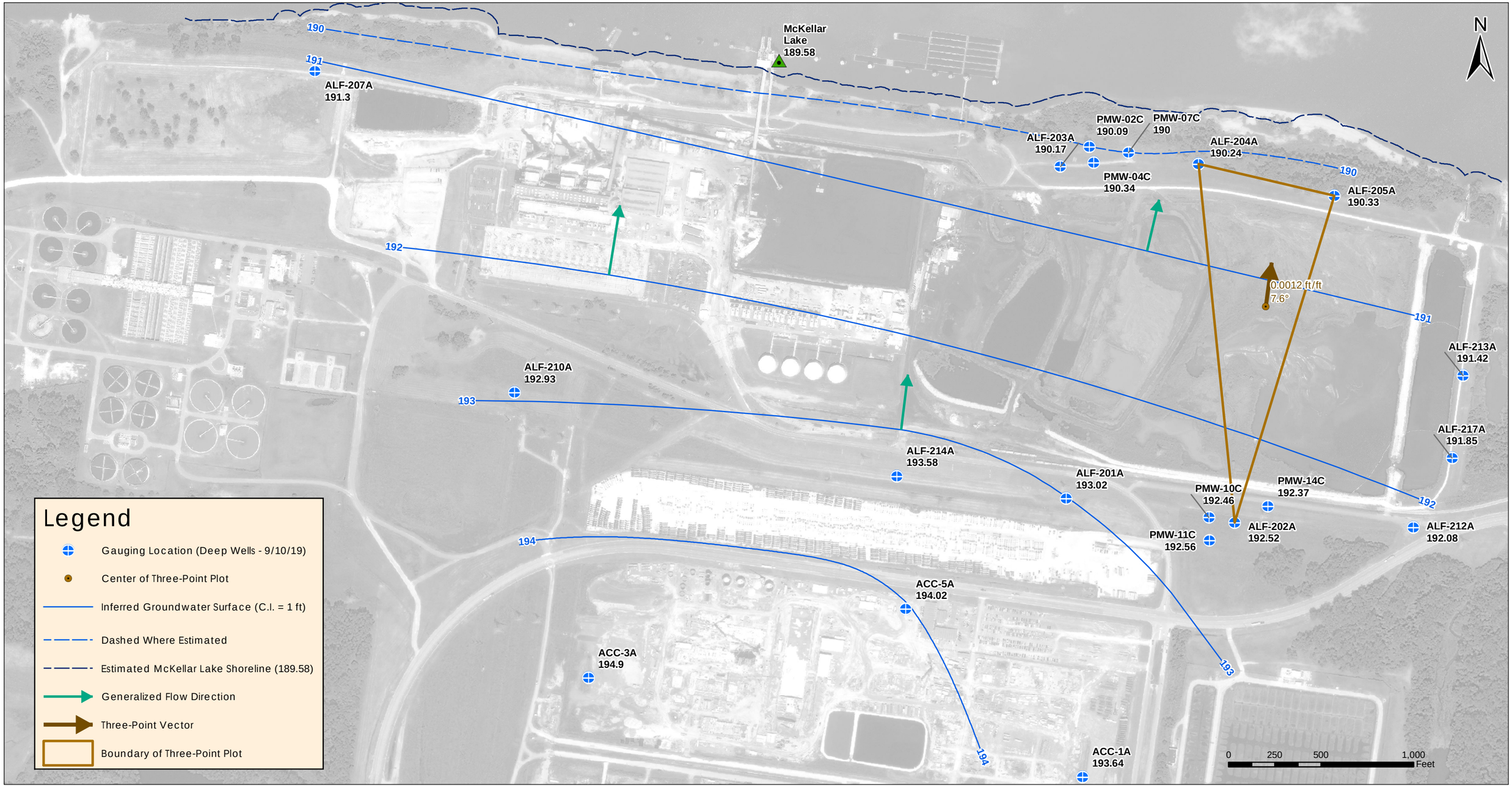


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
4c

Title
Alluvial Aquifer Groundwater Elevation Map Intermediate Wells (September 2019)



Q:\active\TVA\ALF103_data\gis_cad\gis\process_features\20191017_Q3_2019_GWE_Contour_Maps\FIG 2d GWE DEEP_201909_20191017.mxd
Revised: 2019-10-21 By: pribel

October 2019

Stantec

Notes
1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
2. Imagery provided by client (dated 2015)
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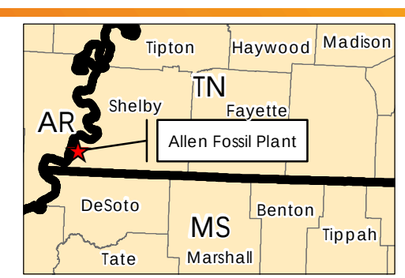
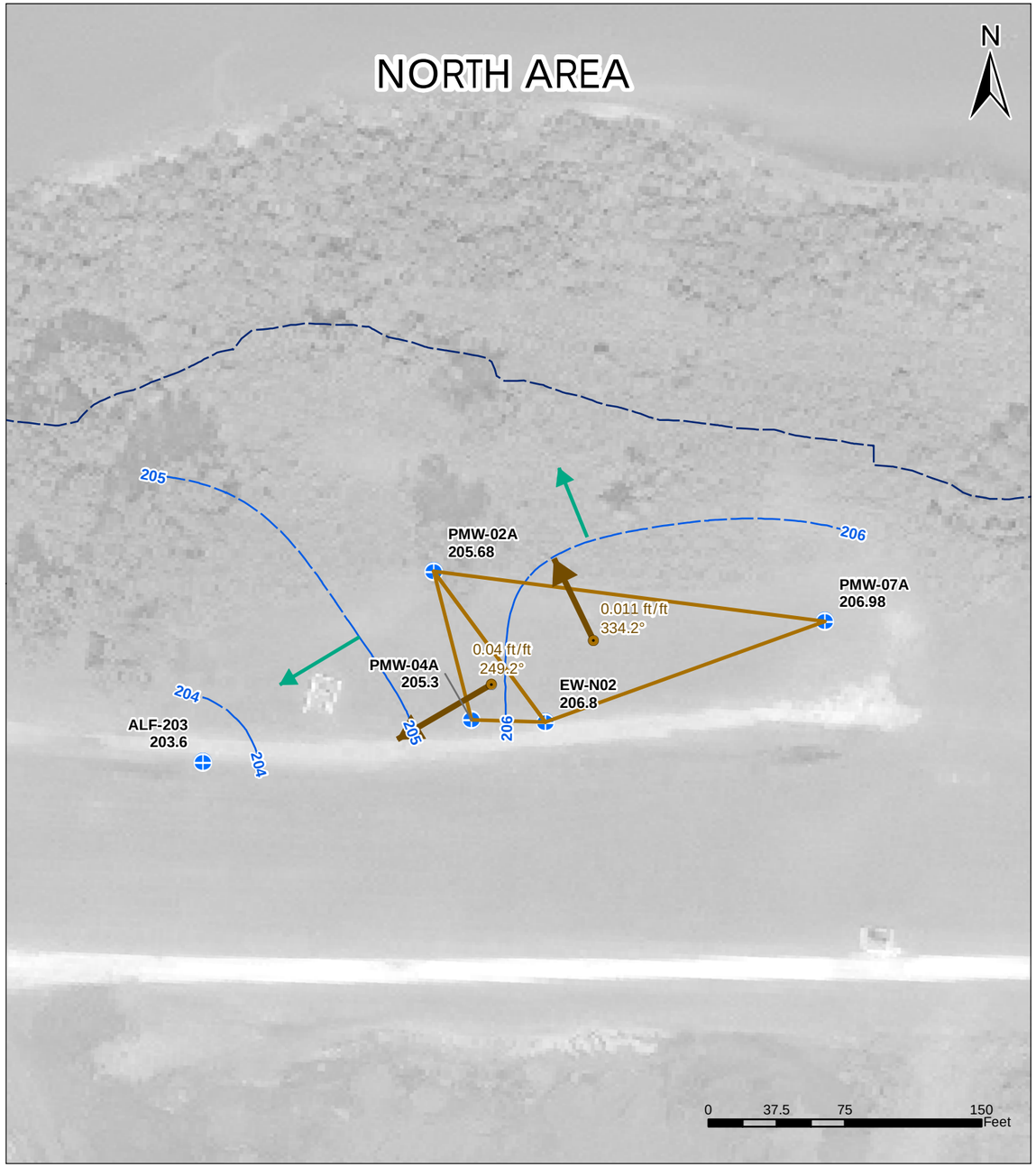
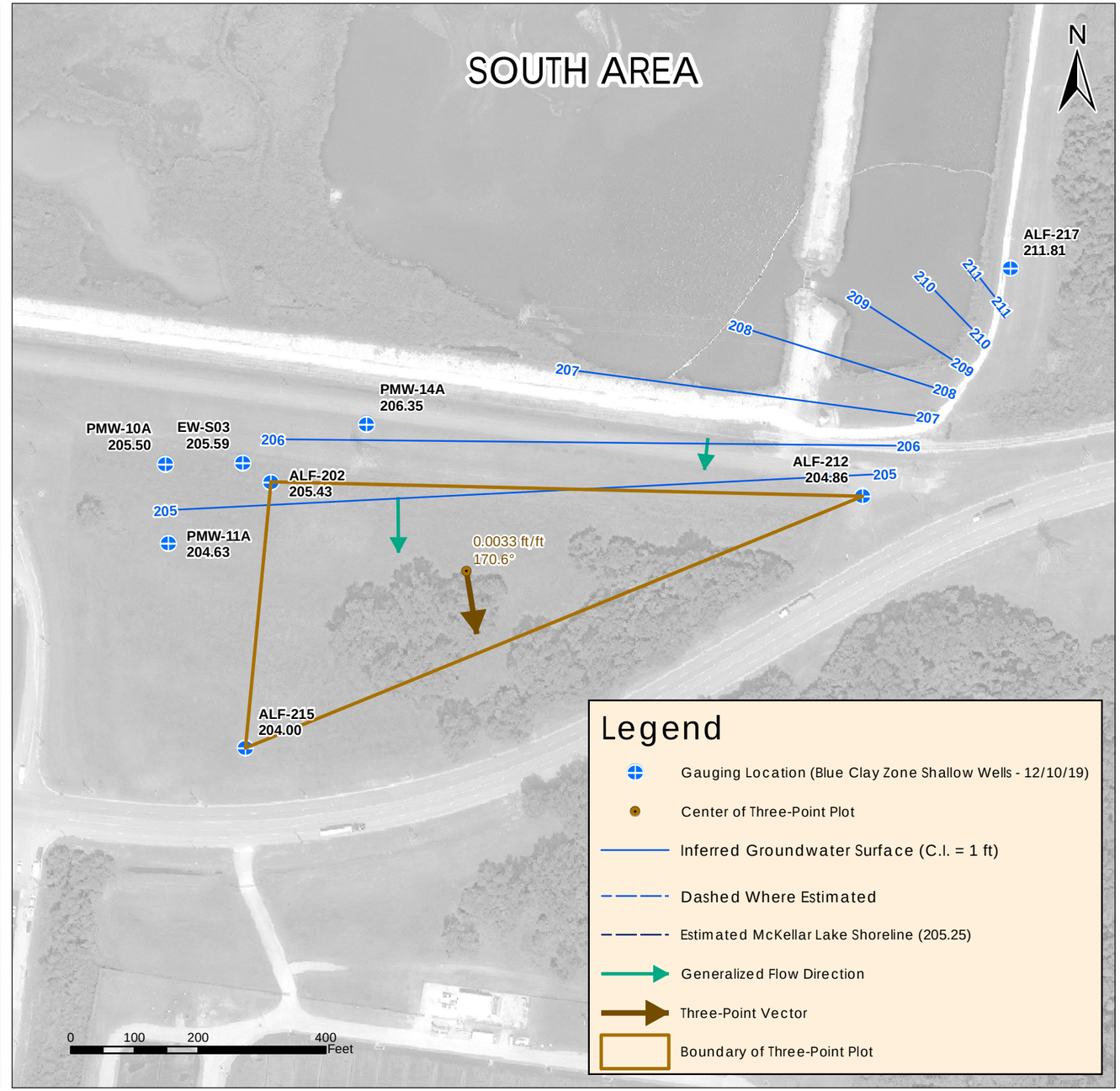


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
5c

Title
Alluvial Aquifer
Groundwater Elevation Map
Deep Wells
(September 2019)





C:\Proj\Temp\175568209\03_data\gis\mxds\FIG 2d GWE BCZ_201912_20200605.mxd
Revised: 2020-06-05 By: pribell

June 2020

Stantec

Notes

1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
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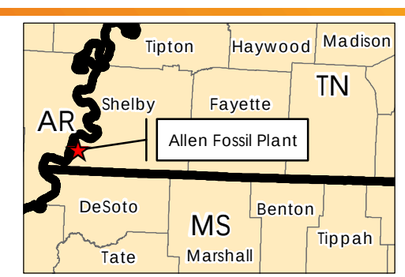
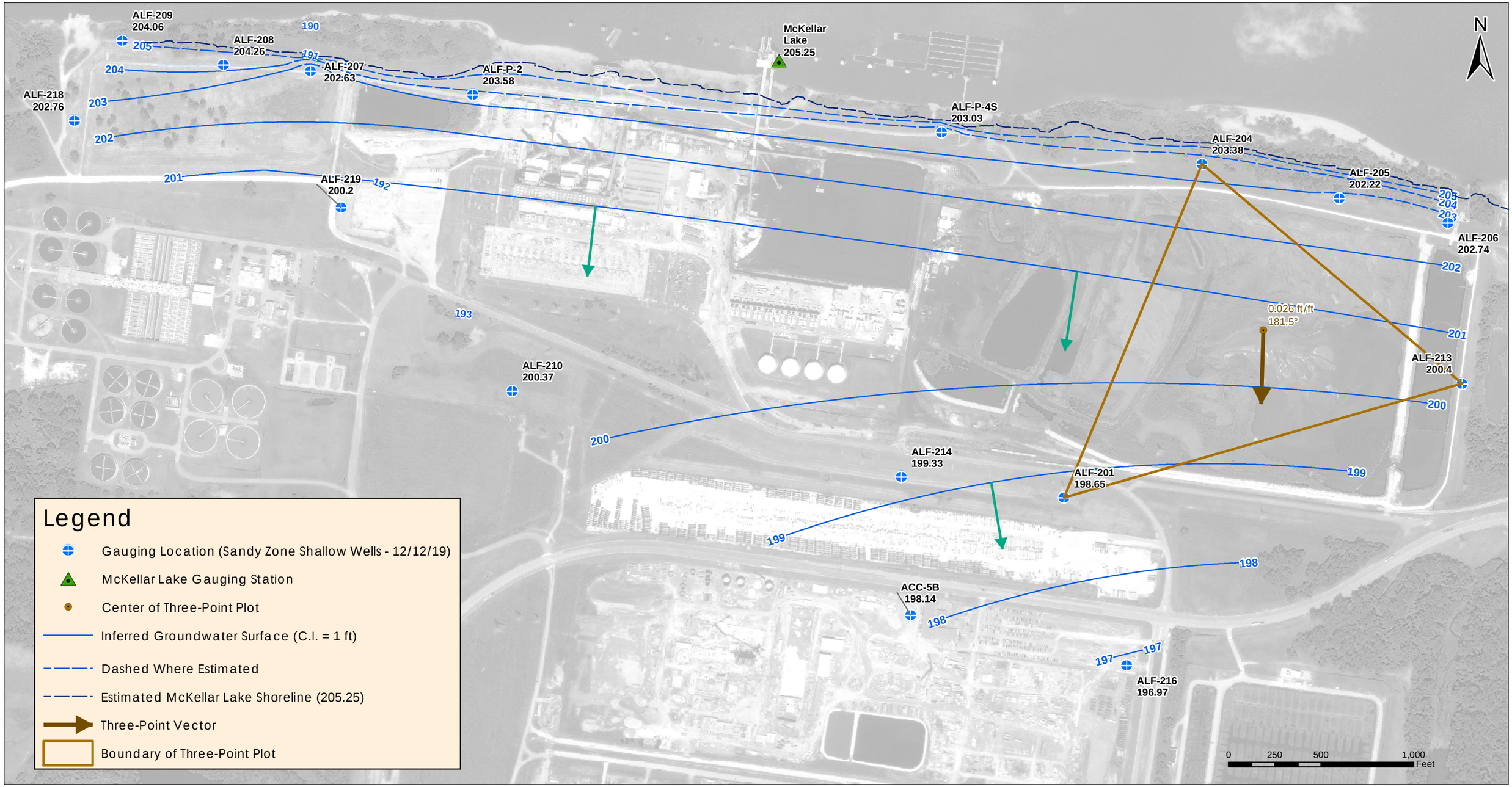


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
2d

Title
Alluvial Aquifer
Groundwater Elevation Map
Blue Clay Zone Shallow Wells
(December 2019)



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Revised: 2020-01-26 By: prbell

January 2020

Stantec

Notes

1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
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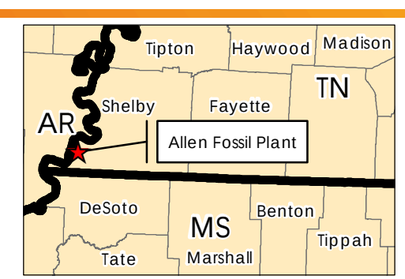
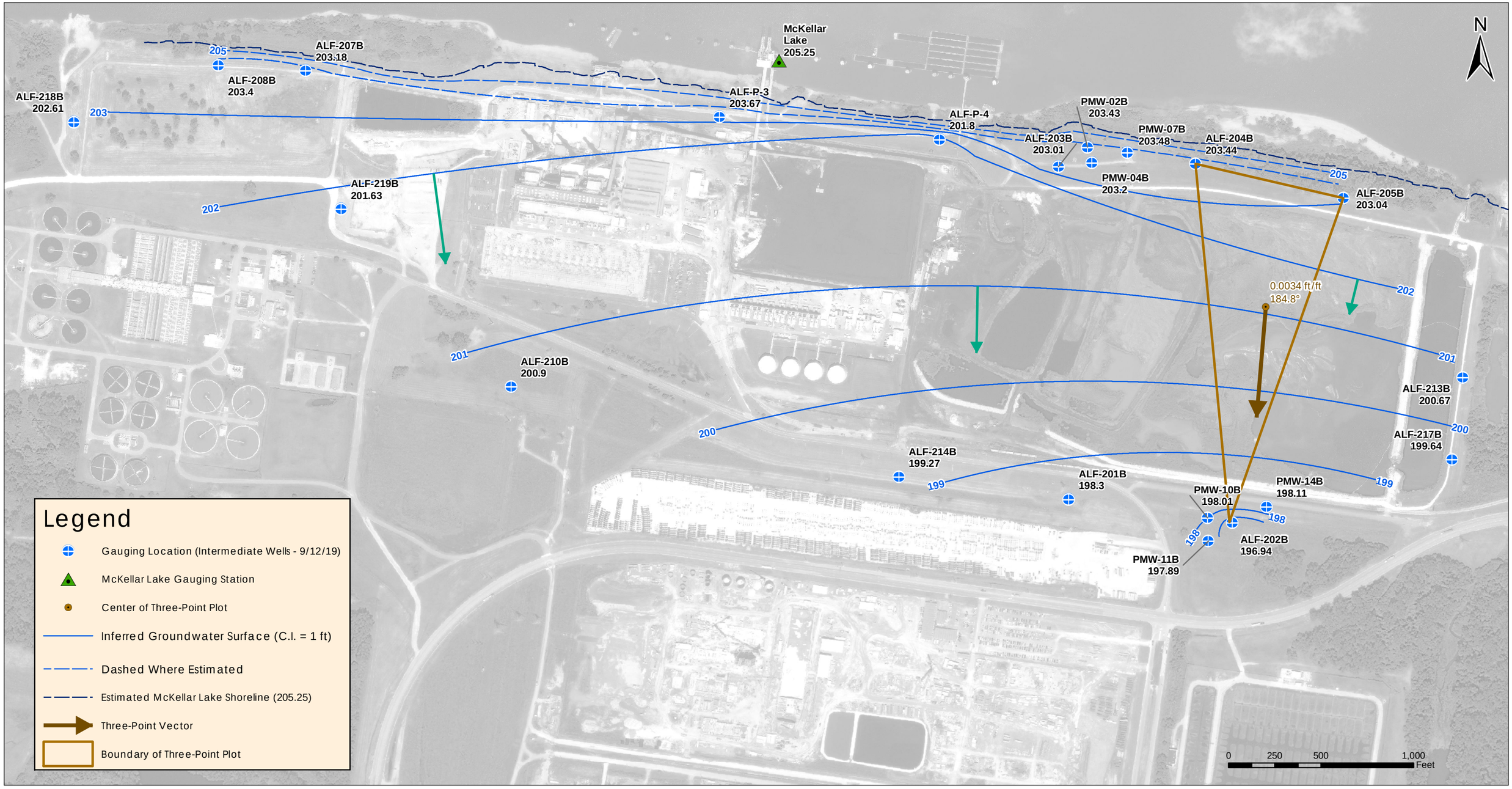


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
3d

Title
Alluvial Aquifer
Groundwater Elevation Map
Sandy Zone Shallow Wells
(December 2019)



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Revised: 2020-01-28 By: prbell

January 2020

Stantec

Notes
1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
2. Imagery provided by client (dated 2015)
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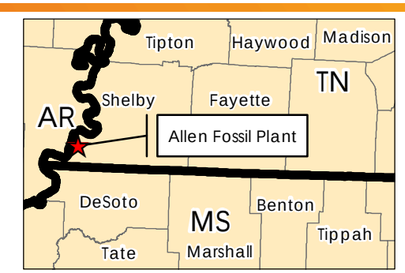
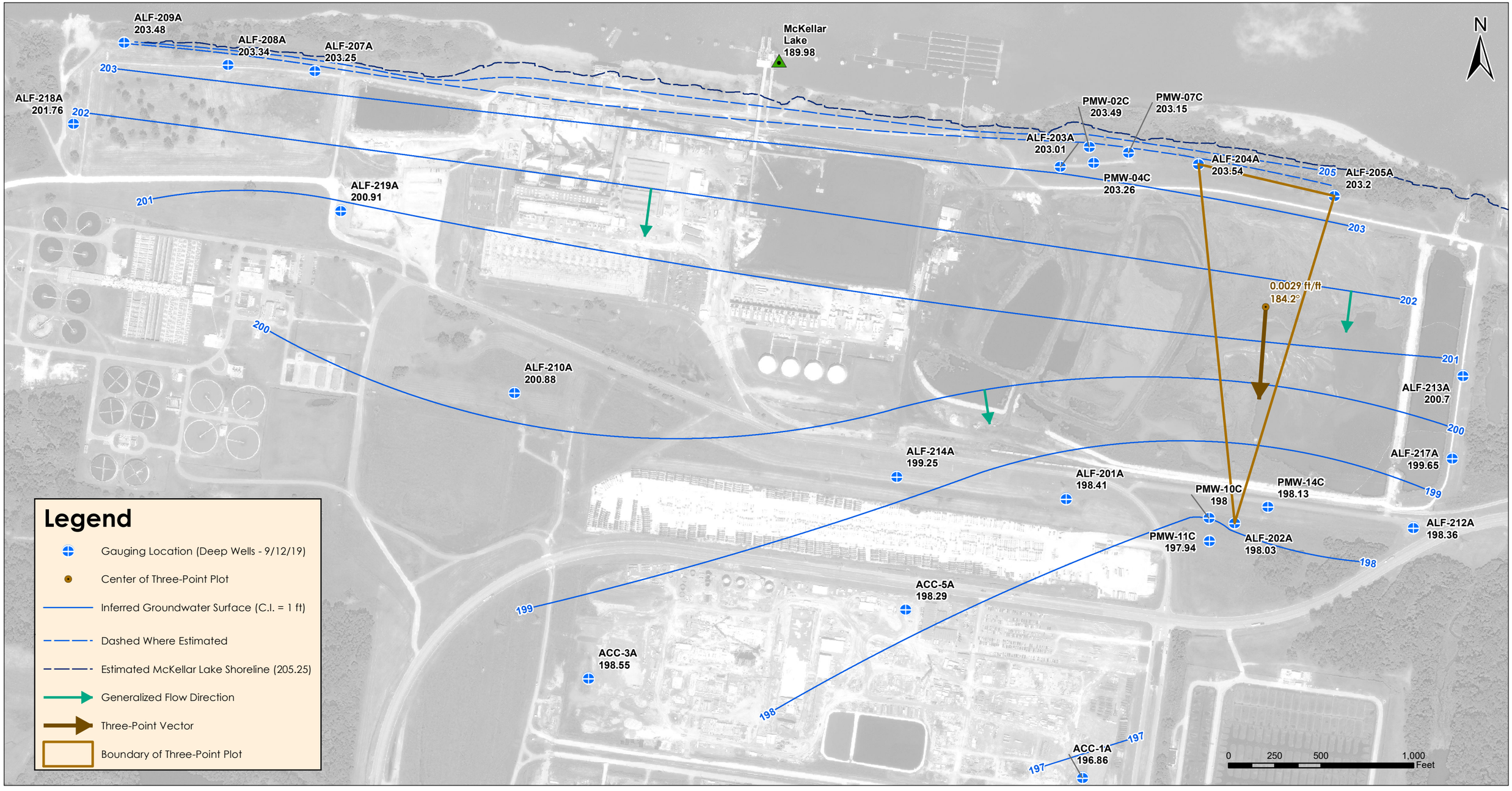


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
4d

Title
Alluvial Aquifer Groundwater Elevation Map Intermediate Wells (December 2019)



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Revised: 2020-03-10 By: prbell

March 2020

Stantec

Notes

1. Horizontal Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet. Elevations listed are in feet above North American Vertical Datum of 1929.
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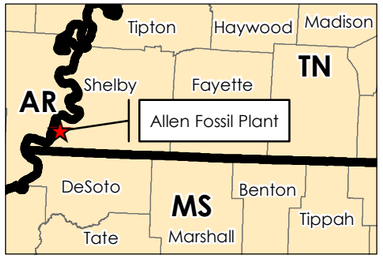


Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
5d

Title
Alluvial Aquifer Groundwater Elevation Map Deep Wells (September 2019)

U:\TVA-EIP\175567295\gis\mxds\ACC\GW_Surface\Updates_20200127\Fig6a_Shallow_Inter.mxd
Revised: 2020-03-13 By: mbough

March 2020

Stantec

Notes

1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet

2. Imagery provided by client (dated 2018 & 2019)

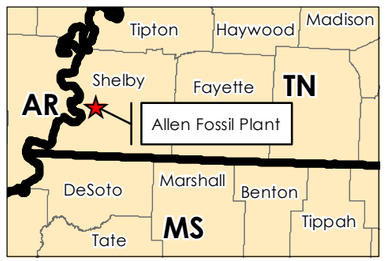
3. Vertical gradient averaging includes groundwater elevation data measured between 9/20/2017 and 12/10/2019

4. For this map, groundwater elevation data from the sandy zone of the shallow Alluvial aquifer was compared to intermediate Alluvial aquifer groundwater elevation data

Legend

Upward Vertical Gradient (Feet/Foot)

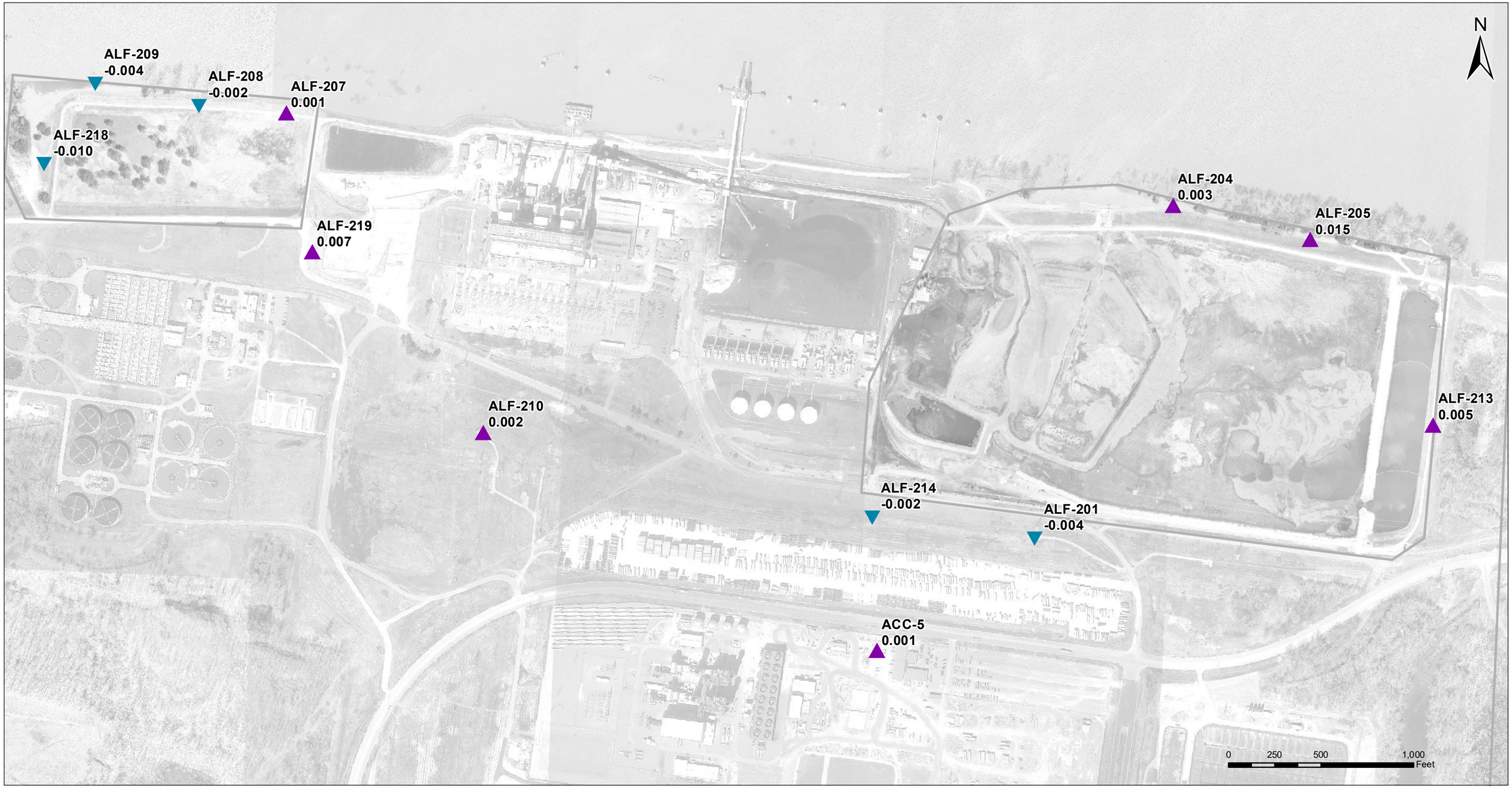
Downward Vertical Gradient (Feet/Foot)



Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
6a

Title
Vertical Gradients
Shallow to Intermediate Wells
(Average 2017 - 2019)



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Revised: 2020-03-13 By: mbough

March 2020

Stantec

Notes

1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet

2. Imagery provided by client (dated 2018 & 2019)

3. Vertical gradient averaging includes groundwater elevation data measured between 9/20/2017 and 12/10/2019

4. For this map, groundwater elevation data from the sandy zone of the shallow Alluvial aquifer was compared to deep Alluvial aquifer groundwater elevation data

Legend

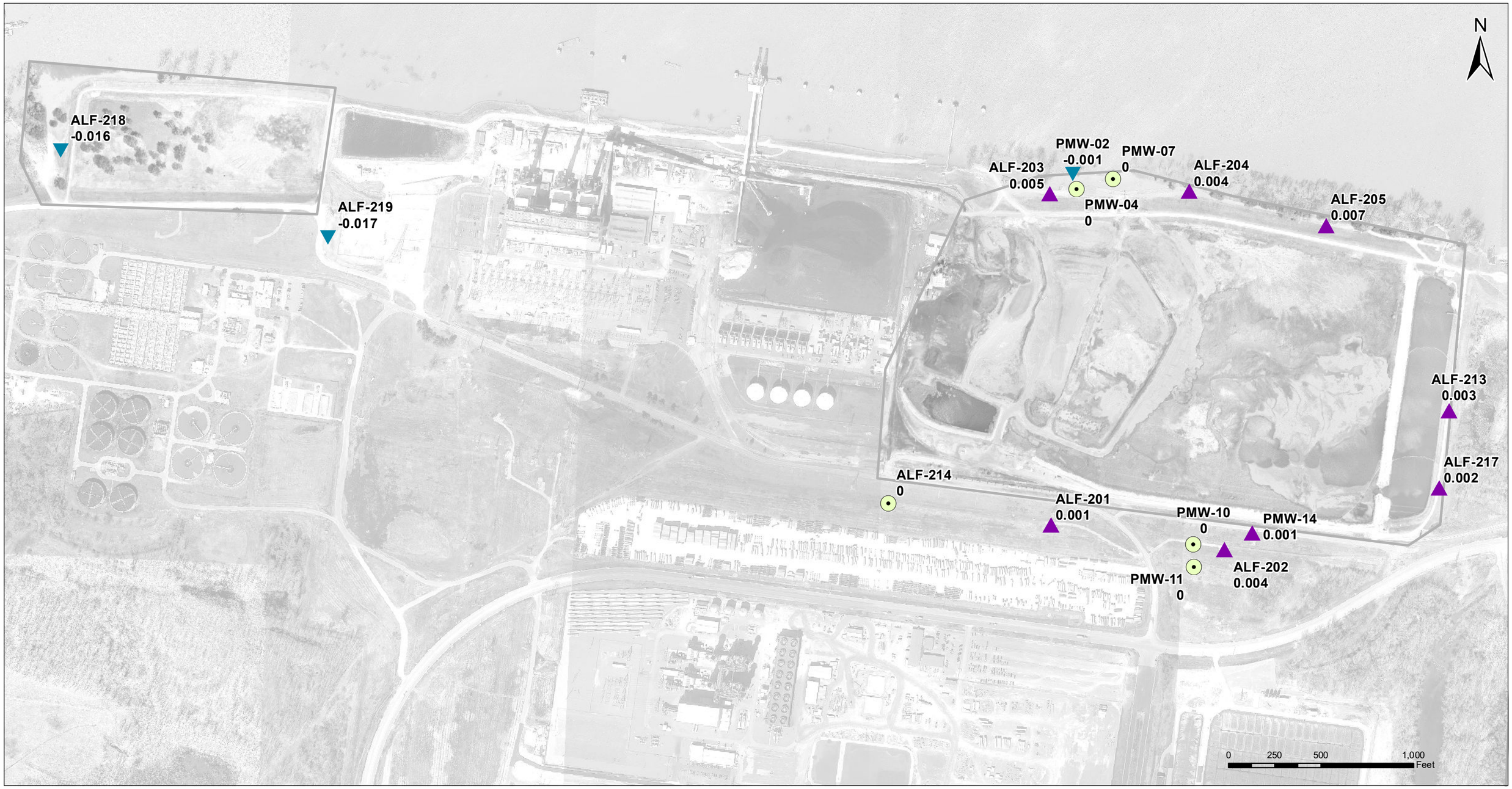
Upward Vertical Gradient (Feet/Foot)

Downward Vertical Gradient (Feet/Foot)

Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
6b

Title
Vertical Gradients Shallow to Deep Wells (Average 2017 - 2019)



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Revised: 2020-03-13 By: mbough

March 2020

Stantec

Notes

1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Imagery provided by client (dated 2018 & 2019)
3. Vertical gradient averaging includes groundwater elevation data measured between 9/20/2017 and 12/10/2019

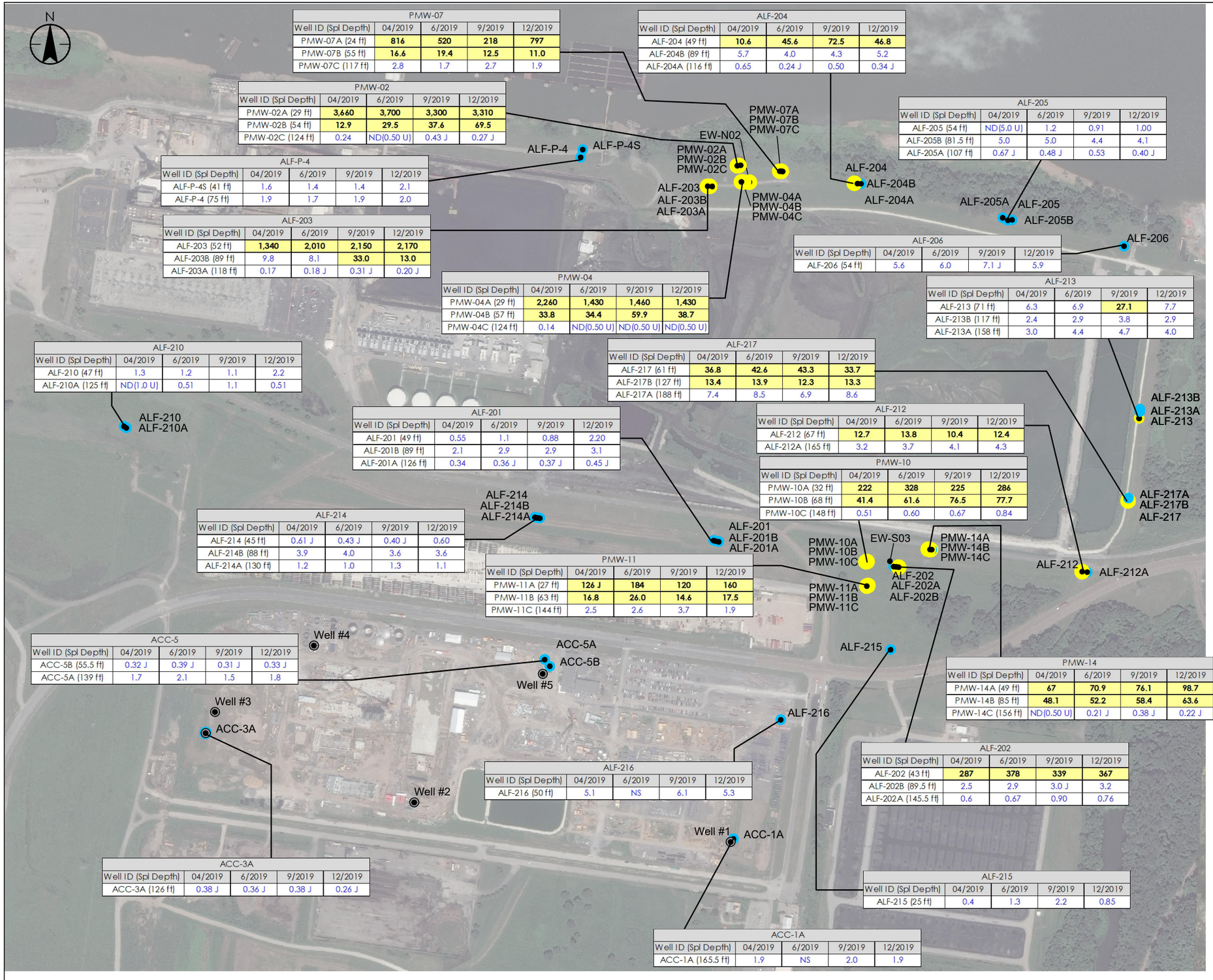
Legend

- Upward Vertical Gradient (Feet/Foot)
- No Gradient
- Downward Vertical Gradient (Feet/Foot)

Client/Project
Tennessee Valley Authority
Allen Fossil Plant
Memphis, Shelby County, Tennessee

Figure No.
6c

Title
Vertical Gradients Intermediate to Deep Wells (Average 2017 - 2019)



PMW-07				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-07A (24 ft)	**816**	**520**	**218**	**797**
PMW-07B (55 ft)	**16.6**	**19.4**	**12.5**	**11.0**
PMW-07C (117 ft)	2.8	1.7	2.7	1.9

ALF-204				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-204 (49 ft)	**10.6**	**45.6**	**72.5**	**46.8**
ALF-204B (89 ft)	5.7	4.0	4.3	5.2
ALF-204A (116 ft)	0.65	0.24 J	0.50	0.34 J

PMW-02				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-02A (29 ft)	**3,660**	**3,700**	**3,300**	**3,310**
PMW-02B (54 ft)	**12.9**	**29.5**	**37.6**	**69.5**
PMW-02C (124 ft)	0.24	ND(0.50 U)	0.43 J	0.27 J

ALF-205				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-205 (54 ft)	ND(5.0 U)	1.2	0.91	1.00
ALF-205B (81.5 ft)	5.0	5.0	4.4	4.1
ALF-205A (107 ft)	0.67 J	0.48 J	0.53	0.40 J

ALF-P-4				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-P-4S (41 ft)	1.6	1.4	1.4	2.1
ALF-P-4 (75 ft)	1.9	1.7	1.9	2.0

ALF-203				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-203 (52 ft)	**1,340**	**2,010**	**2,150**	**2,170**
ALF-203B (89 ft)	9.8	8.1	**33.0**	**13.0**
ALF-203A (118 ft)	0.17	0.18 J	0.31 J	0.20 J

ALF-206				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-206 (54 ft)	5.6	6.0	7.1 J	5.9

PMW-04				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-04A (29 ft)	**2,260**	**1,430**	**1,460**	**1,430**
PMW-04B (57 ft)	**33.8**	**34.4**	**59.9**	**38.7**
PMW-04C (124 ft)	0.14	ND(0.50 U)	ND(0.50 U)	ND(0.50 U)

ALF-213				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-213 (71 ft)	6.3	6.9	**27.1**	7.7
ALF-213B (117 ft)	2.4	2.9	3.8	2.9
ALF-213A (158 ft)	3.0	4.4	4.7	4.0

ALF-210				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-210 (47 ft)	1.3	1.2	1.1	2.2
ALF-210A (125 ft)	ND(1.0 U)	0.51	1.1	0.51

ALF-217				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-217 (61 ft)	**36.8**	**42.6**	**43.3**	**33.7**
ALF-217B (127 ft)	**13.4**	**13.9**	**12.3**	**13.3**
ALF-217A (188 ft)	7.4	8.5	6.9	8.6

ALF-201				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-201 (49 ft)	0.55	1.1	0.88	2.20
ALF-201B (89 ft)	2.1	2.9	2.9	3.1
ALF-201A (126 ft)	0.34	0.36 J	0.37 J	0.45 J

ALF-212				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-212 (67 ft)	**12.7**	**13.8**	**10.4**	**12.4**
ALF-212A (165 ft)	3.2	3.7	4.1	4.3

PMW-10				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-10A (32 ft)	**222**	**328**	**225**	**286**
PMW-10B (68 ft)	**41.4**	**61.6**	**76.5**	**77.7**
PMW-10C (148 ft)	0.51	0.60	0.67	0.84

ALF-214				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-214 (45 ft)	0.61 J	0.43 J	0.40 J	0.60
ALF-214B (88 ft)	3.9	4.0	3.6	3.6
ALF-214A (130 ft)	1.2	1.0	1.3	1.1

PMW-11				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-11A (27 ft)	**126 J**	**184**	**120**	**160**
PMW-11B (63 ft)	**16.8**	**26.0**	**14.6**	**17.5**
PMW-11C (144 ft)	2.5	2.6	3.7	1.9

ACC-5				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-5B (55.5 ft)	0.32 J	0.39 J	0.31 J	0.33 J
ACC-5A (139 ft)	1.7	2.1	1.5	1.8

PMW-14				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-14A (49 ft)	**67**	**70.9**	**76.1**	**98.7**
PMW-14B (85 ft)	**48.1**	**52.2**	**58.4**	**63.6**
PMW-14C (156 ft)	ND(0.50 U)	0.21 J	0.38 J	0.22 J

ALF-216				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-216 (50 ft)	5.1	NS	6.1	5.3

ALF-202				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-202 (43 ft)	**287**	**378**	**339**	**367**
ALF-202B (89.5 ft)	2.5	2.9	3.0 J	3.2
ALF-202A (145.5 ft)	0.6	0.67	0.90	0.76

ACC-3A				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-3A (126 ft)	0.38 J	0.36 J	0.38 J	0.26 J

ALF-215				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-215 (25 ft)	0.4	1.3	2.2	0.85

ACC-1A				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-1A (165.5 ft)	1.9	NS	2.0	1.9

Figure No.

7a

Title

Arsenic Groundwater Sample Concentrations from Monitoring Wells (April-December 2019)

Client/Project

TENNESSEE VALLEY AUTHORITY
ALLEN FOSSIL PLANT

0 500' 1000'

Legend

- Groundwater Monitoring Well (Alluvial Aquifer) (ALF-, EW-, and PMW- series wells)
- Production Well (Memphis Aquifer)
- Sample Result is less than MCL of 10 µg/L
- Sample Result is above MCL of 10 µg/L

Well Location ID

ALF-203				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-203 (52 ft)	**1,340**	**2,010**	**2,150**	**2,170**
ALF-203B (89 ft)	9.8	8.1	**33.0**	**13.0**
ALF-203A (118 ft)	0.17	0.18 J	0.31 J	0.20 J

Well ID

Sample Depth (in feet)

Concentration Does Not Exceed MCL (µg/L)

Concentration Exceeds MCL (µg/L)

Notes

1. Coordinate System: GCS WGS 1984
2. Imagery provided by TerraServer (2016)
3. Existing monitoring wells are referenced from TVA Drawing 10W858-03 Allen Fossil Plant Reservation
4. Concentrations are reported in micrograms per liter (µg/L)
5. The coloration of the well symbols (blue or yellow) on the map is based on the most recent round (April-December 2019) of groundwater analytical data as compared to the MCL
6. Analytical Results derived from unfiltered samples
7. ND - Non-Detect
8. U - The analyte was not detected above the indicated reporting limit
9. J - The result is estimated
10. U* - The analyte was detected in an associated blank
11. UJ - The analyte was not detected above the estimated reporting limit

Stantec

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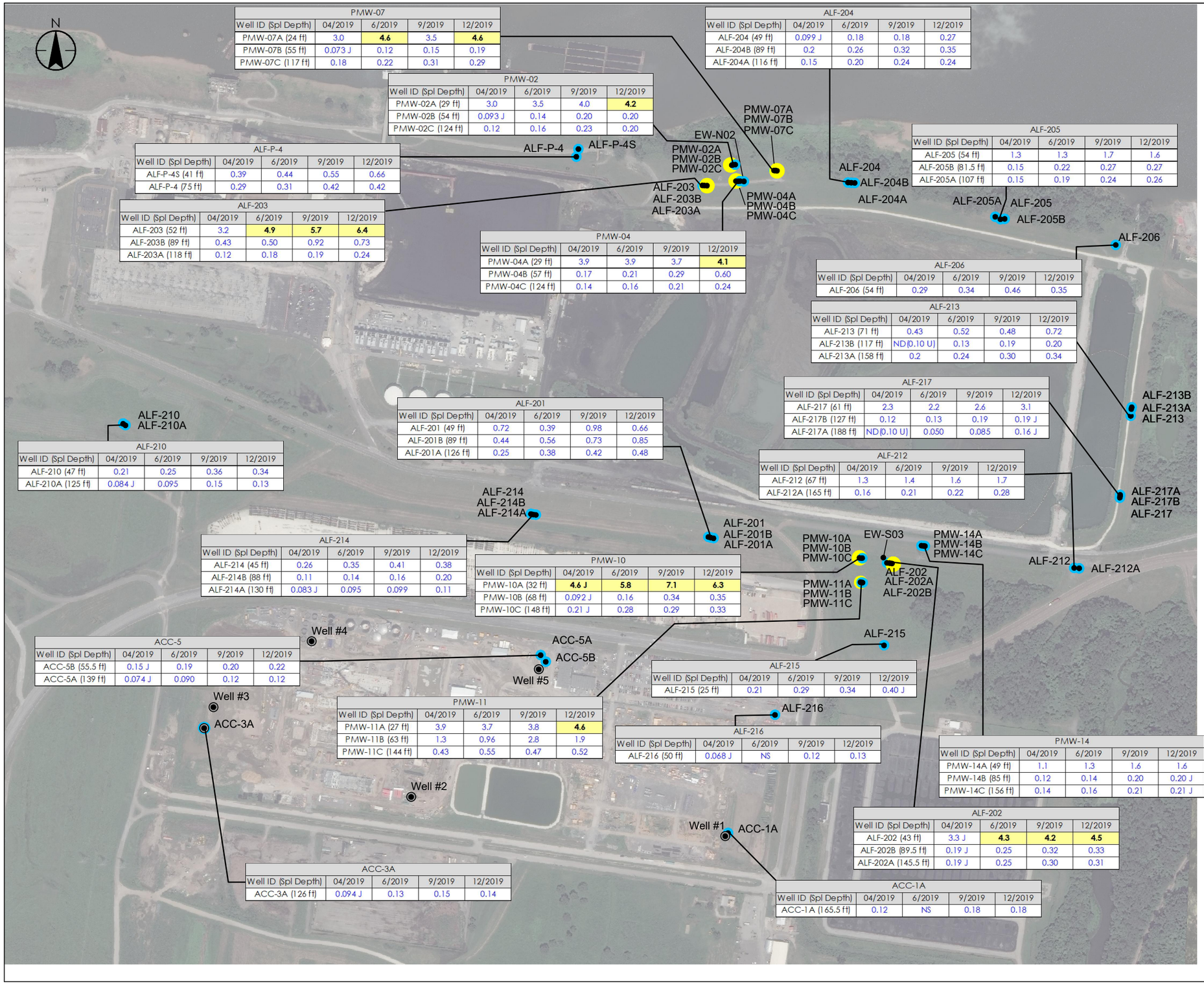
2020/01/29 8:11 AM By: Nolan, Vincent



PMW-07				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-07A (24 ft)	3.0	**4.6**	3.5	**4.6**
PMW-07B (55 ft)	0.073 J	0.12	0.15	0.19
PMW-07C (117 ft)	0.18	0.22	0.31	0.29

ALF-204				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-204 (49 ft)	0.099 J	0.18	0.18	0.27
ALF-204B (89 ft)	0.2	0.26	0.32	0.35
ALF-204A (116 ft)	0.15	0.20	0.24	0.24

PMW-02				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-02A (29 ft)	3.0	3.5	4.0	**4.2**
PMW-02B (54 ft)	0.093 J	0.14	0.20	0.20
PMW-02C (124 ft)	0.12	0.16	0.23	0.20

ALF-205				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-205 (54 ft)	1.3	1.3	1.7	1.6
ALF-205B (81.5 ft)	0.15	0.22	0.27	0.27
ALF-205A (107 ft)	0.15	0.19	0.24	0.26

ALF-P-4				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-P-4S (41 ft)	0.39	0.44	0.55	0.66
ALF-P-4 (75 ft)	0.29	0.31	0.42	0.42

ALF-203				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-203 (52 ft)	3.2	**4.9**	**5.7**	**6.4**
ALF-203B (89 ft)	0.43	0.50	0.92	0.73
ALF-203A (118 ft)	0.12	0.18	0.19	0.24

PMW-04				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-04A (29 ft)	3.9	3.9	3.7	**4.1**
PMW-04B (57 ft)	0.17	0.21	0.29	0.60
PMW-04C (124 ft)	0.14	0.16	0.21	0.24

ALF-206				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-206 (54 ft)	0.29	0.34	0.46	0.35

ALF-213				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-213 (71 ft)	0.43	0.52	0.48	0.72
ALF-213B (117 ft)	ND(0.10 U)	0.13	0.19	0.20
ALF-213A (158 ft)	0.2	0.24	0.30	0.34

ALF-217				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-217 (61 ft)	2.3	2.2	2.6	3.1
ALF-217B (127 ft)	0.12	0.13	0.19	0.19 J
ALF-217A (188 ft)	ND(0.10 U)	0.050	0.085	0.16 J

ALF-210				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-210 (47 ft)	0.21	0.25	0.36	0.34
ALF-210A (125 ft)	0.084 J	0.095	0.15	0.13

ALF-201				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-201 (49 ft)	0.72	0.39	0.98	0.66
ALF-201B (89 ft)	0.44	0.56	0.73	0.85
ALF-201A (126 ft)	0.25	0.38	0.42	0.48

ALF-212				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-212 (67 ft)	1.3	1.4	1.6	1.7
ALF-212A (165 ft)	0.16	0.21	0.22	0.28

ALF-214				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-214 (45 ft)	0.26	0.35	0.41	0.38
ALF-214B (88 ft)	0.11	0.14	0.16	0.20
ALF-214A (130 ft)	0.083 J	0.095	0.099	0.11

PMW-10				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-10A (32 ft)	**4.6 J**	**5.8**	**7.1**	**6.3**
PMW-10B (68 ft)	0.092 J	0.16	0.34	0.35
PMW-10C (148 ft)	0.21 J	0.28	0.29	0.33

ACC-5				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-5B (55.5 ft)	0.15 J	0.19	0.20	0.22
ACC-5A (139 ft)	0.074 J	0.090	0.12	0.12

ALF-215				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-215 (25 ft)	0.21	0.29	0.34	0.40 J

PMW-11				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-11A (27 ft)	3.9	3.7	3.8	**4.6**
PMW-11B (63 ft)	1.3	0.96	2.8	1.9
PMW-11C (144 ft)	0.43	0.55	0.47	0.52

ALF-216				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-216 (50 ft)	0.068 J	NS	0.12	0.13

PMW-14				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-14A (49 ft)	1.1	1.3	1.6	1.6
PMW-14B (85 ft)	0.12	0.14	0.20	0.20 J
PMW-14C (156 ft)	0.14	0.16	0.21	0.21 J

ALF-202				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-202 (43 ft)	3.3 J	**4.3**	**4.2**	**4.5**
ALF-202B (89.5 ft)	0.19 J	0.25	0.32	0.33
ALF-202A (145.5 ft)	0.19 J	0.25	0.30	0.31

ACC-3A				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-3A (126 ft)	0.094 J	0.13	0.15	0.14

ACC-1A				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-1A (165.5 ft)	0.12	NS	0.18	0.18

Figure No.

7b

Title

Fluoride Groundwater Sample Concentrations from Monitoring Wells (April-December 2019)

Client/Project

TENNESSEE VALLEY AUTHORITY
ALLEN FOSSIL PLANT

0 500' 1000'

Legend

- Groundwater Monitoring Well (Alluvial Aquifer) (ALF-, EW-, and PMW- series wells)
- Production Well (Memphis Aquifer)
- Sample Result is less than MCL of 4 mg/L
- Sample Result is above MCL of 4 mg/L

Well Location ID

ALF-203				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-203 (52 ft)	3.2	**4.9**	**5.7**	**6.4**
ALF-203B (89 ft)	0.43	0.50	0.92	0.73
ALF-203A (118 ft)	0.12	0.18	0.19	0.24

Well ID

Sample Depth (in feet)

Concentration Does Not Exceed MCL (mg/L)

Concentration Exceeds MCL (mg/L)

Notes

1. Coordinate System: GCS WGS 1984
2. Imagery provided by TerraServer (2016)
3. Existing monitoring wells are referenced from TVA Drawing 10W858-03 Allen Fossil Plant Reservation
4. Concentrations are reported in milligrams per liter (mg/L)
5. The coloration of the well symbols (blue or yellow) on the map is based on the most recent round (April-December 2019) of groundwater analytical data as compared to the MCL
6. Analytical Results derived from unfiltered samples
7. ND - Non-Detect
8. U - The analyte was not detected above the indicated reporting limit
9. J - The result is estimated
10. U* - The analyte was detected in an associated blank
11. UJ - The analyte was not detected above the estimated reporting limit

Stantec

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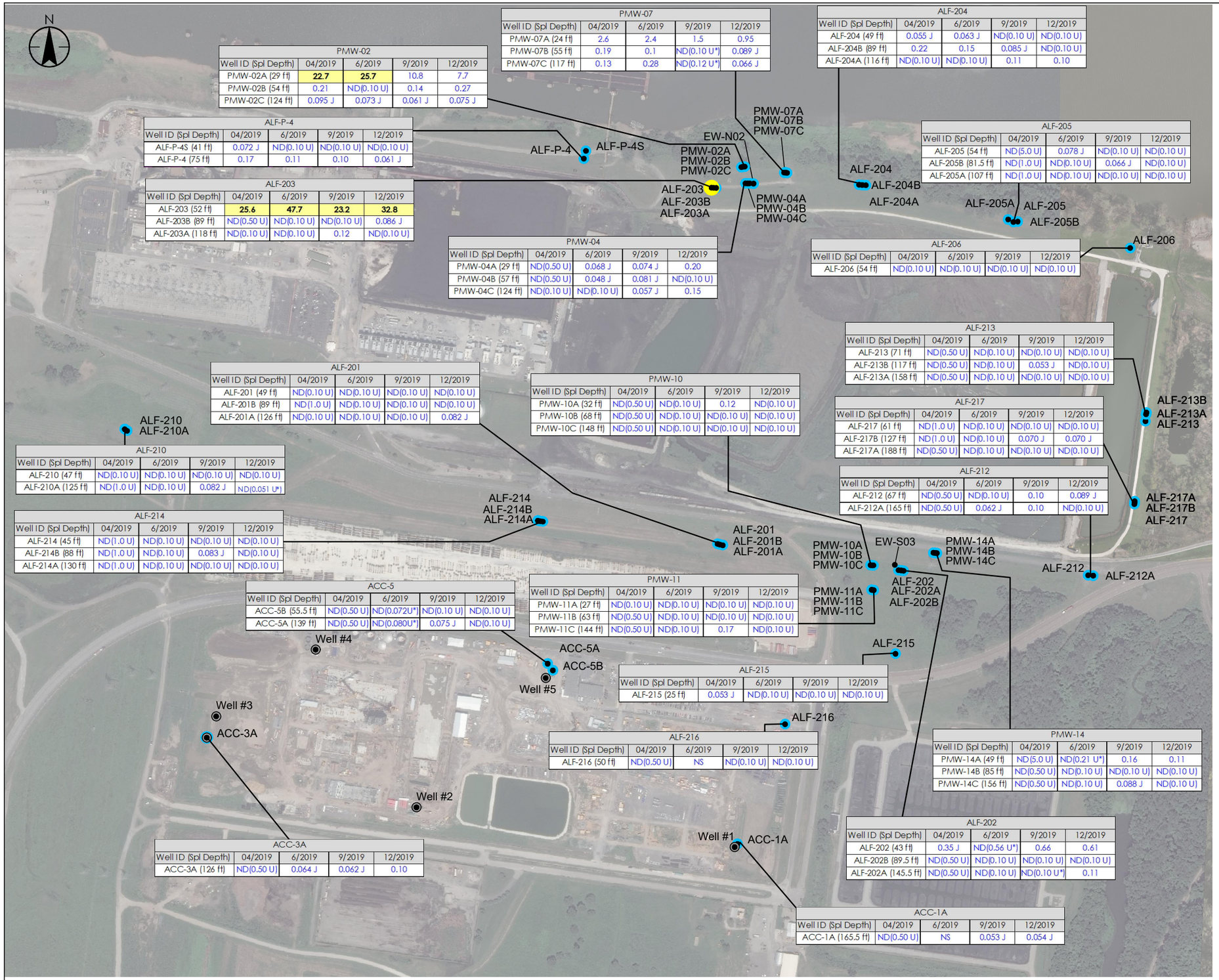

PMW-02				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-02A (29 ft)	**22.7**	**25.7**	10.8	7.7
PMW-02B (54 ft)	0.21	ND(0.10 U)	0.14	0.27
PMW-02C (124 ft)	0.095 J	0.073 J	0.061 J	0.075 J

PMW-07				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-07A (24 ft)	2.6	2.4	1.5	0.95
PMW-07B (55 ft)	0.19	0.1	ND(0.10 U*)	0.089 J
PMW-07C (117 ft)	0.13	0.28	ND(0.12 U*)	0.066 J

ALF-204				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-204 (49 ft)	0.055 J	0.063 J	ND(0.10 U)	ND(0.10 U)
ALF-204B (89 ft)	0.22	0.15	0.085 J	ND(0.10 U)
ALF-204A (116 ft)	ND(0.10 U)	ND(0.10 U)	0.11	0.10

ALF-P-4				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-P-4S (41 ft)	0.072 J	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)
ALF-P-4 (75 ft)	0.17	0.11	0.10	0.061 J

ALF-205				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-205 (54 ft)	ND(5.0 U)	0.078 J	ND(0.10 U)	ND(0.10 U)
ALF-205B (81.5 ft)	ND(1.0 U)	ND(0.10 U)	0.066 J	ND(0.10 U)
ALF-205A (107 ft)	ND(1.0 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)

ALF-203				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-203 (52 ft)	**25.6**	**47.7**	**23.2**	**32.8**
ALF-203B (89 ft)	ND(0.50 U)	ND(0.10 U)	ND(0.10 U)	0.086 J
ALF-203A (118 ft)	ND(0.10 U)	ND(0.10 U)	0.12	ND(0.10 U)

PMW-04				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-04A (29 ft)	ND(0.50 U)	0.068 J	0.074 J	0.20
PMW-04B (57 ft)	ND(0.50 U)	0.048 J	0.081 J	ND(0.10 U)
PMW-04C (124 ft)	ND(0.10 U)	ND(0.10 U)	0.057 J	0.15

ALF-206				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-206 (54 ft)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)

ALF-213				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-213 (71 ft)	ND(0.50 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)
ALF-213B (117 ft)	ND(0.50 U)	ND(0.10 U)	0.053 J	ND(0.10 U)
ALF-213A (158 ft)	ND(0.50 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)

ALF-201				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-201 (49 ft)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)
ALF-201B (89 ft)	ND(1.0 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)
ALF-201A (126 ft)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)	0.082 J

PMW-10				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-10A (32 ft)	ND(0.50 U)	ND(0.10 U)	0.12	ND(0.10 U)
PMW-10B (68 ft)	ND(0.50 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)
PMW-10C (148 ft)	ND(0.50 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)

ALF-217				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-217 (61 ft)	ND(1.0 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)
ALF-217B (127 ft)	ND(1.0 U)	ND(0.10 U)	0.070 J	0.070 J
ALF-217A (188 ft)	ND(0.50 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)

ALF-212				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-212 (67 ft)	ND(0.50 U)	ND(0.10 U)	0.10	0.089 J
ALF-212A (165 ft)	ND(0.50 U)	0.062 J	0.10	ND(0.10 U)

ALF-210				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-210 (47 ft)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)
ALF-210A (125 ft)	ND(1.0 U)	ND(0.10 U)	0.082 J	ND(0.051 U*)

ALF-214				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-214 (45 ft)	ND(1.0 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)
ALF-214B (88 ft)	ND(1.0 U)	ND(0.10 U)	0.083 J	ND(0.10 U)
ALF-214A (130 ft)	ND(1.0 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)

ACC-5				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-5B (55.5 ft)	ND(0.50 U)	ND(0.072U*)	ND(0.10 U)	ND(0.10 U)
ACC-5A (139 ft)	ND(0.50 U)	ND(0.080U*)	0.075 J	ND(0.10 U)

PMW-11				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-11A (27 ft)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)
PMW-11B (63 ft)	ND(0.50 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)
PMW-11C (144 ft)	ND(0.50 U)	ND(0.10 U)	0.17	ND(0.10 U)

ALF-215				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-215 (25 ft)	0.053 J	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)

ALF-216				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-216 (50 ft)	ND(0.50 U)	NS	ND(0.10 U)	ND(0.10 U)

PMW-14				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-14A (49 ft)	ND(5.0 U)	ND(0.21 U*)	0.16	0.11
PMW-14B (85 ft)	ND(0.50 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)
PMW-14C (156 ft)	ND(0.50 U)	ND(0.10 U)	0.088 J	ND(0.10 U)

ACC-3A				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-3A (126 ft)	ND(0.50 U)	0.064 J	0.062 J	0.10

ALF-202				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-202 (43 ft)	0.35 J	ND(0.56 U*)	0.66	0.61
ALF-202B (89.5 ft)	ND(0.50 U)	ND(0.10 U)	ND(0.10 U)	ND(0.10 U)
ALF-202A (145.5 ft)	ND(0.50 U)	ND(0.10 U)	ND(0.10 U*)	0.11

ACC-1A				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-1A (165.5 ft)	ND(0.50 U)	NS	0.053 J	0.054 J

Figure No.

7c

Title

Lead Groundwater Sample Concentrations from Monitoring Wells (April-December 2019)

Client/Project

TENNESSEE VALLEY AUTHORITY
ALLEN FOSSIL PLANT

0 500' 1000'

Legend

- Groundwater Monitoring Well (Alluvial Aquifer) (ALF-, EW-, and PMW- series wells)
- Production Well (Memphis Aquifer)
- Sample Result is less than MCL of 15 µg/L
- Sample Result is above MCL of 15 µg/L

Well Location ID

ALF-203				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-203 (52 ft)	**25.6**	**47.7**	**23.2**	**32.8**
ALF-203B (89 ft)	ND(0.50 U)	ND(0.10 U)	ND(0.10 U)	0.086 J
ALF-203A (118 ft)	ND(0.10 U)	ND(0.10 U)	0.12	ND(0.10 U)

Well ID

Sample Depth (in feet)

Concentration Does Not Exceed MCL (µg/L)

Concentration Exceeds MCL (µg/L)

Notes

1. Coordinate System: GCS WGS 1984
2. Imagery provided by TerraServer (2016)
3. Existing monitoring wells are referenced from TVA Drawing 10W858-03 Allen Fossil Plant Reservation
4. Concentrations are reported in micrograms per liter (µg/L)
5. The coloration of the well symbols (blue or yellow) on the map is based on the most recent round (April-December 2019) of groundwater analytical data as compared to the MCL
6. Analytical Results derived from unfiltered samples
7. ND - Non-Detect
8. U - The analyte was not detected above the indicated reporting limit
9. J - The result is estimated
10. U* - The analyte was detected in an associated blank
11. UJ - The analyte was not detected above the estimated reporting limit

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2020/01/29 8:38 AM By: Nolan, Vincent

PMW-02				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-02A (29 ft)	**10.0 J**	**10.1 J**	**10.0 J**	**9.7 J**
PMW-02B (54 ft)	7.5 J	7.0 J	6.7 J	7.3 J
PMW-02C (124 ft)	7.4 J	7.2 J	6.3 J	6.3 J

PMW-07				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-07A (24 ft)	**9.1 J**	**8.8 J**	7.8 J	**8.4 J**
PMW-07B (55 ft)	7.3 J	7.1 J	7.2 J	6.5 J
PMW-07C (117 ft)	7.8 J	7.5 J	7.2 J	7.2 J

ALF-204				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-204 (49 ft)	7.7 J	7.0 J	6.8 J	6.8 J
ALF-204B (89 ft)	7.1 J	6.2 J	7.3 J	6.6 J
ALF-204A (116 ft)	7.2 J	6.5 J	6.8 J	6.4 J

ALF-P-4				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-P-4S (41 ft)	8.0 J	7.0 J	7.5 J	7.6 J
ALF-P-4 (75 ft)	7.9 J	7.1 J	7.2 J	7.2 J

ALF-205				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-205 (54 ft)	7.6 J	7.0 J	7.1 J	6.9 J
ALF-205B (81.5 ft)	7.2 J	7.0 J	6.2 J	5.7 J
ALF-205A (107 ft)	7.1 J	6.5 J	7.3 J	6.1 J

ALF-203				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-203 (52 ft)	**9.1 J**	**9.5 J**	7.6 J	**9.6 J**
ALF-203B (89 ft)	7.7 J	7.0 J	7.1 J	7.3 J
ALF-203A (118 ft)	7.4 J	6.9 J	7.4 J	7.4 J

PMW-04				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-04A (29 ft)	8.0 J	7.7 J	7.2 J	7.6 J
PMW-04B (57 ft)	7.7 J	7.3 J	6.9 J	7.3 J
PMW-04C (124 ft)	7.6 J	6.4 J	7.3 J	6.7 J

ALF-206				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-206 (54 ft)	7.1 J	6.5 J	6.5 J	6.4 J

ALF-210				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-210 (47 ft)	6.8 J	6.6 J	7.2 J	7.0 J
ALF-210A (125 ft)	6.9 J	6.6 J	6.6 J	6.9 J

PMW-10				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-10A (32 ft)	7.4 J	7.1 J	7.3 J	7.9 J
PMW-10B (68 ft)	7.7 J	6.9 J	7.0 J	7.4 J
PMW-10C (148 ft)	7.1 J	6.6 J	7.1 J	7.4 J

ALF-213				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-213 (71 ft)	7.1 J	6.9 J	6.6 J	7.4 J
ALF-213B (117 ft)	7.3 J	6.8 J	6.8 J	7.0 J
ALF-213A (158 ft)	7.1 J	7.0 J	7.0 J	6.6 J

ALF-217				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-217 (61 ft)	7.4 J	6.9 J	7.0 J	7.5 J
ALF-217B (127 ft)	7.0 J	6.6 J	7.0 J	7.0 J
ALF-217A (188 ft)	7.0 J	6.9 J	7.0 J	6.8 J

ALF-201				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-201 (49 ft)	7.7 J	6.7 J	7.4 J	6.9 J
ALF-201B (89 ft)	7.6 J	7.0 J	7.1 J	7.1 J
ALF-201A (126 ft)	7.6 J	6.9 J	6.8 J	7.2 J

ALF-212				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-212 (67 ft)	7.3 J	7.0 J	7.1 J	7.1 J
ALF-212A (165 ft)	7.1 J	6.6 J	7.0 J	7.2 J

ALF-214				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-214 (45 ft)	7.5 J	7.0 J	6.8 J	7.4 J
ALF-214B (88 ft)	6.8 J	6.5 J	6.3 J	7.0 J
ALF-214A (130 ft)	7.1 J	6.5 J	6.2 J	6.8 J

PMW-11				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-11A (27 ft)	7.4 J	7.0 J	7.2 J	6.7 J
PMW-11B (63 ft)	7.3 J	6.9 J	7.2 J	6.7 J
PMW-11C (144 ft)	7.2 J	7.1 J	7.1 J	7.4 J

ACC-5				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-5B (55.5 ft)	7.0 J	6.8 J	6.6 J	6.6 J
ACC-5A (139 ft)	6.8 J	6.4 J	6.5 J	7.0 J

ALF-215				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-215 (25 ft)	7.0 J	6.5 J	7.1 J	7.4 J

PMW-14				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-14A (49 ft)	7.3 J	6.7 J	7.0 J	7.3 J
PMW-14B (85 ft)	7.1 J	6.7 J	6.9 J	7.0 J
PMW-14C (156 ft)	7.0 J	6.3 J	7.1 J	7.3 J

ALF-216				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-216 (50 ft)	6.8 J	NS	6.5 J	6.7 J

ACC-3A				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-3A (126 ft)	6.9 J	7.1 J	6.7 J	6.5 J

ALF-202				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-202 (43 ft)	7.4 J	7.5 J	7.4 J	7.1 J
ALF-202B (89.5 ft)	7.0 J	7.2 J	7.0 J	6.7 J
ALF-202A (145.5 ft)	7.1 J	7.1 J	7.1 J	6.7 J

ACC-1A				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-1A (165.5 ft)	6.8 J	NS	6.2 J	6.9 J

Figure No.

7d

Title

pH Measurements from Groundwater Samples from Monitoring Wells (April-December 2019)

Client/Project

TENNESSEE VALLEY AUTHORITY
ALLEN FOSSIL PLANT

0 500' 1000'

Legend

- Groundwater Monitoring Well (Alluvial Aquifer) (ALF-, EW-, and PMW- series wells)
- Production Well (Memphis Aquifer)
- pH Less Than 8.0 (pH Screening Level)
- pH Greater Than 8.0 (pH Screening Level)

* Laboratory-measured pH values in Standard Units (S.U.) are estimated due to hold time, J qualifiers are not shown in the result boxes.

Well Location ID

ALF-203				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-203 (52 ft)	**9.1 J**	**9.5 J**	7.6 J	**9.6 J**
ALF-203B (89 ft)	7.7 J	7.0 J	7.1 J	7.3 J
ALF-203A (118 ft)	7.4 J	6.9 J	7.4 J	7.4 J

Well ID

Sample Depth (in feet)

Concentration Does Not Exceed Screening Level (s.u.)

Concentration Exceeds Screening Level (s.u)

Notes

1. Coordinate System: GCS WGS 1984
2. Imagery provided by TerraServer (2016)
3. Existing monitoring wells are referenced from TVA Drawing 10W858-03 Allen Fossil Plant Reservation
4. The coloration of the well symbols (blue or yellow) on the map is based on the most recent round (April-December 2019) of groundwater analytical data
5. Analytical results derived from unfiltered samples

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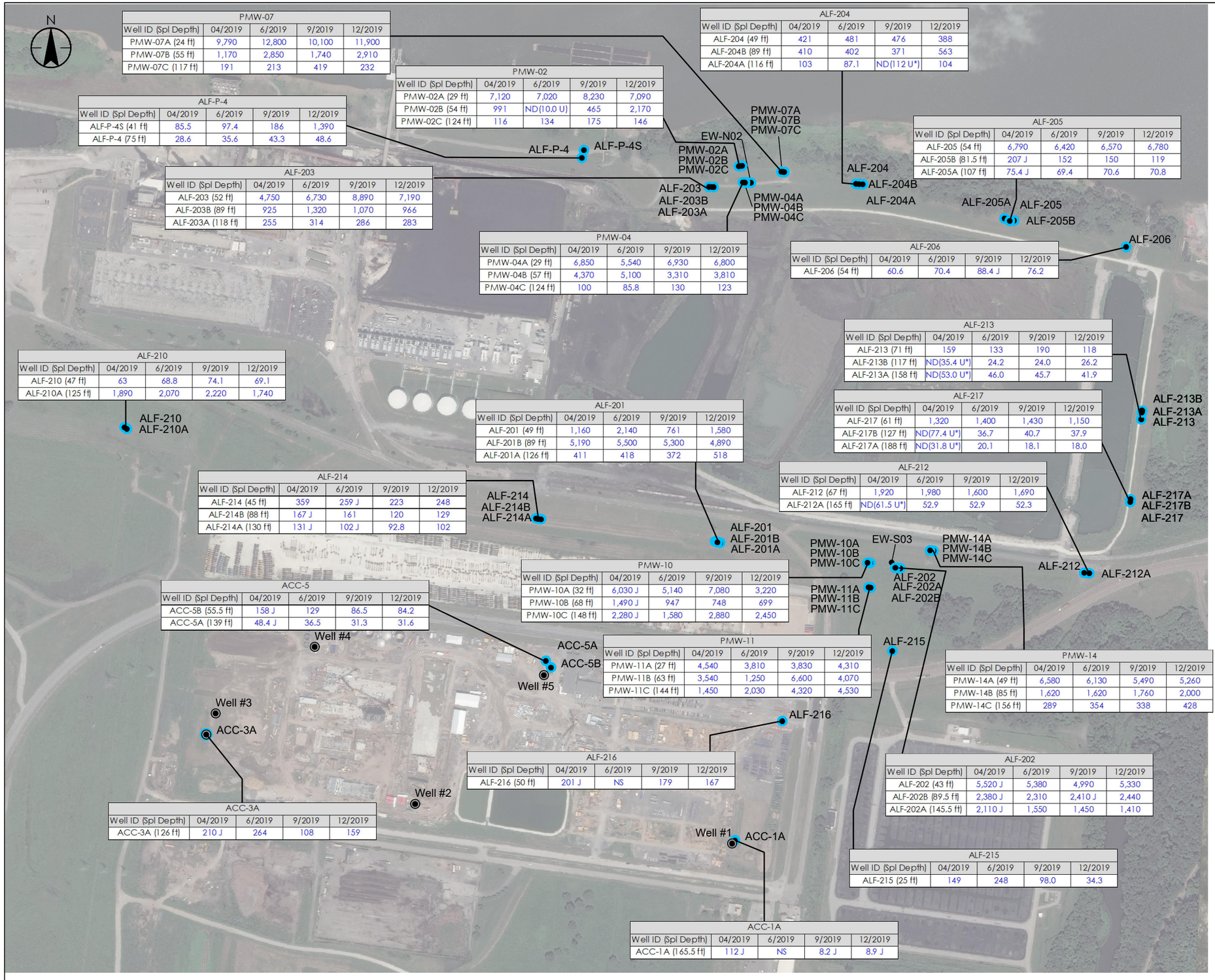
2020/03/10 7:27 AM By: Nolan, Vincent



PMW-07				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-07A (24 ft)	9,790	12,800	10,100	11,900
PMW-07B (55 ft)	1,170	2,850	1,740	2,910
PMW-07C (117 ft)	191	213	419	232

ALF-204				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-204 (49 ft)	421	481	476	388
ALF-204B (89 ft)	410	402	371	563
ALF-204A (116 ft)	103	87.1	ND(112 U*)	104

PMW-02				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-02A (29 ft)	7,120	7,020	8,230	7,090
PMW-02B (54 ft)	991	ND(10.0 U)	465	2,170
PMW-02C (124 ft)	116	134	175	146

ALF-P-4				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-P-4S (41 ft)	85.5	97.4	186	1,390
ALF-P-4 (75 ft)	28.6	35.6	43.3	48.6

ALF-205				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-205 (54 ft)	6,790	6,420	6,570	6,780
ALF-205B (81.5 ft)	207 J	152	150	119
ALF-205A (107 ft)	75.4 J	69.4	70.6	70.8

ALF-203				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-203 (52 ft)	4,750	6,730	8,890	7,190
ALF-203B (89 ft)	925	1,320	1,070	966
ALF-203A (118 ft)	255	314	286	283

PMW-04				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-04A (29 ft)	6,850	5,540	6,930	6,800
PMW-04B (57 ft)	4,370	5,100	3,310	3,810
PMW-04C (124 ft)	100	85.8	130	123

ALF-206				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-206 (54 ft)	60.6	70.4	88.4 J	76.2

ALF-210				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-210 (47 ft)	63	68.8	74.1	69.1
ALF-210A (125 ft)	1,890	2,070	2,220	1,740

ALF-213				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-213 (71 ft)	159	133	190	118
ALF-213B (117 ft)	ND(35.4 U*)	24.2	24.0	26.2
ALF-213A (158 ft)	ND(53.0 U*)	46.0	45.7	41.9

ALF-217				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-217 (61 ft)	1,320	1,400	1,430	1,150
ALF-217B (127 ft)	ND(77.4 U*)	36.7	40.7	37.9
ALF-217A (188 ft)	ND(31.8 U*)	20.1	18.1	18.0

ALF-201				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-201 (49 ft)	1,160	2,140	761	1,580
ALF-201B (89 ft)	5,190	5,500	5,300	4,890
ALF-201A (126 ft)	411	418	372	518

ALF-212				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-212 (67 ft)	1,920	1,980	1,600	1,690
ALF-212A (165 ft)	ND(61.5 U*)	52.9	52.9	52.3

ALF-214				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-214 (45 ft)	359	259 J	223	248
ALF-214B (88 ft)	167 J	161	120	129
ALF-214A (130 ft)	131 J	102 J	92.8	102

PMW-10				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-10A (32 ft)	6,030 J	5,140	7,080	3,220
PMW-10B (68 ft)	1,490 J	947	748	699
PMW-10C (148 ft)	2,280 J	1,580	2,880	2,450

ACC-5				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-5B (55.5 ft)	158 J	129	86.5	84.2
ACC-5A (139 ft)	48.4 J	36.5	31.3	31.6

PMW-11				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-11A (27 ft)	4,540	3,810	3,830	4,310
PMW-11B (63 ft)	3,540	1,250	6,600	4,070
PMW-11C (144 ft)	1,450	2,030	4,320	4,530

PMW-14				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
PMW-14A (49 ft)	6,580	6,130	5,490	5,260
PMW-14B (85 ft)	1,620	1,620	1,760	2,000
PMW-14C (156 ft)	289	354	338	428

ALF-216				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-216 (50 ft)	201 J	NS	179	167

ALF-202				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-202 (43 ft)	5,520 J	5,380	4,990	5,330
ALF-202B (89.5 ft)	2,380 J	2,310	2,410 J	2,440
ALF-202A (145.5 ft)	2,110 J	1,550	1,450	1,410

ACC-3A				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-3A (126 ft)	210 J	264	108	159

ALF-215				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-215 (25 ft)	149	248	98.0	34.3

ACC-1A				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ACC-1A (165.5 ft)	112 J	NS	8.2 J	8.9 J

Figure No.

7e

Title

Boron Groundwater Sample Concentrations from Monitoring Wells (April-December 2019)

Client/Project

TENNESSEE VALLEY AUTHORITY
ALLEN FOSSIL PLANT

0 500' 1000'

Legend

- Groundwater Monitoring Well (Alluvial Aquifer) (ALF-, EW-, and PMW- series wells)
- Production Well (Memphis Aquifer)
- No MCL has been established for this constituent

Well Location ID

ALF-201				
Well ID (Spl Depth)	04/2019	6/2019	9/2019	12/2019
ALF-201 (49 ft)	1,160	2,140	761	1,580
ALF-201B (89 ft)	5,190	5,500	5,300	4,890
ALF-201A (126 ft)	411	418	372	518

Well ID

Sample Depth (in feet)

Notes

1. Coordinate System: GCS WGS 1984
2. Imagery provided by TerraServer (2016)
3. Existing monitoring wells are referenced from TVA Drawing 10W858-03 Allen Fossil Plant Reservation
4. Concentrations are reported in micrograms per liter (µg/L)
5. Analytical Results derived from unfiltered samples
6. ND - Non-Detect
7. U - The analyte was not detected above the indicated reporting limit
8. J - The result is estimated
9. U* - The analyte was detected in an associated blank
10. UJ - The analyte was not detected above the estimated reporting limit

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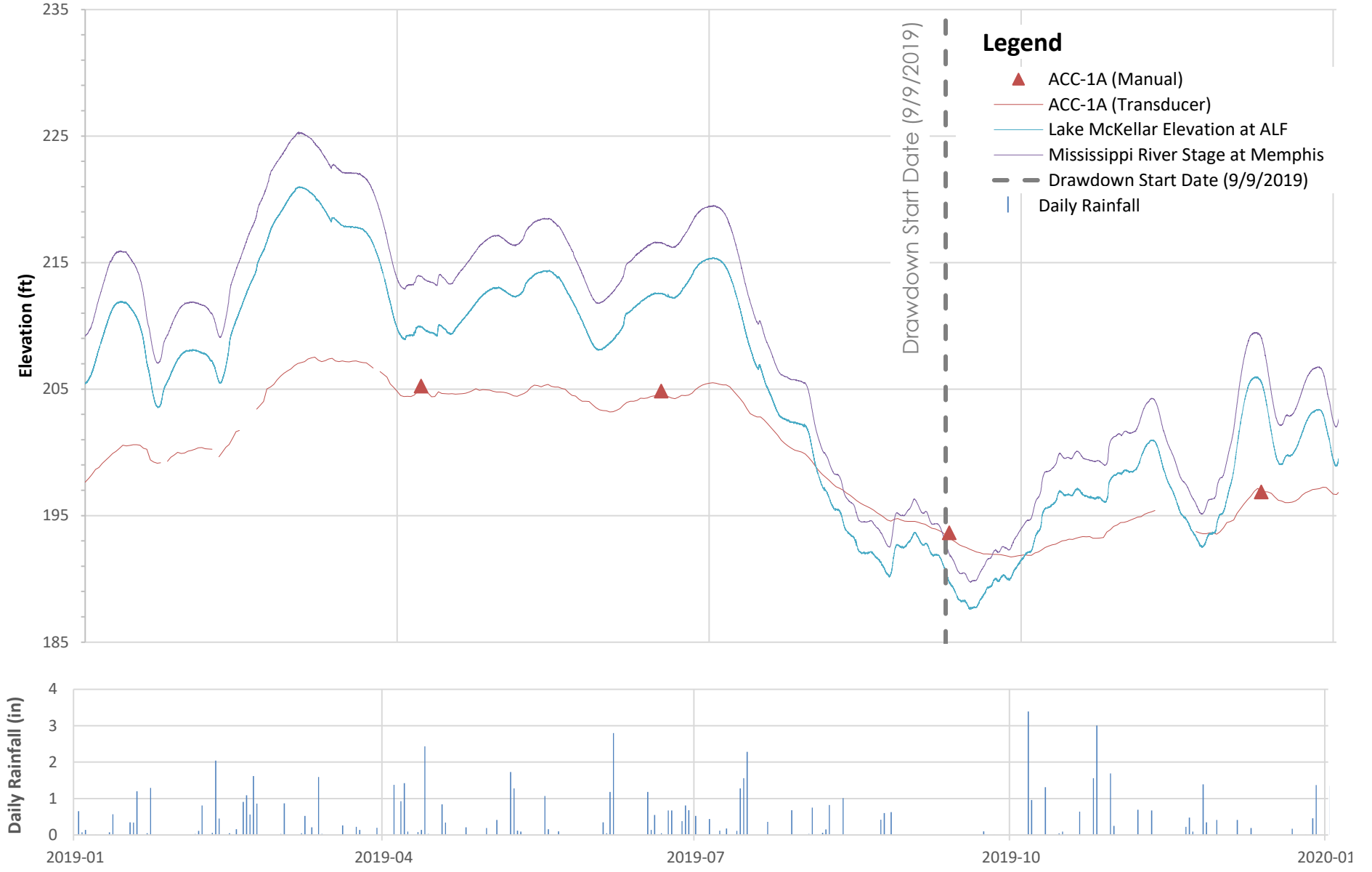
APPENDIX A
2019 TVA ALLEN MONITORING WELL HYDROGRAPHS



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

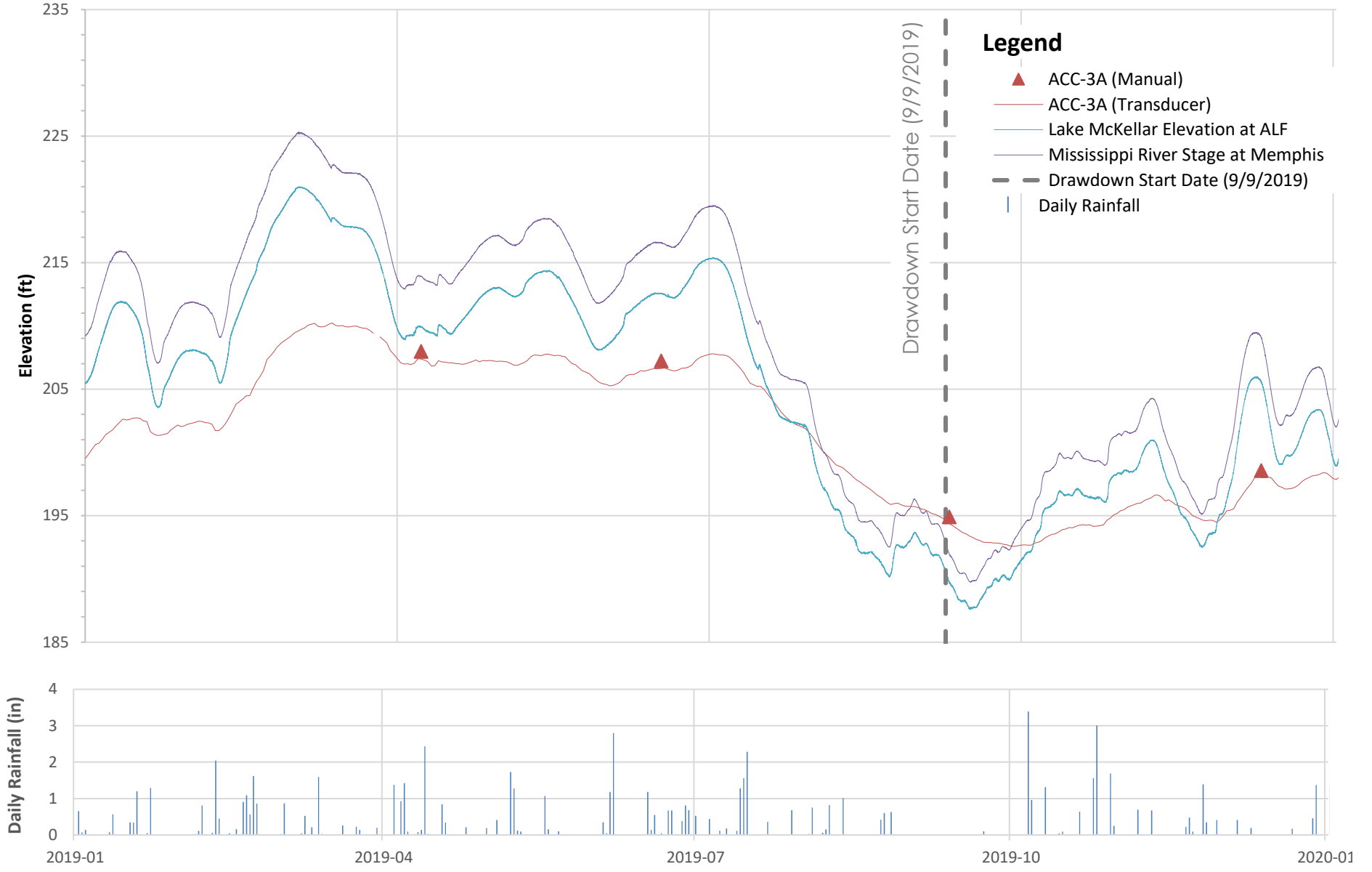
Stantec

Figure/Well No.

1 **ACC-1A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

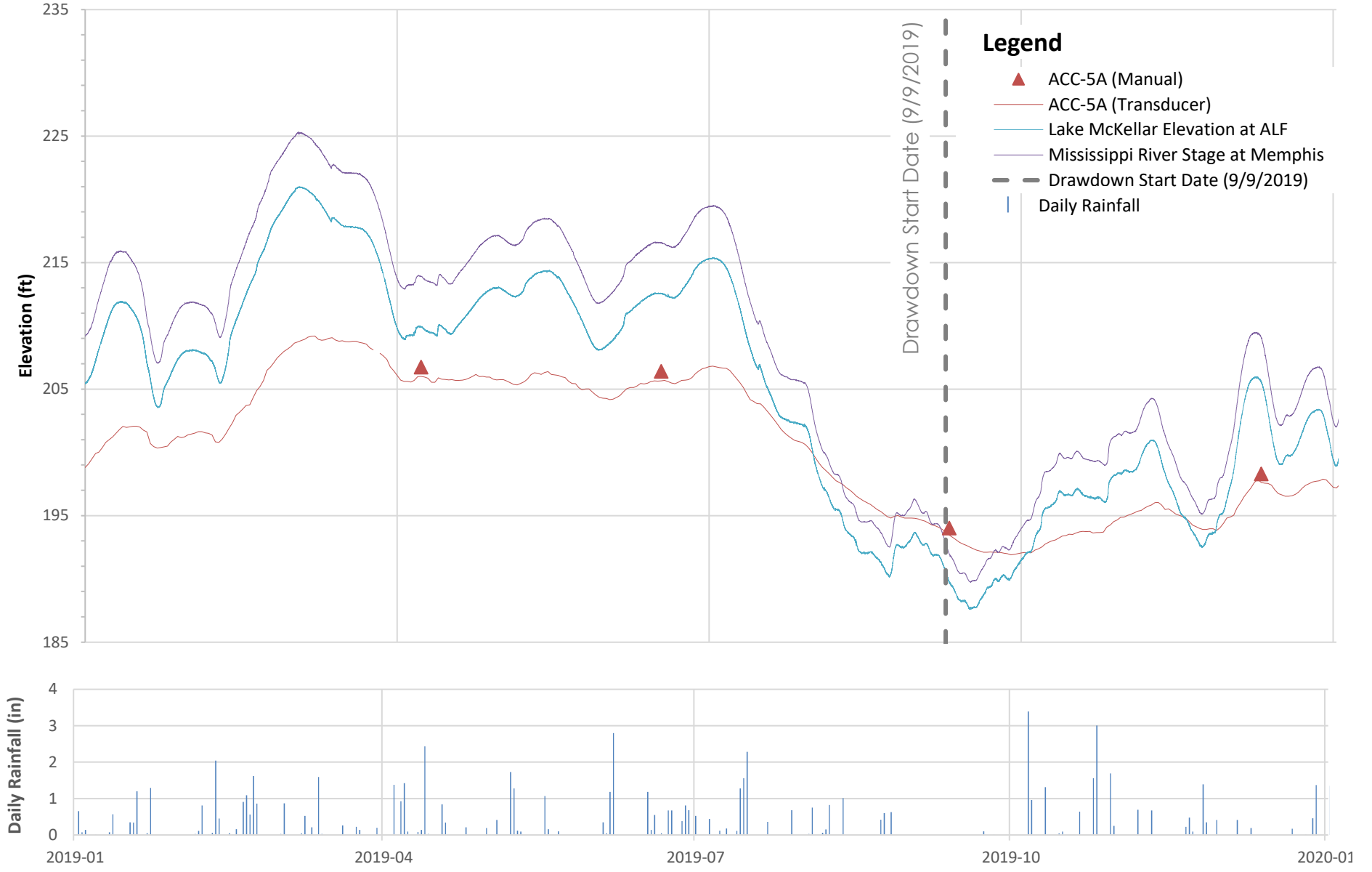
Stantec

Figure/Well No.

2 **ACC-3A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

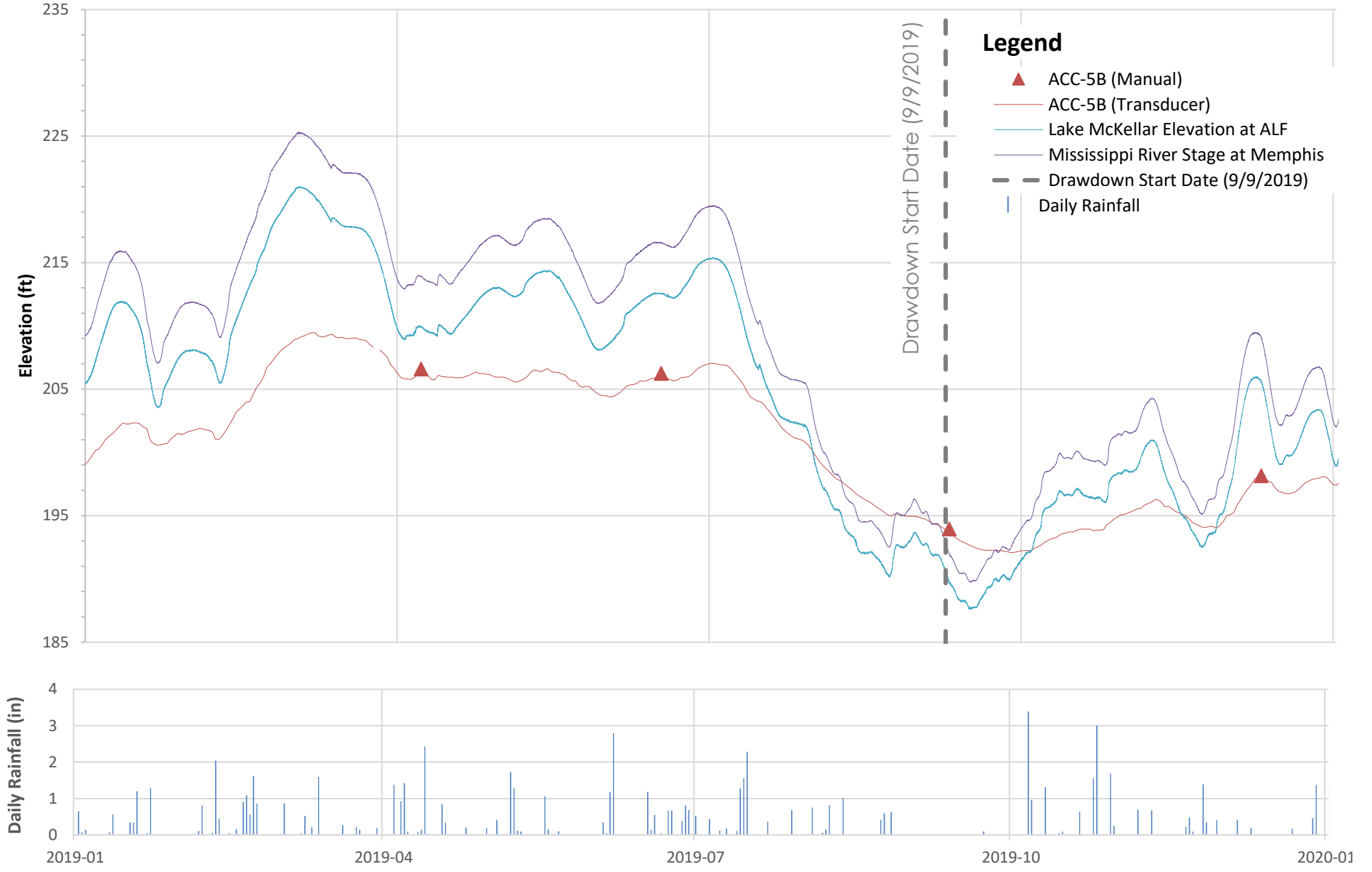
Stantec

Figure/Well No.

3 **ACC-5A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

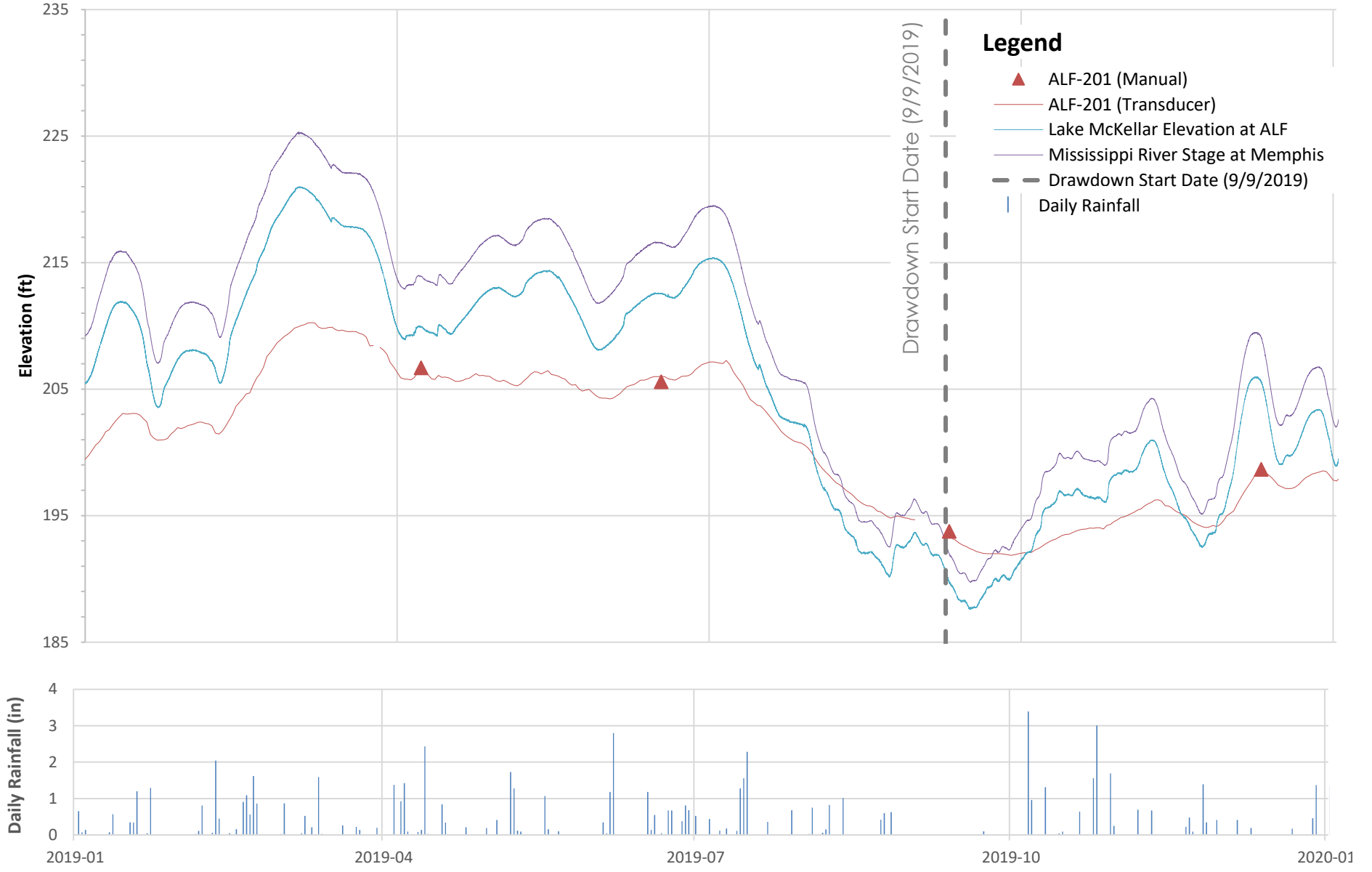
Stantec

Figure/Well No.

4 **ACC-5B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

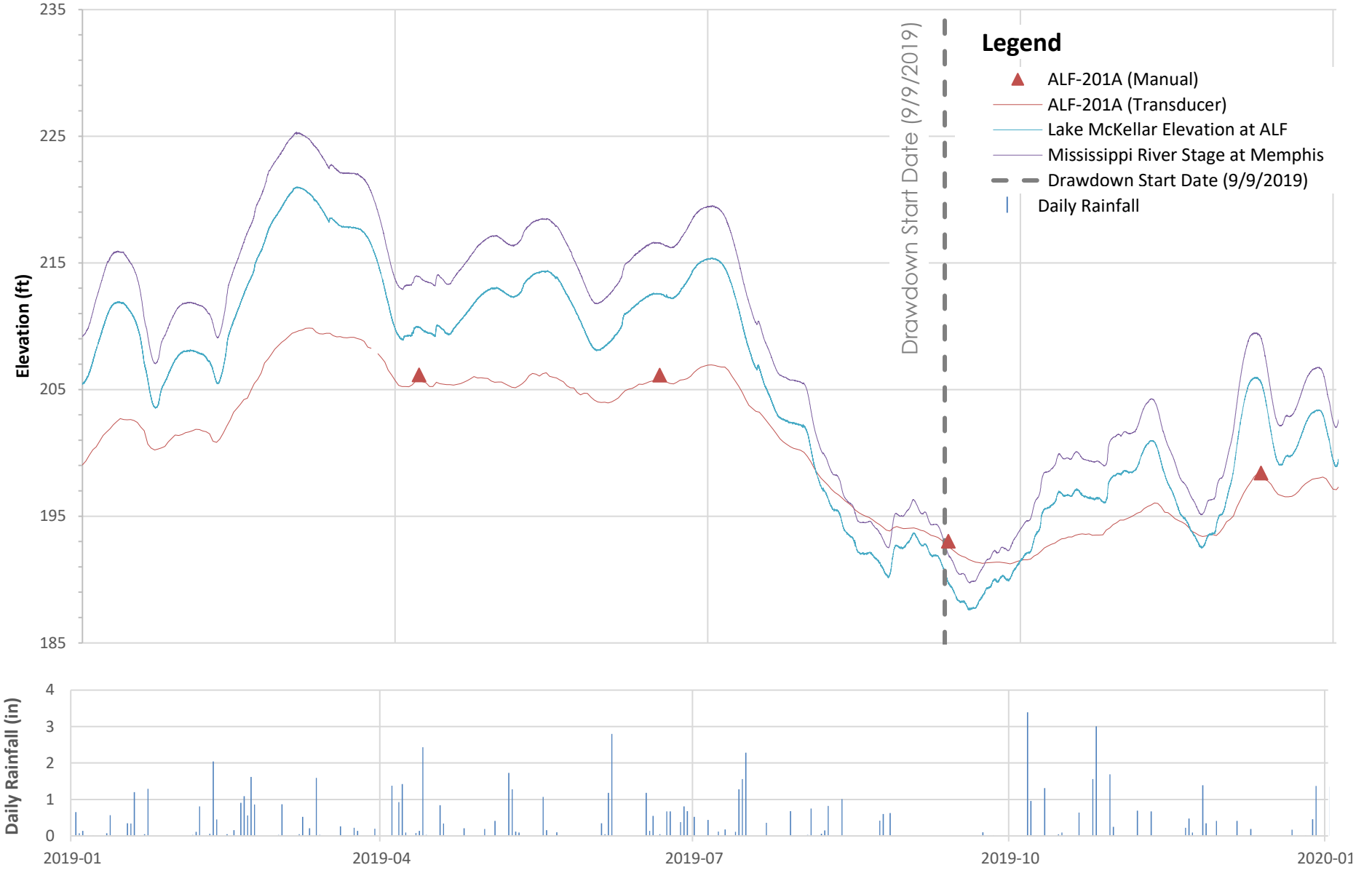
Stantec

Figure/Well No.

5 **ALF-201**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

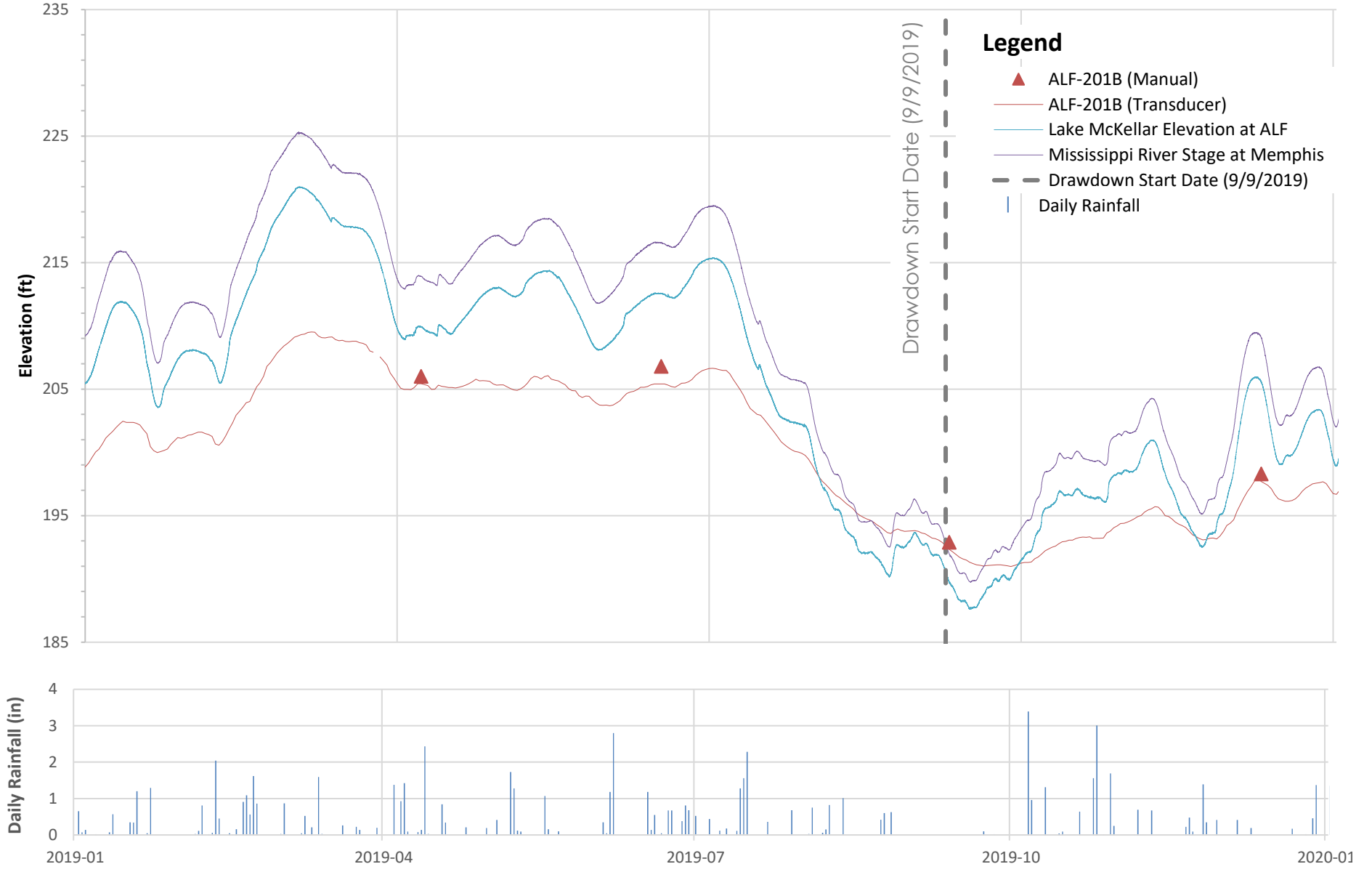
Stantec

Figure/Well No.

6 **ALF-201A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

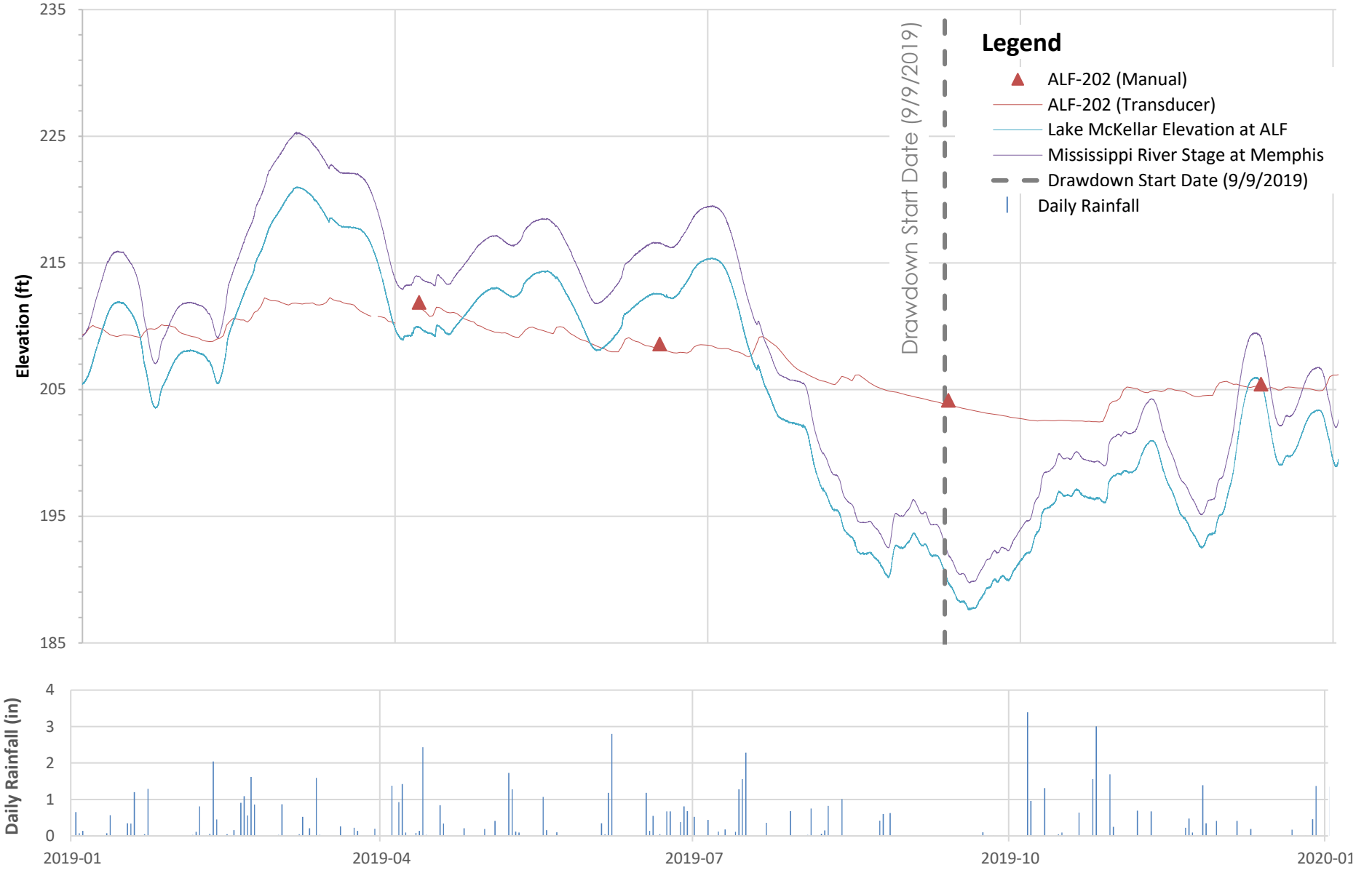
Stantec

Figure/Well No.

7 **ALF-201B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

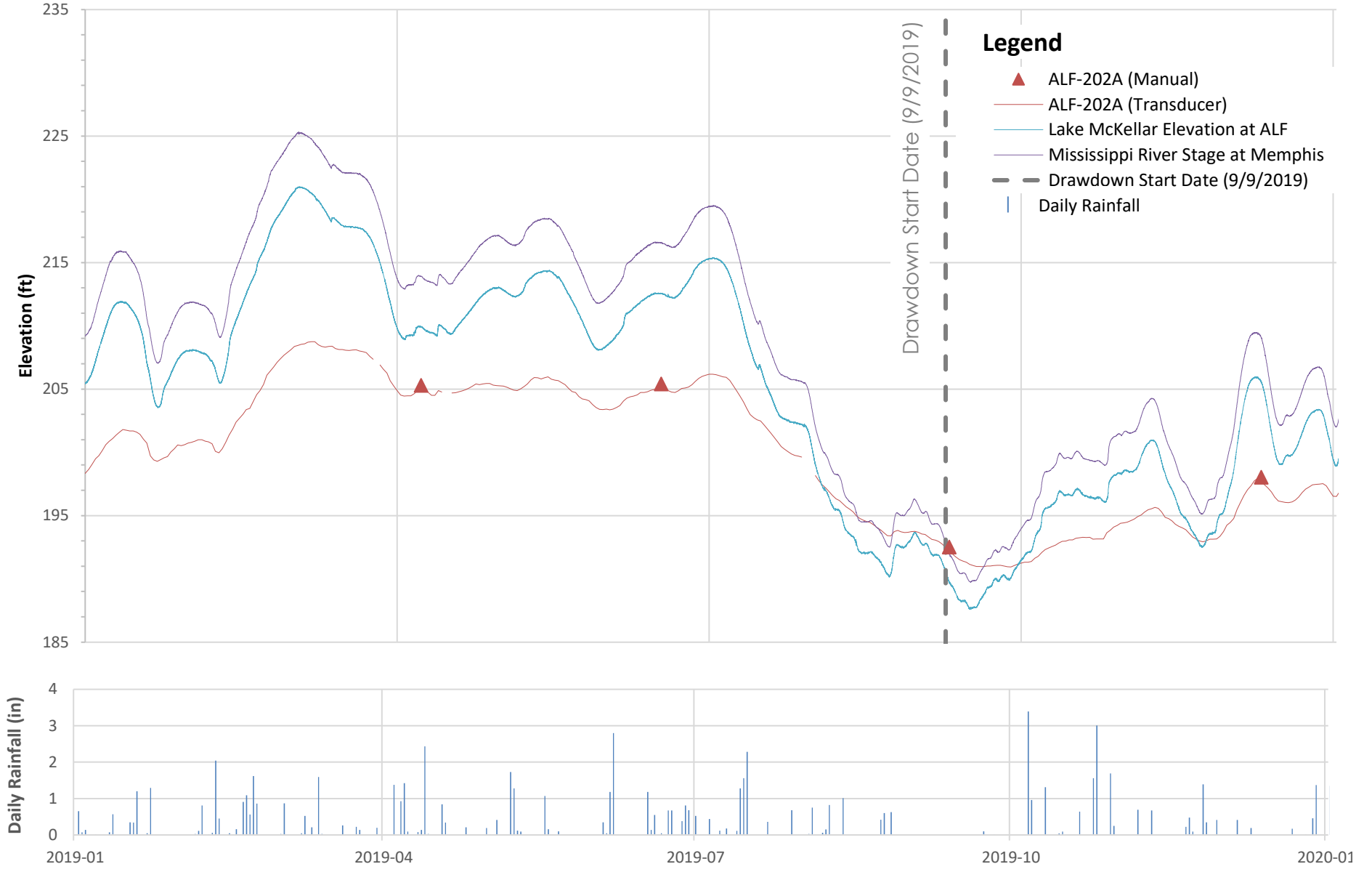
Stantec

Figure/Well No.

8 **ALF-202**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

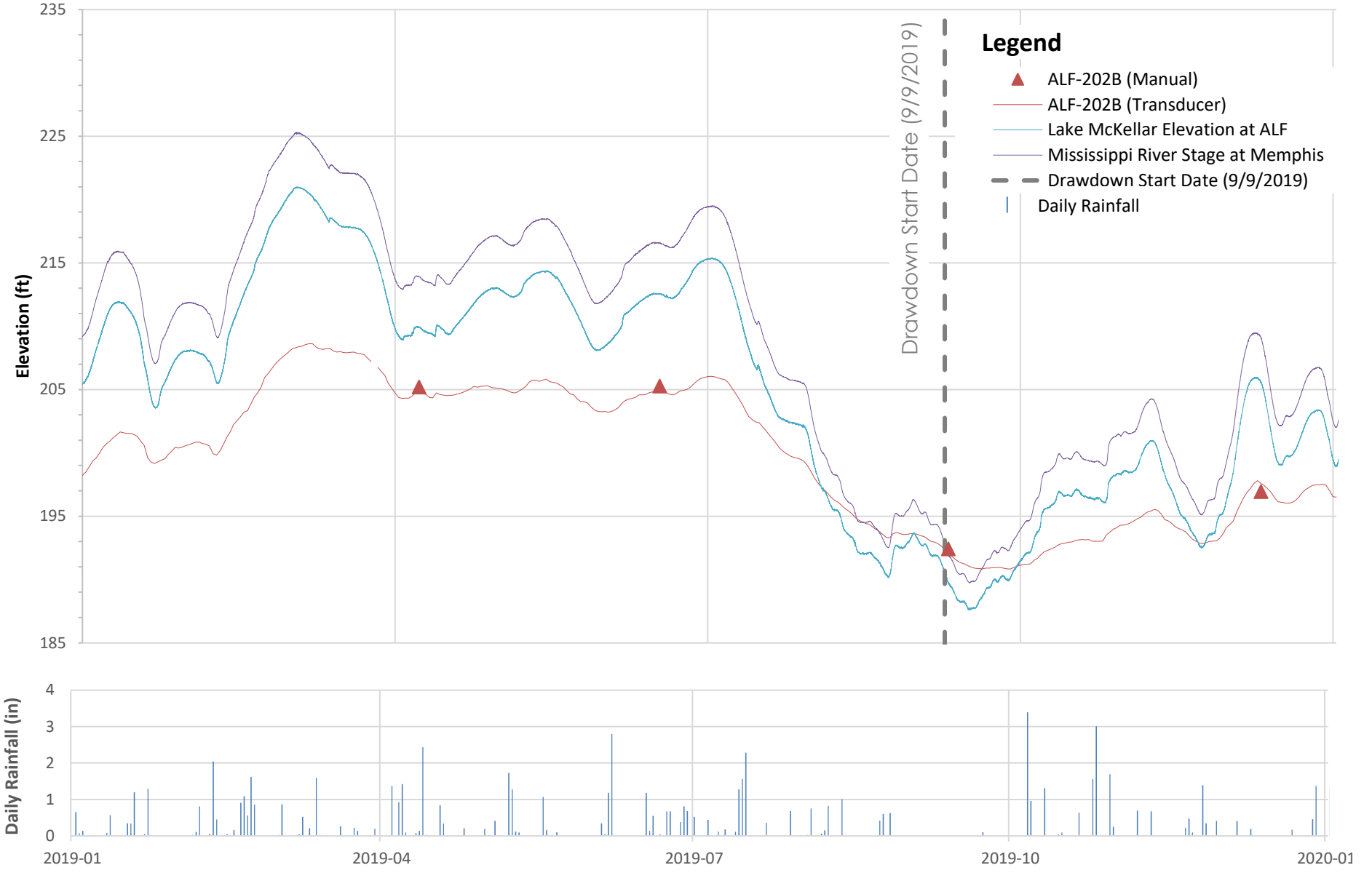
Stantec

Figure/Well No.

9 **ALF-202A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

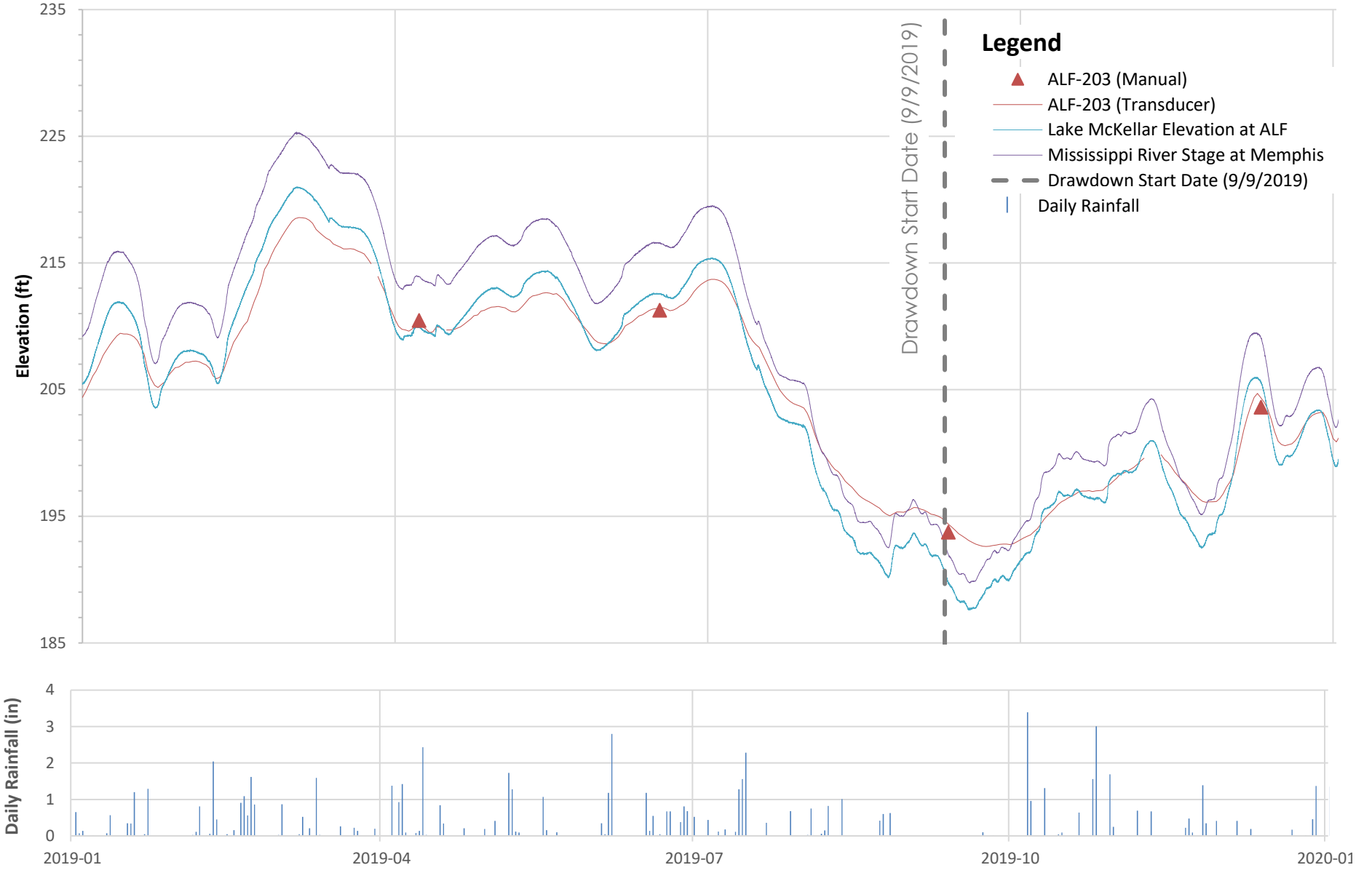
Stantec

Figure/Well No.

10 **ALF-202B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

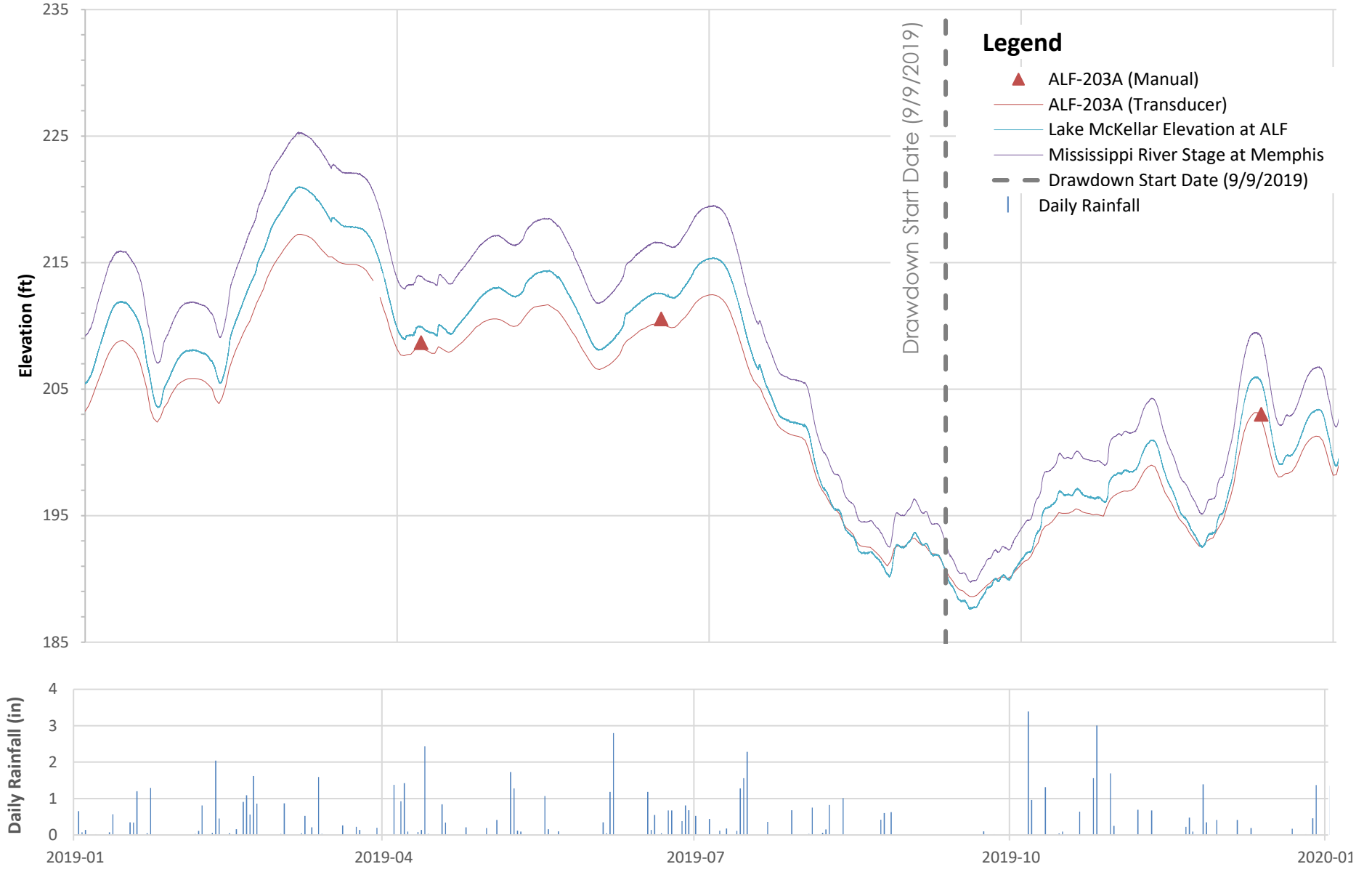
Stantec

Figure/Well No.

11 **ALF-203**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

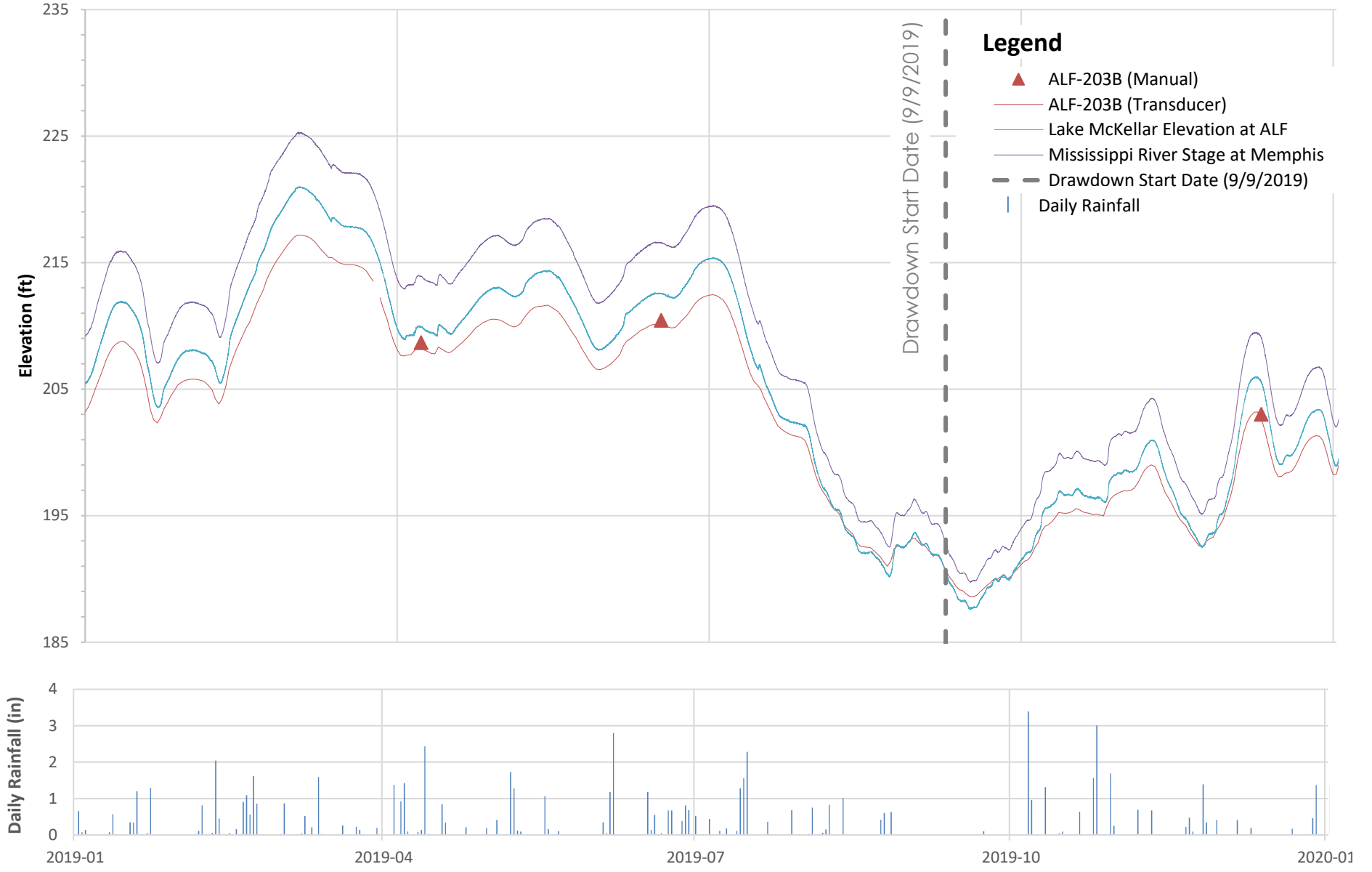
Stantec

Figure/Well No.

12 **ALF-203A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

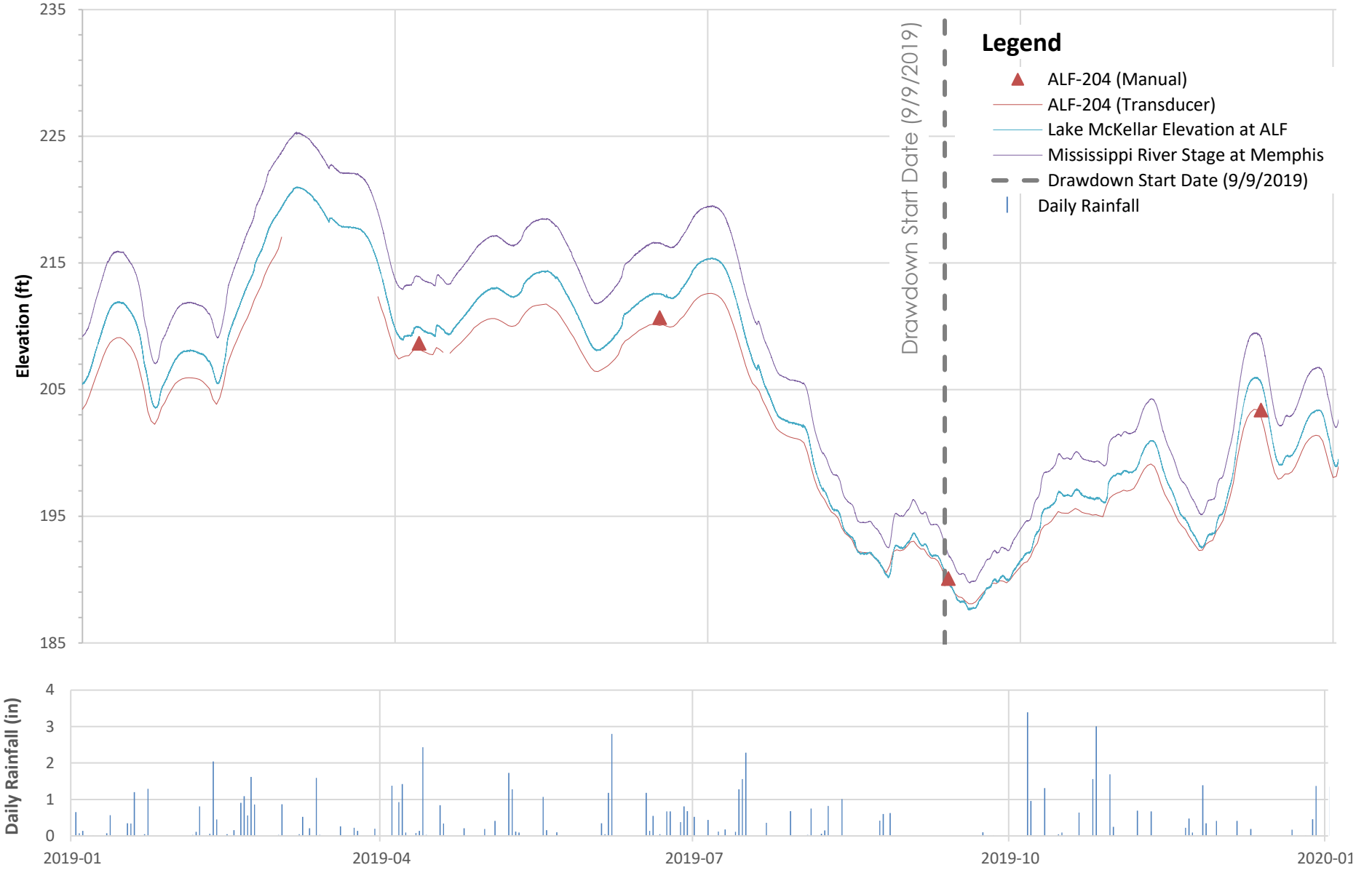
Stantec

Figure/Well No.

13 **ALF-203B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

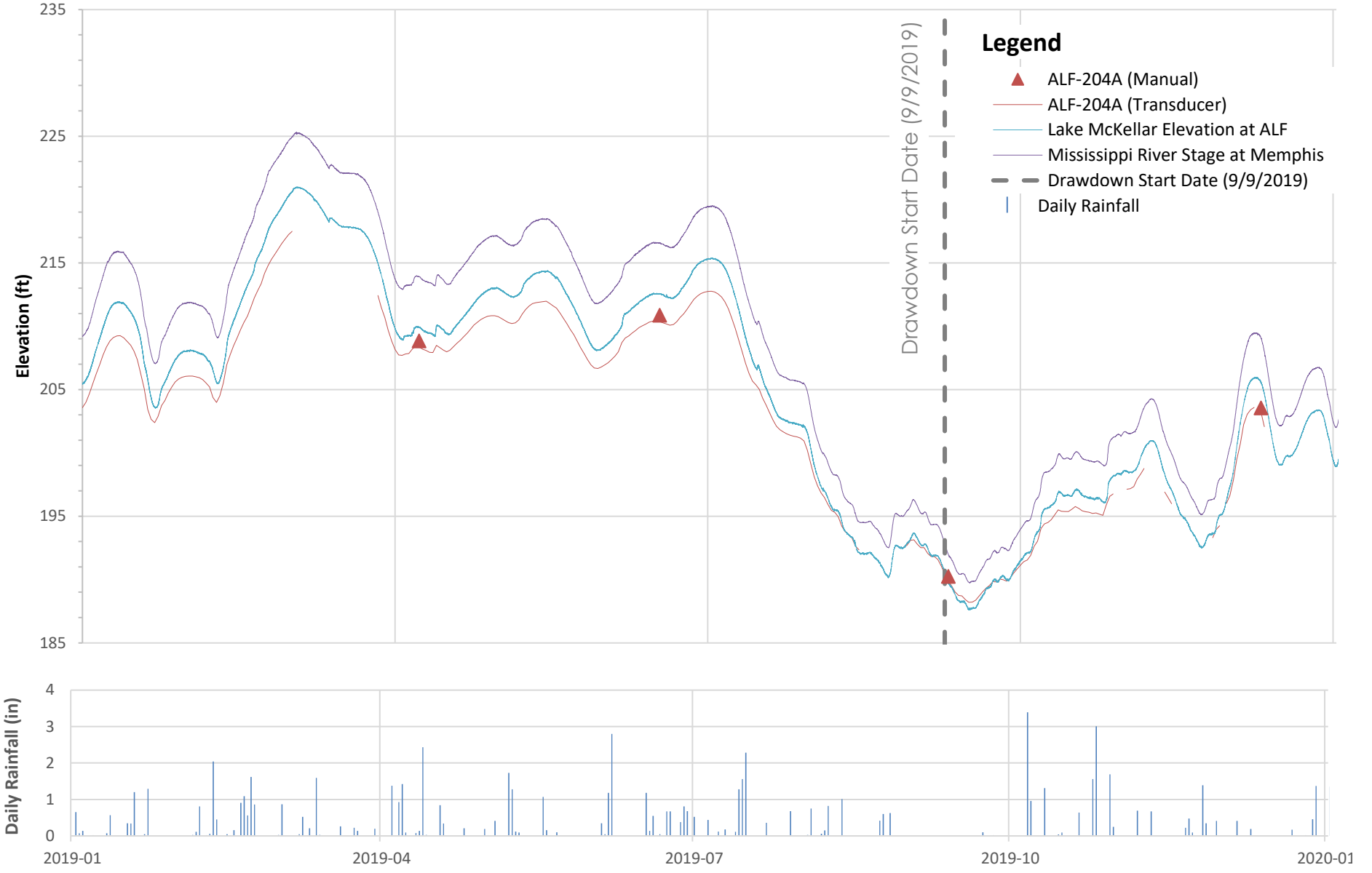
Stantec

Figure/Well No.

14 **ALF-204**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

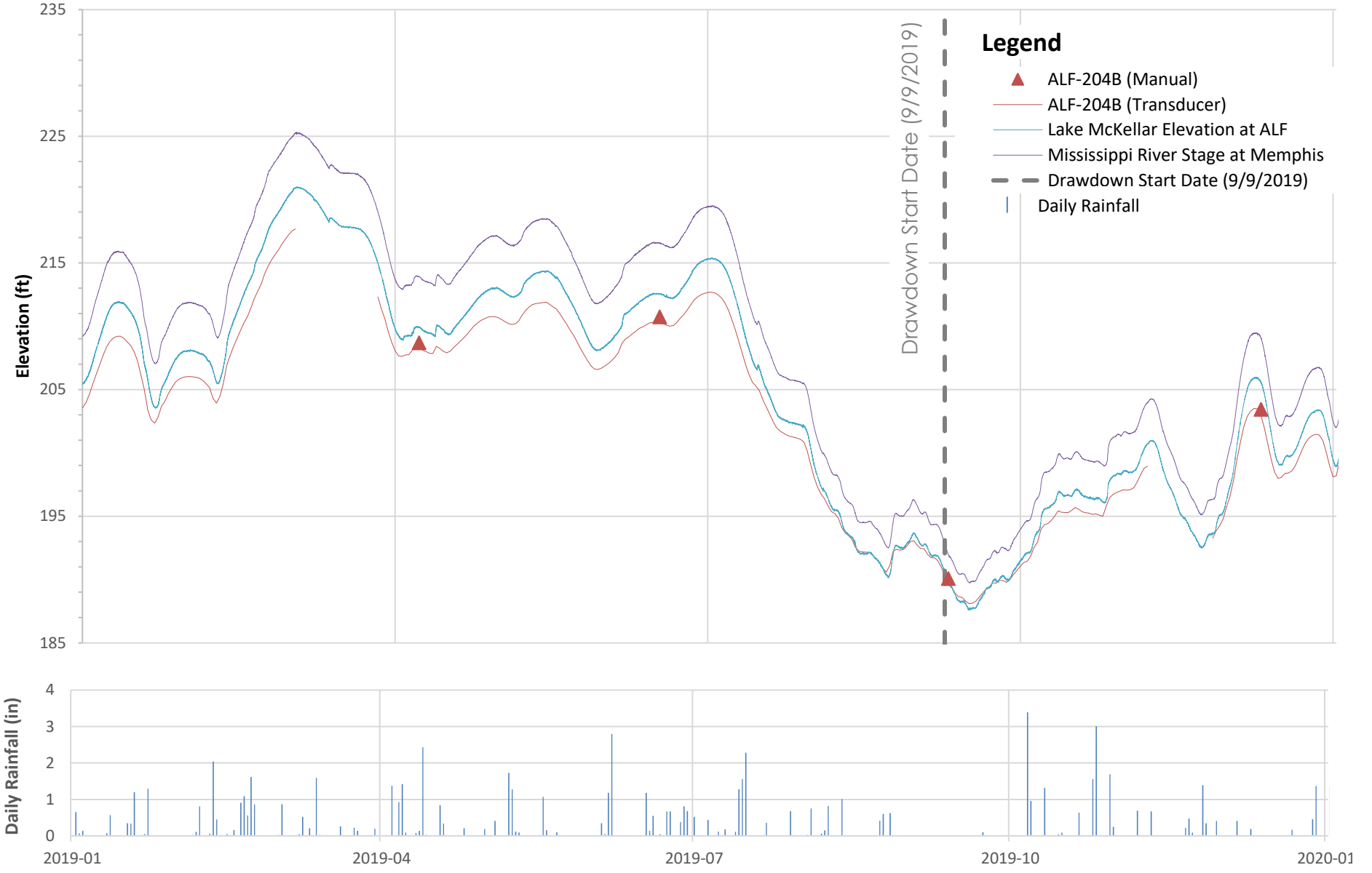
Stantec

Figure/Well No.

15 **ALF-204A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

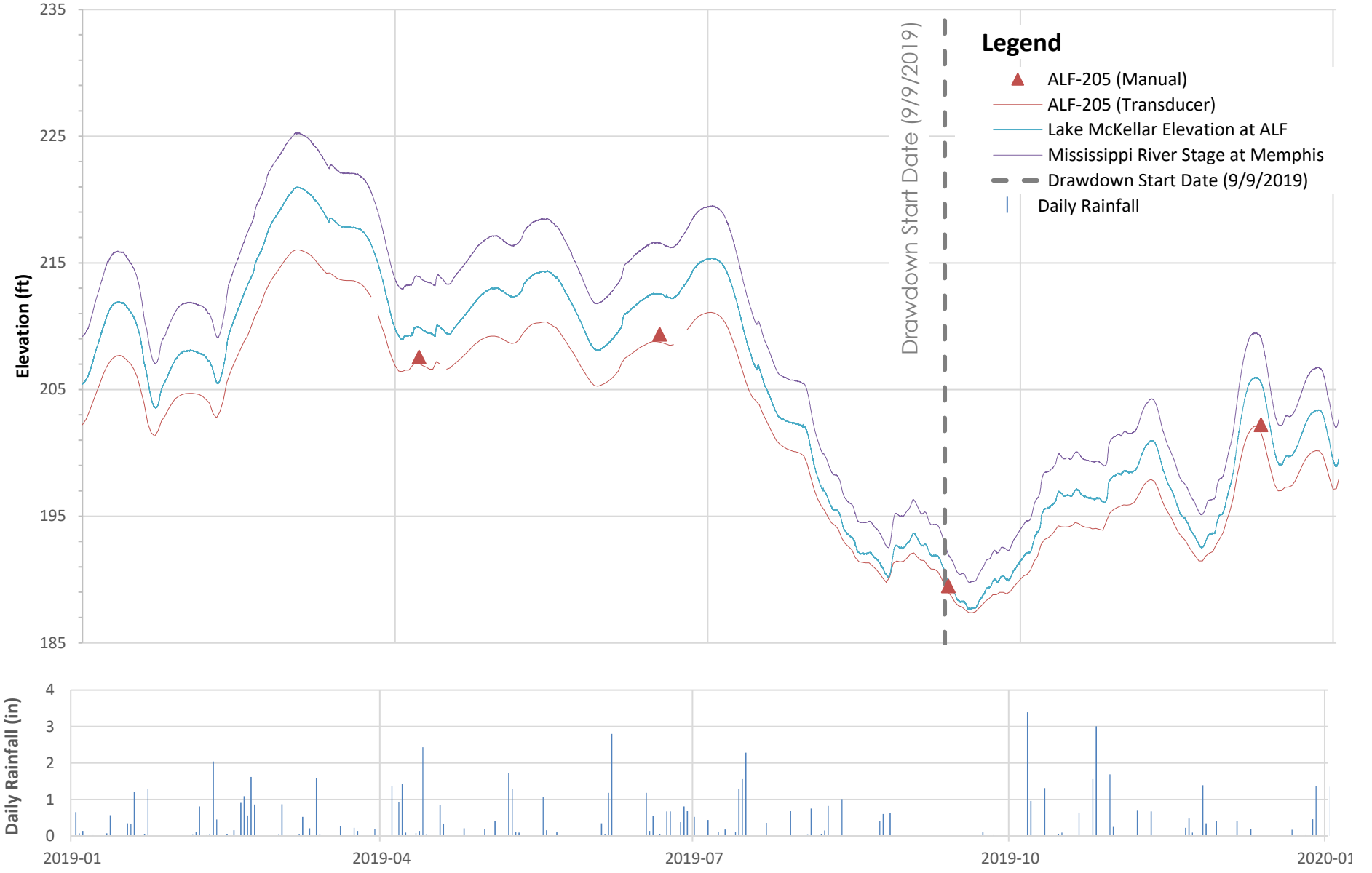
Stantec

Figure/Well No.

16 **ALF-204B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

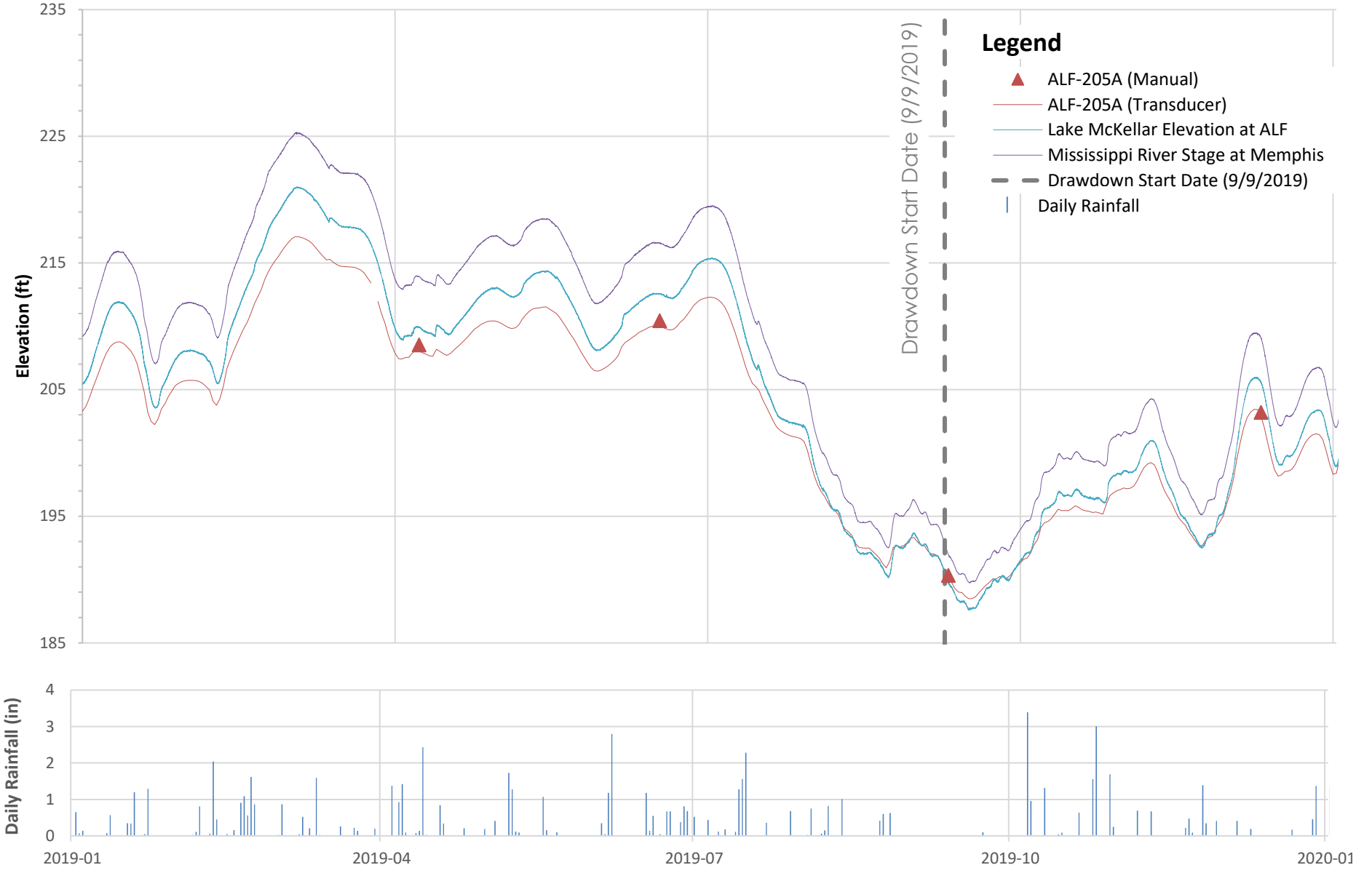
Stantec

Figure/Well No.

17 **ALF-205**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

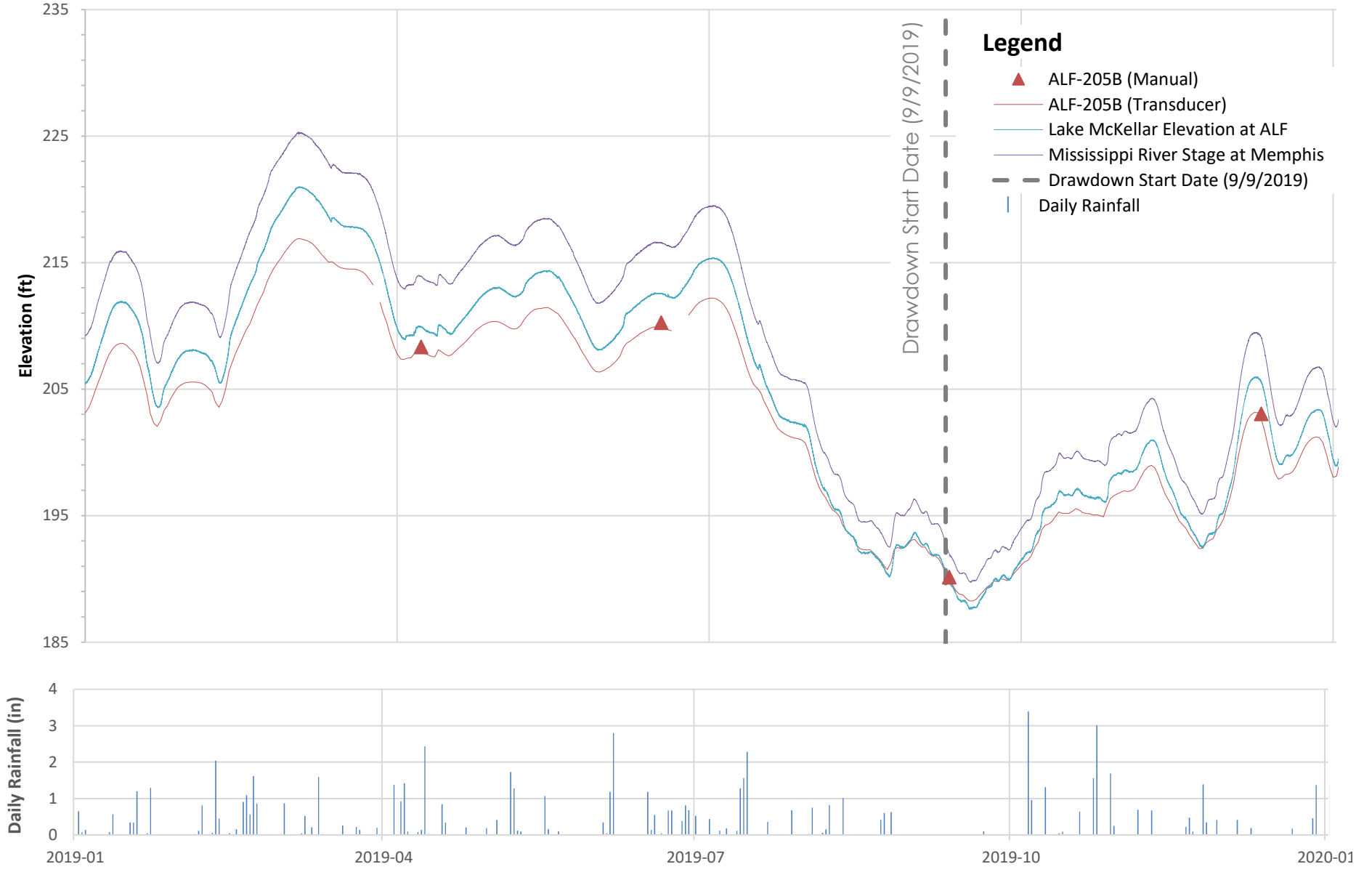
Stantec

Figure/Well No.

18 **ALF-205A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

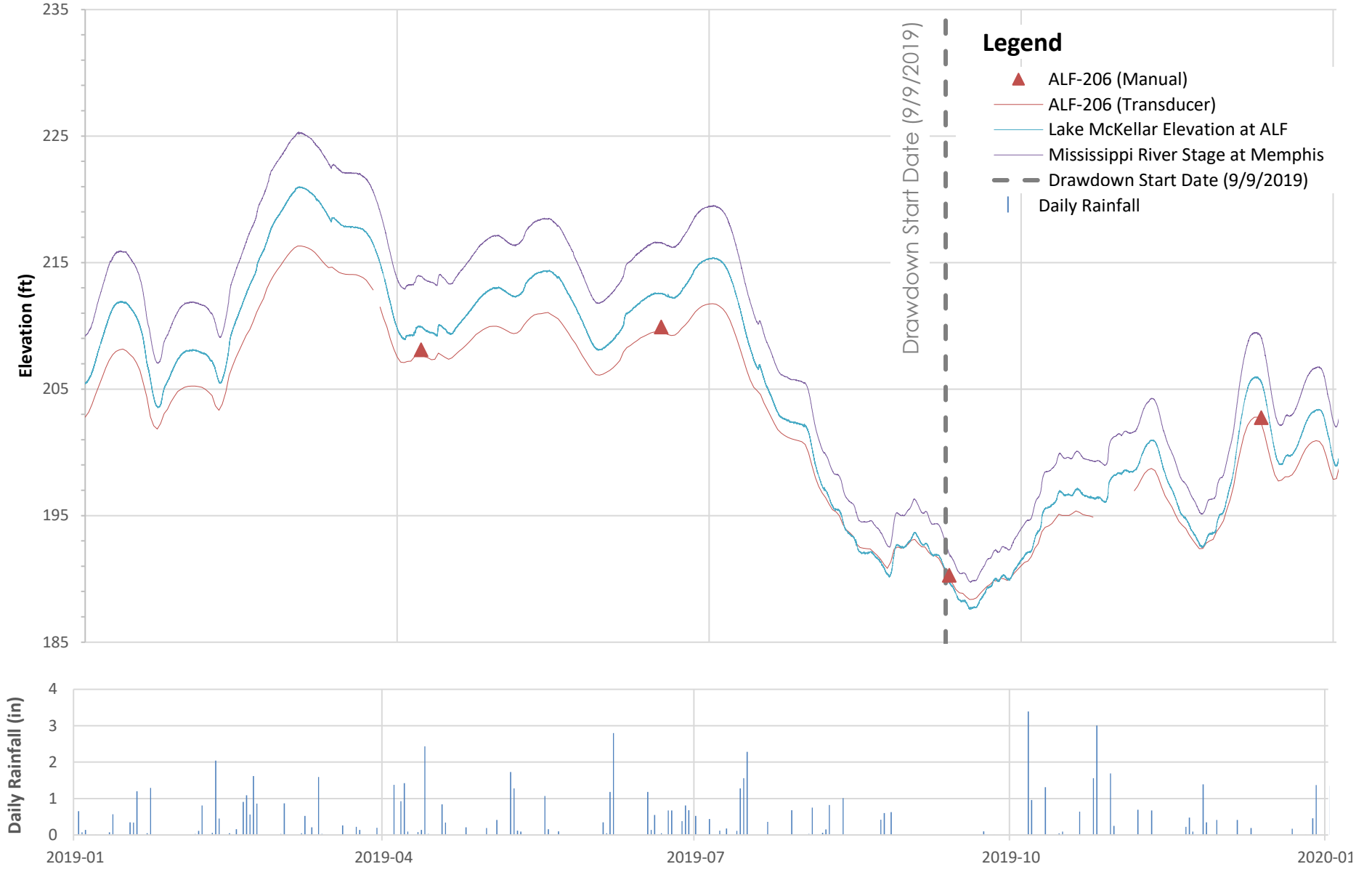
Stantec

Figure/Well No.

19 **ALF-205B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

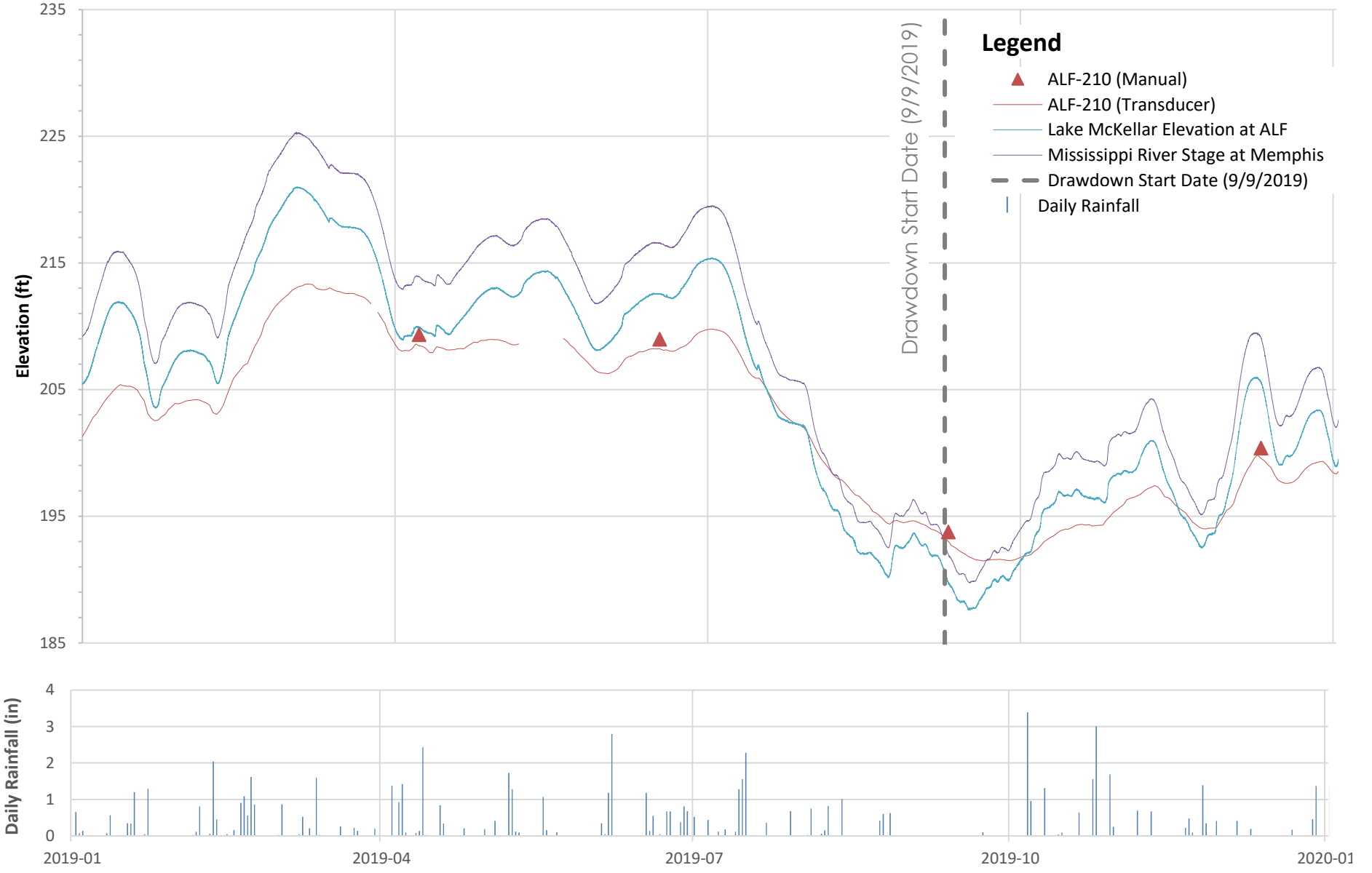
Stantec

Figure/Well No.

20 **ALF-206**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

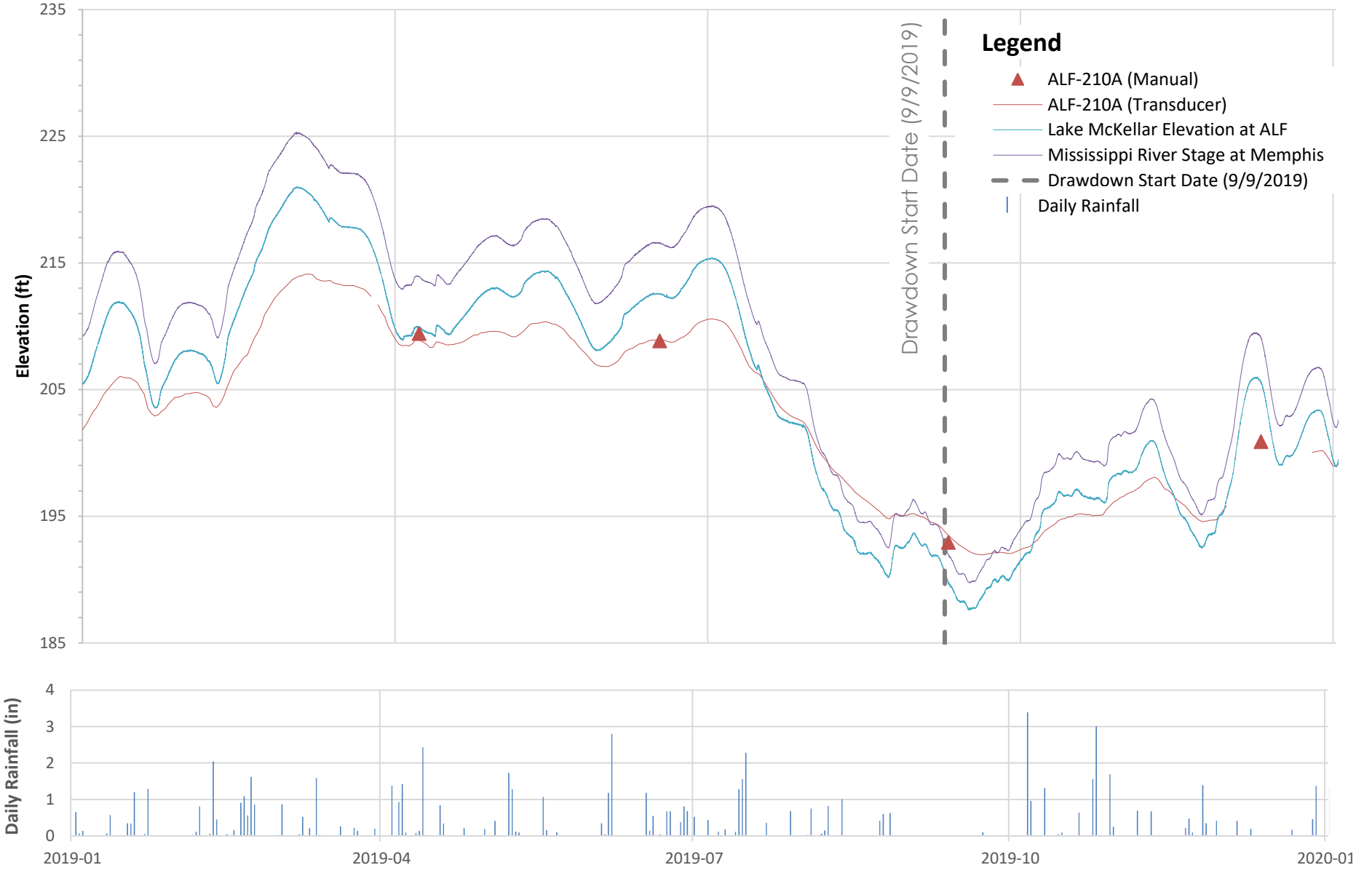
Stantec

Figure/Well No.

21 **ALF-210**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

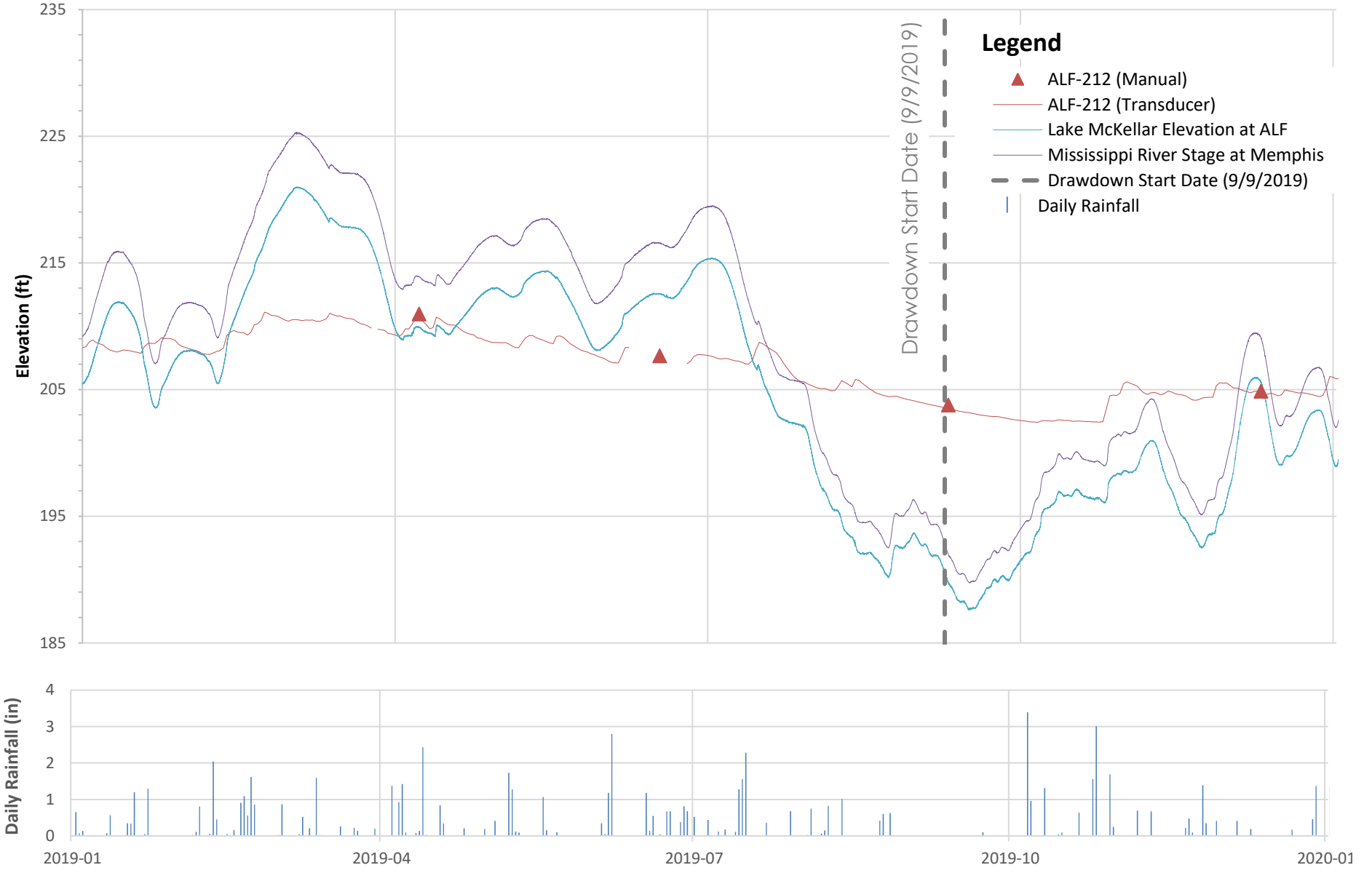
Stantec

Figure/Well No.

22 **ALF-210A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

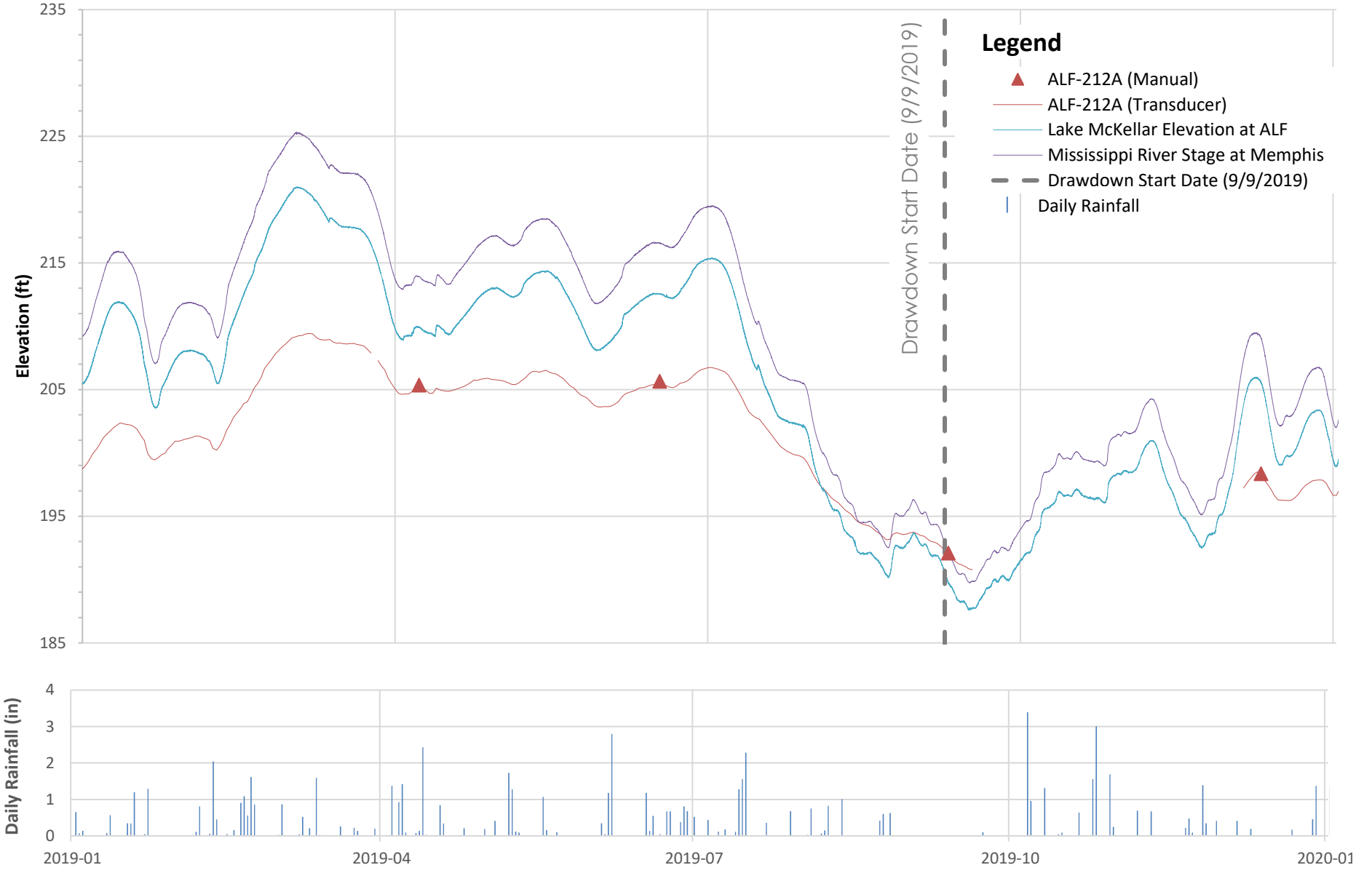
Stantec

Figure/Well No.

23 **ALF-212**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

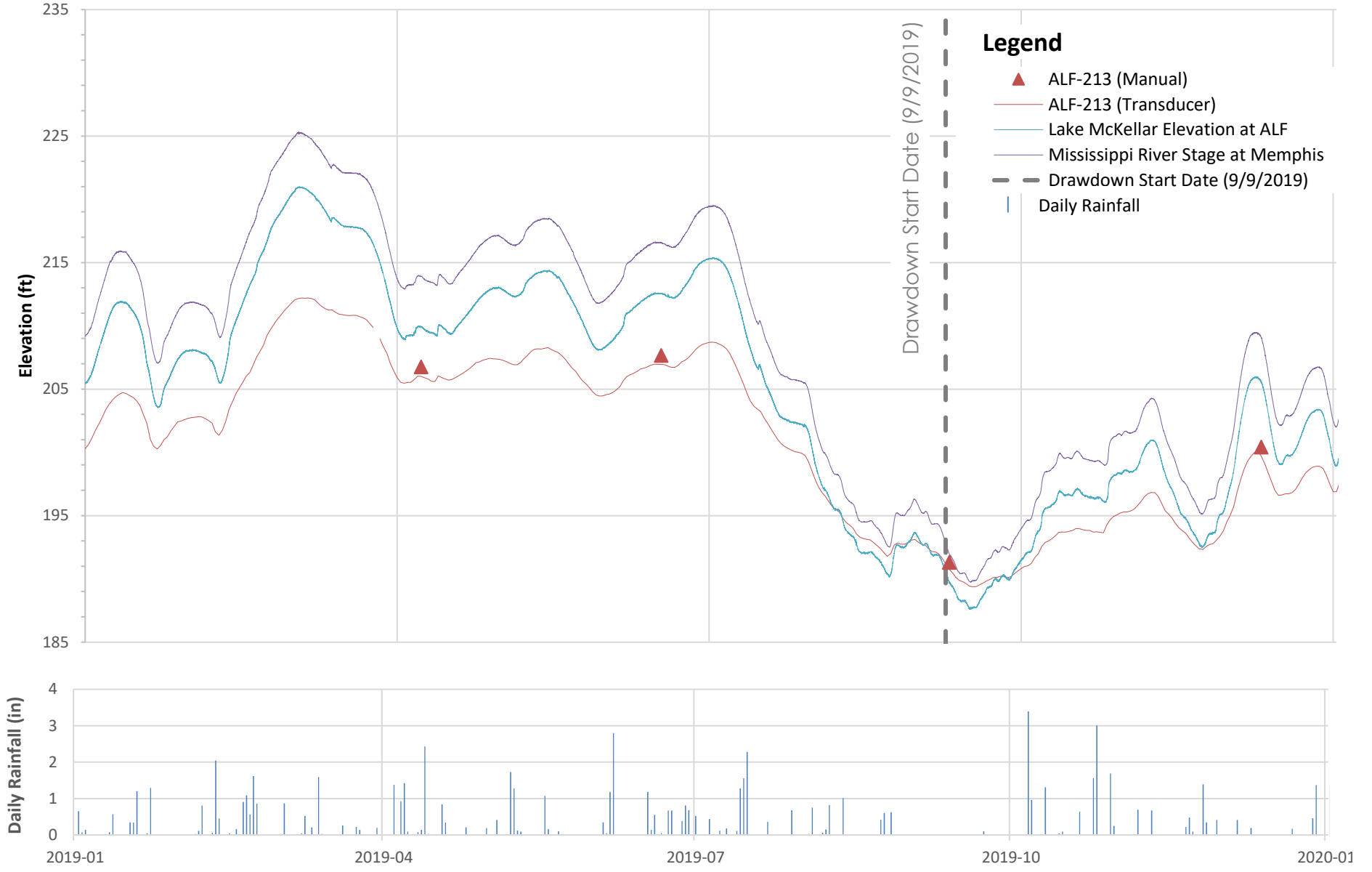
Stantec

Figure/Well No.

24 **ALF-212A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

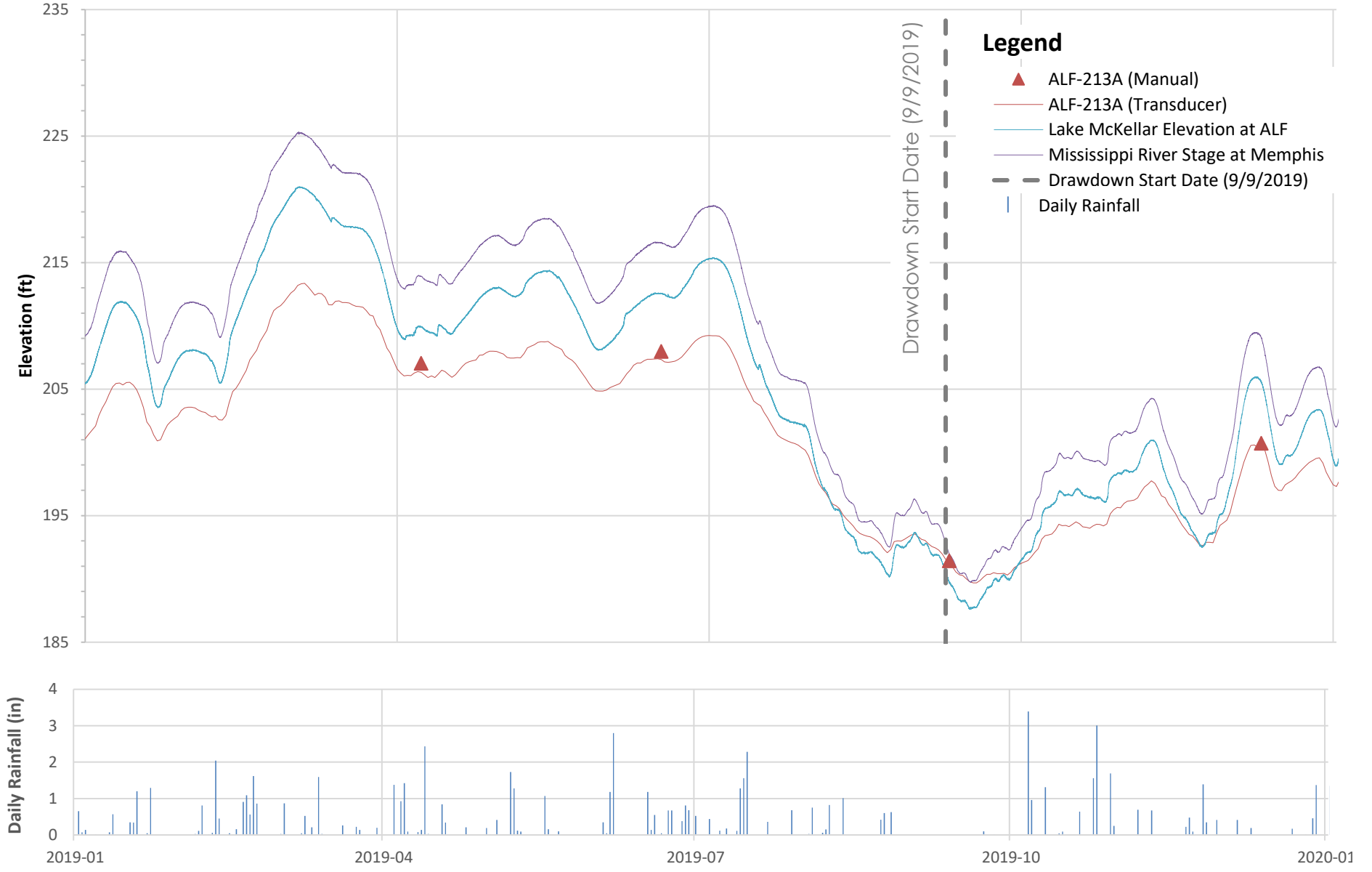
Stantec

Figure/Well No.

25 **ALF-213**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

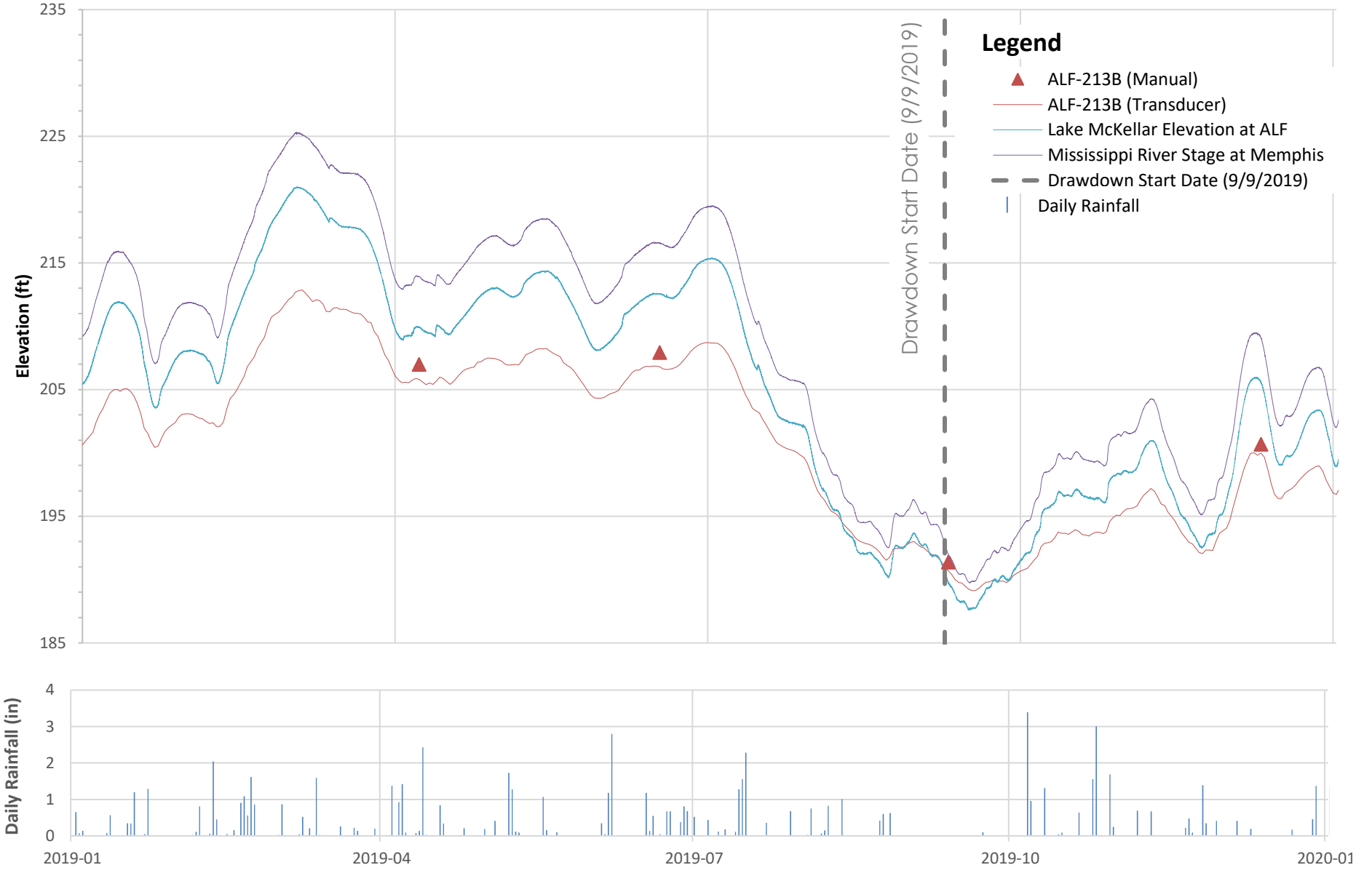
Stantec

Figure/Well No.

26 **ALF-213A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

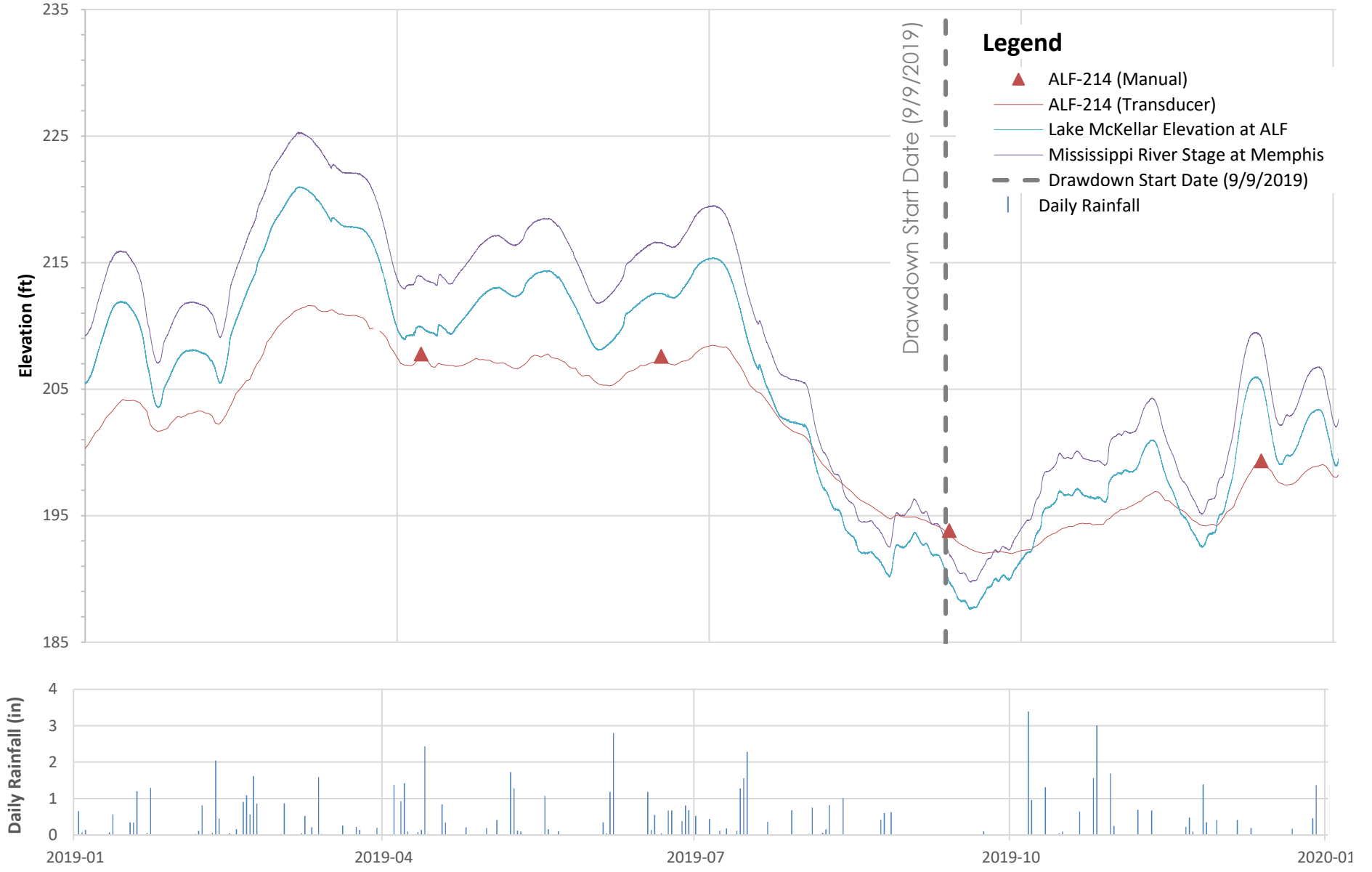
Stantec

Figure/Well No.

27 **ALF-213B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

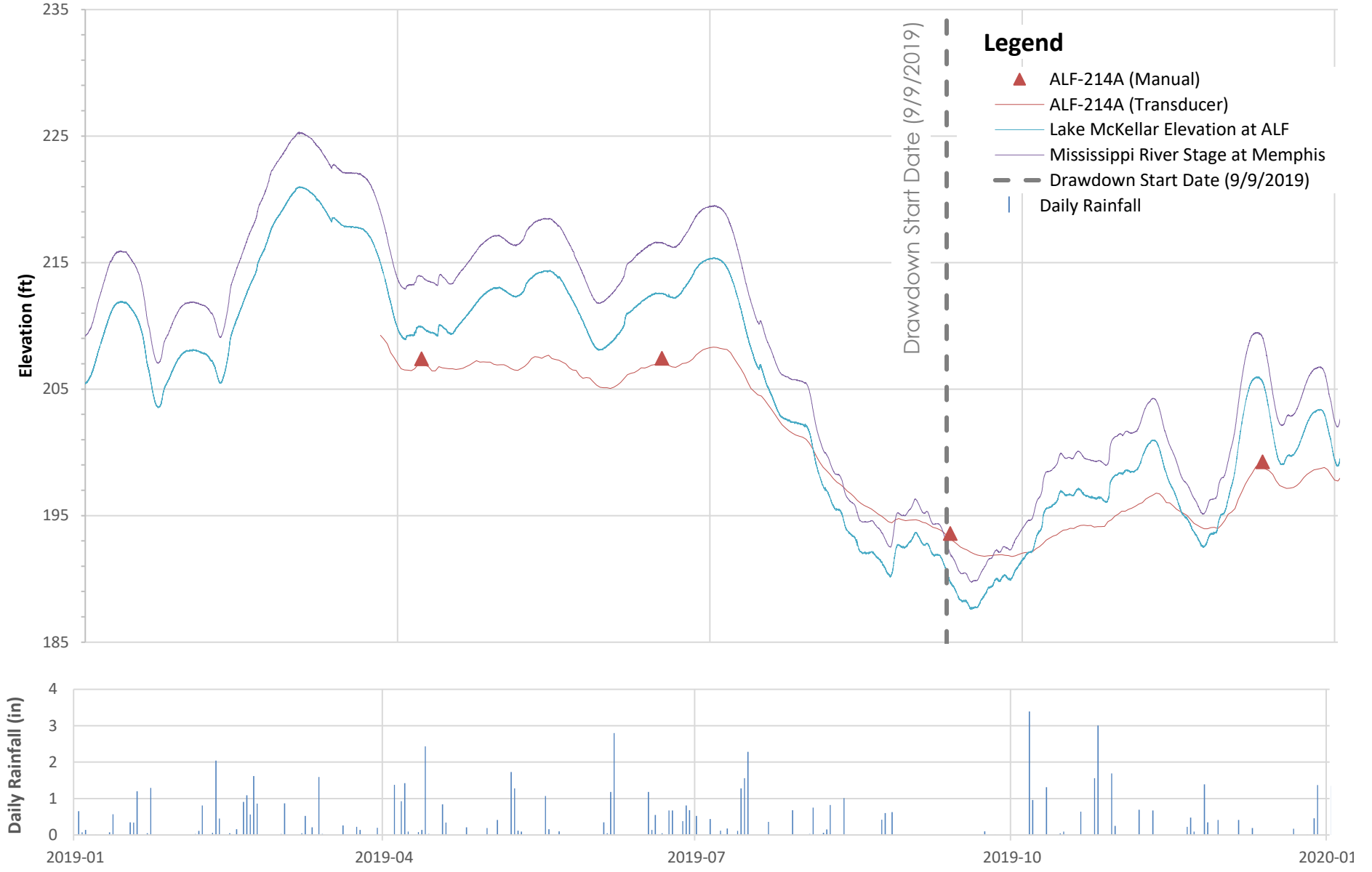
Stantec

Figure/Well No.

28 **ALF-214**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Notes:

There was an iSite data gap in the data acquisition between 12/4/2018 and 3/28/2019 for ALF-214A. wire analyzer and is not representative of water level fluctuations in The well.

Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

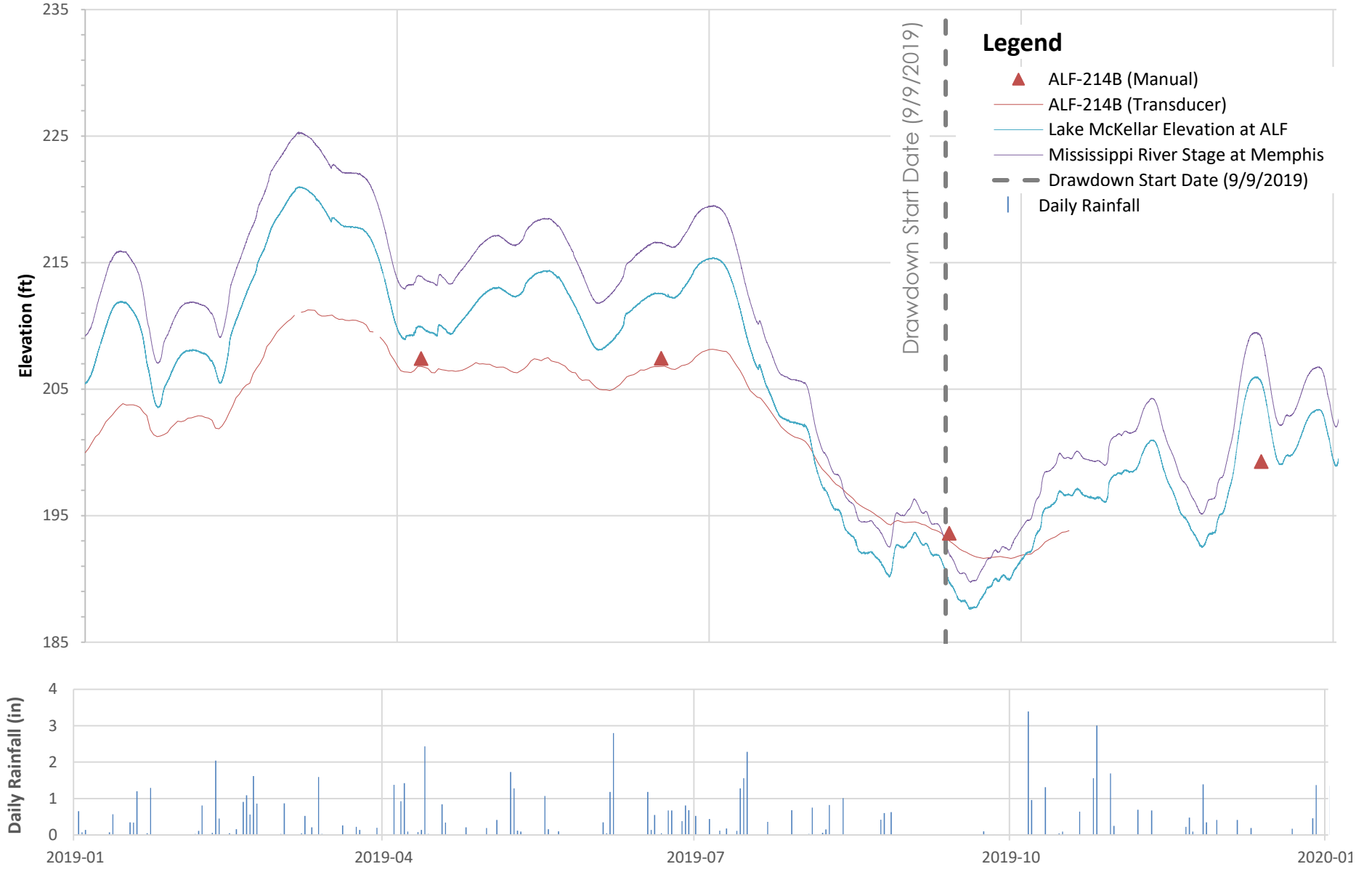
Stantec

Figure/Well No.

29 **ALF-214A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

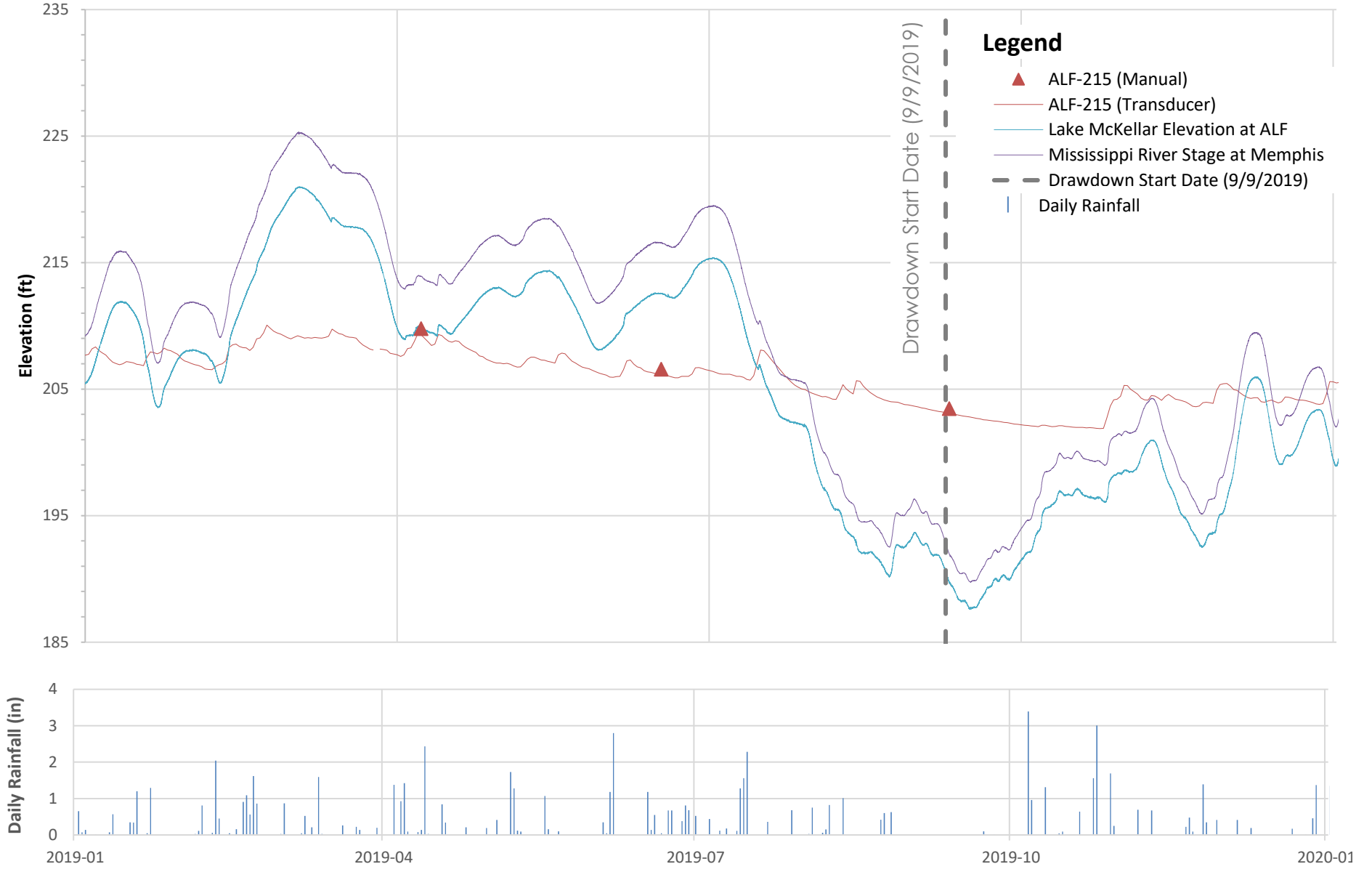
Stantec

Figure/Well No.

30 **ALF-214B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

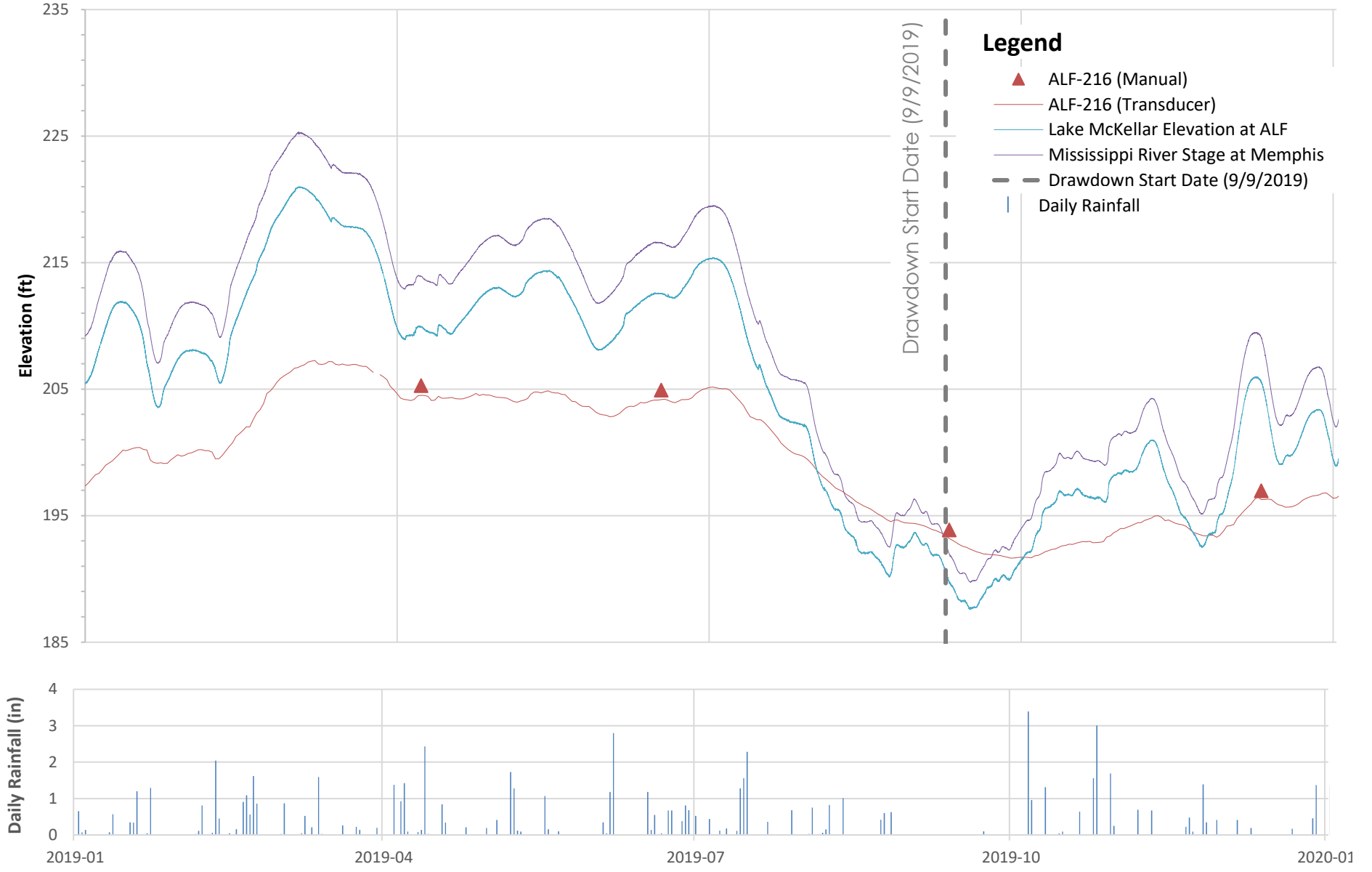
Stantec

Figure/Well No.

31 **ALF-215**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

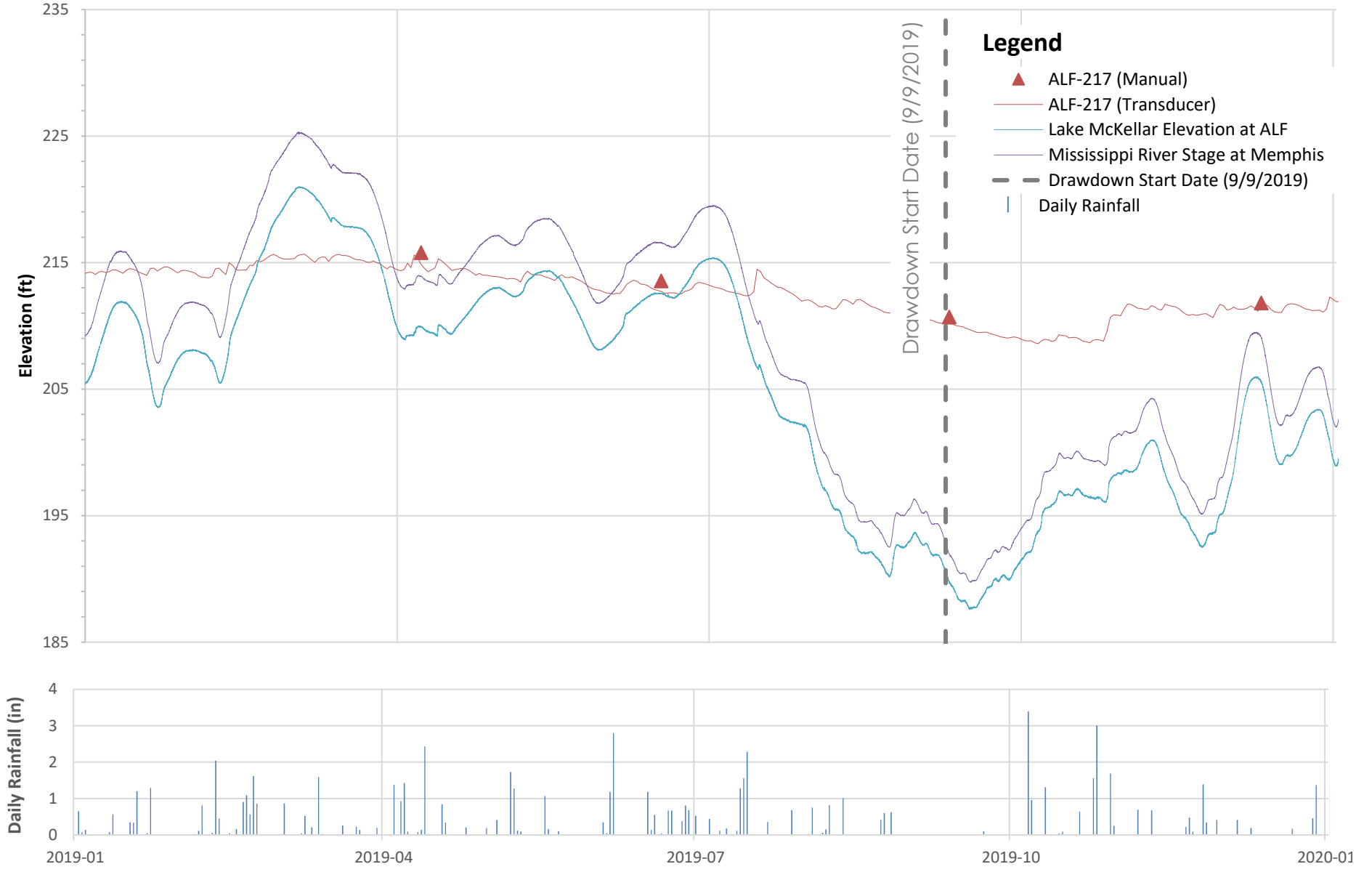
Stantec

Figure/Well No.

32 **ALF-216**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

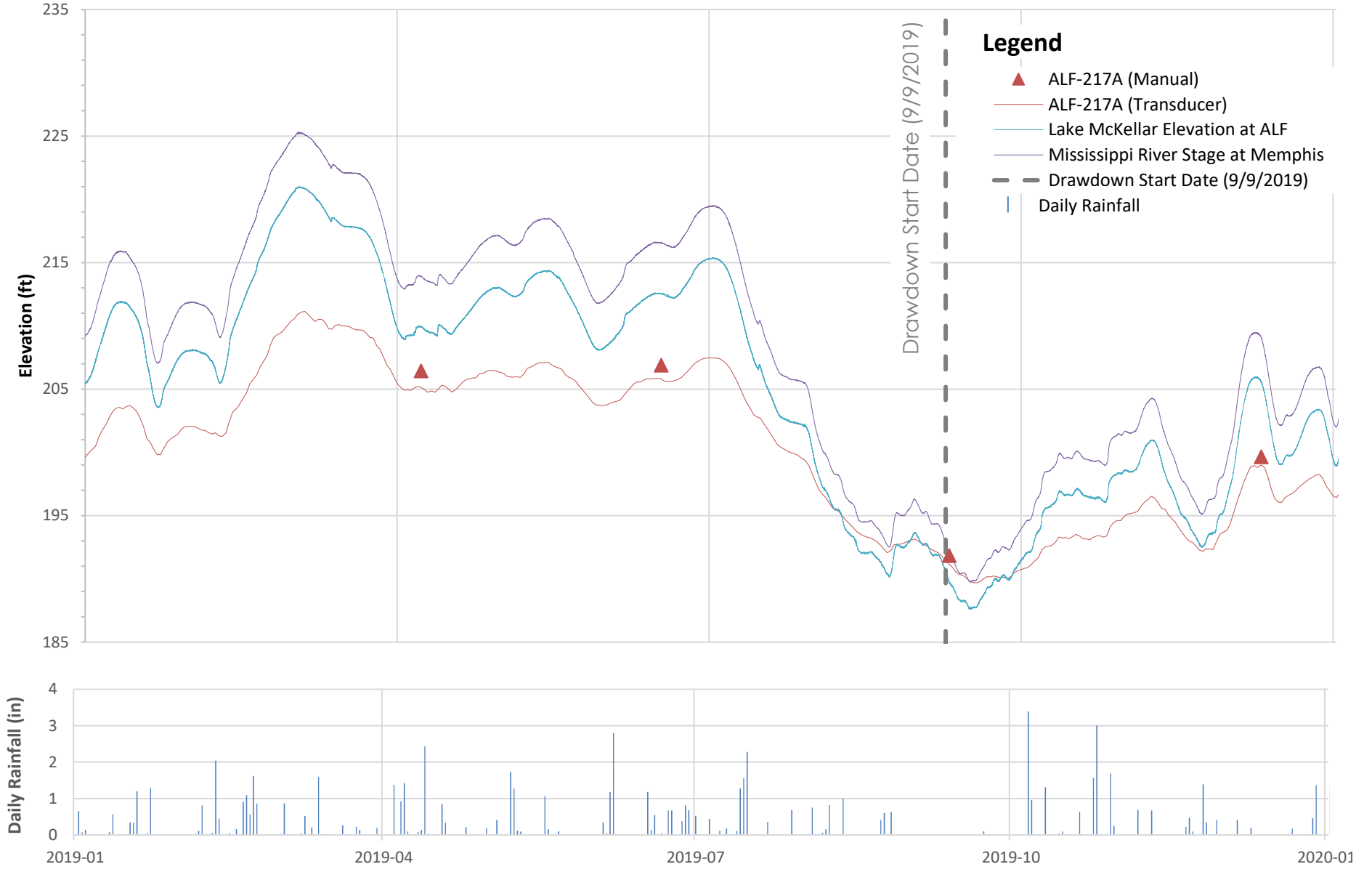
Stantec

Figure/Well No.

33 **ALF-217**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

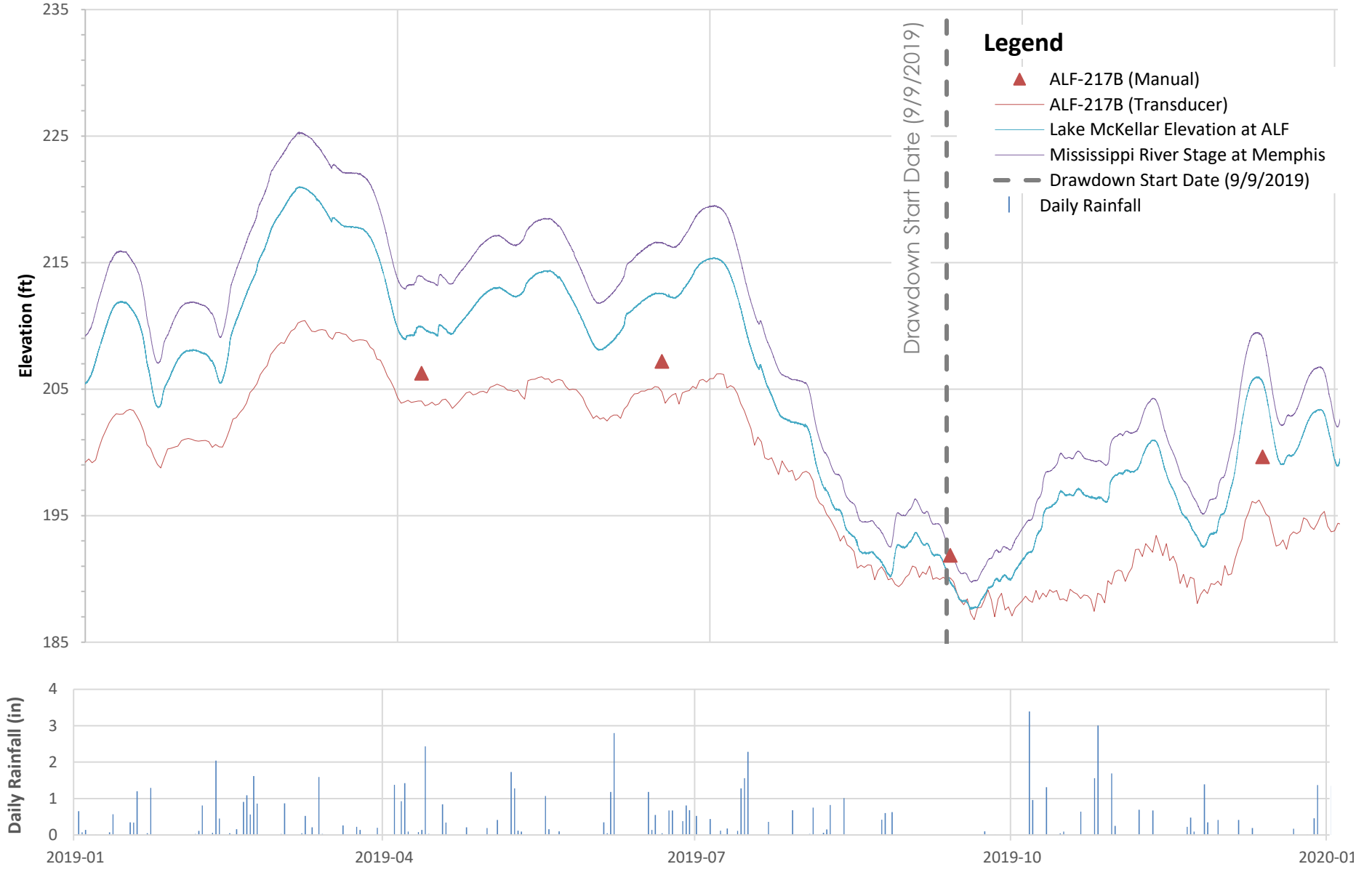
Stantec

Figure/Well No.

34 **ALF-217A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Notes:

The data for this sensor is in question due to oscillating data for high frequency measurements. This sensor appears to be affected by a malfunctioning transducer or vibrating wire analyzer and is not representative of water level fluctuations in the well.

Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

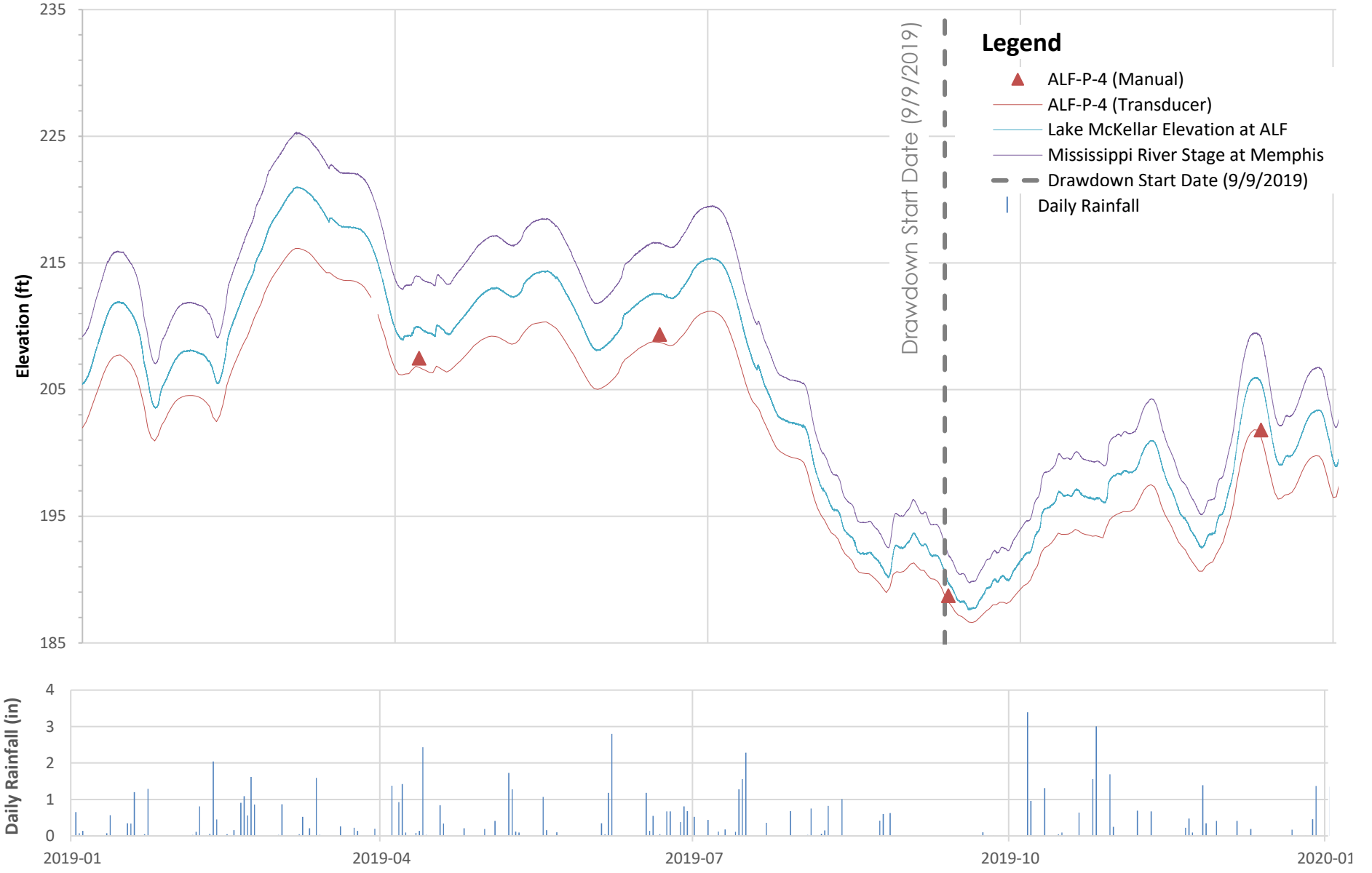
Stantec

Figure/Well No.

35 **ALF-217B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

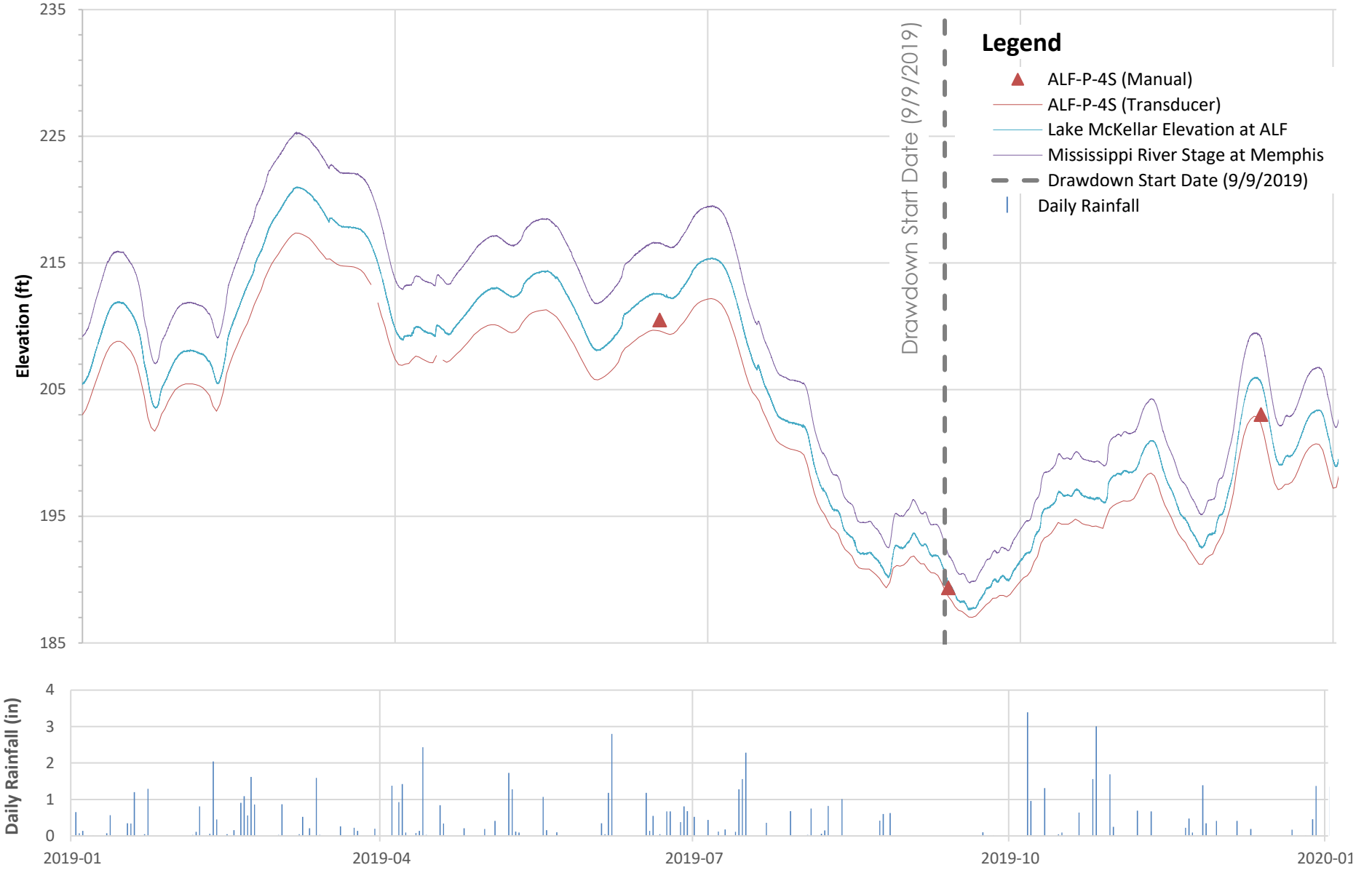
Stantec

Figure/Well No.

36 **ALF-P-4**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

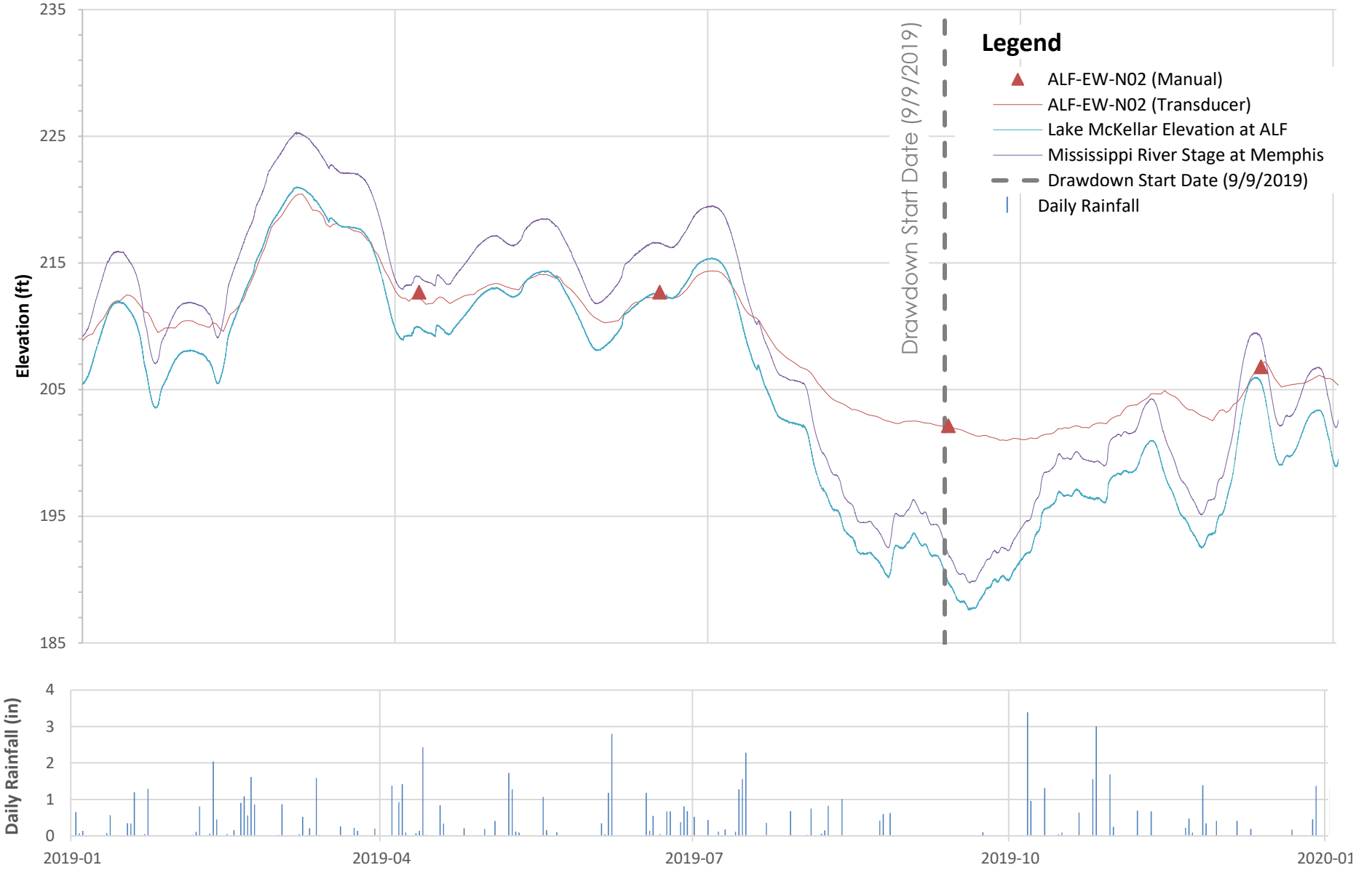
Stantec

Figure/Well No.

37 **ALF-P-4S**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

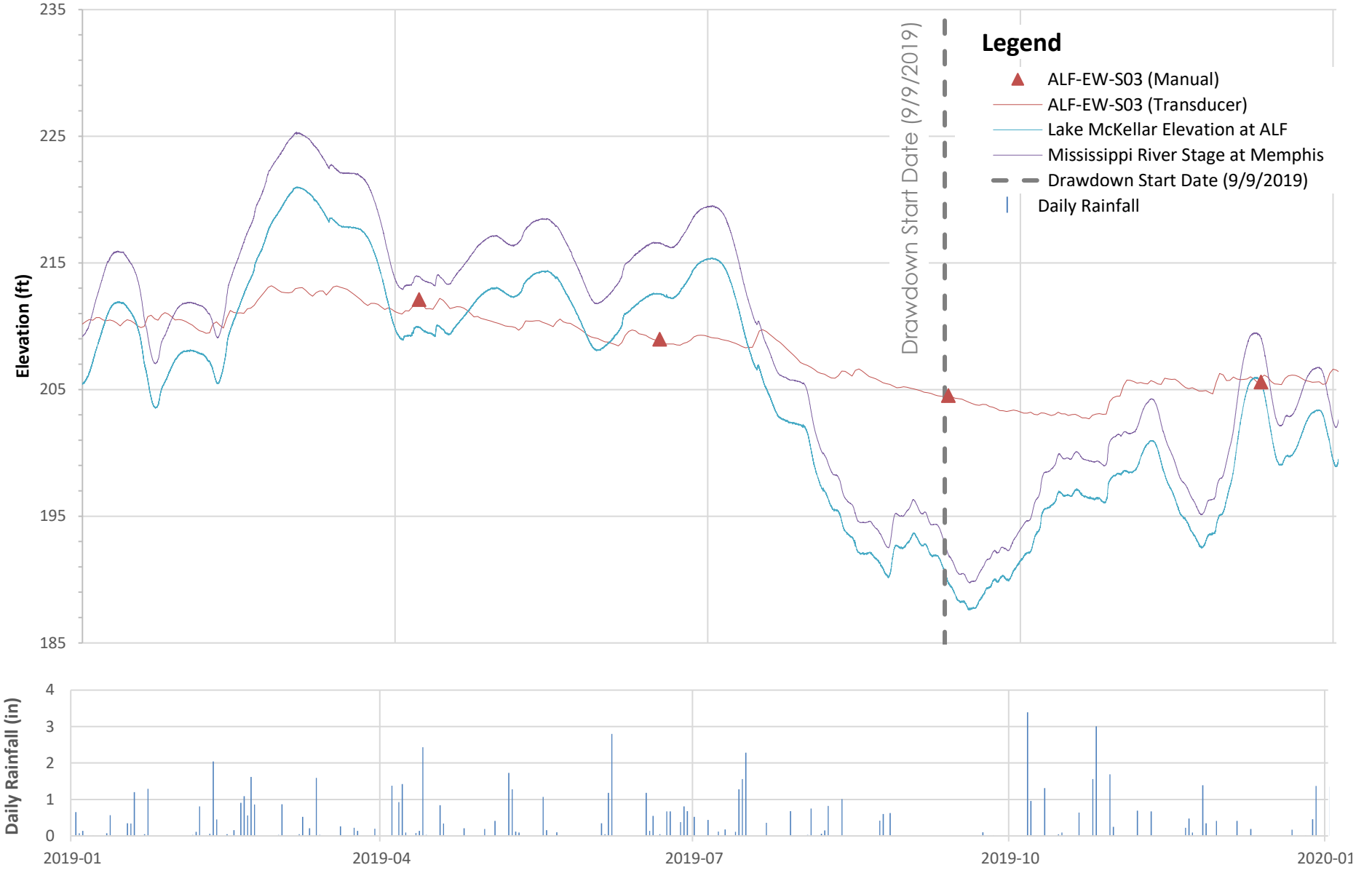
Stantec

Figure/Well No.

38 **ALF-EW-N02**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

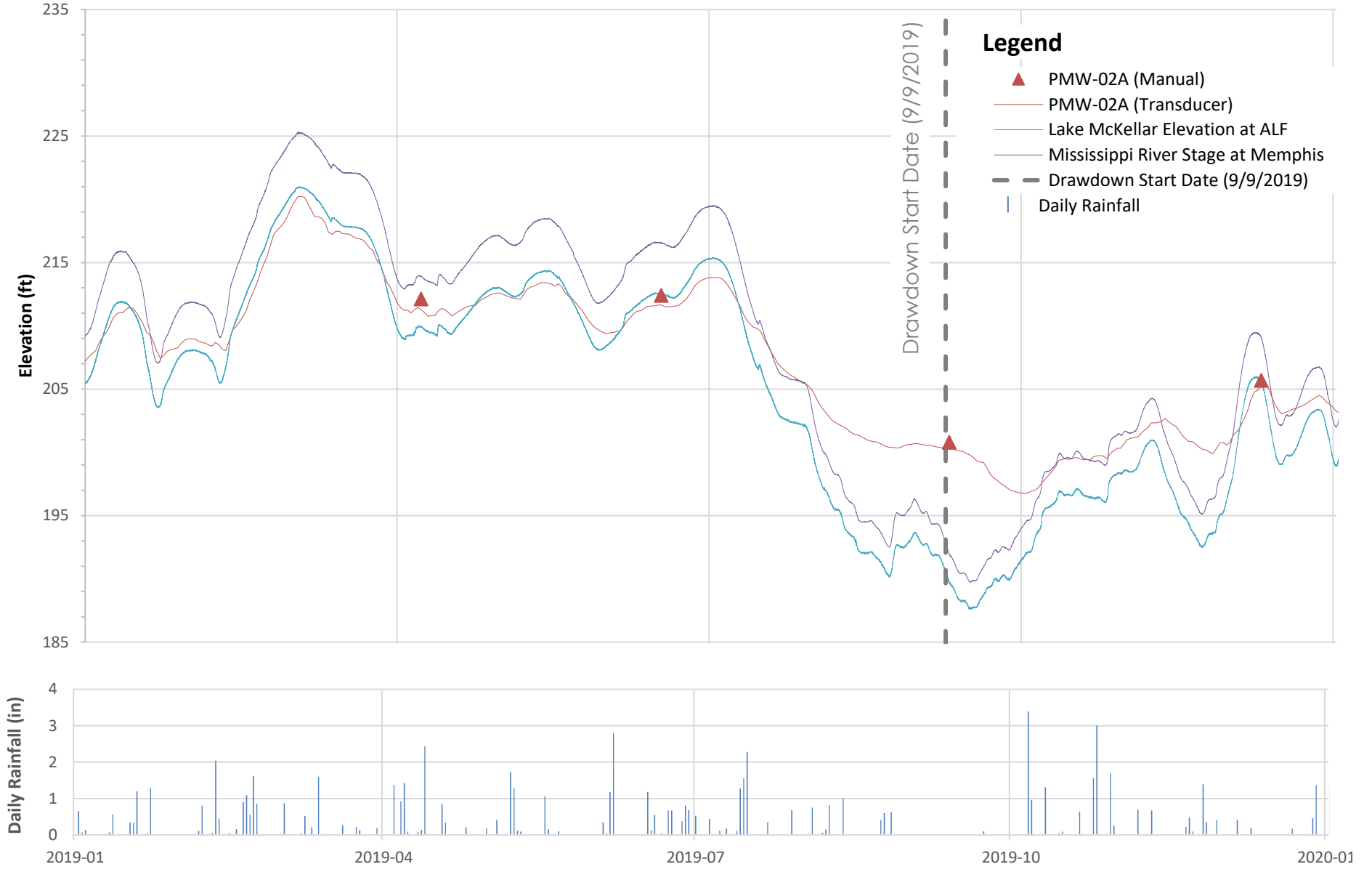
Stantec

Figure/Well No.

39 **ALF-EW-S03**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

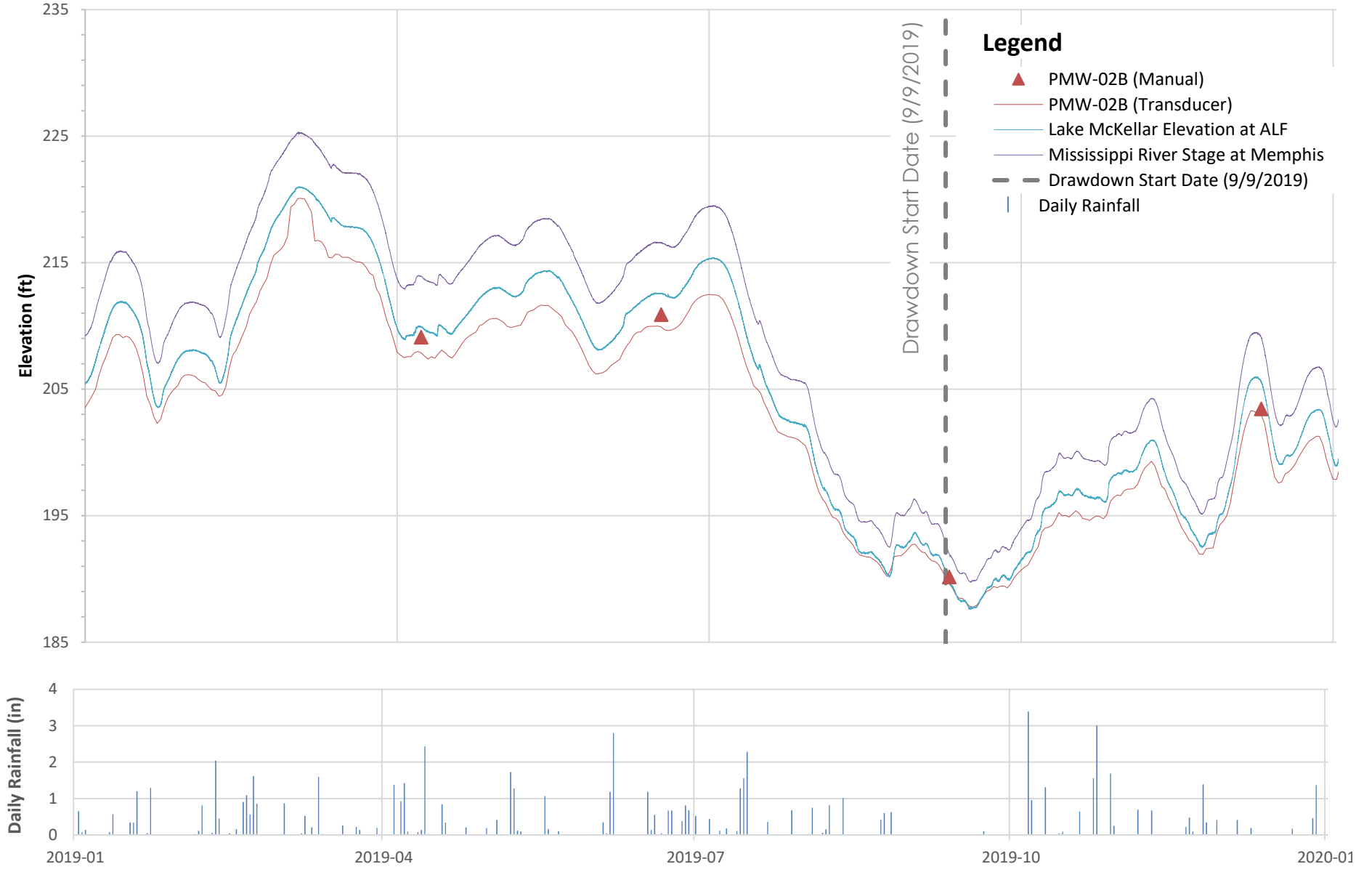
Stantec

Figure/Well No.

40 **PMW-02A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

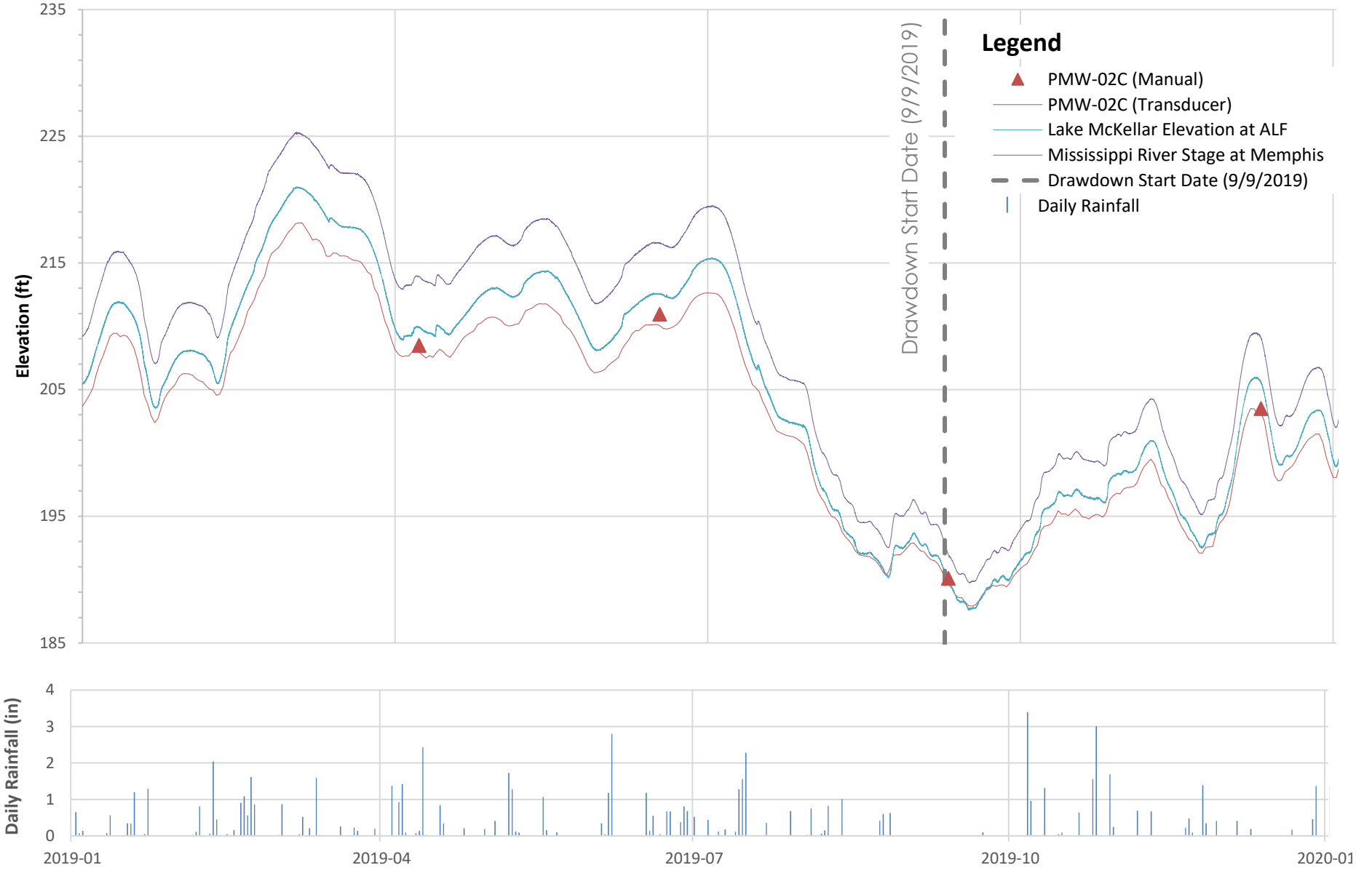
Stantec

Figure/Well No.

41 **PMW-02B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

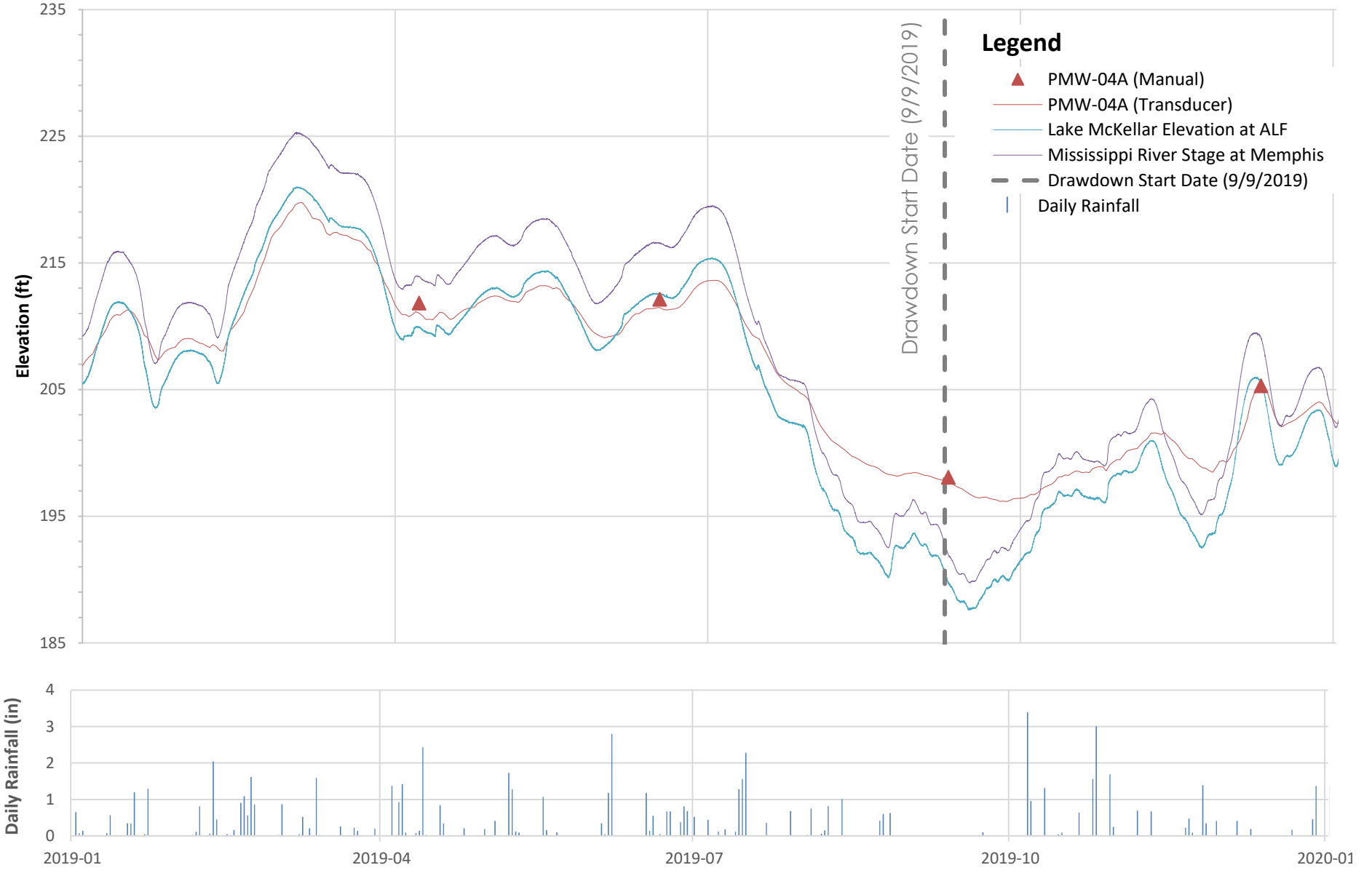
Stantec

Figure/Well No.

42 **PMW-02C**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

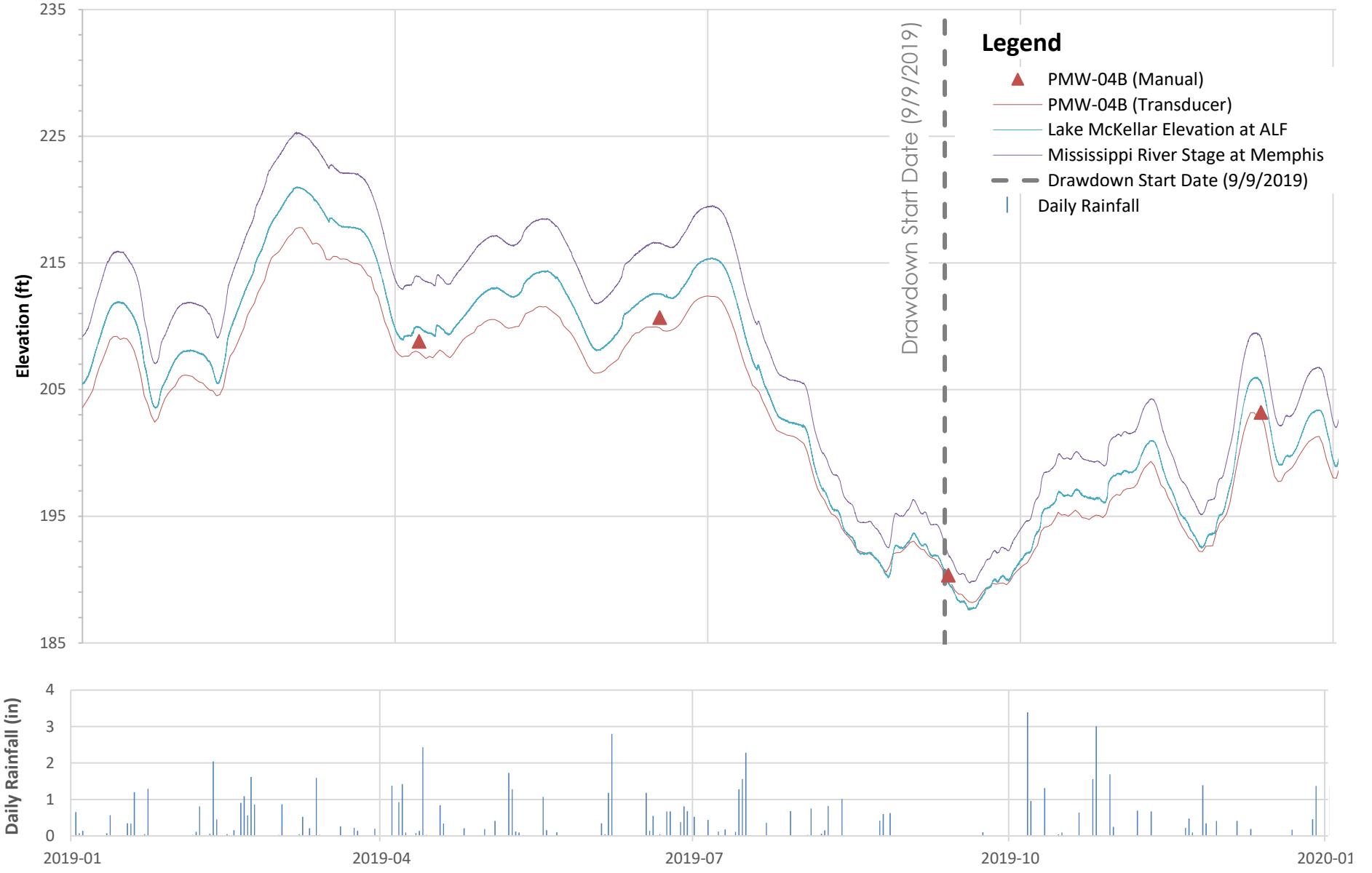
Stantec

Figure/Well No.

43 **PMW-04A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

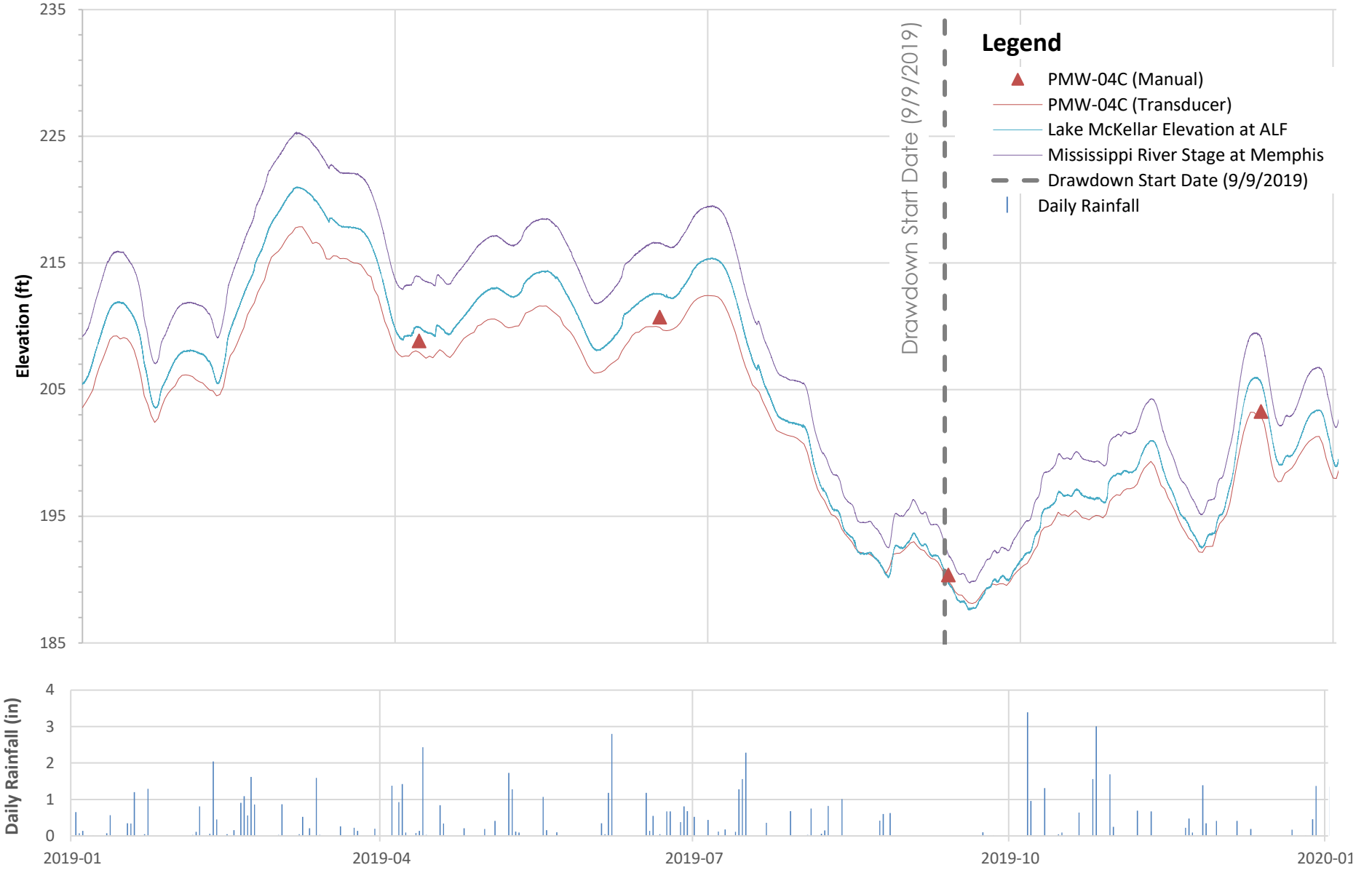
Stantec

Figure/Well No.

44 **PMW-04B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

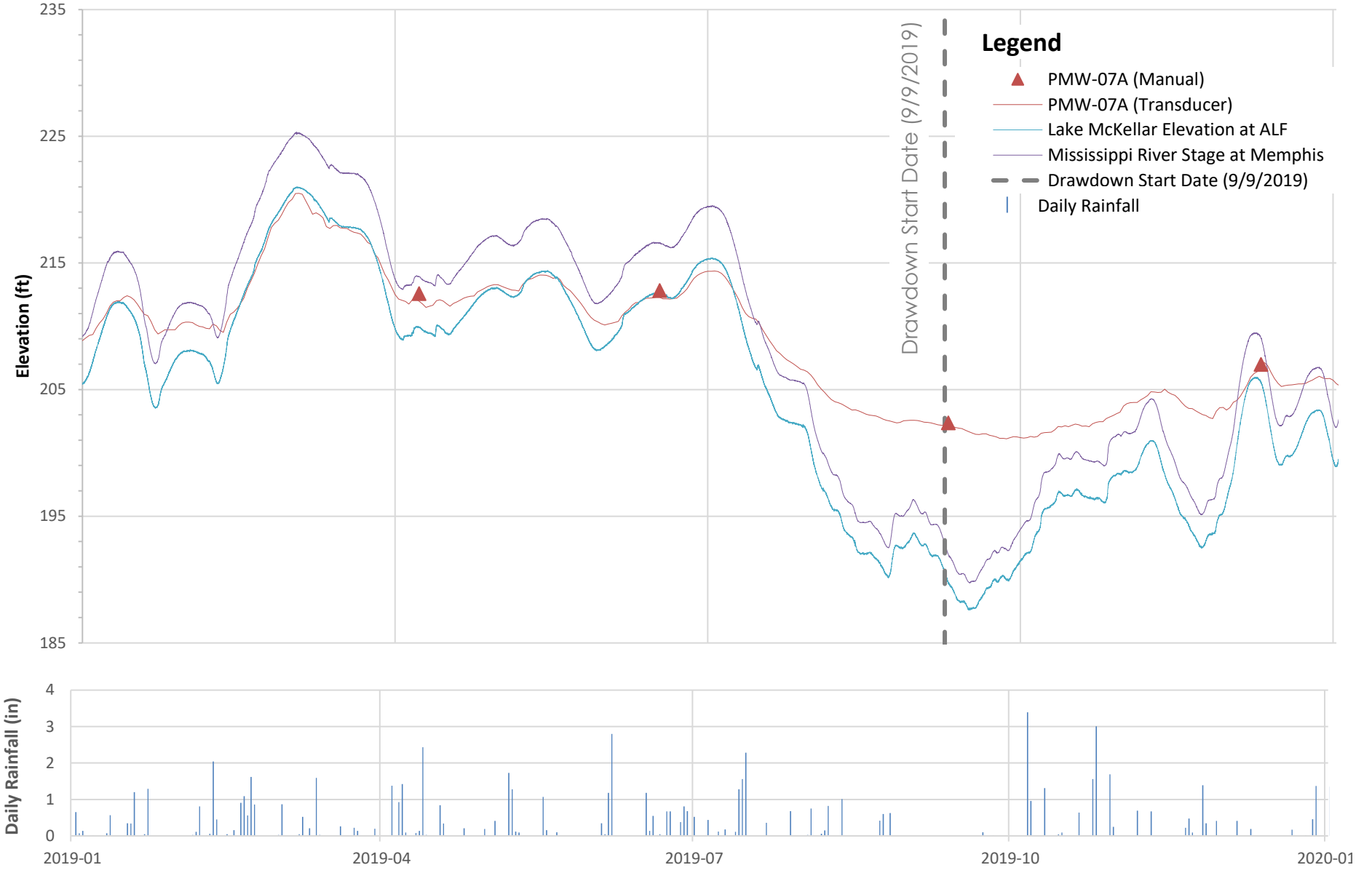
Stantec

Figure/Well No.

45 **PMW-04C**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

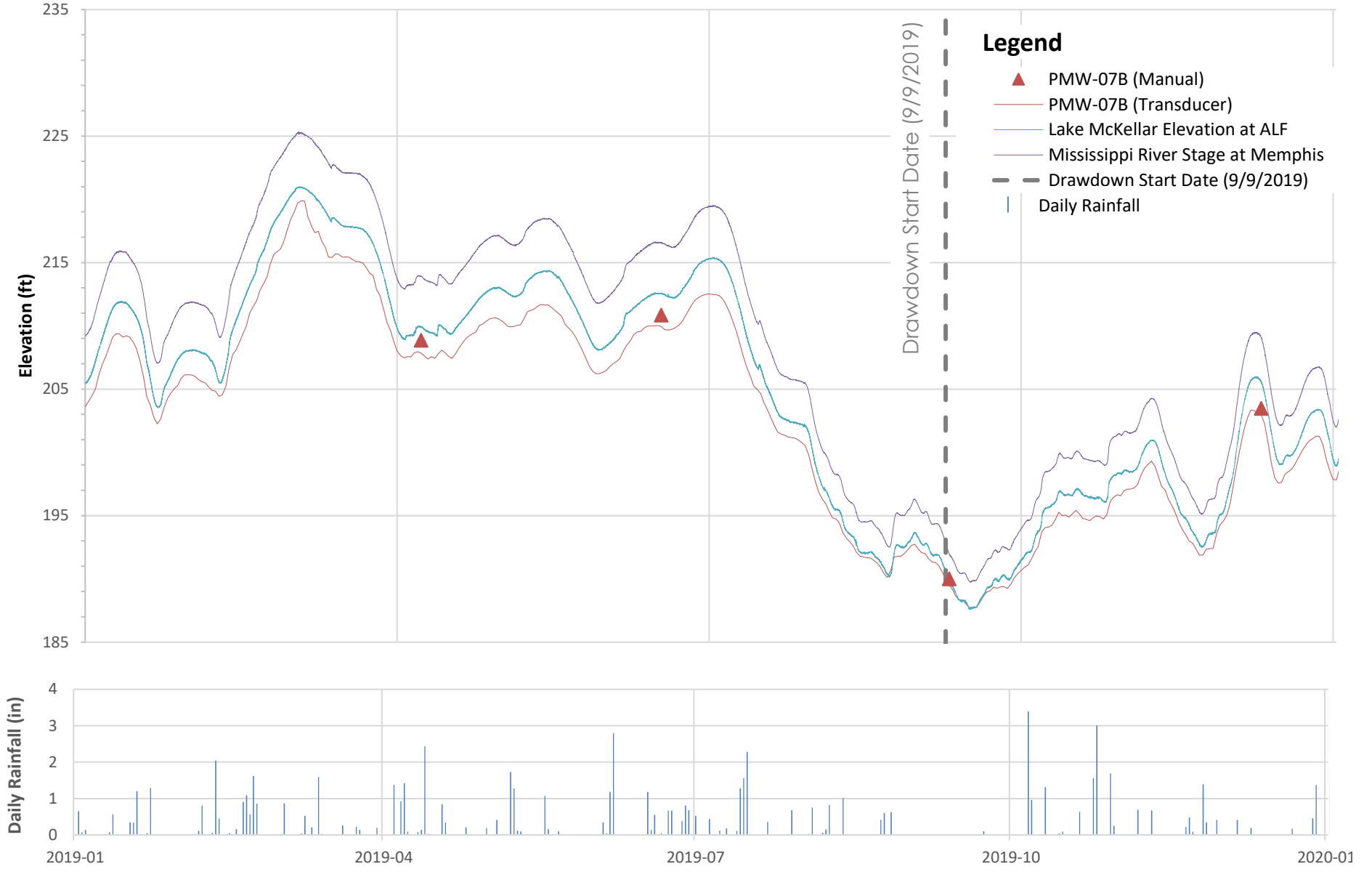
Stantec

Figure/Well No.

46 **PMW-07A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

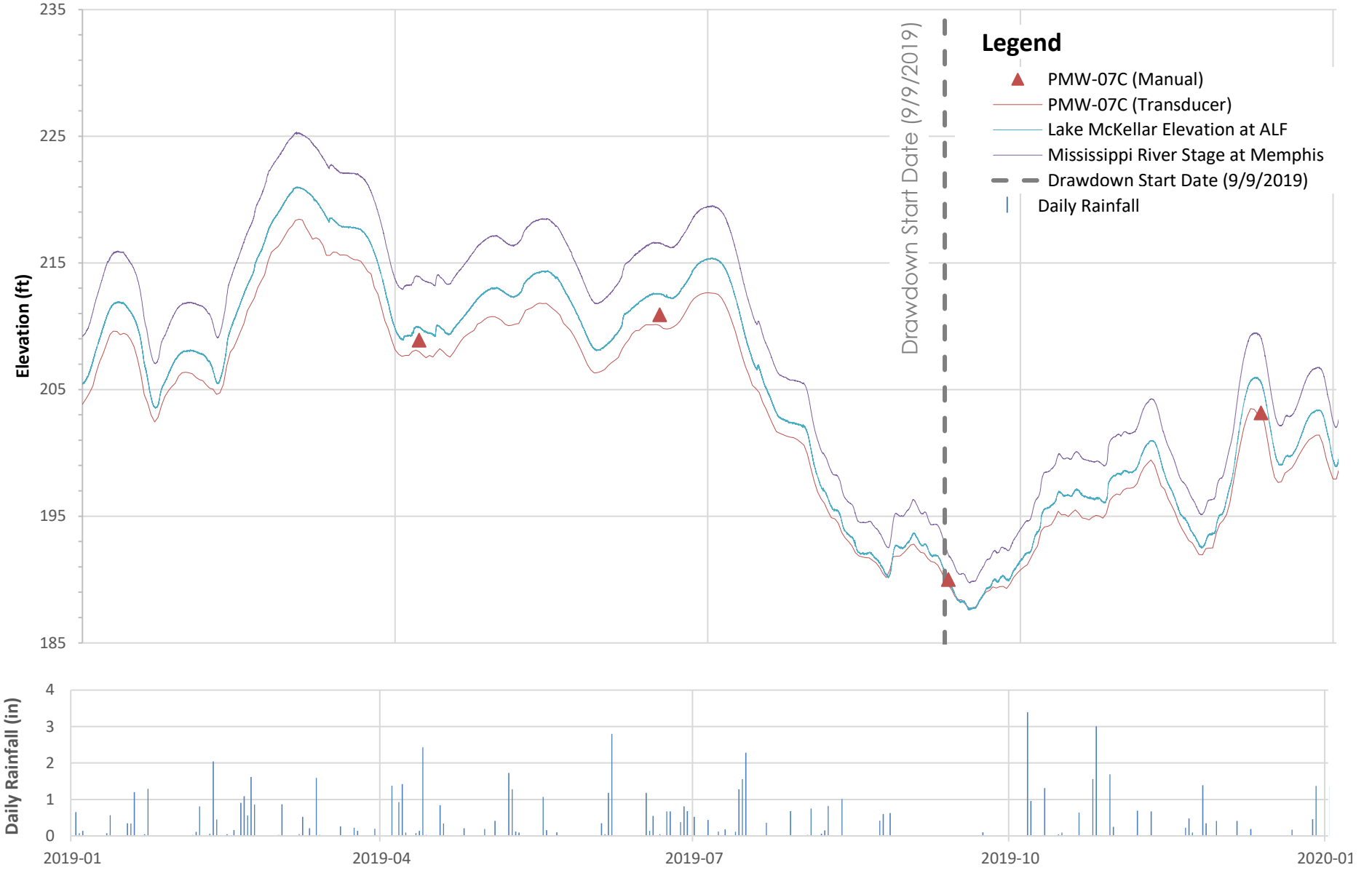
Stantec

Figure/Well No.

47 **PMW-07B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

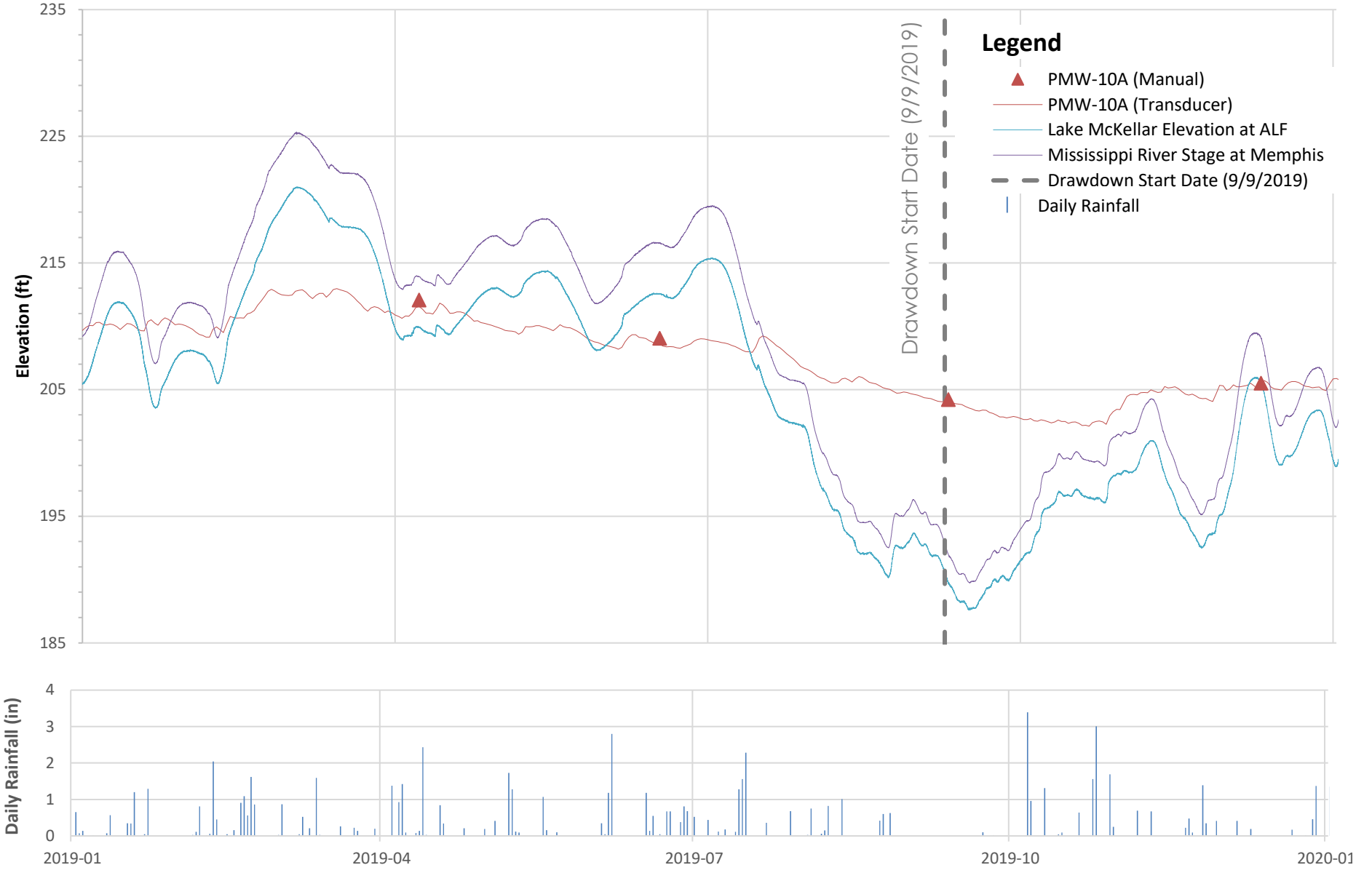
Stantec

Figure/Well No.

48 **PMW-07C**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

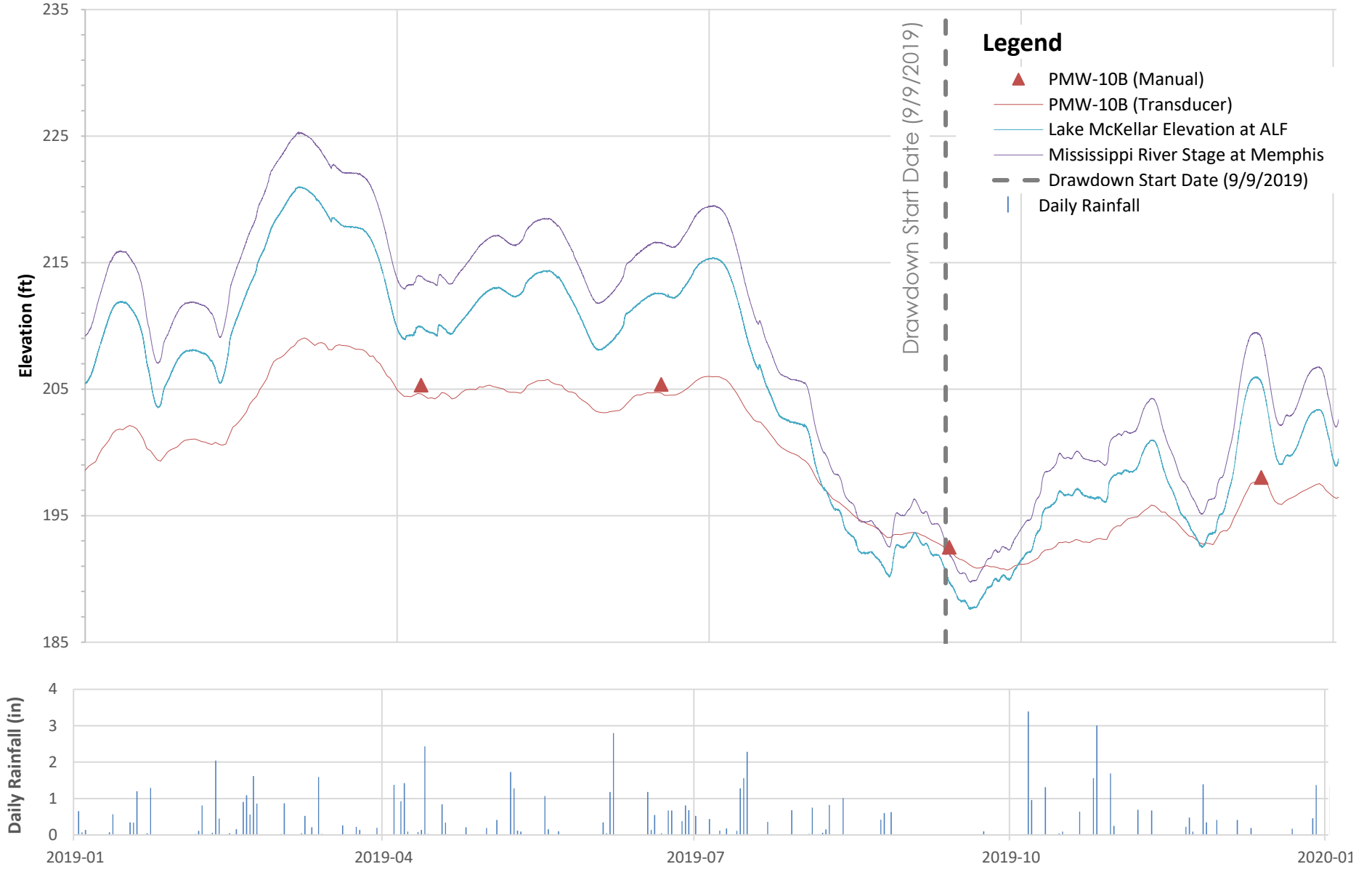
Stantec

Figure/Well No.

49 **PMW-10A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

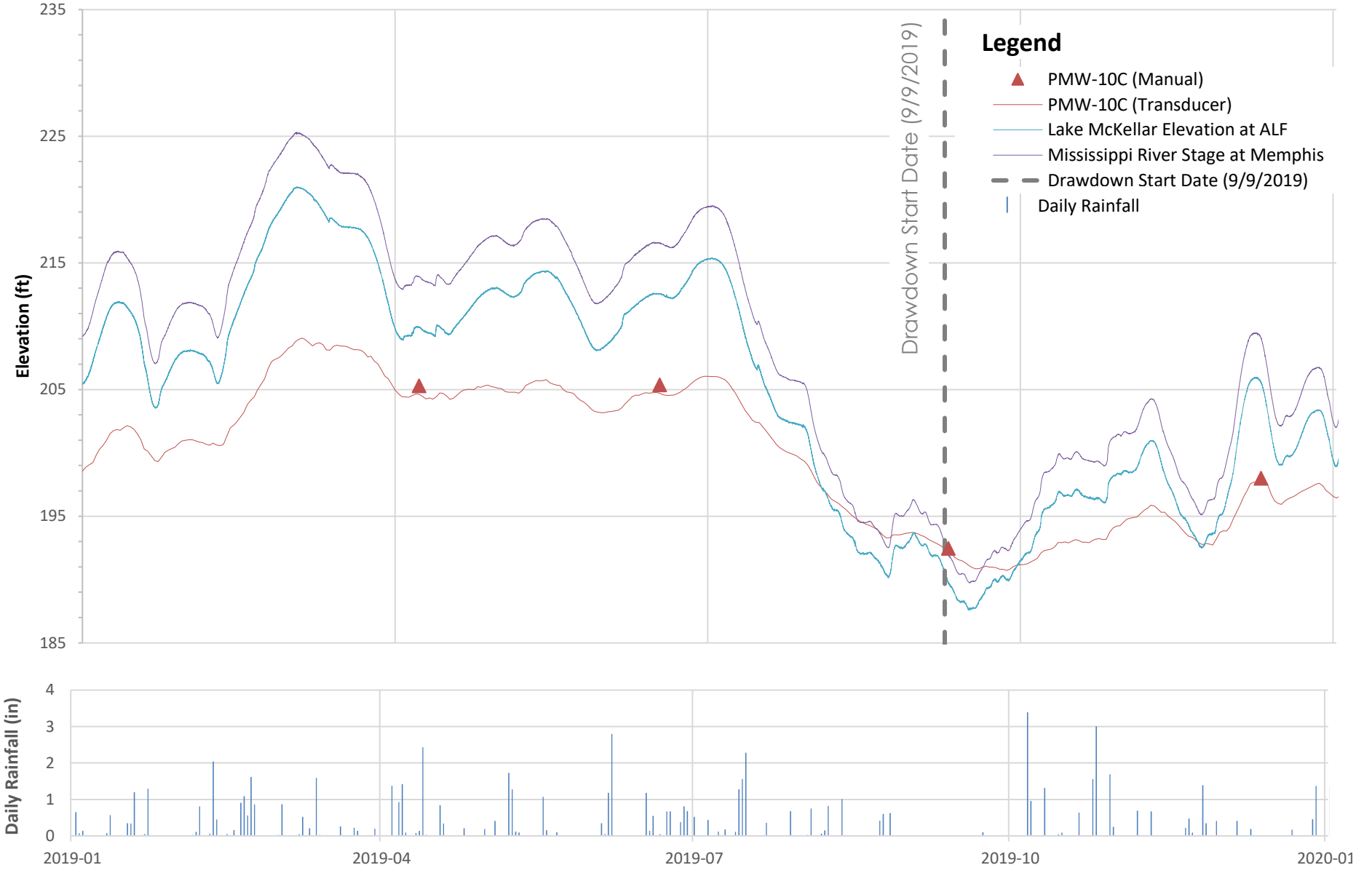
Stantec

Figure/Well No.

50 **PMW-10B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

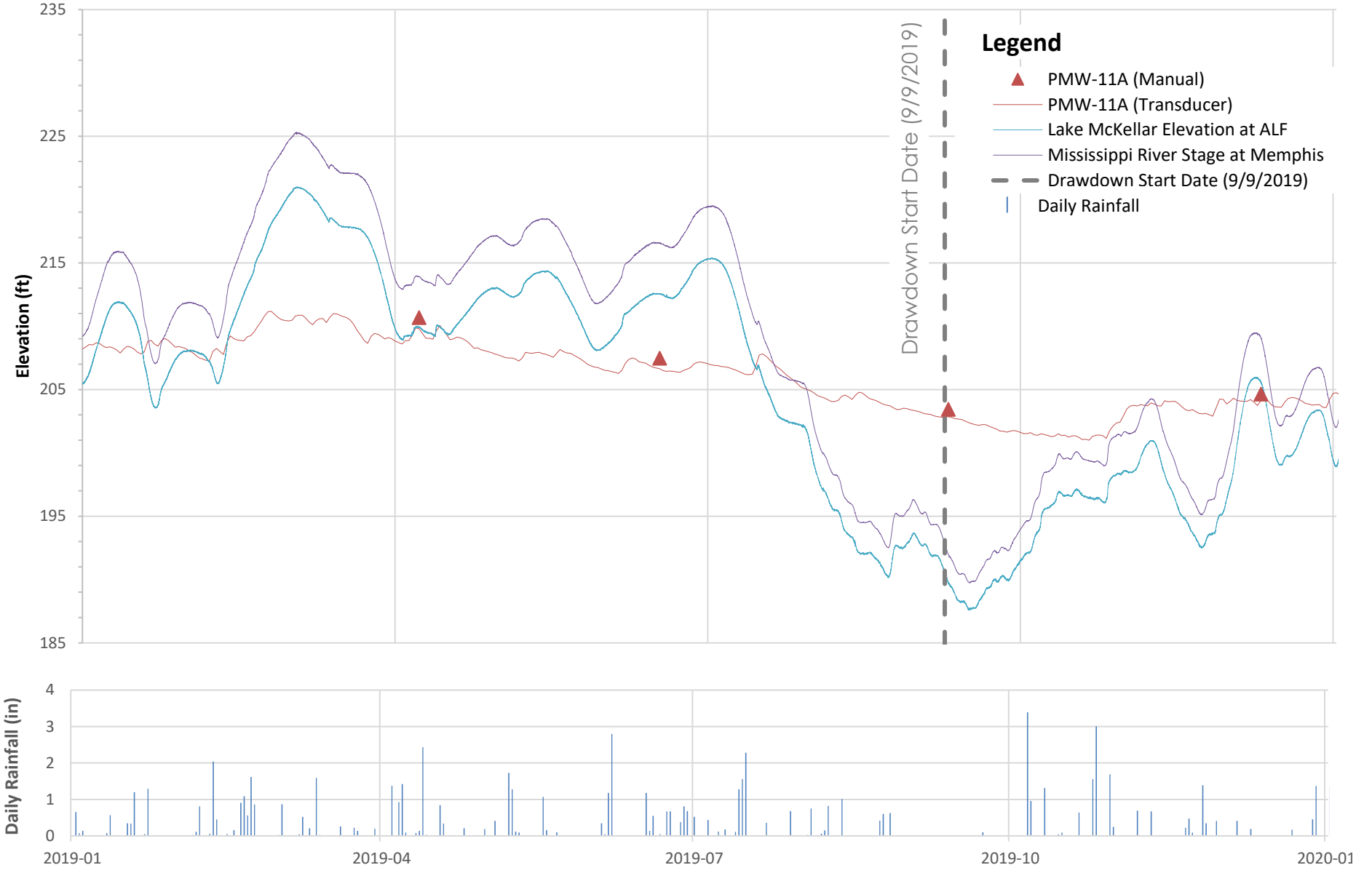
Stantec

Figure/Well No.

51 **PMW-10C**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

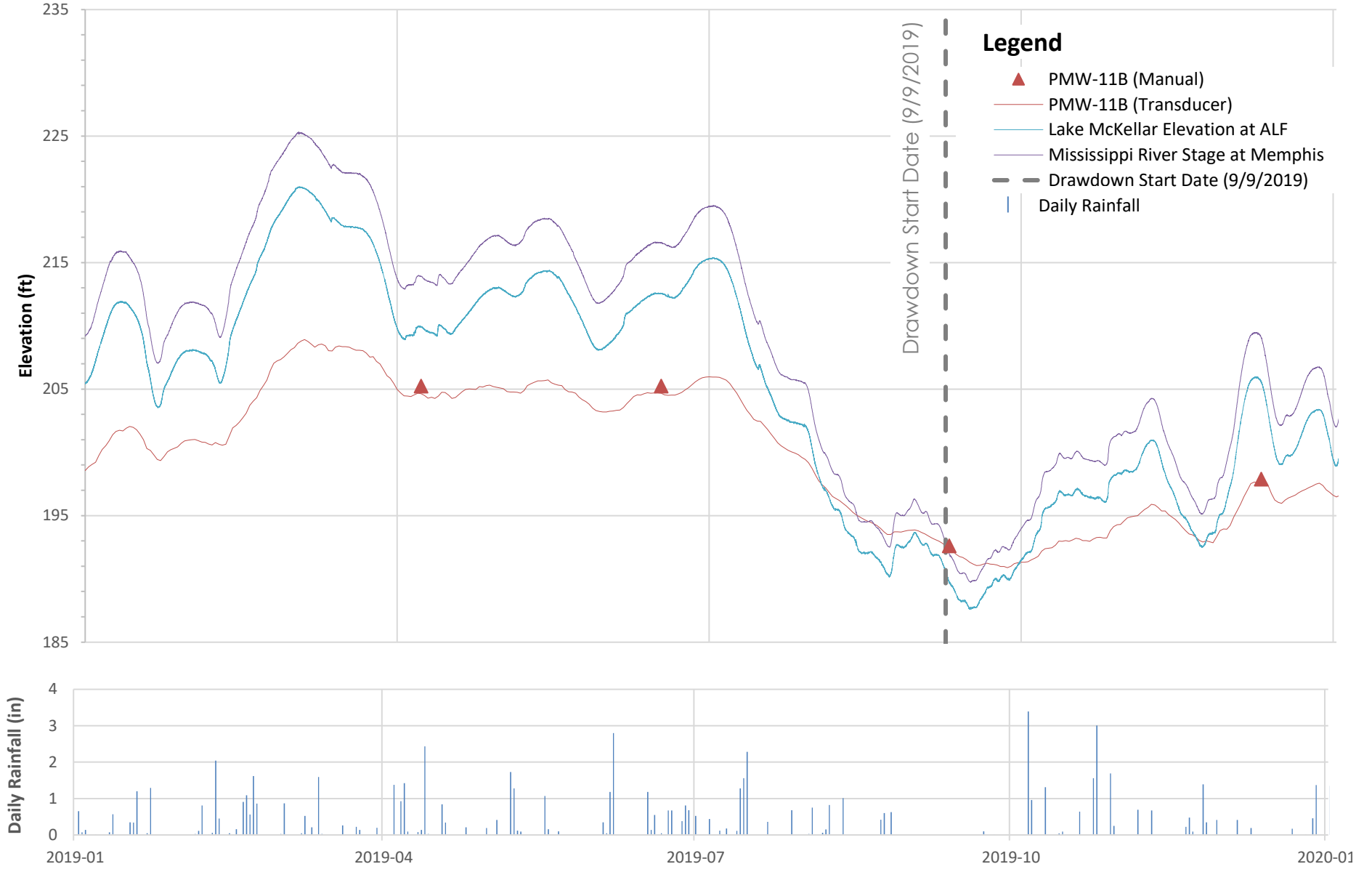
Stantec

Figure/Well No.

52 **PMW-11A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

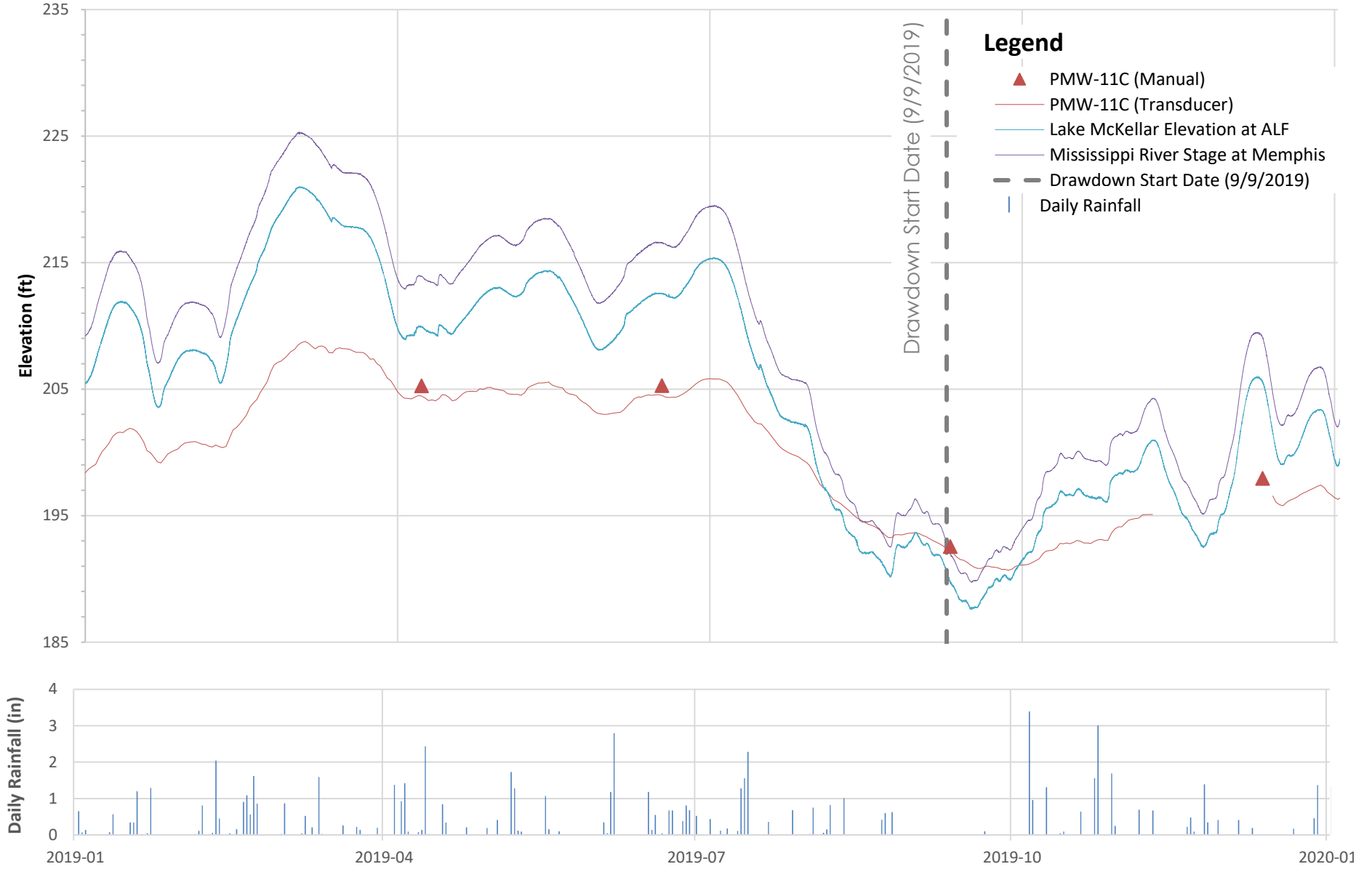
Stantec

Figure/Well No.

53 **PMW-11B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Notes:

Anomalous data from November 9 through December 12, 2019, February 18, 2020, March 1, 2020 were not included in the ALF-PMW-11C hydrograph.

Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

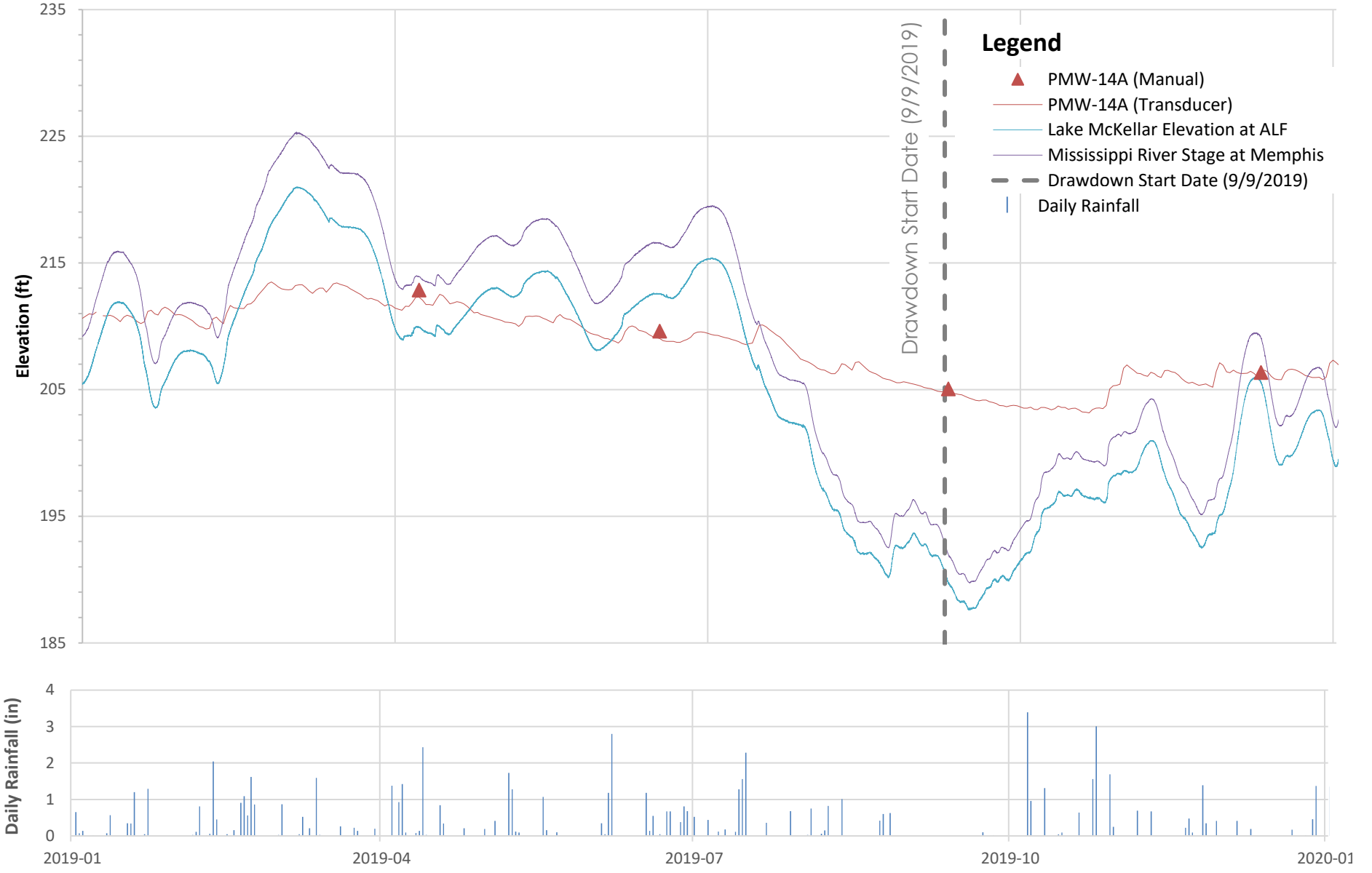
Stantec

Figure/Well No.

54 **PMW-11C**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

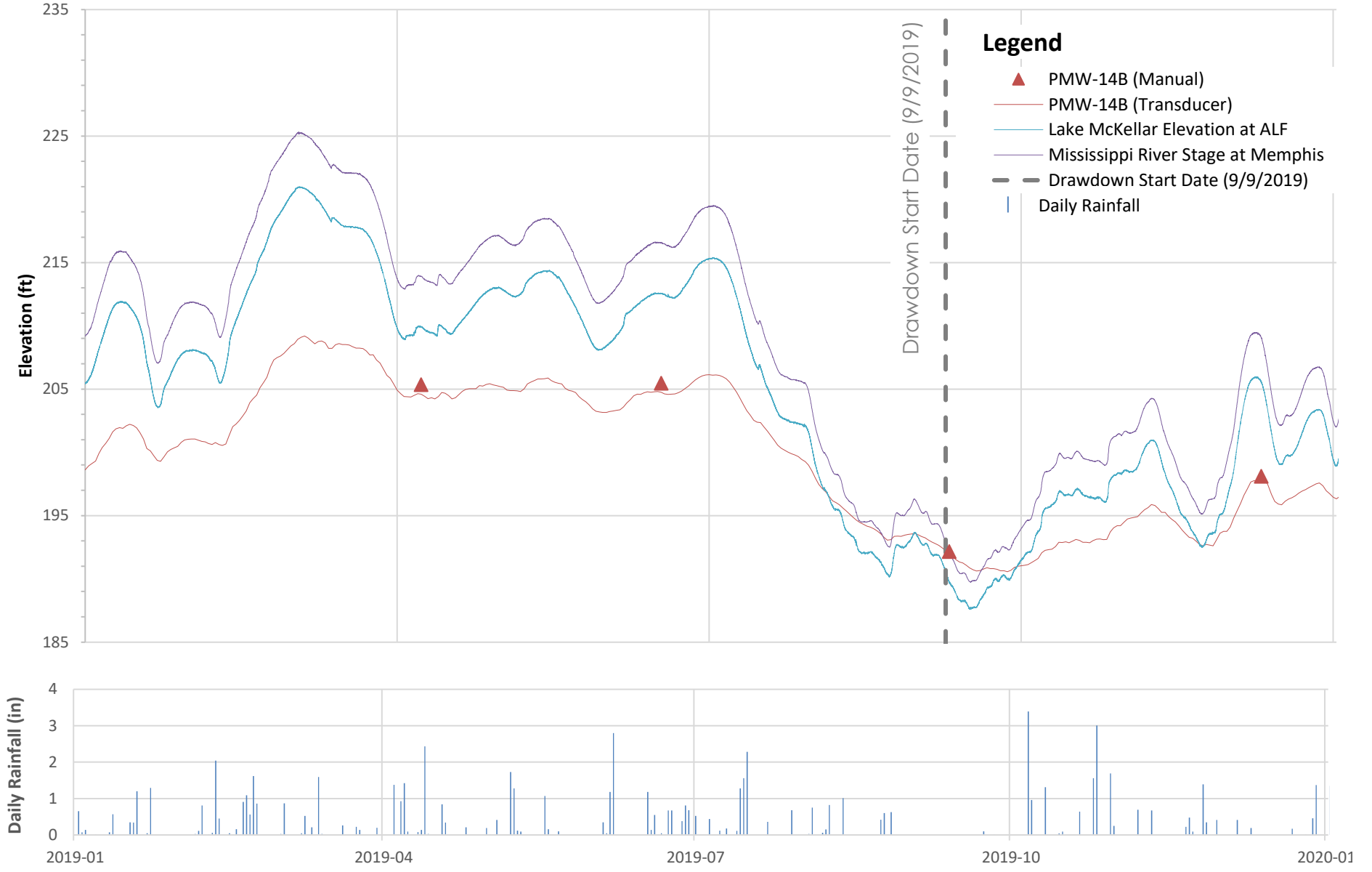
Stantec

Figure/Well No.

55 **PMW-14A**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

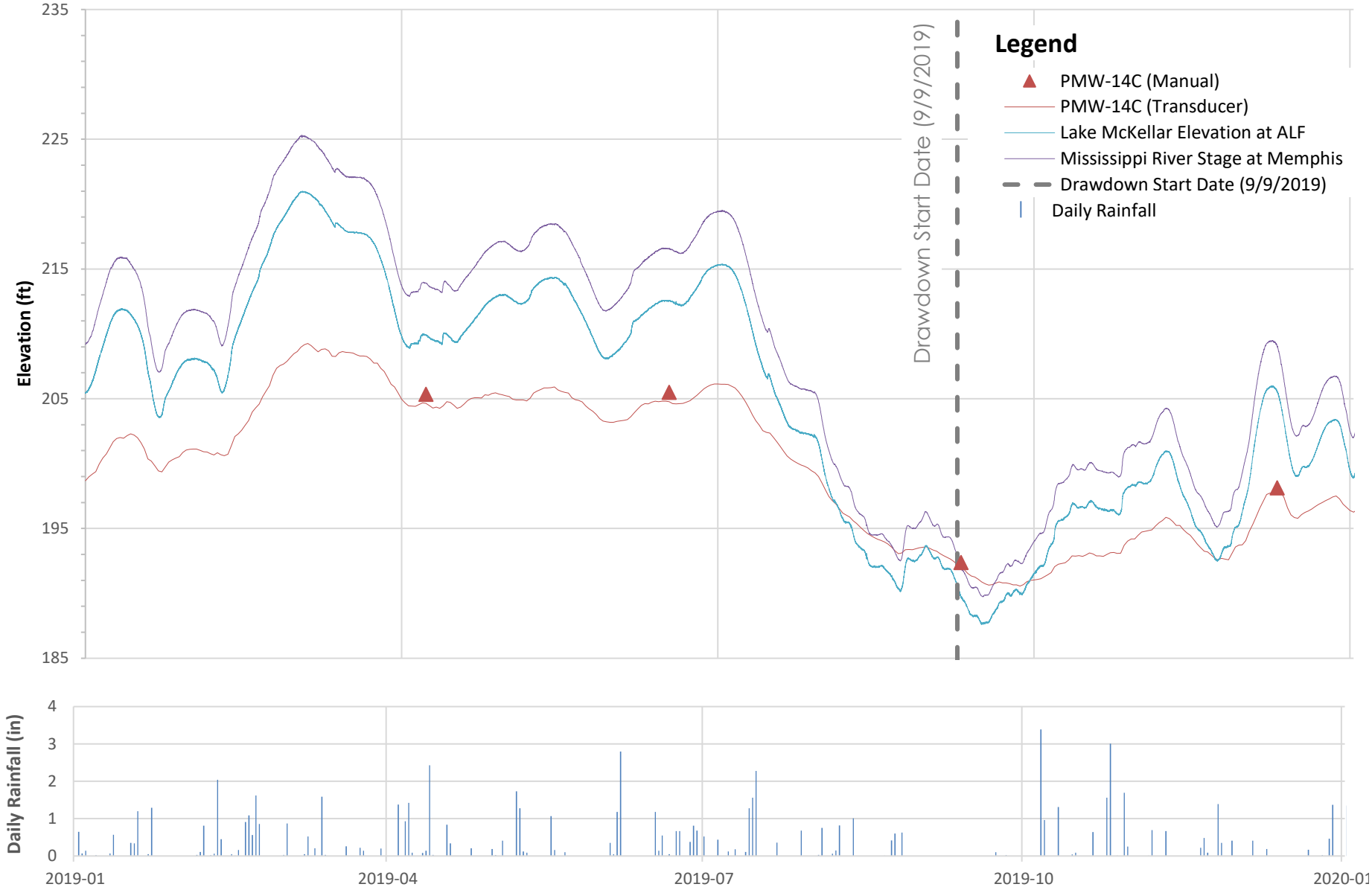
Stantec

Figure/Well No.

56 **PMW-14B**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall



Client/Project

Tennessee Valley Authority
Allen Fossil Plant (ALF)

Stantec

Figure/Well No.

57 **PMW-14C**

Title

Groundwater Elevation Hydrograph With Surface Water and Rainfall

APPENDIX B
2019 TVA ALLEN MONITORING WELL GROUNDWATER SAMPLING FORMS

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	9.69
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	170.50
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	160.81 / 1589.52
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	165.5
Well ID:	ACC-1A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/10/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
11:05	9.70	240	0	18.5	6.77	606	1.03	11.0	-82.5	0.76	Clear	No odor
11:10	9.70	240	1.2	18.5	6.71	605	0.75	8.0	-84.5	1.74	Clear	No odor
11:15	9.70	240	2.4	18.6	6.68	605	0.56	5.8	-85.9	1.91	Clear	No odor
11:20	9.70	240	3.6	18.5	6.67	605	0.50	5.2	-86.4	1.85	Clear	No odor
11:25	9.70	240	4.8	18.6	6.66	604	0.46	4.9	-87.3	0.65	Clear	No odor
11:30	9.70	240	6	18.7	6.64	604	0.41	4.4	-86.8	0.57	Clear	No odor
Final Values:		11:30	6.00	18.7	6.64	604	0.41	4.4	-86.8	0.57	Clear	

BTP
4-10-19

Final Controller Settings:	
Setting ID:	106
Pressure Setting:	90
Ambient Air (°C):	27

Sample ID:	ALF-GW-ACC1A-20190410 CS 5/23/2019	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/10/2019	*Field Blank ID:*	NA
Collection Time:	11:33	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6	*Equipment Blank ID:*	NA
Sample Depth (feet):	165.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.61	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	9.70	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:38
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	160.1	**Bottom of Screen (ft. btoc):**	170.1
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/10/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/10/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/11/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	11.22
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	130.80
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	119.58 / 1181.98
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	126.0
Well ID:	ACC-3A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/10/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
16:33	11.22	425	0	18.4	6.99	852	1.52	16.0	-74.7	1.44	Clear	No odor
16:36	11.22	425	1.28	18.3	6.86	854	1.06	11.0	-84.2	1.30	Clear	No odor
16:39	11.22	425	2.55	18.3	6.81	856	0.77	8.1	-91.0	0.83	Clear	No odor
16:42	11.22	425	3.83	18.3	6.79	855	0.56	6.2	-94.4	1.20	Clear	No odor
16:45	11.22	425	5.1	18.3	6.78	854	0.51	5.0	-95.4	0.69	Clear	No odor
16:48	11.22	425	6.38	18.3	6.77	853	0.46	4.4	-96.4	0.69	Clear	No odor
Final Values:		16:48	6.38	18.3	6.77	853	0.46	4.4	-96.4	0.69	Clear	

BTP
4-10-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	75
Ambient Air (°C):	29

Sample ID:	ALF-GW-ACC3A-20190410 CS 5/23/2019	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/10/2019	*Field Blank ID:*	NA
Collection Time:	16:51	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6.38	*Equipment Blank ID:*	NA
Sample Depth (feet):	126.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.81	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	11.22	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	16:54
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	120.4	**Bottom of Screen (ft. btoc):**	130.4
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:** Professional Plus	**Serial No:** 18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/10/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/10/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/11/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	13.67
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	144.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	130.33 / 1288.24
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	139.0
Well ID:	ACC-5A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/10/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
15:19	13.67	225	0	20.2	7.21	652	0.96	10.7	-57.7	3.28	Clear	No odor
15:22	13.67	225	0.68	20.2	6.86	697	0.93	10.6	-55.2	3.53	Clear	No odor
15:25	13.67	225	1.35	20.1	6.67	701	0.71	8.2	-57.7	2.83	Clear	No odor
15:28	13.87	225	2.03	20.1	6.64	702	0.64	6.7	-59.5	6.43	Clear	No odor
15:31	13.87	225	2.7	20.0	6.62	704	0.51	5.8	-62.3	4.93	Clear	No odor
15:34	13.87	225	3.38	20.0	6.60	705	0.50	5.5	-63.1	2.00	Clear	No odor
15:37	13.87	225	4.05	20.0	6.60	706	0.44	4.6	-65.4	3.40	Clear	No odor
15:40	13.87	225	4.73	20.1	6.59	704	0.41	4.6	-65.9	3.28	Clear	No odor
Final Values:		15:40	4.73	20.1	6.59	704	0.41	4.6	-65.9	3.28	Clear	

BTP
4-10-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	85
Ambient Air (°C):	29

Sample ID:	ALF-GW-ACC5A-20190410	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/10/2019	*Field Blank ID:*	NA
Collection Time:	15:43	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.73	*Equipment Blank ID:*	NA
Sample Depth (feet):	139.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.37	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	13.87	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	15:49
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	133.6	**Bottom of Screen (ft. btoc):**	143.6
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
Serial No:	18J102202		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/10/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/10/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/11/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	13.83
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	60.60
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	46.77 / 462.3
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	55.5
Well ID:	ACC-5B	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/10/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
14:16	13.82	260	0	19.7	6.83	853	0.99	10.7	-69.9	5.12	Clear	No odor
14:19	13.82	260	0.78	19.8	6.84	853	0.85	9.8	-71.8	4.45	Clear	No odor
14:22	13.82	260	1.56	19.9	6.81	853	0.75	8.0	-74.5	1.82	Clear	No odor
14:25	13.82	260	2.34	19.9	6.80	851	0.65	7.2	-75.5	2.36	Clear	No odor
14:28	13.82	260	3.12	19.7	6.80	853	0.58	6.3	-75.9	3.25	Clear	No odor
14:31	13.82	260	3.9	19.8	6.78	853	0.54	5.9	-76.3	1.28	Clear	No odor
14:34	13.82	260	4.68	19.9	6.79	854	0.54	5.8	-76.7	1.01	Clear	No odor
Final Values:		14:34	4.68	19.9	6.79	854	0.54	5.8	-76.7	1.01	Clear	

BTR
4-10-19

Final Controller Settings:	
Setting ID:	104
Pressure Setting:	30
Ambient Air (°C):	28

Sample ID:	ALF-GW-ACC5B-20190410	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/10/2019	*Field Blank ID:*	NA
Collection Time:	14:37	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.68	*Equipment Blank ID:*	NA
Sample Depth (feet):	55.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.37	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	13.82	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:43
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	50.2	**Bottom of Screen (ft. btoc):**	60.2
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
Serial No:	18J102202		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/10/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/10/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/11/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	15.92
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	50.70
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	34.78 / 343.78
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	49.0
Well ID:	ALF-201	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/15/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
12:35	16.55	100	0	20.1	7.96	813	2.25	23.3	98.9	4.27	Clear	No odor
12:38	16.61	100	0.3	20.1	7.45	808	1.26	13.8	98.7	4.38	Clear	No odor
12:41	16.65	100	0.6	20.1	7.27	807	1.12	12.5	97.6	5.47	Clear	No odor
12:44	16.68	100	0.9	20.0	7.15	807	1.07	11.8	96.5	2.81	Clear	No odor
12:47	16.70	100	1.2	20.1	7.08	805	0.96	10.6	95.0	3.25	Clear	No odor
12:50	16.72	100	1.5	20.0	7.02	805	0.90	10.0	93.6	5.65	Clear	No odor
12:53	16.75	100	1.8	20.1	6.98	804	0.82	9.1	91.4	3.22	Clear	No odor
12:56	16.77	100	2.1	20.1	6.97	804	0.78	8.4	90.5	3.08	Clear	No odor
								BTP 4-15-19				
												Final Controller Settings:
												Setting ID: 103
												Pressure Setting: 25
Final Values:		12:56	2.1	20.1	6.97	804	0.78	8.4	90.5	3.08	Clear	**Ambient Air (°C):** 19

Sample ID:	ALF-GW-ALF201-20190415	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/15/2019	*Field Blank ID:*	NA
Collection Time:	12:59	*Field Duplicate ID:*	ALF-GW-FB09-20190415
Total Volume Purged (L):*	2.1	*Equipment Blank ID:*	NA
Sample Depth (feet):	49.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	4.33	*DI water lot #:*	Pace fill date: 3/13/19
Depth to Water After Sampling (feet):	16.82	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:07
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	23.3	**Bottom of Screen (ft. btoc):**	49.9
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/15/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/15/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/16/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	16.58
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	130.70
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	114.12 / 1128.01
Project Number:	175577013		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	126.0
Well ID:	ALF-201A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/15/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
13:53	16.58	400	0	20.3	7.39	597	0.91	10.6	-79.5	1.24	Clear	No odor
13:56	16.58	400	1.2	20.2	7.33	595	0.83	8.7	-84.2	1.73	Clear	No odor
13:59	16.58	400	2.4	20.2	7.26	594	0.67	7.8	-88.7	1.29	Clear	No odor
14:02	16.58	400	3.6	20.0	7.24	593	0.67	7.1	-91.0	1.78	Clear	No odor
14:05	16.58	400	4.8	20.2	7.20	593	0.53	5.1	-91.9	1.04	Clear	No odor
14:08	16.58	400	6	20.0	7.19	594	0.51	5.5	-93.0	1.14	Clear	No odor
14:11	16.58	400	7.2	20.0	7.16	594	0.46	5.1	93.5	1.02	Clear	No odor
Final Values:		14:11	7.2	20.02	7.16	594	0.46	5.1	93.5	1.02	Clear	

BTP
4-15-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	75
Ambient Air (°C):	21

Sample ID:	ALF-GW-ALF201A-20190415	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/15/2019	*Field Blank ID:*	NA
Collection Time:	14:14	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	7.2	*Equipment Blank ID:*	NA
Sample Depth (feet):	126.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.02	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	16.58	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:18
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	120.3	**Bottom of Screen (ft. btoc):**	130.3
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/15/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/15/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/16/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	16.89
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	77.41 / 765.15
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.0
Well ID:	ALF-201B	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/15/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
14:45	16.90	365	0	20.3	7.06	832	3.02	36.2	-80.6	2.52	Clear	No odor
14:48	16.90	365	1.095	20.3	7.03	828	2.81	31.2	-85.9	1.55	Clear	No odor
14:51	16.90	365	2.19	20.3	7.00	825	2.70	30.7	-90.1	1.09	Clear	No odor
14:54	16.90	365	3.285	20.4	6.99	824	2.70	30.1	-97.5	1.65	Clear	No odor
14:57	16.90	365	4.38	20.4	6.99	821	2.68	29.0	-98.9	1.03	Clear	No odor
Final Values:		14:57	4.38	20.4	6.99	821	2.68	29	-98.9	1.03	Clear	

BTP
4-15-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	50
Ambient Air (°C):	21

Sample ID:	ALF-GW-ALF201B-20190415	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/15/2019	*Field Blank ID:*	NA
Collection Time:	15:00	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.38	*Equipment Blank ID:*	NA
Sample Depth (feet):	89.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.01	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	16.90	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	15:06
		Drawdown Stabilized < 0.3 ft:	Yes

Top of Screen (ft. btoc):	83.9	**Bottom of Screen (ft. btoc):**	93.9
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
Serial No:	18J102202		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/15/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/15/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/16/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	8.43
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	44.80
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	36.37 / 359.5
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	43.0
Well ID:	ALF-202	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/10/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (uS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
9:08	8.46	212	0	18.1	7.47	556.6	1.13	11.8	155.5	5.00	CLEAR	NO ODOR
9:11	8.46	212	0.64	18.1	7.40	555.5	0.96	10.2	153.7	5.97	CLEAR	NO ODOR
9:14	8.46	212	1.27	18.1	7.43	557.7	0.66	6.5	148.3	6.74	CLEAR	NO ODOR
9:17	8.46	212	1.91	18.2	7.44	557.2	0.52	5.4	144.2	6.43	CLEAR	NO ODOR
9:20	8.46	212	2.54	18.3	7.45	557.6	0.43	4.4	139.5	6.60	CLEAR	NO ODOR
9:23	8.46	212	3.18	18.3	7.45	557.9	0.42	4.1	136.6	6.83	CLEAR	NO ODOR
9:26	8.46	212	3.82	18.3	7.44	558.2	0.39	4.3	135.4	6.35	CLEAR	NO ODOR
Final Values:		9:26	3.82	18.3	7.44	558.2	0.39	4.3	135.4	6.35	CLEAR	

AS 4/10/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	23
Ambient Air (°C):	20.1

Sample ID:	ALF-GW-ALF202-20190410	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/10/2019	*Field Blank ID:*	NA
Collection Time:	9:31	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.82	*Equipment Blank ID:*	NA
Sample Depth (feet):	43.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	7.42	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	8.46	*Filter purged for minimum two minutes:*	Yes
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:38
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	23.4	**Bottom of Screen (ft. btoc):**	44.6
Color:	clear	**Odor:**	no odor

Instruments Manufacturer: QED **Model:** MP50 **Serial No:** MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/10/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/10/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/11/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	14.97
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	150.50
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	135.53 / 1339.64
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	145.5
Well ID:	ALF-202A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/10/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
11:20	14.99	110	0	20.1	6.55	496.4	0.65	7.2	33.8	1.05	CLEAR	NO ODOR
11:23	14.99	110	0.33	20.1	6.58	496.2	0.64	6.7	31.6	1.18	CLEAR	NO ODOR
11:26	14.99	110	0.66	20.0	6.61	494.4	0.53	5.9	29.7	0.40	CLEAR	NO ODOR
11:29	14.99	110	0.99	20.0	6.63	492.3	0.48	5.3	26.0	0.65	CLEAR	NO ODOR
11:32	14.99	110	1.32	19.9	6.65	492.4	0.43	4.7	23.8	0.50	CLEAR	NO ODOR
11:35	14.99	110	1.65	19.9	6.66	492.6	0.44	4.7	23.3	0.37	CLEAR	NO ODOR
Final Values:		11:35	1.65	19.9	6.66	492.6	0.44	4.7	23.3	0.37	CLEAR	

AS 4/10/19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	65
Ambient Air (°C):	26

Sample ID:	ALF-GW-ALF202A-20190410	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/10/2019	*Field Blank ID:*	NA
Collection Time:	11:38	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.65	*Equipment Blank ID:*	NA
Sample Depth (feet):	145.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.43	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	14.99	*Filter purged for minimum two minutes:*	Yes
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:49
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	140.1	**Bottom of Screen (ft. btoc):**	150.1
Color:	clear	**Odor:**	no odor
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/10/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/10/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/11/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	15.62
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.50
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	78.88 / 779.68
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.5
Well ID:	ALF-202B	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/10/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
12:25	15.67	400	0	19.1	7.00	619	0.57	5.8	27.5	9.70	CLEAR	NO ODOR
12:28	15.67	400	1.2	19.0	6.96	621	0.50	5.3	11.8	6.49	CLEAR	NO ODOR
12:31	15.67	400	2.4	19.1	6.94	620	0.50	5.5	5.2	5.11	CLEAR	NO ODOR
12:34	15.67	400	3.6	19.0	6.93	621	0.42	4.6	-1.4	4.12	CLEAR	NO ODOR
Final Values:		12:34	3.6	19.0	6.93	621	0.42	4.6	-1.4	4.12	CLEAR	

AS 4/10/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	52
Ambient Air (°C):	27

Sample ID:	ALF-GW-ALF202B-20190410	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/10/2019	*Field Blank ID:*	NA
Collection Time:	12:37	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.6	*Equipment Blank ID:*	NA
Sample Depth (feet):	89.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.21	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	15.67	*Filter purged for minimum two minutes:*	Yes
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	>>Y/N<<
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	12:45
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	84.1	**Bottom of Screen (ft. btoc):**	94.1
Color:	clear	**Odor:**	no odor
Instruments Manufacturer:	QED	**Model:**	MP50
Serial No:	MP50-1468		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/10/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/10/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/11/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	12.00
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	54.10
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	42.10 / 416.14
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	52.0
Well ID:	ALF-203	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/15/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
14:06	12.18	100	0	19.5	9.68	1042.3	0.85	9.2	97.7	2.17	CLEAR	NO ODOR
14:09	12.23	100	0.3	19.4	9.44	1010.0	0.61	6.7	100.7	2.09	CLEAR	NO ODOR
14:12	12.25	100	0.6	19.3	9.40	997.0	0.56	6.0	100.4	2.45	CLEAR	NO ODOR
14:15	12.28	100	0.9	19.3	9.40	994.0	0.52	5.6	99.1	0.44	CLEAR	NO ODOR
Final Values:		14:15	0.9	19.3	9.4	994	0.52	5.6	99.1	0.44	CLEAR	

AS 4/15/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	22
Ambient Air (°C):	21

Sample ID:	ALF-GW-ALF203-20190415	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	ALF-GW-FB10-20190415
Sample Date:	4/15/2019	*Field Duplicate ID:*	NA
Collection Time:	14:18	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	0.9	*Filter Blank ID:*	NA
Sample Depth (feet):	52.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace fill date: 3/12/2019
Follow up turbidity value (NTU):	0.53	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	12.41	*Filter Lot #:*	None
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	None	*Filter Sample Rad.:*	No
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	14:30
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	33.1	**Bottom of Screen (ft. btoc):**	54.1
Color:	CLEAR	**Odor:**	No Odor
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/15/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/15/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/16/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	13.67
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	122.70
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	109.03 / 1077.7
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	118.0
Well ID:	ALF-203A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/15/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
13:13	13.67	400	0	17.8	6.69	353.6	0.46	3.2	127.2	2.48	CLEAR	NO ODOR
13:16	13.67	400	1.2	1.7	6.70	354.3	0.40	2.3	107.7	1.31	CLEAR	NO ODOR
13:19	13.67	400	2.4	17.8	6.73	352.9	0.19	3.5	92.8	2.01	CLEAR	NO ODOR
Final Values:		13:19	2.4	17.8	6.73	352.9	0.19	3.5	92.8	2.01	CLEAR	

AS 4/15/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	62
Ambient Air (°C):	20

Sample ID:	ALF-GW-ALF203B-20190415	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/15/2019	*Field Blank ID:*	NA
Collection Time:	13:24	*Field Duplicate ID:*	ALF-GW-DUP02-20190415
Total Volume Purged (L):*	2.4	*Equipment Blank ID:*	NA
Sample Depth (feet):	118.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.68	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	13.67	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:35
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	112.3	**Bottom of Screen (ft. btoc):**	122.3
Color:	CLEAR	**Odor:**	No Odor
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/15/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/15/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/16/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	13.62
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	80.68 / 797.48
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.0
Well ID:	ALF-203B	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/15/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
12:00	13.62	400	0	17.5	6.70	457.8	0.45	5.9	173.5	3.99	clear	no odor
12:03	13.62	400	1.2	17.1	6.73	448.6	0.23	3.2	163.5	2.89	clear	no odor
12:06	13.62	400	2.4	17.5	6.70	449.7	0.22	3.0	156.9	1.95	clear	no odor
Final Values:		12:06	2.4	17.5	6.7	449.7	0.22	3	156.9	1.95	clear	

AS 4/15/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	50
Ambient Air (°C):	19

Sample ID:	ALF-GW-ALF203B-20190415	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/15/2019	*Field Blank ID:*	NA
Collection Time:	12:09	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.4	*Equipment Blank ID:*	NA
Sample Depth (feet):	89.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.82	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	13.62	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	12:19
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	83.9	**Bottom of Screen (ft. btoc):**	93.9
Color:	clear	**Odor:**	No Odor
Instruments Manufacturer:	QED	**Model:**	MP50
Serial No:	MP50-1468		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/15/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/15/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/16/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	10.13
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	59.20
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	49.07 / 485.03
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	49.0
Well ID:	ALF-204	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
13:51	10.31	100	0	19.5	6.51	497.7	2.00	21.4	147.1	3.35	clear	no odor
13:54	13.39	100	0.3	19.4	6.38	506.9	1.53	16.2	143.6	3.91	clear	no odor
13:57	13.46	100	0.6	19.5	6.46	506.8	1.13	12.4	130.6	2.27	clear	no odor
14:00	13.50	100	0.9	19.3	6.59	509.6	0.88	9.8	104.3	2.77	clear	no odor
14:03	13.53	100	1.2	19.4	6.62	509.2	0.81	9.0	97.3	2.44	clear	no odor
14:06	13.56	100	1.5	19.1	6.68	510.7	0.76	8.3	77.9	2.61	clear	no odor
Final Values:		14:06	1.5	19.1	6.68	510.7	0.76	8.3	77.9	2.61	clear	

AC 4/16/19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	22
Ambient Air (°C):	23.7

Sample ID:	ALF-GW-ALF204-20190412~~6~~ CS 5/23/19	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/16/2019	*Field Blank ID:*	NA
Collection Time:	14:10	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.5	*Equipment Blank ID:*	NA
Sample Depth (feet):	49.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.38	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	13.62	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:16
		Drawdown Stabilized < 0.3 ft:	No
Top of Screen (ft. btoc):	49.0	**Bottom of Screen (ft. btoc):**	59.2
Color:	clear	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/17/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	10.21
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	120.70
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	110.49 / 1092.13
Project Number:	175577013		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	116.0
Well ID:	ALF-204A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
14:35	10.23	425	0	16.5	7.13	390.9	3.27	34.3	-17.4	2.07	Clear	None
14:38	10.23	425	1.28	16.1	7.06	385.3	2.84	29.6	-47.8	1.33	Clear	None
14:41	10.23	425	2.55	16.1	7.06	384.3	2.83	28.2	-58.8	1.57	Clear	None
14:44	10.23	425	3.83	16.1	7.06	383.8	2.70	27.8	-62.3	1.45	Clear	None
Final Values:		14:44	3.83	16.1	7.06	383.8	2.7	27.8	-62.3	1.45	Clear	

BTP 4-16-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	70
Ambient Air (°C):	23

Sample ID:	ALF-GW-ALF204A-20190416	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/16/2019	*Field Blank ID:*	NA
Collection Time:	14:47	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.83	*Equipment Blank ID:*	NA
Sample Depth (feet):	116.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.61	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	10.23	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:52
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	110.3	**Bottom of Screen (ft. btoc):**	120.3
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/17/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	10.27
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.10
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	83.83 / 828.61
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.0
Well ID:	ALF-204B	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
13:51	10.28	415	0	16.6	7.60	320.8	2.30	24.3	53.4	3.78	Clear	No odor
13:54	10.28	415	1.25	16.3	7.27	314.4	1.36	12.9	21.2	3.04	Clear	No odor
13:57	10.28	415	2.49	16.2	7.14	314.2	0.78	8.3	-3.2	5.34	Clear	No odor
14:00	10.28	415	3.74	16.3	7.08	314.4	0.61	6.3	17.1	4.99	Clear	No odor
14:03	10.28	415	4.98	16.2	7.06	314.6	0.50	5.2	-26.9	4.82	Clear	No odor
14:06	10.28	415	6.23	16.2	7.03	314.9	0.45	4.7	-33.1	6.05	Clear	No odor
14:09	10.28	415	7.47	16.2	7.02	314.3	0.41	4.1	-38.1	5.32	Clear	No odor
Final Values:		14:09	7.47	16.2	7.02	314.3	0.41	4.1	-38.1	5.32	Clear	

BTP
4-16-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	55
Ambient Air (°C):	23

Sample ID:	ALF-GW-ALF204B-20190416	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/16/2019	*Field Blank ID:*	NA
Collection Time:	14:12	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	7.47	*Equipment Blank ID:*	NA
Sample Depth (feet):	89.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	5.31	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	10.28	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:16
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	83.7	**Bottom of Screen (ft. btoc):**	93.7
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
Serial No:	18J102202		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/17/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	14.45
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	56.40
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	41.95 / 414.65
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	54.0
Well ID:	ALF-205	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
9:16	14.58	100	0	15.7	6.97	835.0	2.30	23.7	113.9	1.94	CLEAR	NO ODOR
9:19	14.62	100	0.3	5.8	6.92	896.0	1.53	15.4	114.8	1.25	CLEAR	NO ODOR
9:22	14.66	100	0.6	15.8	6.92	912.0	1.20	12.4	114.4	1.11	CLEAR	NO ODOR
9:25	14.68	100	0.9	15.8	6.93	922.0	1.07	11.5	113.4	2.07	CLEAR	NO ODOR
9:28	14.69	100	1.2	15.8	6.90	927.0	1.01	10.5	111.9	1.05	CLEAR	NO ODOR
9:31	14.70	100	1.5	15.8	6.95	929.0	0.99	10.2	110.9	1.27	CLEAR	NO ODOR
Final Values:		9:31	1.5	15.8	6.95	929	0.99	10.2	110.9	1.27	CLEAR	

AS 4/12/19

Final Controller Settings:	
Setting ID:	104
Pressure Setting:	26
Ambient Air (°C):	21.2

Sample ID:	ALF-GW-ALF205-20190412	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	ALF-AQ-FB0820190412
Sample Date:	4/12/2019	*Field Duplicate ID:*	NA
Collection Time:	9:35	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	1.5	*Filter Blank ID:*	NA
Sample Depth (feet):	54.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace fill date: 3/12/2019
Follow up turbidity value (NTU):	1.33	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	14.98	*Filter Lot #:*	None
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	None	*Filter Sample Rad.:*	No
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	9:45
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	34.5	**Bottom of Screen (ft. btoc):**	55.5
Color:	CLEAR	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/12/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/15/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	12.92
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	112.40
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	99.48 / 983.3
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	107.0
Well ID:	ALF-205A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
8:32	12.92	360	0	15.6	6.44	337.8	0.43	5.0	141.7	8.93	CLEAR	NO ODOR
8:35	12.92	360	1.08	15.6	6.53	338.0	0.43	6.2	119.3	7.12	CLEAR	NO ODOR
8:38	12.92	360	2.16	15.6	6.60	338.3	0.22	3.1	93.7	6.33	CLEAR	NO ODOR
Final Values:		8:38	2.16	15.6	6.6	338.3	0.22	3.1	93.7	6.33	CLEAR	

AS 4/12/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	60
Ambient Air (°C):	19.5

Sample ID:	ALF-GW-ALF205A-20190412 CS 5/23/2019	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/12/2019	*Field Blank ID:*	NA
Collection Time:	8:40	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.16	*Equipment Blank ID:*	NA
Sample Depth (feet):	107.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	4.50	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	12.92	*Filter purged for minimum two minutes:*	Yes
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	8:48
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	102.0	**Bottom of Screen (ft. btoc):**	112.0
Color:	CLEAR	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:** MP50	**Serial No:** MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/12/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/15/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	13.32
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	86.50
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	73.18 / 723.34
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	81.5
Well ID:	ALF-205B	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
10:25	13.34	400	0	15.8	6.90	350.6	0.37	4.3	79.1	7.64	CLEAR	NO ODOR
10:28	13.34	400	1.2	15.7	6.96	351.6	0.40	2.8	64.5	2.22	CLEAR	NO ODOR
10:31	13.34	400	2.4	15.6	6.98	351.9	0.28	2.2	52.1	2.17	CLEAR	NO ODOR
Final Values:		10:31	2.4	15.6	6.98	351.9	0.28	2.2	52.1	2.17	CLEAR	

AS 4/12/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	49
Ambient Air (°C):	22

Sample ID:	ALF-GW-ALF205B-20190412	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/12/2019	*Field Blank ID:*	NA
Collection Time:	10:34	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.4	*Equipment Blank ID:*	NA
Sample Depth (feet):	81.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.87	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	13.34	*Filter purged for minimum two minutes:*	Yes
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:38
		Drawdown Stabilized < 0.3 ft:	Yes

Top of Screen (ft. btoc):	76.1	**Bottom of Screen (ft. btoc):**	86.1
Color:	CLEAR	**Odor:**	NO ODOR

Instruments Manufacturer:	QED	**Model:**	MP50	**Serial No:**	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/12/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/15/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	17.83
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	64.40
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	46.57 / 460.32
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	54.0
Well ID:	ALF-206	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/9/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
13:49	17.84	380	0	17.1	6.57	329.7	0.97	9.6	110.2	4.76	CLEAR	NO ODOR
13:52	17.84	380	1.14	17.0	6.71	330.8	0.57	6.0	82.9	3.55	CLEAR	NO ODOR
13:55	17.84	380	2.28	16.9	6.79	331.2	0.45	4.5	44.8	3.80	CLEAR	NO ODOR
13:58	17.84	380	3.42	16.9	6.84	337.6	0.38	3.9	-4.2	3.86	CLEAR	NO ODOR
14:01	17.84	380	4.56	16.9	6.86	352.6	0.36	3.6	-29.3	3.25	CLEAR	NO ODOR
14:04	17.84	380	5.7	17.0	6.91	368.3	0.37	3.6	-63.6	3.88	CLEAR	NO ODOR
14:07	17.84	380	6.84	17.0	6.92	369.7	0.38	3.6	-70.4	4.36	CLEAR	NO ODOR
Final Values:		14:07	6.84	17	6.92	369.7	0.38	3.6	-70.4	4.36	CLEAR	

AS 4/9/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	29
Ambient Air (°C):	27

Sample ID:	ALF-GW-ALF206-20190409	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/9/2019	*Field Blank ID:*	NA
Collection Time:	14:10	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6.84	*Equipment Blank ID:*	NA
Sample Depth (feet):	54.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.31	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	17.84	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:25
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	54.0	**Bottom of Screen (ft. btoc):**	64.2
Color:	CLEAR	**Odor:**	NA
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
Serial No:	41774		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	ANDREW STEVENS	**Date:**	4/9/2019	**Signature:**	
Sampler Name:	SULEIMAN KHAN	**Date:**	4/9/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/10/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	10.53
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	48.80
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	38.27 / 378.28
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	47.0
Well ID:	ALF-210	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/9/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
14:00	11.85	210	0	19.0	6.68	809	2.18	19.9	73.0	61.4	Clear	No odor
14:05	11.85	210	1.05	18.8	6.62	808	1.30	13.8	72.0	54.9	Clear	No odor
14:10	11.85	210	2.1	18.9	6.59	806	0.94	10.1	66.1	47.9	Clear	No odor
14:15	11.85	210	3.15	19.0	6.58	805	0.79	8.4	60.0	43.4	Clear	No odor
14:20	11.85	210	4.2	19.1	6.57	803	0.72	8.1	54.7	40.6	Clear	No odor
14:25	11.86	210	5.25	19.0	6.58	802	0.72	7.7	52.5	33.0	Clear	No odor
14:30	11.85	210	6.3	18.9	6.57	804	0.67	7.2	50.8	34.8	Clear	No odor
14:35	11.87	210	7.35	18.9	6.58	803	0.86	10.1	48.8	35.4	Clear	No odor
14:40	11.88	210	8.4	18.8	6.59	805	0.65	7.0	40.9	30.9	Clear	No odor
14:45	11.90	210	9.45	18.7	6.59	802	0.64	6.9	40.1	30.9	Clear	No odor
14:50	11.92	210	10.5	18.8	6.59	801	0.68	7.1	37.8	29.3	Clear	No odor
14:55	11.92	210	11.55	18.7	6.61	802	0.98	10.2	31.2	25.7	Clear	No odor
15:00	11.93	210	12.6	18.7	6.60	802	1.09	12.0	26.5	25.5	Clear	No odor
15:05	11.93	210	13.65	18.5	6.60	798	1.09	11.0	24.3	24.5	Clear	No odor
15:10	12.00	210	14.7	18.6	6.60	799	1.07	11.4	22.0	22.1	Clear	No odor
							BTP 4-9-19					
												Final Controller Settings:
												Setting ID: 103
												Pressure Setting: 25
Final Values:		15:10	14.7	18.6	6.60	799	1.07	11.4	22	22.1	Clear	**Ambient Air (°C):** 26

Sample ID:	ALF-GW-ALF210-20190409	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	NA
Sample Date:	4/9/2019	*Field Duplicate ID:*	NA
Collection Time:	15:13	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	14.7	*Filter Blank ID:*	ALF-GW-FLB01-20190409
Sample Depth (feet):	47.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace fill date: 3/12/19
Follow up turbidity value (NTU):	19.2	*Filter purged for minimum two minutes:*	Yes
Depth to Water After Sampling (feet):	12.07	*Filter Lot #:*	L1832
Analysis:	RI	*Filter Sample Metals:*	Yes
Tubing Lot #:	None	*Filter Sample Rad.:*	No
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	15:17
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	27.2	**Bottom of Screen (ft. btoc):**	48.1
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/9/2019	**Signature:**	Bryan Pennell
Sampler Name:	Ismael Arroyo	**Date:**	4/9/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/10/2019	**Signature:**	Courtnae Ramser

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	11.06
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	130.40
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	119.34 / 1179.61
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	125.0
Well ID:	ALF-210A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/9/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
16:15	11.06	125	0	19.0	6.78	1249	0.56	7.2	-111.4	8.67	Clear	No odor
16:20	11.06	125	0.63	19.3	6.75	1257	0.72	7.8	-110.5	1.08	Clear	No odor
16:25	11.06	125	1.25	19.3	6.75	1267	0.54	6.0	-109.5	1.08	Clear	No odor
16:30	11.06	125	1.88	19.2	6.75	1270	0.52	5.6	-107.7	1.87	Clear	No odor
16:35	11.06	125	2.5	19.3	6.75	1267	0.43	4.9	-106.9	0.84	Clear	No odor
16:40	11.06	125	3.13	19.2	6.76	1269	0.49	4.9	-105.0	0.60	Clear	No odor
16:45	11.06	125	3.75	19.2	6.76	1270	0.60	6.4	-103.0	0.91	Clear	No odor
16:50	11.06	125	4.38	19.3	6.77	1269	0.26	2.0	-101.7	0.56	Clear	No odor
								BTP				
								4-9-19				
												Final Controller Settings:
												Setting ID: 106
												Pressure Setting: 80
Final Values:		16:50	4.38	19.3	6.77	1269	0.26	2	-101.7	0.56	Clear	**Ambient Air (°C):** 27

Sample ID:	ALF-GW-ALF210A-20190409	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	ALF-GW-FB01-20190409
Sample Date:	4/9/2019	*Field Duplicate ID:*	NA
Collection Time:	16:53	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	4.375	*Filter Blank ID:*	NA
Sample Depth (feet):	125.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace fill date: 3/12/19
Follow up turbidity value (NTU):	0.83	*Filter purged for minimum two minutes:*	Yes
Depth to Water After Sampling (feet):	11.08	*Filter Lot #:*	L1832
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	None	*Filter Sample Rad.:*	No
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	17:03
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	120.0	**Bottom of Screen (ft. btoc):**	130.0
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/9/2019	**Signature:**	Bryan Pennell
Sampler Name:	Ismael Arroyo	**Date:**	4/9/2019	**Signature:**	Ismael Arroyo
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/10/2019	**Signature:**	Courtnae Ramser

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	29.20
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	81.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	52.10 / 514.98
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	67.0
Well ID:	ALF-212	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
16:18	29.35	110	0	21.7	7.11	722.0	1.26	20.8	-9.9	36.9	clear	no odor
16:21	29.35	110	0.33	21.8	7.10	721.6	1.11	18.9	-17.6	40.1	clear	no odor
16:24	29.35	110	0.66	21.7	7.04	715.3	1.00	16.7	-20.9	31.1	clear	no odor
16:27	29.35	110	0.99	21.7	7.01	714.7	0.92	10.5	-27.1	14.4	clear	no odor
16:30	29.35	110	1.32	21.8	6.99	714.0	0.83	9.1	-30.1	9.81	clear	no odor
16:34	29.35	110	1.76	21.5	6.98	715.0	0.81	8.7	-36.5	8.29	clear	no odor
16:37	29.35	110	2.09	21.5	6.98	716.0	0.79	8.5	-43.1	8.29	clear	no odor
16:40	29.35	110	2.42	21.0	6.98	715.0	0.78	8.5	-46.4	5.91	clear	no odor
Final Values:		16:40	2.42	21	6.98	715	0.78	8.5	-46.4	5.91	clear	

AS 4/11/19

Final Controller Settings:	
Setting ID:	104
Pressure Setting:	36
Ambient Air (°C):	24.9

Sample ID:	ALF-GW-ALF212-20190411	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	NA
Collection Time:	16:43	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.42	*Equipment Blank ID:*	NA
Sample Depth (feet):	67.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.23	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	29.35	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	16:53
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	71.0	**Bottom of Screen (ft. btoc):**	81.2
Color:	clear	**Odor:**	no odor

Instruments Manufacturer:	QED	**Model:**	MP50	**Serial No:**	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/12/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	34.46
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	169.80
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	135.34 / 1337.76
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	165.0
Well ID:	ALF-212A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
16:20	34.45	250	0	19.8	7.12	621	1.53	17.2	-71.6	5.27	Clear	No odor
16:23	34.45	250	0.75	19.7	6.90	611	1.41	14.5	-81.9	3.54	Clear	No odor
16:26	34.45	250	1.5	19.6	6.85	610	1.00	10.8	-93.8	1.99	Clear	No odor
16:29	34.45	250	2.25	19.8	6.80	608	0.93	9.6	-96.8	1.77	Clear	No odor
16:32	34.45	250	3	19.7	6.79	606	0.92	9.0	-103.0	1.29	Clear	No odor
Final Values:		16:32	3.00	19.7	6.79	606	0.92	9.0	-103.0	1.29	Clear	

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Final Controller Settings:	
Setting ID:	105
Pressure Setting:	105
Ambient Air (°C):	27

Sample ID:	ALF-GW-ALF212A-20190411	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	NA
Collection Time:	16:35	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3	*Equipment Blank ID:*	NA
Sample Depth (feet):	165.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.74	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	34.45	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	16:40
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	159.4	**Bottom of Screen (ft. btoc):**	169.4
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
Serial No:	18J102202		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/12/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	33.92
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	81.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	47.38 / 468.32
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	71.0
Well ID:	ALF-213	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
8:38	33.95	300	0	17.5	7.22	388.7	0.77	8.0	-152.7	4.53	Clear	No odor
8:41	33.95	300	0.9	17.6	7.19	388.4	0.78	7.7	-155.4	1.16	Clear	No odor
8:44	33.95	300	1.8	17.6	7.17	288.9	0.70	7.3	-157.2	0.67	Clear	No odor
8:47	33.95	300	2.7	17.6	7.16	389.1	0.63	6.6	-158.3	0.57	Clear	No odor
8:50	33.95	300	3.6	17.6	7.13	388.9	0.64	6.6	-159.3	0.62	Clear	No odor
8:53	33.95	300	4.5	17.6	7.11	388.8	0.64	6.1	-159.7	0.57	Clear	No odor
Final Values:		8:53	4.50	17.6	7.11	388.8	0.64	6.1	-159.7	0.57	Clear	

BTP
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Final Controller Settings:	
Setting ID:	104
Pressure Setting:	38
Ambient Air (°C):	20

Sample ID:	ALF-GW-ALF213-20190411	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	NA
Collection Time:	8:56	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.5	*Equipment Blank ID:*	NA
Sample Depth (feet):	71.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.65	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	33.95	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:01
		Drawdown Stabilized < 0.3 ft:	Yes

Top of Screen (ft. btoc):	71.0	**Bottom of Screen (ft. btoc):**	81.2
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
Serial No:	18J102202		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/12/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	34.44
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	162.75
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	128.31 / 1268.27
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	157.8
Well ID:	ALF-213A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
11:08	34.43	305	0	18.8	7.52	359.6	3.07	31.1	-110.6	2.71	Clear	No odor
11:11	34.43	305	0.92	18.8	7.41	354.2	2.36	23.1	-110.6	0.90	Clear	No odor
11:14	34.43	305	1.83	17.9	7.29	337.6	1.00	11.4	-126.5	1.04	Clear	No odor
11:17	34.43	305	2.75	17.9	7.21	336.7	9.10	7.9	-129.7	0.73	Clear	No odor
11:20	34.43	305	3.66	18.0	7.16	336.7	0.77	8.4	-131.5	0.76	Clear	No odor
11:23	34.43	305	4.58	18.0	7.10	336.5	0.69	7.5	-133.2	0.68	Clear	No odor
11:26	34.43	305	5.49	18.0	7.07	337.1	0.60	6.5	-133.4	0.79	Clear	No odor
11:29	34.43	305	6.41	17.9	7.05	336.7	0.59	6.4	-133.8	0.72	Clear	No odor
11:32	34.43	305	7.32	17.9	7.04	337.1	0.51	6.0	-133.8	0.83	Clear	No odor
11:35	34.43	305	8.24	17.9	7.03	337.3	0.54	5.8	-133.8	0.85	Clear	No odor
11:38	34.43	305	9.15	17.9	7.02	338.4	0.53	5.5	-133.4	0.73	Clear	No odor
Final Values:		11:38	9.15	17.9	7.02	338.4	0.53	5.5	-133.4	0.73	Clear	

BTC
4-11-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	66
Ambient Air (°C):	24

Sample ID:	ALF-GW-ALF213A-20190411	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	NA
Collection Time:	11:41	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	9.15	*Equipment Blank ID:*	NA
Sample Depth (feet):	157.8	*Filter Blank ID:*	ALF-GW-FLB02-20190411
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.88	*DI water lot #:*	Pace fill date: 3/12/19
Depth to Water After Sampling (feet):	34.43	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	No lot # on As Spec filter disks
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:47
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	152.8	**Bottom of Screen (ft. btoc):**	162.8
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/12/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	34.52
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	121.75
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	87.23 / 862.22
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	116.8
Well ID:	ALF-213B	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
9:55	34.52	225	0	18.5	7.31	882	1.24	12.4	-118.7	4.90	Clear	No odor
9:58	34.52	225	0.68	18.4	7.06	877	1.31	13.3	-94.0	5.82	Clear	No odor
10:01	34.52	225	1.35	18.4	6.96	872	1.00	10.6	-118.3	5.03	Clear	No odor
10:04	34.52	225	2.03	18.5	6.97	871	0.90	9.4	-131.1	4.78	Clear	No odor
10:07	34.52	225	2.70	15.5	6.99	870	0.88	9.1	-139.8	3.16	Clear	No odor
10:10	34.52	225	3.38	18.5	7.00	869	0.83	8.8	-141.6	2.26	Clear	No odor
10:13	34.52	225	4.05	18.5	7.01	869	0.76	8.3	-143.0	2.17	Clear	No odor
								BTP 4-10-19				
												Final Controller Settings:
												Setting ID: 105
												Pressure Setting: 98
Final Values:		10:13	4.05	18.5	7.01	869	0.76	8.3	-143.0	2.17	Clear	**Ambient Air (°C):** 22

Sample ID:	ALF-GW-ALF213B-20190411	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	ALF-GW-FB05-20190411
Collection Time:	10:16	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.05	*Equipment Blank ID:*	NA
Sample Depth (feet):	116.8	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.09	*DI water lot #:*	Pace fill date: 3/12/19
Depth to Water After Sampling (feet):	34.52	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:22
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	111.8	**Bottom of Screen (ft. btoc):**	121.8
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/12/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	14.05
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	54.90
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	40.85 / 403.78
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	45.0
Well ID:	ALF-214	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
9:28	14.16	350	0	17.7	7.20	537.9	1.09	11.8	49.2	0.99	Clear	No odor
9:31	14.16	350	1.05	17.8	7.16	535.8	0.80	8.5	45.0	1.48	Clear	No odor
9:34	14.16	350	2.1	17.7	7.14	533.9	0.67	7.3	44.6	2.55	Clear	No odor
9:37	14.16	350	3.15	17.7	7.12	533.4	0.61	6.7	45.7	2.17	Clear	No odor
9:40	14.16	350	4.2	17.8	7.12	532.2	0.58	6.0	47.0	0.81	Clear	No odor
9:43	14.16	350	5.25	17.8	7.12	531.3	0.54	5.3	49.1	0.75	Clear	No odor
Final Values:		9:43	5.25	17.8	7.12	531.3	0.54	5.3	49.1	0.75	Clear	

BJP 4-12-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	25
Ambient Air (°C):	14

Sample ID:	ALF-GW-ALF214-20190412	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/12/2019	*Field Blank ID:*	ALF-GW-FB07-20190412
Collection Time:	9:46	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.25	*Equipment Blank ID:*	NA
Sample Depth (feet):	45.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.66	*DI water lot #:*	Pace fill date: 3/12/19
Depth to Water After Sampling (feet):	14.16	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:49
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	34.5	**Bottom of Screen (ft. btoc):**	54.5
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/12/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/12/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/13/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	15.42
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	133.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	117.58 / 1162.21
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	130.0
Well ID:	ALF-214A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
10:25	14.54	445	0	18.1	7.10	1116	1.01	10.6	-22.0	4.96	Clear	No odor
10:28	14.54	445	1.335	17.8	6.77	1125	0.81	8.3	-20.4	3.76	Clear	No odor
10:31	14.54	445	2.67	17.8	6.67	1121	0.70	7.1	-27.8	4.99	Clear	No odor
10:34	14.54	445	4.005	17.8	6.61	1116	0.59	6.1	-32.7	1.21	Clear	No odor
10:37	14.54	445	5.34	17.8	6.58	1111	0.57	5.5	-36.5	3.93	Clear	No odor
10:40	14.54	445	6.675	17.8	6.56	1106	0.45	4.8	-39.8	3.70	Clear	No odor
10:43	14.54	445	8.01	17.8	6.54	1105	0.44	4.7	-41.8	2.04	Clear	No odor
10:46	14.54	445	9.35	17.9	6.54	1108	0.45	5.1	-43.1	1.92	Clear	No odor
Final Values:		10:46	9.35	17.9	6.54	1108	0.45	5.1	-43.1	1.92	Clear	

BJP
4-12-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	82
Ambient Air (°C):	14

Sample ID:	ALF-GW-ALF214A-20190412	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/12/2019	*Field Blank ID:*	NA
Collection Time:	10:49	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	9.35	*Equipment Blank ID:*	NA
Sample Depth (feet):	130.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.23	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	14.54	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:53
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	122.6	**Bottom of Screen (ft. btoc):**	132.6
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:** Professional Plus	**Serial No:** 18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/12/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/12/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/13/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	14.23
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	93.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	79.07 / 781.56
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	88.0
Well ID:	ALF-214B	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
8:27	14.25	300	0	17.4	7.13	890	1.66	17.1	-69.9	6.79	Clear	No odor
8:30	14.25	300	0.9	17.4	6.93	894	1.01	10.4	-84.7	5.28	Clear	No odor
8:33	14.25	300	1.8	17.6	6.87	894	0.81	8.3	-90.5	7.02	Clear	No odor
8:36	14.25	300	2.7	17.5	6.83	896	0.71	7.3	-94.3	4.33	Clear	No odor
8:39	14.25	300	3.6	17.5	6.80	895	0.66	6.8	-96.3	3.74	Clear	No odor
8:42	14.25	300	4.5	17.6	6.79	896	0.63	6.5	-98.1	2.79	Clear	No odor
Final Values:		8:42	4.5	17.6	6.79	896	0.63	6.5	-98.1	2.79	Clear	

RJP
4-12-19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	40
Ambient Air (°C):	12

Sample ID:	ALF-GW-ALF214B-20190412	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/12/2019	*Field Blank ID:*	NA
Collection Time:	8:45	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.5	*Equipment Blank ID:*	NA
Sample Depth (feet):	88.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.21	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	14.25	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	8:51
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	82.9	**Bottom of Screen (ft. btoc):**	92.9
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
Serial No:	18J102202		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/12/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/12/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/13/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	6.55
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	30.40
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	23.85 / 235.74
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	25.0
Well ID:	ALF-215	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/9/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
15:06	6.69	204	0	17.6	6.79	536.5	0.83	8.7	119.4	2.06	CLEAR	NO ODOR
15:09	6.69	204	0.61	17.6	6.74	534.3	0.70	7.3	116.9	0.57	CLEAR	NO ODOR
15:12	6.69	204	1.22	17.5	6.73	534.0	0.64	6.9	114.6	0.69	CLEAR	NO ODOR
15:15	6.69	204	1.84	17.5	6.73	532.6	0.55	5.7	109.3	0.47	CLEAR	NO ODOR
15:18	6.69	204	2.45	17.5	6.72	532.5	0.51	5.3	106.7	0.48	CLEAR	NO ODOR
15:21	6.69	204	3.06	17.4	6.72	531.7	0.47	4.7	102.5	0.32	CLEAR	NO ODOR
Final Values:		15:21	3.06	17.4	6.72	531.7	0.47	4.7	102.5	0.32	CLEAR	

AS 4/9/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	15
Ambient Air (°C):	27

Sample ID:	ALF-GW-ALF215-20190409	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/9/2019	*Field Blank ID:*	NA
Collection Time:	~~15:22~~ 15:24 CS 5/28/2019	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.06	*Equipment Blank ID:*	NA
Sample Depth (feet):	25.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.41	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	6.69	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	15:32
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	20.0	**Bottom of Screen (ft. btoc):**	30.0
Color:	CLEAR	**Odor:**	No Odor
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
Serial No:	41774		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/9/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/9/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/10/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	11.95
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	60.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	48.05 / 474.95
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	50.0
Well ID:	ALF-216	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/10/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
12:20	11.97	250	0	19.1	6.73	1034	1.20	12.7	-104.7	26.9	Clear	No odor
12:25	11.97	250	1.25	19.1	6.69	1033	0.89	9.7	-106.6	25.4	Clear	No odor
12:30	11.97	250	2.5	18.8	6.68	1032	0.74	7.8	-107.5	22.0	Clear	No odor
12:35	11.97	250	3.75	19.0	6.67	1028	0.56	5.9	-108.7	18.1	Clear	No odor
12:40	11.97	250	5	18.8	6.68	1027	0.46	4.8	-108.7	17.9	Clear	No odor
12:45	11.97	250	6.25	18.9	6.68	1024	0.56	6.0	-108.6	16.1	Clear	No odor
12:50	11.97	250	7.5	18.9	6.68	1022	0.48	4.9	-108.4	13.8	Clear	No odor
13:00	11.97	250	10	18.9	6.70	1021	0.42	4.5	-108.3	13.5	Clear	No odor
13:05	11.97	250	11.25	18.9	6.70	1020	0.40	4.3	-107.6	10.6	Clear	No odor
13:10	11.97	250	12.5	18.8	6.70	1020	0.41	4.5	-107.4	10.1	Clear	No odor
13:15	11.97	250	13.75	18.8	6.71	1017	0.41	4.2	-107.7	8.53	Clear	No odor
13:20	11.97	250	15	18.8	6.71	1019	0.38	4.1	-107.6	8.80	Clear	No odor
13:25	11.97	250	16.25	19.0	6.72	1020	0.37	3.9	-107.6	7.53	Clear	No odor
Final Values:		13:25	16.25	19.0	6.72	1020	0.37	3.9	-107.6	7.53	Clear	

BTP
4-10-19

Final Controller Settings:	
Setting ID:	104
Pressure Setting:	28
Ambient Air (°C):	27

Sample ID:	ALF-GW-ALF216-20190410	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	ALF-GW-FB03-20190410
Sample Date:	4/10/2019	*Field Duplicate ID:*	NA
Collection Time:	13:28	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	16.25	*Filter Blank ID:*	NA
Sample Depth (feet):	50.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace fill date: 3/12/19
Follow up turbidity value (NTU):	5.69	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	11.97	*Filter Lot #:*	None
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	None	*Filter Sample Rad.:*	No
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:34
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	39.6	**Bottom of Screen (ft. btoc):**	59.6
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/10/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/10/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/11/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	25.66
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	71.75
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	46.09 / 455.57
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	60.8
Well ID:	ALF-217	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*0.93*		
12:45	25.73	250	0	19.4	7.20	682	1.36	13.2	-102.1	1.84	Clear	No odor
12:48	25.73	250	0.75	19.1	7.16	680	0.76	8.4	-118.5	0.93	Clear	No odor
12:51	25.73	250	1.5	19.0	7.12	680	0.63	7.0	-122.5	0.86	Clear	No odor
12:54	25.73	250	2.25	19.1	7.10	680	0.60	6.4	-124.9	0.62	Clear	No odor
12:57	25.73	250	3	18.9	7.10	680	0.60	6.2	-125.9	0.48	Clear	No odor
Final Values:		12:57	3.00	18.9	7.10	680	0.60	6.2	-125.9	0.48	Clear	

BTP
4-11-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	22
Ambient Air (°C):	26

Sample ID:	ALF-GW-ALF217-20190411	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	NA
Collection Time:	13:00	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3	*Equipment Blank ID:*	NA
Sample Depth (feet):	60.8	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.63	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	27.53	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:07
		Drawdown Stabilized < 0.3 ft:	Yes

Top of Screen (ft. btoc):	49.8	**Bottom of Screen (ft. btoc):**	71.8
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
Serial No:	18J102202		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/12/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	34.85
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	192.75
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	157.90 / 1560.75
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	187.8
Well ID:	ALF-217A	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
14:41	34.94	260	0	19.2	7.16	693	1.69	17.2	-99.6	3.05	Clear	No odor
14:44	34.94	260	0.78	19.1	6.97	688	1.55	15.8	-119.8	1.39	Clear	No odor
14:47	34.94	260	1.56	19.1	6.93	689	1.25	13.0	-126.3	3.52	Clear	No odor
14:50	34.94	260	2.34	19.1	6.92	688	1.17	11.9	-129.4	0.12	Clear	No odor
14:53	34.94	260	3.12	19.1	6.89	686	0.97	10.3	-130.7	0.27	Clear	No odor
14:56	34.94	260	3.9	18.9	6.89	685	0.82	8.7	-131.7	0.75	Clear	No odor
14:59	13.94	260	4.68	18.8	6.88	686	0.69	7.6	-133.2	0.83	Clear	No odor
15:02	13.94	260	5.46	18.7	6.87	685	0.70	7.3	-134.3	0.78	Clear	No odor
15:05	13.94	260	6.24	18.7	6.88	684	0.59	6.4	-135.4	1.05	Clear	No odor
15:08	13.94	260	7.02	18.6	6.87	684	0.62	6.6	-136.2	1.05	Clear	No odor
15:11	13.94	260	7.8	18.7	6.87	685	0.56	5.9	-136.7	0.63	Clear	No odor
Final Values:		15:11	7.8	18.7	6.87	685	0.56	5.9	-136.7	0.63	Clear	

BTP
4-11-19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	90
Ambient Air (°C):	27

Sample ID:	ALF-GW-ALF217AA-20190411	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	NA
Collection Time:	15:14	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	7.8	*Equipment Blank ID:*	ALF-GW-EB01-20190411
Sample Depth (feet):	187.8	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.74	*DI water lot #:*	Pace fill date: 3/12/19
Depth to Water After Sampling (feet):	13.94	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	15:18
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	182.8	**Bottom of Screen (ft. btoc):**	192.8
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/12/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	34.77
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	131.75
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	96.98 / 958.59
Project Number:	175577013		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	126.8
Well ID:	ALF-217B	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
13:45	34.77	365	0	18.5	7.30	1033	1.21	12.6	-120.3	12.6	Clear	No odor
13:48	34.77	365	1.10	18.5	7.15	1036	1.25	12.8	-126.5	12.9	Clear	No odor
13:51	34.77	365	2.19	18.5	7.03	1035	1.20	14.0	129.5	11.9	Clear	No odor
13:54	34.77	365	3.29	18.6	6.98	1036	1.23	14.0	-131.3	9.96	Clear	No odor
13:57	34.77	365	4.38	18.4	6.96	1033	1.12	12.4	-132.0	7.68	Clear	No odor
14:00	34.77	365	5.48	18.5	6.94	1033	1.10	10.8	-132.8	5.98	Clear	No odor
Final Values:		14:00	5.475	18.5	6.94	1033	1.1	10.8	-132.8	5.98	Clear	

BTP
4-11-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	78
Ambient Air (°C):	27

Sample ID:	ALF-GW-ALF217BB-20190411	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	NA
Collection Time:	14:03	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.475	*Equipment Blank ID:*	NA
Sample Depth (feet):	126.8	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.26	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	34.77	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:10
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	121.8	**Bottom of Screen (ft. btoc):**	131.8
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/12/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	14.09
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	83.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	68.91 / 681.14
Project Number:	175577013		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	77.0
Well ID:	P-4	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
9:20	14.09	415	0	18.9	7.35	236.1	1.82	18.3	-78.8	4.11	Clear	No odor
9:23	14.09	415	1.25	18.9	7.30	233.6	1.11	11.9	-95.3	4.76	Clear	No odor
9:26	14.09	415	2.49	18.8	7.27	232.6	0.89	11.6	-102.5	3.69	Clear	No odor
9:29	14.09	415	3.74	18.7	7.26	231.6	0.88	8.2	105.6	4.16	Clear	No odor
9:32	14.09	415	4.98	18.6	7.25	230.8	0.66	7.2	-110.3	3.81	Clear	No odor
9:35	14.09	415	6.23	18.5	7.25	230.4	0.64	6.5	-111.0	3.70	Clear	No odor
9:38	14.09	415	7.47	18.4	7.25	230.2	0.61	6.2	-111.5	3.86	Clear	No odor
Final Values:		9:38	7.47	18.4	7.25	230.2	0.61	6.2	-111.5	3.86	Clear	

BTP
4-16-19

Final Controller Settings:	
Setting ID:	104
Pressure Setting:	42
Ambient Air (°C):	18

Sample ID:	ALF-GW-P4-20190416	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/16/2019	*Field Blank ID:*	NA
Collection Time:	9:41	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	7.47	*Equipment Blank ID:*	NA
Sample Depth (feet):	77.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.05	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	14.09	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:47
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	71.7	**Bottom of Screen (ft. btoc):**	81.8
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:** Professional Plus	**Serial No:** 18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/17/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	7.80
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	50.10
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	42.30 / 418.11
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	41.0
Well ID:	P-4S	**Method of Purging:**	Low Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
8:20	7.80	440	0	15.1	7.39	350.6	1.61	14.3	159.0	3.19	Clear	No odor
8:23	7.80	440	1.32	15.1	7.22	350.8	1.35	10.4	119.9	2.55	Clear	No odor
8:26	7.80	440	2.64	15.2	7.14	350.7	0.82	8.8	78.7	4.55	Clear	No odor
8:29	7.00	440	3.96	15.2	7.12	350.2	0.56	7.5	55.4	6.12	Clear	No odor
8:32	7.80	440	5.28	15.2	7.10	350.4	0.54	5.7	36.6	4.84	Clear	No odor
8:35	7.80	440	6.6	15.2	7.07	350.7	0.53	0.6	27.9	3.35	Clear	No odor
8:38	7.80	440	7.92	15.2	7.05	350.4	0.50	5.1	18.8	4.38	Clear	No odor
8:41	7.80	440	9.24	15.2	7.03	350.3	0.46	4.6	11.9	3.46	Clear	No odor
Final Values:		8:41	9.24	15.2	7.03	350.3	0.46	4.6	11.9	3.46	Clear	

BTP
4-16-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	27
Ambient Air (°C):	14

Sample ID:	ALF-GW-P4S-20190416	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/16/2019	*Field Blank ID:*	ALF-GW-FB11-20190416
Collection Time:	8:44	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	9.24	*Equipment Blank ID:*	NA
Sample Depth (feet):	41.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.78	*DI water lot #:*	Pace fill date:03/13/19
Depth to Water After Sampling (feet):	7.80	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	8:49
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	31.0	**Bottom of Screen (ft. btoc):**	51.0
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/17/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	8.30
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	37.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	28.70 / 283.68
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	29.0
Well ID:	PMW-02A	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
12:32	8.38	170	0	18.6	9.67	839.0	0.81	9.0	131.2	18.4	amber	no odor
12:35	8.38	170	0.51	18.5	9.76	888.0	0.70	8.0	129.7	18.2	amber	no odor
12:38	8.38	170	1.02	18.6	9.81	887.0	0.67	6.7	126.3	17.9	amber	no odor
12:41	8.38	170	1.53	18.6	9.92	887.0	0.56	6.0	121.6	18.5	amber	no odor
12:44	8.38	170	2.04	18.6	10.14	880.0	0.50	5.1	115.0	18.4	amber	no odor
12:47	8.38	170	2.55	18.6	10.23	887.0	0.45	5.0	113.1	18.9	amber	no odor
12:50	8.38	170	3.06	18.5	10.31	886.0	0.37	4.2	110.3	18.1	amber	no odor
12:53	8.38	170	3.57	18.5	10.38	889.0	0.38	3.7	104.8	17.7	amber	no odor
12:56	8.38	170	4.08	18.0	10.42	888.0	0.36	3.5	103.5	18.7	amber	no odor
Final Values:		12:56	4.08	18	10.42	888	0.36	3.5	103.5	18.7	amber	

PC 4/16/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	15
Ambient Air (°C):	22

Sample ID:	ALF-GW-PMW02A-20190416	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/16/2019	*Field Blank ID:*	NA
Collection Time:	12:58	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.08	*Equipment Blank ID:*	NA
Sample Depth (feet):	29.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	18.9	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	8.38	*Filter purged for minimum two minutes:*	Yes
Analysis:	RI	*Filter Lot #:*	A1701
Tubing Lot #:	NA	*Filter Sample Metals:*	Yes
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:06
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	15.0	**Bottom of Screen (ft. btoc):**	36.0
Color:	CLEAR	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/17/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	11.23
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	57.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	45.77 / 452.41
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	54.0
Well ID:	PMW-02B	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
11:24	11.53	100	0	19.1	6.52	511.7	0.96	9.8	126.7	9.83	Clear	No odor
11:27	11.58	100	0.3	18.8	6.72	510.0	0.56	6.0	123.3	7.69	Clear	No odor
11:30	11.59	100	0.6	18.8	6.82	511.3	0.55	5.6	121.2	8.00	Clear	No odor
11:33	11.59	100	0.9	18.9	6.86	511.7	0.54	5.5	115.8	7.16	Clear	No odor
Final Values:		11:33	0.9	18.9	6.86	511.7	0.54	5.5	115.8	7.16	Clear	

PCS 4/16/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	27
Ambient Air (°C):	21.3

Sample ID:	ALF-GW-PMW02B-20190416	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/16/2019	*Field Blank ID:*	NA
Collection Time:	11:36	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	0.9	*Equipment Blank ID:*	NA
Sample Depth (feet):	54.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	6.68	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	11.59	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:46
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	45.0	**Bottom of Screen (ft. btoc):**	55.0
Color:	CLEAR	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/17/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	11.13
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	137.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	125.87 / 1244.15
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	124.0
Well ID:	PMW-02C	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/15/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
15:25	11.13	400	0	17.0	6.32	349.5	0.97	8.4	149.5	8.75	CLEAR	NO ODOR
15:28	11.13	400	1.2	16.9	6.78	348.6	0.43	5.2	348.2	7.89	CLEAR	NO ODOR
15:31	11.13	400	2.4	16.9	6.75	348.0	0.24	2.4	348.2	7.95	CLEAR	NO ODOR
15:34	11.13	400	3.6	16.9	6.85	348.6	0.25	2.1	348.8	5.47	CLEAR	NO ODOR
Final Values:		15:34	3.6	16.9	6.85	348.6	0.25	2.1	348.8	5.47	CLEAR	

AS 4/15/19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	72
Ambient Air (°C):	22.8

Sample ID:	ALF-GW-PMW-02C-20190415 CS 5/23/19	**QA/QC Sample Collected:**	No
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	NA
Sample Date:	4/15/2019	*Field Duplicate ID:*	NA
Collection Time:	15:38	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	3.6	*Filter Blank ID:*	NA
Sample Depth (feet):	124.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
Follow up turbidity value (NTU):	3.87	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	11.13	*Filter Lot #:*	None
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	None	*Filter Sample Rad.:*	No
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	15:50
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes

Top of Screen (ft. btoc):	115.0	**Bottom of Screen (ft. btoc):**	125.0
Color:	CLEAR	**Odor:**	No Odor

Instruments Manufacturer: QED **Model:** MP50 **Serial No:** MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/15/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/15/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/16/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	9.46
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	37.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	27.54 / 272.22
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	29.0
Well ID:	PMW-04A	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
10:25	9.46	425	0	18.1	7.21	868	1.11	11.5	15.2	1.61	Clear	No odor
10:28	9.46	425	1.28	18.0	7.41	870	0.63	7.0	4.8	2.44	Clear	No odor
10:31	9.46	425	2.55	18.0	7.51	870	0.53	5.8	-2.7	2.29	Clear	No odor
10:34	9.46	425	3.83	18.0	7.56	870	0.48	5.7	-6.8	2.12	Clear	No odor
10:37	9.46	425	5.10	18.1	7.59	870	0.47	4.6	-10.8	4.02	Clear	No odor
10:40	9.46	425	6.38	18.1	7.62	870	0.46	4.6	-14.1	1.67	Clear	No odor
Final Values:		10:40	6.38	18.1	7.62	870	0.46	4.6	-14.1	1.67	Clear	

BTP
4-16-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	20
Ambient Air (°C):	19

Sample ID:	ALF-GW-PMW04A-20190416	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/16/2019	*Field Blank ID:*	NA
Collection Time:	10:43	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6.38	*Equipment Blank ID:*	NA
Sample Depth (feet):	29.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.26	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	9.46	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:47
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	15.0	**Bottom of Screen (ft. btoc):**	36.0
Color:	Clear	**Odor:**	Clear
Instruments Manufacturer:	YSI	**Model:** Professional Plus	**Serial No:** 18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/17/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	12.54
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	62.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	49.46 / 488.88
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	57.0
Well ID:	PMW-04B	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
11:09	12.59	410	0	17.8	7.59	703	2.36	21.1	-76.9	3.00	Clear	No odor
11:12	12.59	410	1.23	17.7	7.35	697	1.06	1.1	-112.5	3.39	Clear	No odor
11:15	12.59	410	2.46	17.7	7.22	695	0.66	6.8	-132.5	1.07	Clear	No odor
11:18	12.59	410	3.69	17.7	7.18	695	0.48	5.3	-139.6	1.94	Clear	No odor
11:21	12.59	410	4.92	17.7	7.16	694	0.43	4.3	-143.3	2.18	Clear	No odor
11:24	12.59	410	6.15	17.7	7.15	693	0.37	3.8	-146.3	1.22	Clear	No odor
Final Values:		11:24	6.15	17.7	7.15	693	0.37	3.8	-146.3	1.22	Clear	

RTP
4-16-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	30
Ambient Air (°C):	21

Sample ID:	ALF-GW-PMW04B-20190416	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/16/2019	*Field Blank ID:*	NA
Collection Time:	11:27	*Field Duplicate ID:*	ALF-GW-DUP03-20190416
Total Volume Purged (L):*	6.15	*Equipment Blank ID:*	NA
Sample Depth (feet):	57.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.82	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	12.59	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:32
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	48.0	**Bottom of Screen (ft. btoc):**	58.0
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/17/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	12.46
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	137.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	124.54 / 1231.01
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	124.0
Well ID:	PMW-04C	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
12:11	12.47	425	0	17.9	7.34	388.7	2.79	22.9	28.4	2.98	Clear	No odor
12:14	12.47	425	1.28	17.4	7.11	371.5	1.23	13.7	-6.7	1.98	Clear	No odor
12:17	12.47	425	2.55	17.4	7.05	369.1	0.69	7.4	-39.7	2.64.	Clear	No odor
12:20	12.47	425	3.83	17.3	7.07	368.2	0.50	0.6	-64.3	2.05	Clear	No odor
12:23	12.47	425	5.10	17.3	7.10	367.7	0.49	8.5	-79.4	1.88	Clear	No odor
12:26	12.47	425	6.38	17.2	7.11	366.5	0.48	4.3	-91.7	1.85	Clear	No odor
12:29	12.47	425	7.65	17.2	7.13	366.6	0.42	3.7	-96.5	1.74	Clear	No odor
Final Values:		12:29	7.65	17.2	7.13	366.6	0.42	3.7	-96.5	1.74	Clear	

BTP
4-16-19

Final Controller Settings:	
Setting ID:	103
Pressure Setting:	78
Ambient Air (°C):	22

Sample ID:	ALF-GW-PMW04C-20190416	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	Yes
Sample Date:	4/16/2019	*Field Blank ID:*	NA
Collection Time:	12:34	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	7.65	*Equipment Blank ID:*	NA
Sample Depth (feet):	124.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.17	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	12.47	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	12:38
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	115.0	**Bottom of Screen (ft. btoc):**	125.0
Color:	Clear	**Odor:**	None
Instruments Manufacturer:	YSI	**Model:**	Professional Plus
		Serial No:	18J102202

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819--2AFW	022519-2GCU	022519-2AJN	022519-2BXU	022519-2GCU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	6
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Bryan Pennell	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/17/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	6.63
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	27.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	20.37 / 201.35
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	24.0
Well ID:	PMW-07A	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
10:00	6.64	180	0	17.5	9.18	796.0	0.90	9.8	122.4	6.49	CLEAR	NO ODOR
10:03	6.64	180	0.54	17.5	9.30	795.0	0.67	7.1	122.0	6.61	CLEAR	NO ODOR
10:06	6.64	180	1.08	17.5	9.38	799.0	0.58	5.9	119.4	6.09	CLEAR	NO ODOR
10:09	6.64	180	1.62	17.5	9.43	804.0	0.55	6.1	116.0	6.02	CLEAR	NO ODOR
10:12	6.64	180	2.16	17.5	9.44	804.0	0.53	5.7	114.3	6.03	CLEAR	NO ODOR
Final Values:		10:12	2.16	17.5	9.44	804	0.53	5.7	114.3	6.03	CLEAR	

HC 4/16/19

Final Controller Settings:	
Setting ID:	102
Pressure Setting:	18
Ambient Air (°C):	21.3

Sample ID:	ALF-GW-PMW07A-20190416	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	ALF-GW-FB12-20190416
Sample Date:	4/16/2019	*Field Duplicate ID:*	NA
Collection Time:	10:16	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	2.16	*Filter Blank ID:*	NA
Sample Depth (feet):	24.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace fill date: 3/12/2019
Follow up turbidity value (NTU):	5.96	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	6.64	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Filter Sample Rad.:*	No
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	10:26
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	15.0	**Bottom of Screen (ft. btoc):**	25.0
Color:	CLEAR	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/17/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	10.43
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	57.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	46.57 / 460.32
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	55.0
Well ID:	PMW-07B	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
9:09	10.43	110	0	17.1	6.35	541.3	0.82	8.5	122.2	4.24	clear	no odor
9:12	10.43	110	0.33	17.1	6.37	552.2	0.78	8.0	119.0	4.43	clear	no odor
9:15	10.43	110	0.66	17.1	6.44	561.2	0.73	7.6	113.7	4.06	clear	no odor
Final Values:		9:15	0.66	17.1	6.44	561.2	0.73	7.6	113.7	4.06	clear	

AG 4/16/19

Final Controller Settings:	
Setting ID:	104
Pressure Setting:	27
Ambient Air (°C):	18

Sample ID:	ALF-GW-PMW07B-20190416	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/16/2019	*Field Blank ID:*	NA
Collection Time:	9:17	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	0.66	*Equipment Blank ID:*	NA
Sample Depth (feet):	55.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.15	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	10.43	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:29
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	46.0	**Bottom of Screen (ft. btoc):**	56.0
Color:	CLEAR	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:**	MP50
Serial No:	MP50-1468		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/17/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	12.39
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	124.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	111.61 / 1103.2
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	117.0
Well ID:	PMW-07C	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
8:17	12.39	368	0	16.6	5.73	356.3	1.78	18.4	166.9	11.0	clear	no odor
8:20	12.39	368	1.104	16.4	5.93	361.2	0.99	11.0	158.5	6.78	clear	no odor
8:23	12.39	368	2.208	16.4	6.12	360.1	0.74	9.7	150.7	5.32	clear	no odor
8:26	12.39	368	3.312	16.5	6.33	356.4	0.53	5.6	142.7	5.11	clear	no odor
8:29	12.39	368	4.416	16.5	6.49	353.9	0.45	5.5	136.9	4.77	clear	no odor
8:32	12.39	368	5.52	16.5	6.59	352.3	0.38	3.9	129.5	3.78	clear	no odor
8:35	12.39	368	6.624	16.4	6.69	351.3	0.42	4.7	3.4	3.42	clear	no odor
Final Values:		8:35	6.624	16.4	6.69	351.3	0.42	4.7	3.4	3.42	clear	

HC 4/16/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	60
Ambient Air (°C):	15

Sample ID:	ALF-GW-PMW-07C-20190416	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/16/2019	*Field Blank ID:*	NA
Collection Time:	8:38	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6.624	*Equipment Blank ID:*	NA
Sample Depth (feet):	117.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.64	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	12.39	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	8:43
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	108.0	**Bottom of Screen (ft. btoc):**	118.0
Color:	CLEAR	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/16/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/16/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/17/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	10.28
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	45.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	34.72 / 343.19
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	32.0
Well ID:	PMW-10A	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/10/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
16:10	10.30	320	0	19.2	7.04	542.7	0.95	10.3	88.6	4.35	clear	no odor
16:13	10.30	320	0.96	19.8	7.09	542.0	0.62	6.6	93.7	4.78	clear	no odor
16:19	10.30	320	2.88	19.8	7.14	541.2	0.38	4.2	96.4	4.23	clear	no odor
16:22	10.30	320	3.84	19.1	7.13	542.9	0.37	4.0	95.9	4.11	clear	no odor
16:25	10.30	320	4.8	19.1	7.18	536.9	0.35	3.6	94.9	4.08	clear	no odor
Final Values:		16:25	4.8	19.1	7.18	536.9	0.35	3.6	94.9	4.08	clear	

AS 4/10/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	20
Ambient Air (°C):	28.7

Sample ID:	ALF-GW-PMW10~~C~~A-20190410 CS 5/23/19	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/10/2019	*Field Blank ID:*	ALF-GW-FB04-20190410
Collection Time:	16:30	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.8	*Equipment Blank ID:*	NA
Sample Depth (feet):	32.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.54	*DI water lot #:*	Pace fill date: 3/12/19
Depth to Water After Sampling (feet):	10.30	*Filter purged for minimum two minutes:*	Yes
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	16:40
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	18.0	**Bottom of Screen (ft. btoc):**	39.0
Color:	clear	**Odor:**	no odor
Instruments Manufacturer:	QED	**Model:**	MP50
Serial No:	MP50-1468		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/10/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/10/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/11/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	17.16
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	75.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	57.84 / 571.72
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	68.0
Well ID:	PMW-10B	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/10/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
14:44	17.20	100	0	20.9	7.35	859	0.66	7.2	35.6	4.78	CLEAR	NO ODOR
14:47	17.20	100	0.3	20.9	7.37	866	0.60	6.8	26.4	4.13	CLEAR	NO ODOR
14:50	17.21	100	0.6	21.0	7.41	870	0.58	6.4	18.1	3.66	CLEAR	NO ODOR
14:53	17.21	100	0.9	20.8	7.44	875	0.55	6.3	9.6	3.56	CLEAR	NO ODOR
Final Values:		14:53	0.9	20.8	7.44	875	0.55	6.3	9.6	3.56	CLEAR	

AS 4/10/19

Final Controller Settings:	
Setting ID:	106
Pressure Setting:	35
Ambient Air (°C):	28.8

Sample ID:	ALF-GW-PMW10B-20190410	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/10/2019	*Field Blank ID:*	NA
Collection Time:	14:59	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	0.9	*Equipment Blank ID:*	NA
Sample Depth (feet):	68.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.22	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	17.22	*Filter purged for minimum two minutes:*	Yes
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	15:10
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	59.0	**Bottom of Screen (ft. btoc):**	69.0
Color:	clear	**Odor:**	no odor
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/10/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/10/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/11/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	17.04
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	175.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	157.96 / 1561.35
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	148.0
Well ID:	PMW-10C	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/10/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
13:24	17.70	260	0	19.6	6.77	454.4	1.06	11.5	25.3	3.71	CLEAR	NO ODOR
13:27	17.70	260	0.78	19.6	6.79	446.2	0.57	6.1	37.9	1.99	CLEAR	NO ODOR
13:30	17.70	260	1.56	19.6	6.83	443.5	0.50	5.5	34.6	1.40	CLEAR	NO ODOR
13:33	17.70	260	2.34	19.5	6.85	444.6	0.45	4.7	28.5	2.76	CLEAR	NO ODOR
13:36	17.70	260	3.12	19.5	6.85	442.4	0.40	4.4	23.6	1.36	CLEAR	NO ODOR
Final Values:		13:36	3.12	19.5	6.85	442.4	0.4	4.4	23.6	1.36	CLEAR	

AS 4/10/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	70
Ambient Air (°C):	27.1

Sample ID:	ALF-GW-PMW10C-20190410	**QA/QC Sample Collected:**	No
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	NA
Sample Date:	4/10/2019	*Field Duplicate ID:*	NA
Collection Time:	13:39	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	3.12	*Filter Blank ID:*	NA
Sample Depth (feet):	148.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
Follow up turbidity value (NTU):	1.21	*Filter purged for minimum two minutes:*	Yes
Depth to Water After Sampling (feet):	17.70	*Filter Lot #:*	None
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	None	*Filter Sample Rad.:*	No
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:48
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	139.0	**Bottom of Screen (ft. btoc):**	149.0
Color:	clear	**Odor:**	no odor
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/10/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/10/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	4/11/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	7.98
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	35.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	27.02 / 267.08
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	27.0
Well ID:	PMW-11A	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
10:24	8.00	280	0	19.2	7.13	574.0	0.89	9.5	73.4	10.9	CLEAR	NO ODOR
10:27	8.00	280	0.84	19.2	7.13	574.0	0.73	7.5	66.2	16.1	CLEAR	NO ODOR
10:30	8.00	280	1.68	19.2	7.11	574.0	0.57	6.2	58.3	16.7	CLEAR	NO ODOR
10:33	8.00	280	2.52	19.2	7.11	573.0	0.45	4.7	47.3	16.9	CLEAR	NO ODOR
10:36	8.00	280	3.36	19.2	7.10	574.0	0.41	4.4	35.5	14.9	CLEAR	NO ODOR
10:39	8.00	280	4.2	19.2	7.10	575.0	0.38	4.2	29.5	13.2	CLEAR	NO ODOR
10:42	8.00	280	5.04	19.2	7.10	574.0	0.39	4.0	25.6	11.3	CLEAR	NO ODOR
10:45	8.00	280	5.88	19.2	7.10	575.0	0.39	3.9	20.1	12.1	CLEAR	NO ODOR
10:48	8.00	280	6.72	19.2	7.13	576.0	0.36	4.1	18.8	11.0	CLEAR	NO ODOR
10:51	8.00	280	7.56	19.2	7.09	576.0	0.39	4.3	14.4	10.6	CLEAR	NO ODOR
10:54	8.00	280	8.4	19.2	7.09	576.0	0.37	4.3	11.1	10.0	CLEAR	NO ODOR
10:57	8.00	280	9.24	19.2	7.10	576.0	0.39	4.3	9.3	9.78	CLEAR	NO ODOR
Final Values:		10:57	9.24	19.2	7.1	576	0.39	4.3	9.3	9.78	CLEAR	

AS 4/11/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	15
Ambient Air (°C):	22.3

Sample ID:	ALF-GW-PMW11A-20190411	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	ALF-AQ-FB06-20190411
Collection Time:	11:00	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	9.24	*Equipment Blank ID:*	NA
Sample Depth (feet):	27.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	8.70	*DI water lot #:*	Pace fill date: 3/12/19
Depth to Water After Sampling (feet):	8.00	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:10
		Drawdown Stabilized < 0.3 ft:	Yes

Top of Screen (ft. btoc):	13.0	**Bottom of Screen (ft. btoc):**	34.0
Color:	CLEAR	**Odor:**	NO ODOR

Instruments Manufacturer:	QED	**Model:**	MP50
Serial No:	MP50-1468		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/12/2019	**Signature:**	Cassidy Sutherland

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	12.83
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	65.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	52.17 / 515.67
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	63.0
Well ID:	PMW-11B	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
9:29	12.85	240	0	19.7	7.07	676.0	0.61	6.3	18.4	3.06	CLEAR	NO ODOR
9:32	12.85	240	0.72	19.7	7.10	680.0	0.44	4.8	-16.8	1.27	CLEAR	NO ODOR
9:35	12.85	240	1.44	19.8	7.07	675.0	0.42	4.4	-21.9	1.33	CLEAR	NO ODOR
9:38	12.85	240	2.16	19.8	7.07	673.0	0.42	4.4	-26.0	1.11	CLEAR	NO ODOR
Final Values:		9:38	2.16	19.8	7.07	673	0.42	4.4	-26	1.11	CLEAR	

AS 4/11/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	35
Ambient Air (°C):	20.1

Sample ID:	ALF-GW-PMW11B-20190411	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	NA
Collection Time:	9:42	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.16	*Equipment Blank ID:*	NA
Sample Depth (feet):	63.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.05	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	12.85	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:52
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	54.0	**Bottom of Screen (ft. btoc):**	64.0
Color:	CLEAR	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/12/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	12.83
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	256.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	243.17 / 2403.6
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	144.0
Well ID:	PMW-11C	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
8:29	13.98	130	0	19.3	6.97	523.7	0.86	9.3	43.6	0.71	clear	no odor
8:32	13.98	130	0.39	19.4	6.80	521.3	0.80	8.8	457.0	0.63	clear	no odor
8:35	13.98	124	0.762	19.4	6.71	519.3	0.66	8.1	48.0	1.25	clear	no odor
8:38	13.98	130	1.152	19.4	6.74	515.7	0.60	6.7	40.9	1.13	clear	no odor
8:41	13.98	130	1.542	19.4	6.80	512.8	0.55	5.6	26.2	1.16	clear	no odor
Final Values:		8:41	1.542	19.4	6.8	512.8	0.55	5.6	26.2	1.16	clear	

AS 4/11/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	70
Ambient Air (°C):	20.2

Sample ID:	ALF-GW-PMW11C-20190411	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	NA
Collection Time:	8:47	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.542	*Equipment Blank ID:*	NA
Sample Depth (feet):	144.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.11	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	13.98	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	8:55
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	135.0	**Bottom of Screen (ft. btoc):**	145.0
Color:	CLEAR	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/12/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	27.81
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	57.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	29.19 / 288.53
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	49.0
Well ID:	PMW-14A	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
15:08	27.85	220	0	20.1	7.09	650.0	1.91	19.8	93.8	6.49	clear	no odor
15:11	27.85	220	0.66	20.1	7.06	650.0	1.35	14.9	76.3	2.53	clear	no odor
15:14	27.85	220	1.32	20.0	7.03	649.0	1.08	12.1	57.4	2.42	clear	no odor
15:17	27.85	220	1.98	20.1	7.00	649.0	0.79	8.7	34.2	3.22	clear	no odor
15:20	27.85	220	2.64	20.1	6.97	649.0	0.66	7.2	19.3	1.54	clear	no odor
15:23	27.85	220	3.3	20.0	6.96	649.0	0.63	6.9	9.9	2.02	clear	no odor
15:26	27.85	220	3.96	20.0	6.94	649.0	0.62	6.7	6.5	1.05	clear	no odor
Final Values:		15:26	3.96	20	6.94	649	0.62	6.7	6.5	1.05	clear	

AS 4/11/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	26
Ambient Air (°C):	24.1

Sample ID:	ALF-GW-PMW14A-20190411	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	NA
Collection Time:	15:30	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.96	*Equipment Blank ID:*	NA
Sample Depth (feet):	49.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.05	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	27.85	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	15:45
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	35.0	**Bottom of Screen (ft. btoc):**	56.0
Color:	CLEAR	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/12/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	35.24
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	87.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	51.76 / 511.62
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	85.0
Well ID:	PMW-14B	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
14:02	35.25	400	0	19.0	6.67	681.0	0.34	3.6	83.6	10.2	clear	no odor
14:05	35.25	400	1.2	18.9	6.82	686.0	0.28	2.3	21.4	7.55	clear	no odor
14:08	35.25	400	2.4	18.9	6.83	686.0	0.27	2.8	10.4	6.93	clear	no odor
14:11	35.25	400	3.6	18.9	6.88	688.0	0.28	2.8	-22.3	2.90	clear	no odor
Final Values:		14:11	3.6	18.9	6.88	688	0.28	2.8	-22.3	2.90	clear	

AS 4/11/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	44
Ambient Air (°C):	23.6

Sample ID:	ALF-GW-PMW14B-20190411	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	4/11/2019	*Field Blank ID:*	NA
Collection Time:	14:14	*Field Duplicate ID:*	ALF-GW-FD01-20190411
Total Volume Purged (L):*	3.6	*Equipment Blank ID:*	NA
Sample Depth (feet):	85.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.01	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	35.25	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:24
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	76.0	**Bottom of Screen (ft. btoc):**	86.0
Color:	CLEAR	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/12/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA ALF RI GROUNDWATER SAMPLING FORM

Project Name:	ALF Groundwater Investigation	**Initial Depth to Water (feet):**	35.23
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	167.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	131.77 / 1302.47
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	156.0
Well ID:	PMW-14C	**Method of Purging:**	Low Flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	TOC
Well Diameter (inches):	4.0	**Date:**	4/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
12:13	35.23	400	0	16.6	6.60	392.9	0.61	6.5	33.2	9.47	CLEAR	NO ODOR
12:16	35.23	400	1.2	18.6	6.71	395.2	0.47	4.7	20.0	5.19	CLEAR	NO ODOR
12:19	35.23	400	2.4	18.3	6.71	395.8	0.41	4.4	7.0	3.25	CLEAR	NO ODOR
12:22	35.23	400	3.6	18.6	6.81	397.8	0.35	3.8	-3.5	1.10	CLEAR	NO ODOR
12:25	35.23	400	4.8	18.6	6.75	398.2	0.34	3.6	-9.4	1.03	CLEAR	NO ODOR
Final Values:		12:25	4.8	18.6	6.75	398.2	0.34	3.6	-9.4	1.03	CLEAR	

AS 4/11/19

Final Controller Settings:	
Setting ID:	105
Pressure Setting:	80
Ambient Air (°C):	23.4

Sample ID:	ALF-GW-PMW14C-20190411	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	Yes
Sample Date:	4/11/2019	*Field Blank ID:*	NA
Collection Time:	12:33	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.8	*Equipment Blank ID:*	NA
Sample Depth (feet):	156.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.92	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	35.23	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Filter Sample Rad.:*	No
If No, Provide Explanation	NA		12:42
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	147.0	**Bottom of Screen (ft. btoc):**	157.0
Color:	CLEAR	**Odor:**	NO ODOR
Instruments Manufacturer:	QED	**Model:**	MP50
		Serial No:	MP50-1468

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	2540D
Bottle Lot Number	021819-2AFW	021819-2AFW	022519-2AJN	022519-2BXU	022519-2CGU	18-0210
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	6
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	Unpreserved

Lead Sampler Name:	Andrew Stevens	**Date:**	4/11/2019	**Signature:**	
Sampler Name:	Suleiman Khan	**Date:**	4/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	4/12/2019	**Signature:**	Cassidy Sutherland

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	12.02
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	130.80
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	118.78 / 293.52
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	126.0
Well ID:	ACC-3A (MD 7/15/19)	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/21/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0830	12.02	300	0	19.4	6.71	877	0.31	3.0	-48.3	3.96	Clear	No odor
0833	12.02	300	0.90	19.3	6.74	879	0.32	0.3	-58.9	1.67	Clear	No odor
0836	12.02	300	1.80	19.2	6.76	879	0.31	3.1	-62.8	1.77	Clear	No odor
0839	12.02	300	2.70	19.2	6.78	879	0.23	2.4	-67.1	1.64	Clear	No odor
0842	12.02	300	3.60	19.2	6.78	879	0.21	2.2	-69.5	1.13	Clear	No odor
Final Values:		0842	3.60	19.2	6.78	879	0.21	2.2	-69.5	1.13	Clear	

BTP
6-21-19

Final Controller Settings:	
Setting ID:	105
Pressure (PSI):	70
Ambient Air (°C):	25

Sample ID:	ALF-GW-ACC3A-20190621	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/21/2019	*Field Blank ID:*	ALF-GW-FB05-20190621
Collection Time:	8:45	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.60	*Equipment Blank ID:*	NA
Sample Depth (feet):	126.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.17	*DI water lot #:*	Pace Analytical Minneapolis supplied, Fill date: 6-14-19
Depth to Water After Sampling (feet):	12.04	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	8:50
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	120.4	**Bottom of Screen (ft. btoc):**	130.4
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/21/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/21/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA TDEC Order	**Initial Depth to Water (feet):**	13.83
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	144.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	130.17 / 321.66
Project Number:	~~175568225~~ 175578046 (MD 7/15/19)		*if water column is < 4.5 L contact Field Coordinator
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	139.0
Well ID:	ACC-5A	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/26/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1023	13.86	260	0	21.0	6.44	753	1.10	11.9	-9.2	1.57	clear	slight egg smell
1026	13.86	260	0.78	21.0	6.37	756	0.95	10.8	-14.7	3.92	clear	slight egg smell
1029	13.86	260	1.56	20.9	6.29	756	0.84	9.5	-17.6	4.25	clear	slight egg smell
1032	13.86	260	2.34	20.9	6.24	754	0.68	7.7	-21.5	6.71	clear	slight egg smell
1035	13.86	260	3.12	20.8	6.24	754	0.49	6.1	-24.2	4.36	clear	slight egg smell
1038	13.86	260	3.90	20.9	6.23	754	0.48	5.8	-26.7	3.72	clear	slight egg smell
1041	13.86	260	4.68	20.8	6.21	754	0.46	5.4	-27.3	4.36	clear	slight egg smell
Final Values:		1041	4.68	20.8	6.21	754	0.46	5.4	-27.3	4.36	clear	

6/26/19

Final Controller Settings:	
Setting ID:	107
Pressure (PSI):	82
Ambient Air (°C):	27

Sample ID:	ALF-GW-ACC5A-20190626	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/26/2019	*Field Blank ID:*	ALF-GW-FB12-20190626
Collection Time:	10:44	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.68	*Equipment Blank ID:*	NA
Sample Depth (feet):	139.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	4.15	*DI water lot #:*	Pace Minneapolis fill date 6/21/19
Depth to Water After Sampling (feet):	13.86	*Filter purged for minimum two minutes:*	Yes
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	Yes
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:56
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	133.6	**Bottom of Screen (ft. btoc):**	143.6
Color:	clear	**Odor:**	slight egg smell

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/26/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/26/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	6/27/2019	**Signature:**	Courtnae Ramser
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA TDEC Order	**Initial Depth to Water (feet):**	14.05
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	60.60
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	46.55 / 115.03
Project Number:	~~175568225~~ 175578046 (MD 7/15/19)		*if water column is < 4.5 L contact Field Coordinator
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	55.5
Well ID:	ACC-5B	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/26/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0920	14.05	400	0	20.0	6.93	917	0.34	3.7	-66.6	4.96	clear	no odor
0923	14.05	400	1.20	19.9	6.77	916	0.28	3.1	-67.5	2.46	clear	no odor
0926	14.05	400	2.40	19.9	6.57	911	0.19	2.1	-67.3	2.56	clear	no odor
0929	14.05	400	3.60	19.9	6.54	910	0.18	1.9	-67.5	2.03	clear	no odor
0932	14.05	400	4.80	19.9	6.51	909	0.15	1.6	-67.0	1.56	clear	no odor
Final Values:		0932	4.80	19.9	6.51	909	0.15	1.6	-67.0	1.56	clear	**Final Controller Settings:**
												Setting ID: 105
												Pressure (PSI): 30
												Ambient Air (°C): 25

RS 6/26/19

Sample ID:	ALF-GW-ACC5B-20190626 (CR 6/27/19)	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/26/2019	*Field Blank ID:*	NA
Collection Time:	9:35	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.8	*Equipment Blank ID:*	NA
Sample Depth (feet):	55.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.27	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	14.05	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	none	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:44
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	50.2		60.2
Color:	clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/26/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/26/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	6/27/2019	**Signature:**	Courtnae Ramser
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI	**Initial Depth to Water (feet):**	16.31
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	50.70
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	34.39 / 84.98
			if water column is < 4.5 L contact Field Coordinator
Project Number:	~~175577013~~ 175578046 (MD 7/15/19)		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	49.0
Well ID:	ALF-~~201B~~ 201 CS 6/24/19	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1221	16.99	136	0	21.7	6.64	765	0.63	7.1	34.0	2.93	clear	no odor
1224	16.99	136	0.41	21.7	6.61	766	0.59	6.7	26.3	3.54	clear	no odor
1227	16.99	136	0.82	21.5	6.58	766	0.55	6.4	20.1	1.96	clear	no odor
1230	16.99	136	1.22	21.4	6.55	765	0.55	6.1	17.8	2.77	clear	no odor
1233	16.99	136	1.63	21.5	6.53	765	0.50	5.7	16.0	2.09	clear	no odor
Final Values:		1233	1.632	21.5	6.53	765	0.50	5.7	16.0	2.09	clear	

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AS

Final Controller Settings:	
Setting ID:	101
Pressure (PSI):	25
Ambient Air (°C):	28

Sample ID:	ALF-GW-ALF201-20190620	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/20/2019	*Field Blank ID:*	ALF-GW-FB04-20190620
Collection Time:	12:36	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.632	*Equipment Blank ID:*	NA
Sample Depth (feet):	49.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.17	*DI water lot #:*	Pace Mineapolis 6/14/19
Depth to Water After Sampling (feet):	16.99	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	12:45
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	23.3	**Bottom of Screen (ft. btoc):**	49.9
Color:	clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/20/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/24/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI	**Initial Depth to Water (feet):**	16.43
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	130.70
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	114.27 / 282.37
			if water column is < 4.5 L contact Field Coordinator
Project Number:	~~175577013~~ 175578046 (MD 7/15/19)		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	126.0
Well ID:	ALF-201A	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1320	16.48	260	0	21.3	6.57	638	0.27	3.0	-61.9	2.08	clear	no odor
1323	16.48	260	0.78	21.3	6.51	640	0.20	2.3	-55.8	0.41	clear	no odor
1326	16.48	260	1.56	21.3	6.49	640	0.21	2.3	-56.8	0.84	clear	no odor
1329	16.48	260	2.34	21.3	6.48	641	0.19	2.0	-58.2	0.48	clear	no odor
1332	16.48	260	3.12	21.3	6.48	642	0.17	2.1	-62.4	0.56	clear	no odor
Final Values:		1332	3.12	21.3	6.48	642	0.17	2.1	-62.4	0.56	clear	

AS 6/20/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	80
Ambient Air (°C):	29

Sample ID:	ALF-GW-ALF201A-20190620	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/20/2019	*Field Blank ID:*	NA
Collection Time:	13:35	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.12	*Equipment Blank ID:*	NA
Sample Depth (feet):	126.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.09	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	16.48	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:45
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	120.3	**Bottom of Screen (ft. btoc):**	130.3
Color:	clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/20/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/24/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/25/19	**Initial Depth to Water (feet):**	16.84
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	77.46 / 191.41
Project Number:	~~175568282~~ 175578046 (MD 7/15/19)		*if water column is < 4.5 L contact Field Coordinator
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.0
Well ID:	ALF-201B	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/21/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1138	16.90	260	0	22.1	7.66	897	1.74	19.1	-44.2	2.19	clear	no odor
1141	16.90	260	0.78	21.7	7.10	890	1.14	13.4	-47.1	1.82	clear	no odor
1144	16.90	260	1.56	21.6	6.89	901	0.77	9.4	-61.2	1.35	clear	no odor
1147	16.90	260	2.34	21.7	6.84	905	0.68	7.9	-65.8	1.22	clear	no odor
1150	16.90	260	3.12	21.7	6.81	906	0.65	7.7	-68.6	0.99	clear	no odor
1153	16.90	260	3.90	21.6	6.78	906	0.62	7.3	-71.7	2.43	clear	no odor
Final Values:		1153	3.90	21.6	6.78	906	0.62	7.3	-71.7	2.43	clear	

AS 6/21/19

Final Controller Settings:	
Setting ID:	102
Pressure (PSI):	60
Ambient Air (°C):	29

Sample ID:	ALF-GW-ALF201B-20190621	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bledder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/21/2019	*Field Blank ID:*	ALF-GW-FB06-20190621
Collection Time:	11:55	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.90	*Equipment Blank ID:*	ALF-GW-EB02-20190621
Sample Depth (feet):	89.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.14	*DI water lot #:*	Pace Minneapolis 6/14/19
Depth to Water After Sampling (feet):	16.90	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	12:05
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	23.3	**Bottom of Screen (ft. btoc):**	49.9
Color:	clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/21/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/21/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA TDEC Order	**Initial Depth to Water (feet):**	11.98
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	44.80
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	32.82 / 324.41
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	43.0
Well ID:	ALF-202	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/26/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1209	12.01	500	0	19.7	7.29	617	0.22	2.4	-139.6	2.29	clear	no odor
1212	12.01	500	1.50	19.7	7.23	619	0.17	1.9	-153.4	1.03	clear	no odor
1215	12.01	500	3.00	19.7	7.18	617	0.12	1.3	-162.5	0.78	clear	no odor
1218	12.01	500	4.50	19.7	7.18	616	0.11	1.2	-166.2	0.80	clear	no odor
1221	12.01	500	6.00	19.7	7.17	615	0.09	1.1	-167.4	1.02	clear	no odor
Final Values:		1221	6.00	19.7	7.17	615	0.09	1.1	-167.4	1.02	clear	

RS 6/26/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	30
Ambient Air (°C):	29

Sample ID:	ALF-GW-ALF202-20190626	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/26/2019	*Field Blank ID:*	NA
Collection Time:	12:24	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6	*Equipment Blank ID:*	NA
Sample Depth (feet):	43.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.04	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	12.01	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	12:34
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	23.4	**Bottom of Screen (ft. btoc):**	44.6
Color:	clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/26/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/26/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	6/27/2019	**Signature:**	Courtnae Ramser
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA TDEC Order	**Initial Depth to Water (feet):**	14.67
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	150.50
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	135.83 / 1342.6
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	145.5
Well ID:	ALF-202A	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/26/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1248	14.71	320	0	20.5	6.75	567	0.27	3.1	-69.0	1.51	clear	slight ~~egg~~ sulphur-like (CR 6/27/19) smell
1251	14.71	320	0.96	20.4	6.64	577	0.27	3.0	-62.5	1.39	clear	slight ~~egg~~ sulphur-like (CR 6/27/19) smell
1254	14.71	320	1.92	20.3	6.60	586	0.24	2.6	-68.8	0.87	clear	slight ~~egg~~ sulphur-like (CR 6/27/19) smell
1257	14.71	320	2.88	20.3	6.58	586	0.19	2.1	-79.6	0.92	clear	slight ~~egg~~ sulphur-like (CR 6/27/19) smell
1300	14.71	320	3.84	20.3	6.57	585	0.17	1.9	-82.5	0.81	clear	slight ~~egg~~ sulphur-like (CR 6/27/19) smell
Final Values:		1300	3.84	20.3	6.57	585	0.17	1.9	-82.5	0.81	clear	

AS 6/26/19

Final Controller Settings:	
Setting ID:	107
Pressure (PSI):	80
Ambient Air (°C):	31

Sample ID:	ALF-GW-ALF202A-20190626	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	NA
Sample Date:	6/26/2019	*Field Duplicate ID:*	NA
Collection Time:	13:03	*Equipment Blank ID:*	ALF-GW-EB04-20190626
Total Volume Purged (L):*	3.84	*Filter Blank ID:*	NA
Sample Depth (feet):	145.5	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Minneapolis fill date 6/21/19
Follow up turbidity value (NTU):	0.89	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	14.71	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	None	*Other Filtered Samples Collected:*	NA
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:13
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	140.1	**Bottom of Screen (ft. btoc):**	150.1
Color:	clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/26/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/26/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	6/27/2019	**Signature:**	Courtnae Ramser
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA TDEC Order	**Initial Depth to Water (feet):**	15.38
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.50
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	79.12 / 782.06
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.5
Well ID:	ALF-202B	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/26/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1345	15.39	480	0	20.2	7.04	653	0.57	5.8	-55.0	8.09	clear	no odor
1348	15.39	480	1.44	19.6	6.78	658	0.26	2.7	-89.3	6.27	clear	no odor
1351	15.39	480	2.88	19.5	6.73	659	0.16	1.8	-107.0	3.30	clear	no odor
1354	15.39	480	4.32	19.5	6.70	650	0.14	1.5	-112.5	3.19	clear	no odor
1357	15.39	480	5.76	19.5	6.68	646	0.12	1.4	-115.5	2.35	clear	no odor
Final Values:		1357	5.76	19.5	6.68	646	0.12	1.4	-115.5	2.35	clear	

AS 6/26/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	60
Ambient Air (°C):	32

Sample ID:	ALF-GW-ALF202B-20190626 (CR 6/27/19)	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/26/2019	*Field Blank ID:*	NA
Collection Time:	14:00	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.76	*Equipment Blank ID:*	NA
Sample Depth (feet):	89.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.83	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	15.38	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:10
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	84.1	**Bottom of Screen (ft. btoc):**	94.1
Color:	clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/26/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/26/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	6/27/2019	**Signature:**	Courtnae Ramser
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/25/19	**Initial Depth to Water (feet):**	11.09
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	54.10
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	43.01 / 106.28
			if water column is < 4.5 L contact Field Coordinator
Project Number:	~~175568282~~ 175578046 (MD 7/15/19)		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	52.0
Well ID:	ALF-203	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/21/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0947	12.05	240	0	20.2	9.16	1070	0.11	1.3	-87.0	3.94	light tan	no odor
0950	12.05	240	0.72	20.1	9.24	1069	0.09	0.9	-101.0	3.12	light tan	no odor
0953	12.05	240	1.44	20.2	9.29	1070	0.08	0.8	-109.0	2.80	light tan	no odor
0956	12.05	240	2.16	20.1	9.32	1072	0.06	0.8	-116.7	3.53	light tan	no odor
0959	12.05	240	2.88	20.1	9.34	1072	0.06	0.5	-122.1	2.90	light tan	no odor
Final Values:		0959	2.88	20.1	9.34	1072	0.06	0.5	-122.1	2.90	light tan	

AS 6/21/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	25
Ambient Air (°C):	28

Sample ID:	ALF-GW-ALF203-20190621	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/21/2019	*Field Blank ID:*	NA
Collection Time:	10:01	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.88	*Equipment Blank ID:*	NA
Sample Depth (feet):	52.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	4.42	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	12.11	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:10
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	33.1	**Bottom of Screen (ft. btoc):**	54.1
Color:	light tan	**Odor:**	no odor CS 6/25/19

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/21/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/21/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/25/19	**Initial Depth to Water (feet):**	11.51
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	122.70
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	111.19 / 274.76
			*if water column is < 4.5 L contact Field Coordinator
Project Number:	~~175568282~~ 175578046 (MD 7/15/19)		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	118.0
Well ID:	ALF-203A	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/24/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0903	11.53	320	0	18.7	6.49	353.0	2.53	27.9	-22.9	2.19	Clear	no odor
0906	11.53	320	0.96	18.7	6.35	349.1	2.17	24.9	-37.5	2.35	Clear	no odor
0909	11.53	320	1.92	18.7	6.33	346.7	1.91	20.3	-43.1	1.53	Clear	no odor
0911	11.53	320	2.56	18.6	6.36	347.5	1.60	17.0	-54.5	3.60	Clear	no odor
0914	11.53	320	3.52	18.6	6.44	349.2	1.26	12.9	-64.6	1.73	Clear	no odor
0917	11.53	320	4.48	18.6	6.43	349.8	1.19	12.4	-68.3	1.83	Clear	no odor
0920	11.53	320	5.44	18.6	6.43	350.1	1.15	11.9	-68.9	1.85	Clear	no odor
Final Values:		0920	5.44	18.6	6.43	350.1	1.15	11.9	-68.9	1.85	Clear	

AS 6/24/19

Final Controller Settings:	
Setting ID:	104
Pressure (PSI):	60
Ambient Air (°C):	24

Sample ID:	ALF-GW-ALF203A-20190624	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/24/2019	*Field Blank ID:*	NA
Collection Time:	9:20	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.44	*Equipment Blank ID:*	NA
Sample Depth (feet):	118.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.58	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	11.53	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:30
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	112.3	**Bottom of Screen (ft. btoc):**	122.3
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/24/2019	**Signature:**	
Sampler Name:	Stafan Stahl	**Date:**	6/24/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/25/19	**Initial Depth to Water (feet):**	11.47
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	82.83 / 204.68
Project Number:	~~175568282~~ 175578046 (MD 7/15/19)		**if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.0
Well ID:	ALF-203B	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/24/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1000	11.47	320	0	18.9	6.74	545	0.14	1.5	-110.6	3.23	clear	no odor
1003	11.47	320	0.96	18.9	6.77	541	0.14	1.6	-112.0	3.02	clear	no odor
1006	11.47	320	1.92	18.9	6.76	541	0.13	1.5	-112.4	1.93	clear	no odor
1009	11.47	320	2.88	18.9	6.76	544	0.13	1.4	-113.3	1.05	clear	no odor
1012	11.47	320	3.84	18.9	6.76	543	0.14	1.4	-114.0	0.85	clear	no odor
Final Values:		1012	3.84	18.9	6.76	543	0.14	1.4	-114.0	0.85	clear	**Final Controller Settings:**
												Setting ID: 100
												Pressure (PSI): 55
												Ambient Air (°C): 26

6/24/19

VAS

Sample ID:	ALF-GW-ALF203B-20190624	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/24/2019	*Field Blank ID:*	NA
Collection Time:	10:23	*Field Duplicate ID:*	ALF-GW-DUP02-20190624
Total Volume Purged (L):*	3.84	*Equipment Blank ID:*	NA
Sample Depth (feet):	89.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.39	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	11.47	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:30
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	83.9	**Bottom of Screen (ft. btoc):**	93.9
Color:	clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	4
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/24/2019	**Signature:**	
Sampler Name:	Stafan Stahl	**Date:**	6/24/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	7.01
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	59.20
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	52.19 / 128.97
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	49.0
Well ID:	ALF-204	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/25/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0826	7.02	125	0	19.6	7.45	561.0	1.28	18.3	-113.7	2.54	Clear	No odor
0829	7.04	125	0.38	19.0	7.16	552.1	0.25	2.7	-154.5	2.50	Clear	No odor
0832	7.04	125	0.75	19.1	7.18	555.2	0.22	2.4	-162.2	2.04	Clear	No odor
0835	7.04	125	1.13	19.1	7.20	551.6	0.20	2.1	-166.1	1.43	Clear	No odor
Final Values:		0835	1.13	19.1	7.20	551.6	0.2	2.1	-166.1	1.43	Clear	

BTP
6-25-19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	25
Ambient Air (°C):	21

Sample ID:	ALF-GW-ALF204-20190625	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/25/2019	*Field Blank ID:*	NA
Collection Time:	8:38	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.13	*Equipment Blank ID:*	NA
Sample Depth (feet):	49.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.38	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	7.06	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	8:44
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	49.0	**Bottom of Screen (ft. btoc):**	59.2
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/25/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/25/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/26/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	7.29
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	120.70
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	113.41 / 280.25
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	116.0
Well ID:	ALF-204A	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/25/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0929	7.30	250	0	18.9	6.93	394.6	0.31	3.1	-14.2	7.71	Clear	No odor
0932	7.30	250	0.75	18.9	6.99	393.8	0.14	1.5	-60.5	1.19	Clear	No odor
0935	7.30	280	1.59	18.7	7.05	392.9	0.13	1.3	-75.3	1.26	Clear	No odor
0938	7.30	250	2.34	18.6	7.06	391.7	0.11	1.1	-81.7	1.02	Clear	No odor
Final Values:		0938	2.34	18.6	7.06	391.7	0.11	1.1	-81.7	1.02	Clear	

RTP 6-25-19

Final Controller Settings:	
Setting ID:	106
Pressure (PSI):	60
Ambient Air (°C):	24

Sample ID:	ALF-GW-ALF204A-20190625	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/25/2019	*Field Blank ID:*	ALF-GW-FB09-20190625
Collection Time:	9:41	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.34	*Equipment Blank ID:*	NA
Sample Depth (feet):	116.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.45	*DI water lot #:*	Pace Analytical Minneapolis supplied, Fill date: 6-21-19
Depth to Water After Sampling (feet):	7.30	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:45
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	110.3	**Bottom of Screen (ft. btoc):**	120.3
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/25/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/25/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/26/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

TVA

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	7.33
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.10
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	86.77 / 214.42
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.0
Well ID:	ALF-204B	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/25/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (uS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1027	7.34	500	0	17.6	7.06	316.1	0.48	4.9	-10.0	4.38	Clear	No odor
1030	7.34	500	1.50	17.4	7.09	315.4	0.22	2.4	-50.3	2.74	Clear	No odor
1033	7.34	500	3.00	17.1	7.14	315.3	0.14	1.5	-68.4	3.59	Clear	No odor
1036	7.34	500	4.50	17.3	7.14	315.0	0.12	1.0	-75.4	3.59	Clear	No odor
Final Values:		1036	4.50	17.3	7.14	315.0	0.12	1	-75.4	3.59	Clear	**Ambient Air (°C):** 26

BTP 6-25-19

Final Controller Settings:
Setting ID: 102
Pressure (PSI): 60

Sample ID:	ALF-GW-ALF204B-20190625	**QA/QC Sample Collected:**	No
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	NA
Sample Date:	6/25/2019	*Field Duplicate ID:*	NA
Collection Time:	10:39	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	4.5	*Filter Blank ID:*	NA
Sample Depth (feet):	89.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
Follow up turbidity value (NTU):	3.45	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	7.34	*Filter Lot #:*	None
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	None	*Other Filtered Samples Collected:*	NA
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	10:44
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	83.7	**Bottom of Screen (ft. btoc):**	93.7
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/25/2019	**Signature:**	[signature]
Sampler Name:	Ismael Arroyo	**Date:**	6/25/2019	**Signature:**	[signature]
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/26/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	[signature]

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	11.67
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	56.40
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	44.73 / 110.53
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	54.0
Well ID:	ALF-205	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/25/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1118	12.10	150	0	19.8	7.20	936	0.43	4.5	-11.1	2.59	Clear	No odor
1121	12.10	150	0.45	19.5	7.13	930	0.19	2.1	-36.4	1.39	Clear	No odor
1124	12.10	150	0.90	19.6	7.12	927	0.17	1.8	-41.5	0.96	Clear	No odor
1127	12.10	150	1.35	19.8	7.14	926	0.14	1.7	-44.2	0.94	Clear	No odor
Final Values:		1127	1.35	19.8	7.14	926	0.14	1.7	-44.2	0.94	Clear	

BTP 6-25-19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	26
Ambient Air (°C):	27

Sample ID:	ALF-GW-ALF205-20190625	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/25/2019	*Field Blank ID:*	NA
Collection Time:	11:30	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.35	*Equipment Blank ID:*	NA
Sample Depth (feet):	54.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.98	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	12.10	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:36
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	34.5	**Bottom of Screen (ft. btoc):**	55.5
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/25/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/25/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/26/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	10.43
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	86.50
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	76.07 / 187.98
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	81.5
Well ID:	ALF-205B	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/25/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1216	10.44	475	0	18.4	7.48	319.1	0.34	3.3	-58.5	4.58	Clear	No odor
1219	10.44	475	1.43	18.2	7.39	308.0	0.10	1.1	-95.2	2.92	Clear	No odor
1222	10.44	475	2.85	18.1	7.41	307.8	0.08	0.8	-113.6	3.24	Clear	No odor
1225	10.44	475	4.28	18.1	7.45	307.3	0.07	0.7	-122.5	3.70	Clear	No odor
Final Values:		1225	4.28	18.1	7.45	307.3	0.07	0.7	-122.5	3.70	Clear	

BTO
6-25-19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	55
Ambient Air (°C):	28

Sample ID:	ALF-GW-ALF205B-20190625	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/25/2019	*Field Blank ID:*	NA
Collection Time:	12:28	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.28	*Equipment Blank ID:*	NA
Sample Depth (feet):	81.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.65	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	10.44	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:32
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	76.1	**Bottom of Screen (ft. btoc):**	86.1
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/25/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/25/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/26/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	10.09
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	112.40
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	102.31 / 252.82
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	107.0
Well ID:	ALF-205A	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/25/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1252	10.09	450	0	17.9	7.06	327.3	0.18	1.7	-37.2	4.36	Clear	No odor
1255	10.09	450	1.35	17.8	7.11	327.3	0.09	1.0	-67.3	2.18	Clear	No odor
1258	10.09	450	2.70	17.8	7.19	327.5	0.08	0.9	-84.7	1.83	Clear	No odor
1301	10.09	450	4.05	17.7	7.22	327.7	0.07	0.7	-96.0	1.70	Clear	No odor
Final Values:		1301	4.05	17.7	7.22	327.7	0.07	0.7	-96.0	1.70	Clear	

B.T.P
6-25-19

Final Controller Settings:	
Setting ID:	106
Pressure (PSI):	60
Ambient Air (°C):	29

Sample ID:	ALF-GW-ALF205A-20190625	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/25/2019	*Field Blank ID:*	NA
Collection Time:	13:04	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.05	*Equipment Blank ID:*	NA
Sample Depth (feet):	107.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.25	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	10.11	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:07
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	102.0	**Bottom of Screen (ft. btoc):**	112.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/25/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/25/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/26/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	15.76
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	64.40
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	48.64 / 120.19
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	54.0
Well ID:	ALF-206	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/24/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1400	15.78	360	0	17.6	7.43	377.0	0.20	1.9	-134.9	3.02	Clear	No odor
1403	15.78	360	1.08	17.3	7.39	372.1	0.14	17.2	-151.9	1.41	Clear	No odor
1406	15.78	360	2.16	17.1	7.39	368.2	0.12	17.1	-155.8	1.24	Clear	No odor
1409	15.78	360	3.24	17.1	7.40	365.7	0.11	17.1	-158.2	1.44	Clear	No odor
1412	15.78	360	4.32	17.1	7.41	360.3	0.10	17.1	-160.7	1.46	Clear	No odor
Final Values:		1412	4.32	17.1	7.41	360.3	0.10	17.1	-160.7	1.46	Clear	

BTP 6-24-19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	25
Ambient Air (°C):	27

Sample ID:	ALF-GW-ALF206-20190624	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/24/2019	*Field Blank ID:*	ALF-GW-FB07-20190624
Collection Time:	14:15	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.32	*Equipment Blank ID:*	NA
Sample Depth (feet):	54.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.86	*DI water lot #:*	Pace Analytical Minneapolis supplied, Fill date: 6-14-19
Depth to Water After Sampling (feet):	15.78	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:20
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	54.0	**Bottom of Screen (ft. btoc):**	64.2
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/24/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/24/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/20/19	**Initial Depth to Water (feet):**	10.82
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	48.80
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	37.98 / 93.85
			if water column is < 4.5 L contact Field Coordinator
Project Number:	~~175568282~~ 175578046 CS 6/20/19		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	47.0
Well ID:	ALF-210	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1006	12.12	200	0	19.8	6.76	838	0.38	3.9	80.9	36.1	clear	no odor
1010	12.15	200	0.80	19.7	6.60	830	0.21	2.3	60.6	34.1	clear	no odor
1017	12.15	132	1.72	20.1	6.52	834	0.24	2.5	40.7	25.6	clear	no odor, flow rate lowered to stabilize drawdown
1020	12.15	132	2.12	20.1	6.51	834	0.22	2.4	34.5	24.0	clear	no odor
1023	12.15	132	2.52	20.1	6.50	834	0.21	2.4	32.9	23.3	clear	no odor
1026	12.15	132	2.91	20.1	6.51	836	0.21	2.4	30.5	23.0	clear	no odor
1029	12.15	132	3.31	20.2	6.51	835	0.21	2.3	27.3	23.2	clear	no odor
1032	12.15	132	3.70	20.3	6.52	836	0.19	2.2	23.1	20.9	clear	no odor
1035	12.15	132	4.10	20.2	6.52	836	0.20	2.0	20.4	23.5	clear	no odor
1038	12.15	132	4.50	20.2	6.51	839	0.17	2.0	18.1	20.6	clear	no odor
1041	12.15	132	4.89	20.2	6.52	839	0.18	2.0	17.2	19.2	clear	no odor
1044	12.15	132	5.29	20.2	6.52	841	0.17	2.0	16.3	18.6	clear	no odor
1047	12.15	132	5.68	20.2	6.52	841	0.18	2.0	15.2	18.4	clear	no odor
1050	12.18	132	6.08	20.1	6.53	840	0.18	2.0	12.8	18.2	clear	no odor
1053	12.15	132	6.48	20.0	6.52	842	0.18	2.0	10.9	19.8	clear	no odor
1056	12.15	132	6.87	20.1	6.54	845	0.17	2.0	9.7	18.6	clear	no odor
1059	12.15	132	7.27	20.2	6.53	843	0.17	2.0	8.6	15.3	clear	no odor
1102	12.15	132	7.66	20.2	6.54	843	0.17	2.0	7.4	16.0	clear	no odor
1105	12.15	132	8.06	20.4	6.54	844	0.17	2.0	4.2	16.1	clear	no odor
1108	12.15	132	8.46	20.4	6.54	845	0.17	2.0	3.1	17.3	clear	no odor
1111	12.15	132	8.85	20.4	6.53	845	0.17	1.8	2.9	17.1	clear	no odor
1114	12.15	132	9.25	20.3	6.52	845	0.18	2.0	2.0	17.4	clear	no odor
1117	12.15	132	9.64	20.4	6.53	846	0.17	1.9	0.3	17.5	clear	**Final Controller Settings:**
				AS	6/19/19							**Setting ID:** 103
												Pressure (PSI): 21
Final Values:		1117	9.64	20.4	6.53	846	0.17	1.9	0.3	17.5	clear	**Ambient Air (°C):** 30

Sample ID:	ALF-GW-ALF210-20190619	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bledder Pump	*Field Blank ID:*	ALF-GW-FB02-20190619
Sample Date:	6/19/2019	*Field Duplicate ID:*	NA
Collection Time:	11:20	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	9.64	*Filter Blank ID:*	ALF-GW-FLB01-20190619
Sample Depth (feet):	47.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Minneapolis 6/13/19
Follow up turbidity value (NTU):	13.20	*Filter purged for minimum two minutes:*	Yes
Depth to Water After Sampling (feet):	12.15	*Filter Lot #:*	L1832
Analysis:	RI	*Filter Sample Metals:*	Yes
Tubing Lot #:	None	*Other Filtered Samples Collected:*	NA
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	11:30
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	27.2	**Bottom of Screen (ft. btoc):**	48.1
Color:	clear	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	4	2	4	2	2	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/19/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/20/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/20/19	**Initial Depth to Water (feet):**	11.00
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	130.40
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	119.40 / 295.05
			if water column is < 4.5 L contact Field Coordinator
Project Number:	~~175568282~~ 175578046 CS 6/20/19		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	125.0
Well ID:	ALF-210A	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1346	11.11	103	0	21.1	6.84	1292	2.01	22.6	-70.9	16.3	Clear	no odor
1349	11.11	103	0.31	20.8	6.76	1284	1.96	21.9	-72.5	9.78	Clear	no odor
1352	11.11	103	0.62	21.2	6.73	1278	1.93	21.5	-74.8	10.8	Clear	no odor
1355	11.11	103	0.93	20.9	6.68	1276	1.80	20.1	-77.1	8.67	Clear	no odor
1358	11.11	103	1.24	20.9	6.63	1280	1.77	19.3	-80.0	6.64	Clear	no odor
1401	11.11	103	1.55	20.6	6.63	1279	1.60	18.3	-83.0	7.28	Clear	no odor
Final Values:		1401	1.55	20.6	6.63	1279	1.60	18.3	-83.0	7.28	Clear	

AS 6/19/19

Final Controller Settings:	
Setting ID:	15\45
Pressure (PSI):	60
Ambient Air (°C):	32

Sample ID:	ALF-GW-ALF210A-20190619 CS 6/20/19	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bledder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/19/2019	*Field Blank ID:*	NA
Collection Time:	14:05	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.55	*Equipment Blank ID:*	NA
Sample Depth (feet):	125.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.87	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	11.11	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:15
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	120.0	**Bottom of Screen (ft. btoc):**	130.0
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/19/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/20/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	32.29
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	81.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	49.01 / 121.11
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	67.0
Well ID:	ALF-212	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*-125.2*	*± 10% or < 10 NTU*	*NA*	
1322	32.44	215	0	20.7	7.02	719	0.88	9.4	-125.4	0.47	Clear	No odor
1325	32.44	215	0.65	20.8	7.02	720	0.62	4.7	-128.2	1.37	Clear	No odor
1328	32.44	215	1.29	20.8	7.03	721	0.36	4.1	-129.3	1.24	Clear	No odor
1331	32.44	215	1.94	20.6	7.03	721	0.33	3.7	-130.2	1.55	Clear	No odor
1334	32.44	215	2.58	20.7	7.03	721	0.29	3.4	-130.4	1.17	Clear	No odor
Final Values:		1334	2.58	20.7	7.03	721	0.29	3.4	-130.4	1.17	Clear	

BTP 6-20-19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	35
Ambient Air (°C):	27

Sample ID:	ALF-GW-ALF212-20190620	**QA/QC Sample Collected:**	Yes
Method of Sampling:	dedicated bladder pump	*MS/MSD/LD collected:*	No
Sample Date:	6/20/2019	*Field Blank ID:*	NA
Collection Time:	~~13:34~~ 13:37 (MD 7/15/19)	*Field Duplicate ID:*	ALF-GW-DUP01-20190620
Total Volume Purged (L):*	2.58	*Equipment Blank ID:*	NA
Sample Depth (feet):	67.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.72	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	32.45	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:41
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	71.0	**Bottom of Screen (ft. btoc):**	81.2
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/20/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/24/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	34.18
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	169.80
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	135.62 / 335.13
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	165.0
Well ID:	ALF-212A	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/21/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0953	34.18	150	0	21.1	7.34	604	0.51	5.5	-138.7	1.07	Clear	No odor
0956	34.18	150	0.45	20.7	6.79	599	0.25	2.7	-75.4	1.47	Clear	No odor
0959	34.18	150	0.90	20.8	6.54	593	0.22	2.6	-79.0	1.38	Clear	No odor
1002	34.18	150	1.35	20.9	6.78	589	0.23	2.3	-90.8	1.18	Clear	No odor
1005	34.16	150	1.80	20.8	6.84	588	0.26	2.9	-98.7	1.38	Clear	No odor
1008	34.10	150	2.25	20.6	6.87	588	0.21	2.2	-102.5	1.31	Clear	No odor
Final Values:		1008	2.25	20.6	6.87	588	0.21	2.2	-102.5	1.31	Clear	

BTP
6-21-19

Final Controller Settings:	
Setting ID:	58 (CPM2)
Pressure (PSI):	80
Ambient Air (°C):	26

Sample ID:	ALF-GW-ALF212A-20190621	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/21/2019	*Field Blank ID:*	NA
Collection Time:	10:11	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.25	*Equipment Blank ID:*	NA
Sample Depth (feet):	165.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.04	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	34.18	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:16
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	159.4	**Bottom of Screen (ft. btoc):**	169.4
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/21/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/21/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	32.55
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	81.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	48.75 / 120.47
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	71.0
Well ID:	ALF-213	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/24/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1305	32.56	325	0	18.7	7.54	395.7	0.53	5.3	-135.8	6.48	Clear	No odor
1308	32.56	325	0.98	18.6	7.39	396.1	0.24	2.6	-151.4	2.47	Clear	No odor
1311	32.56	325	1.95	18.6	7.33	397.9	0.17	1.8	157.1	1.23	Clear	No odor
1314	32.56	325	2.93	18.6	7.31	398.3	0.16	1.6	-159.2	0.87	Clear	No odor
Final Values:		1314	2.93	18.6	7.31	398.3	0.16	1.6	-159.2	0.87	Clear	

BJP 6-24-19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	40
Ambient Air (°C):	27

Sample ID:	ALF-GW-ALF213-20190624	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/24/2019	*Field Blank ID:*	NA
Collection Time:	13:17	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.93	*Equipment Blank ID:*	NA
Sample Depth (feet):	71.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.75	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	32.57	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:21
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	71.0	**Bottom of Screen (ft. btoc):**	81.2
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/24/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/24/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	32.98
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	162.75
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	129.77 / 320.68
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	157.75
Well ID:	ALF-213A	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/24/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0900	32.98	375	0	18.0	7.12	331.1	0.38	0.3	3.3	2.70	Clear	No odor
0903	32.98	375	1.13	17.8	6.86	324.9	0.24	2.5	-93.8	2.40	Clear	No odor
0906	32.98	375	2.25	17.8	6.87	324.5	0.20	2.1	-105.3	1.14	Clear	No odor
0909	32.98	375	3.38	17.7	6.92	324.4	0.16	1.7	-115.3	0.70	Clear	No odor
Final Values:		0909	3.38	17.7	6.92	324.4	0.16	1.7	-115.3	0.70	Clear	

BTP
6-24-19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	80
Ambient Air (°C):	21

Sample ID:	ALF-GW-ALF213A-20190624	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/24/2019	*Field Blank ID:*	NA
Collection Time:	9:12	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.38	*Equipment Blank ID:*	NA
Sample Depth (feet):	157.75	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.89	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	32.98	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:17
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	152.75	**Bottom of Screen (ft. btoc):**	162.75
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/24/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/24/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	33.05
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	121.75
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	88.70 / 219.19
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	116.75
Well ID:	ALF-213B	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/24/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (uS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*color (visual)*	
1200	33.09	135	0	20.8	7.19	859	0.60	6.4	-115.0	6.29	Clear	No odor
1203	33.09	135	0.41	20.7	7.11	858	0.29	3.2	-120.5	1.56	Clear	No odor
1206	33.09	135	0.81	20.6	7.02	859	0.23	2.6	-112.9	1.34	Clear	No odor
1209	33.09	135	1.22	20.3	7.03	856	0.19	2.0	-118.8	1.42	Clear	No odor
Final Values:		1209	1.215	20.3	7.03	856	0.19	2.0	-118.8	1.42	Clear	

BTP 6-24-19

Final Controller Settings:	
Setting ID:	60 (CPM2)
Pressure (PSI):	70
Ambient Air (°C):	25

Sample ID:	ALF-GW-ALF213B-20190624	**QA/QC Sample Collected:**	No
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	NA
Sample Date:	6/24/2019	*Field Duplicate ID:*	NA
Collection Time:	12:12	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	1.215	*Filter Blank ID:*	NA
Sample Depth (feet):	116.75	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
Follow up turbidity value (NTU):	1.56	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	33.09	*Filter Lot #:*	None
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	None	*Other Filtered Samples Collected:*	NA
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	12:17
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	111.75	**Bottom of Screen (ft. btoc):**	121.75
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/24/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/24/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI	**Initial Depth to Water (feet):**	13.78
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	54.90
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	41.12 / 101.61
			if water column is < 4.5 L contact Field Coordinator
Project Number:	~~175577013~~ 175578046 (MD 7/15/19)		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	45.0
Well ID:	ALF-214	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0816	13.82	216	0	18.8	7.28	488.3	1.45	15.1	162.2	3.35	clear	no odor
0819	13.82	216	0.65	18.8	6.80	486.7	1.21	11.2	160.8	1.63	clear	no odor
0822	13.82	216	1.30	18.8	6.78	484.1	1.55	15.3	154.0	2.19	clear	no odor
0825	13.82	216	1.94	18.8	6.79	480.9	1.65	17.7	248.5	2.52	clear	no odor
0828	13.82	216	2.59	18.8	6.80	481.2	1.63	17.7	144.6	2.61	clear	no odor
Final Values:		0828	2.59	18.8	6.80	481.2	1.63	17.7	144.6	2.61	clear	**Ambient Air (°C):** 24

KS 6/20/19

Final Controller Settings:

Setting ID:	103
Pressure (PSI):	25

Sample ID:	ALF-GW-ALF214-20190620	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/20/2019	*Field Blank ID:*	NA
Collection Time:	8:31	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.59	*Equipment Blank ID:*	NA
Sample Depth (feet):	45.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.78	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	13.82	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	8:40
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	34.5	**Bottom of Screen (ft. btoc):**	54.5
Color:	clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/20/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/24/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI	**Initial Depth to Water (feet):**	13.91
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	133.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	119.09 / 294.28
			if water column is < 4.5 L contact Field Coordinator
Project Number:	~~175577013~~ 175578046 (MD 7/15/19)		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	130.0
Well ID:	ALF-214A	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0907	14.04	200	0	20.0	6.59	1137	1.00	11.2	-57.6	2.35	clear	no odor
0910	14.04	200	0.60	19.8	6.22	1131	1.20	13.2	-42.5	1.07	clear	no odor
0913	14.04	200	1.20	19.9	6.18	1131	1.13	12.4	-45.1	1.43	clear	no odor
0916	14.04	200	1.80	19.8	6.15	1131	1.16	12.6	-46.7	2.14	clear	no odor
0919	14.04	200	2.40	19.8	6.12	1131	1.14	11.5	-50.2	2.07	clear	no odor
Final Values:		0919	2.40	19.8	6.12	1131	1.14	11.5	-50.2	2.07	clear	

AS 6/20/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	80
Ambient Air (°C):	25

Sample ID:	ALF-GW-ALF214A-20190620	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/20/2019	*Field Blank ID:*	NA
Collection Time:	9:22	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.40	*Equipment Blank ID:*	NA
Sample Depth (feet):	130.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.84	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	14.04	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:30
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	122.6	**Bottom of Screen (ft. btoc):**	132.6
Color:	clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/20/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/24/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI	**Initial Depth to Water (feet):**	13.82
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	93.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	79.48 / 196.4
			if water column is < 4.5 L contact Field Coordinator
Project Number:	~~175577013~~ 175578046 (MD 7/15/19)		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	88.0
Well ID:	ALF-214B	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1007	13.84	244	0	19.3	6.54	866	0.87	9.4	-80.5	9.73	clear	no odor
1010	13.84	244	0.73	19.3	6.51	865	0.84	9.1	-83.0	8.59	clear	no odor
1013	13.84	244	1.46	19.3	6.49	864	0.82	8.9	-84.3	8.96	clear	no odor
1016	13.84	244	2.20	19.2	6.46	862	0.86	9.1	-85.6	5.29	clear	no odor
1019	13.84	244	2.93	19.2	6.42	859	0.80	8.0	-86.4	4.57	clear	no odor
Final Values:		1019	2.93	19.2	6.42	859	0.80	8.0	-86.4	4.57	clear	

AS 6/20/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	50
Ambient Air (°C):	27

Sample ID:	ALF-GW-ALF214B-20190620	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/20/2019	*Field Blank ID:*	NA
Collection Time:	10:22	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.93	*Equipment Blank ID:*	NA
Sample Depth (feet):	88.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.72	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	13.84	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:30
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	82.9	**Bottom of Screen (ft. btoc):**	92.9
Color:	clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/20/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/24/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/20/19	**Initial Depth to Water (feet):**	9.73
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	30.40
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	20.67 / 51.08
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175577013 175578046 (MD 7/15/19)		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	25.0
Well ID:	ALF-215	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0826	9.81	350	0	17.9	6.88	497.3	3.58	36.7	43.3	3.74	Clear	No odor
0829	9.81	350	1.05	17.8	6.83	495.5	2.89	29.5	26.9	0.82	Clear	No odor
0832	9.81	350	2.10	17.7	6.84	496.4	2.61	27.0	16.7	1.09	Clear	No odor
0835	9.81	350	3.15	17.8	6.84	497.5	2.54	26.8	14.6	1.01	Clear	No odor
Final Values:		0835	3.15	17.8	6.84	497.5	2.54	26.8	14.6	1.01	Clear	

BVD 6-19-19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	15
Ambient Air (°C):	24

Sample ID:	ALF-GW-ALF215-20190619	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/19/2019	*Field Blank ID:*	NA
Collection Time:	0838	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.15	*Equipment Blank ID:*	NA
Sample Depth (feet):	25.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.79	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	9.81	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	0845
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	20.0	**Bottom of Screen (ft. btoc):**	30.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/19/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/20/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Doewr	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/25/19	**Initial Depth to Water (feet):**	27.54
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	71.75
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	44.21 / 109.25
			if water column is < 4.5 L contact Field Coordinator
Project Number:	~~175568282~~ 175578046 (MD 7/15/19)		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	60.8
Well ID:	ALF-217	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/21/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (uS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1336	27.72	320	0	19.8	6.94	739	0.84	9.1	-96.3	1.60	CLEAR	no odor
1339	27.72	320	0.96	19.7	6.89	736	0.66	7.4	-98.7	0.68	CLEAR	no odor
1342	27.72	320	1.92	19.6	6.83	733	0.66	7.3	-99.9	0.61	CLEAR	no odor
1345	27.72	320	2.88	19.8	6.77	732	0.60	6.7	101.7	0.43	CLEAR	no odor
1348	27.72	320	3.84	19.7	6.71	732	0.56	6.5	-102.1	0.39	CLEAR	no odor
Final Values:		1348	3.84	19.7	6.71	732	0.56	6.5	-102.1	0.39	CLEAR	

AS 6/21/19

Final Controller Settings:	
Setting ID:	105
Pressure (PSI):	40
Ambient Air (°C):	30

Sample ID:	ALF-GW-ALF217-20190621	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/21/2019	*Field Blank ID:*	NA
Collection Time:	13:50	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.84	*Equipment Blank ID:*	NA
Sample Depth (feet):	60.8	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.82	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	27.72	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	none	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:00
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	49.75	**Bottom of Screen (ft. btoc):**	71.75
Color:	CLEAR	**Odor:**	NONE

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/21/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/21/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/25/19	**Initial Depth to Water (feet):**	34.20
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	192.75
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	158.55 / 391.79
			if water column is < 4.5 L contact Field Coordinator
Project Number:	~~175577013~~ 175578046 (MD 7/15/19)		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	187.75
Well ID:	ALF-217A	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/21/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0815	34.26	300	0	19.1	7.09	716	1.73	16.9	-111.2	0.58	clear	no odor
0818	34.26	300	0.90	19.0	6.62	697	0.38	4.2	-113.0	1.26	clear	no odor
0821	34.26	300	1.80	19.1	6.53	696	0.27	3.0	-116.4	1.63	clear	no odor
0824	34.26	300	2.70	19.2	6.51	697	0.26	2.7	-116.9	2.47	clear	no odor
Final Values:		0824	2.70	19.2	6.51	697	0.26	2.7	-116.9	2.47	clear	**Ambient Air (°C):** 27

AS 6/21/19

Final Controller Settings:
Setting ID: 106
Pressure (PSI): 84

Sample ID:	ALF-GW-ALF217A-20190621	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/21/2019	*Field Blank ID:*	NA
Collection Time:	8:26	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.70	*Equipment Blank ID:*	NA
Sample Depth (feet):	187.8	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.45	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	34.26	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	8:30
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	182.75	**Bottom of Screen (ft. btoc):**	192.75
Color:	clear	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/21/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/21/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	33.65
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	131.75
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	98.10 / 242.42
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	126.75
Well ID:	ALF-217B	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/25/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (uS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1225	33.68	300	0	19.7	6.59	1076	0.83	9.0	-5.5	2.93	clear	no odor
1228	33.68	300	0.90	19.3	6.44	1109	0.35	3.9	-74.2	1.54	clear	no odor
1231	33.68	300	1.80	19.2	6.42	1100	0.28	2.9	-86.7	1.65	clear	no odor
1234	33.68	300	2.70	19.3	6.41	1091	0.25	2.7	-92.3	1.44	clear	no odor
1237	33.68	300	3.60	19.3	6.42	1089	0.24	2.6	-95.0	1.34	clear	no odor
Final Values:		1237	3.60	19.3	6.42	1089	0.24	2.6	-95.0	1.34	clear	

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	62
Ambient Air (°C):	29

Sample ID:	ALF-GW-ALF217B-20190625	**QA/QC Sample Collected:**	No
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	NA
Sample Date:	6/25/2019	*Field Duplicate ID:*	NA
Collection Time:	12:40	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	3.60	*Filter Blank ID:*	NA
Sample Depth (feet):	126.8	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
Follow up turbidity value (NTU):	1.16	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	33.68	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	None	*Other Filtered Samples Collected:*	NA
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	12:50
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	121.75	**Bottom of Screen (ft. btoc):**	131.75
Color:	clear	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/25/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/25/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/26/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/25/19	**Initial Depth to Water (feet):**	11.57
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	83.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	71.43 / 44.13
Project Number:	~~175568282~~ 175578046 (MD 7/15/19)		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	77.0
Well ID:	P-4	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	2.0	**Date:**	6/24/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1135	11.57	320	0	18.3	6.99	300.0	0.35	3.6	8.5	3.20	clear	rotten egg odor
1138	11.57	320	0.96	18.4	6.87	301.4	0.29	3.2	0.0	2.00	clear	rotten egg odor
1141	11.57	320	1.92	18.4	6.84	298.4	0.23	2.7	-14.6	1.79	clear	rotten egg odor
1144	11.57	320	2.88	18.2	6.80	296.5	0.22	2.3	-26.7	1.55	clear	rotten egg odor
1147	11.57	320	3.84	18.2	6.79	297.0	0.22	2.3	-31.0	2.16	clear	rotten egg odor
Final Values:		1147	3.84	18.2	6.79	297.0	0.22	2.3	-31.0	2.16	clear	

6/24/19

VAS

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	32
Ambient Air (°C):	27

Sample ID:	ALF-GW-P4-20910624	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	Yes
Sample Date:	6/24/2019	*Field Blank ID:*	NA
Collection Time:	~~13:10~~ 11:50 CS 6/25/19	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.84	*Equipment Blank ID:*	NA
Sample Depth (feet):	77.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.89	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	11.57	*Filter purged for minimum two minutes:*	No
Analysis:	RI		NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:20
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	71.7	**Bottom of Screen (ft. btoc):**	81.8
Color:	clear	**Odor:**	Rotten Egg like odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	6
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	6/24/2019	**Signature:**	
Sampler Name:	Stafan Stahl	**Date:**	6/24/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/25/19	**Initial Depth to Water (feet):**	5.00
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	50.10
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	45.10 / 111.45
Project Number:	~~175568282~~ 175578046 (MD 7/15/19)		*if water column is < 4.5 L contact Field Coordinator
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	41.0
Well ID:	P-4S	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/24/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1255	5.00	320	0	18.7	6.75	422.8	0.58	6.0	49.7	3.75	clear	no odor
1258	5.00	320	0.96	18.7	6.75	429.4	0.46	4.8	45.8	3.06	clear	no odor
1301	5.00	320	1.92	18.7	6.73	432.0	0.42	4.5	41.1	2.96	clear	no odor
1304	5.00	320	2.88	18.7	6.73	431.7	0.40	3.4	38.5	1.24	clear	no odor
1307	5.00	320	3.84	18.6	6.73	430.0	0.30	3.4	36.3	1.15	clear	no odor
Final Values:		1307	3.84	18.6	6.73	430.0	0.30	3.4	36.3	1.15	clear	

DS 6/24/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	25
Ambient Air (°C):	28

Sample ID:	ALF-GW-P4S-20190624	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/24/2019	*Field Blank ID:*	ALF-GW-FB08-20190624
Collection Time:	13:10	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.84	*Equipment Blank ID:*	NA
Sample Depth (feet):	41.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.06	*DI water lot #:*	Pace Minneapolis 6/13/19
Depth to Water After Sampling (feet):	5.00	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:00
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	31.0	**Bottom of Screen (ft. btoc):**	51.0
Color:	clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	6/24/2019	**Signature:**	
Sampler Name:	Stafan Stahl	**Date:**	6/24/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	7.28
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	37.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	29.72 / 73.44
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	29.0
Well ID:	PMW-02A	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/26/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1049	7.45	400	0	19.0	10.34	925	0.07	0.1	44.5	13.7	Brown tint	No odor
1052	7.45	400	1.20	18.9	10.38	927	0.04	0.4	38.4	14.3	Brown tint	No odor
1055	7.46	400	2.40	18.9	10.39	929	0.03	0.3	31.3	14.6	Brown tint	No odor
1058	7.46	400	3.60	18.8	10.38	929	0.03	0.3	27.3	14.3	Brown tint	No odor
1101	7.47	400	4.80	18.8	10.35	930	0.03	0.3	27.5	14.9	Brown tint	No odor
												Final Controller Settings:
												Setting ID: 102
												Pressure (PSI): 20
Final Values:		1101	4.8	18.8	10.35	930	0.03	0.3	27.5	14.9	Brown tint	**Ambient Air (°C):** 26

PTP
6-26-19

Sample ID:	ALF-GW-PMW02A-20190626	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/26/2019	*Field Blank ID:*	NA
Collection Time:	11:04	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.8	*Equipment Blank ID:*	NA
Sample Depth (feet):	29.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	14.10	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	7.48	*Filter purged for minimum two minutes:*	Yes
Analysis:	RI	*Filter Lot #:*	L 1832
Tubing Lot #:	None	*Filter Sample Metals:*	Yes
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:10
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	15.0	**Bottom of Screen (ft. btoc):**	36.0
Color:	Brown tint	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/26/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/26/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	6/27/2019	**Signature:**	Courtnae Ramser
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	7.78
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	57.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	49.22 / 121.63
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	54.0
Well ID:	PMW-02B	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/26/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0946	7.82	175	0	19.0	7.24	631	1.26	1.2	-123.7	0.74	Clear	No odor
0949	7.82	175	0.53	20.0	7.24	628	0.55	5.9	-131.8	4.63	Clear	No odor
0952	7.82	175	1.05	19.9	7.26	625	0.31	3.4	-135.8	4.07	Clear	No odor
0955	7.82	175	1.58	20.0	7.28	623	0.23	2.4	-137.6	3.90	Clear	No odor
0958	7.82	175	2.10	20.1	7.30	620	0.19	2.1	-138.5	3.51	Clear	No odor
Final Values:		0958	2.1	20.1	7.3	620	0.19	2.1	-138.5	3.51	Clear	

BTP
6-26-19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	28
Ambient Air (°C):	25

Sample ID:	ALF-GW-PMW02B-20190626	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/26/2019	*Field Blank ID:*	ALF-GW-FB11-20190626
Collection Time:	10:01	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.1	*Equipment Blank ID:*	ALF-GW-EB03-20190626
Sample Depth (feet):	54.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.02	*DI water lot #:*	Pace Analytical Minneapolis, Fill date: 6-21-19
Depth to Water After Sampling (feet):	7.86	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:06
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	45.0	**Bottom of Screen (ft. btoc):**	55.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/26/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/26/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	6/27/2019	**Signature:**	Courtnae Ramser
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	8.07
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	137.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	128.93 / 318.6
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	124.0
Well ID:	PMW-02C	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/26/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0851	8.09	425	0	18.0	6.70	339.4	0.33	3.2	17.0	6.32	Clear	No odor
0854	8.09	425	1.28	17.9	6.76	339.6	0.14	1.7	-28.1	4.24	Clear	No odor
0857	8.09	425	2.55	17.8	6.91	339.1	0.12	1.1	-61.6	2.54	Clear	No odor
0900	8.09	425	3.83	17.8	7.03	338.9	0.08	1.0	-84.6	3.19	Clear	No odor
0903	8.09	425	5.10	17.8	7.08	338.4	0.08	1.0	-96.2	3.22	Clear	No odor
0906	8.09	425	6.38	17.7	7.10	338.3	0.08	0.8	-102.2	3.02	Clear	No odor
Final Values:		0906	6.375	17.7	7.10	338.3	0.08	0.8	-102.2	3.02	Clear	

BTP
6-26-19

Final Controller Settings:	
Setting ID:	105
Pressure (PSI):	80
Ambient Air (°C):	24

Sample ID:	ALF-GW-PMW02C-20190626	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/26/2019	*Field Blank ID:*	NA
Collection Time:	9:09	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6.375	*Equipment Blank ID:*	NA
Sample Depth (feet):	124.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.78	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	8.10	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:12
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	115.0	**Bottom of Screen (ft. btoc):**	125.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/26/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/26/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	6/27/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	8.56
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	37.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	28.44 / 70.28
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	29.0
Well ID:	PMW-04A	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/25/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0826	8.56	460	0	19.0	7.51	954	0.27	2.8	52.9	0.84	clear	no odor
0829	8.56	460	1.38	19.0	7.47	951	0.21	2.4	47.2	1.14	clear	no odor
0832	8.56	460	2.76	19.0	7.45	951	0.20	2.2	39.9	0.96	clear	no odor
0835	8.56	460	4.14	19.0	7.43	949	0.18	2.0	34.9	1.10	clear	no odor
0838	8.56	460	5.52	19.0	7.42	948	0.20	2.4	30.3	0.64	clear	no odor
Final Values:		0838	5.52	19.0	7.42	948	0.20	2.4	30.3	0.64	clear	

AS 6/25/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	20
Ambient Air (°C):	22

Sample ID:	ALF-GW-PMW04A-20190625	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	Yes
Sample Date:	6/25/2019	*Field Blank ID:*	NA
Collection Time:	8:42	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.52	*Equipment Blank ID:*	NA
Sample Depth (feet):	29.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.86	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	8.56	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	8:52
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	15.0	**Bottom of Screen (ft. btoc):**	36.0
Color:	clear	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	6
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/25/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/25/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/26/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	9.83
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	62.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	52.17 / 128.92
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	57.0
Well ID:	PMW-04B	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/25/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0927	9.83	420	0	18.4	7.08	744	0.44	4.5	-120.2	0.86	clear	no odor
0930	9.84	420	1.26	18.3	6.90	728	0.23	2.6	132.7	0.80	clear	no odor
0933	9.84	420	2.52	18.4	6.87	726	0.18	2.1	-135.7	0.60	clear	no odor
0936	9.84	420	3.78	18.3	6.83	735	0.19	2.0	-138.0	0.99	clear	no odor
0939	9.84	420	5.04	18.2	6.83	737	0.16	1.9	-138.1	1.05	clear	no odor
												Final Controller Settings:
												Setting ID: 103
												Pressure (PSI): 30
Final Values:		0939	5.04	18.2	6.83	737	0.16	1.9	-138.1	1.05	clear	**Ambient Air (°C):** 25

6/25/19

AS

Sample ID:	ALF-GW-PMW04B-20190625	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/25/2019	*Field Blank ID:*	NA
Collection Time:	9:42	*Field Duplicate ID:*	ALF-GW-DUP03-20190625
Total Volume Purged (L):*	5.04	*Equipment Blank ID:*	NA
Sample Depth (feet):	57.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.45	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	9.83	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:52
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	48.0	**Bottom of Screen (ft. btoc):**	58.0
Color:	clear	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	4
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/25/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/25/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/26/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	9.62
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	137.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	127.38 / 314.77
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	124.0
Well ID:	PMW-04C	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/25/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1027	9.62	340	0	19.2	6.42	432.4	0.79	8.0	35.4	1.16	clear	no odor
1030	9.62	340	1.02	19.1	6.44	430.2	0.29	3.2	8.5	1.60	clear	no odor
1033	9.62	340	2.04	18.9	6.47	421.8	0.20	2.2	-16.2	2.03	clear	no odor
1036	9.62	340	3.06	18.7	6.47	416.6	0.19	1.9	-28.6	1.73	clear	no odor
1039	9.62	340	4.08	18.8	6.49	415.1	0.14	1.9	-40.3	1.71	clear	no odor
Final Values:		1039	4.08	18.8	6.49	415.1	0.14	1.9	-40.3	1.71	clear	

6/25/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	80
Ambient Air (°C):	28

Sample ID:	ALF-GW-PMW04C-20190625	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/25/2019	*Field Blank ID:*	ALF-GW-FB10-20190625
Collection Time:	10:42	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.08	*Equipment Blank ID:*	NA
Sample Depth (feet):	124.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.53	*DI water lot #:*	Pace Minneapolis fill date 6/21/19
Depth to Water After Sampling (feet):	9.62	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:50
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	115.0	**Bottom of Screen (ft. btoc):**	125.0
Color:	clear	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1483

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO3	Unpreserved	HNO3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	6/25/2019	**Signature:**	
Sampler Name:	Stefan Stahl	**Date:**	6/25/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/26/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	5.78
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	27.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	21.22 / 52.44
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	24.0
Well ID:	PMW-07A	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/26/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1315	5.80	500	0	19.5	8.78	872	0.28	2.8	13.7	6.99	Clear	No odor
1318	5.80	500	1.50	19.5	9.01	872	0.13	1.4	-23.4	6.46	Clear	No odor
1321	5.80	500	3.00	19.4	9.08	872	0.10	0.9	-40.3	6.66	Clear	No odor
1324	5.80	500	4.50	19.3	9.10	872	0.07	0.8	-53.0	5.26	Clear	No odor
Final Values:		1324	4.5	19.3	9.10	872	0.07	0.8	-53	5.26	Clear	

BTP
6-26-19

Final Controller Settings:	
Setting ID:	105
Pressure (PSI):	18
Ambient Air (°C):	30

Sample ID:	ALF-GW-PMW07A-20190626	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/26/2019	*Field Blank ID:*	NA
Collection Time:	13:27	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.5	*Equipment Blank ID:*	NA
Sample Depth (feet):	24.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	6.86	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	5.80	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:32
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	15.0	**Bottom of Screen (ft. btoc):**	25.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/26/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/26/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	6/27/2019	**Signature:**	Courtnae Ramser
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	7.16
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	57.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	49.84 / 123.16
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	55.0
Well ID:	PMW-07B	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/26/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1235	7.48	450	0	18.8	7.18	728	1.33	14.1	-122.8	2.09	Clear	No odor
1238	7.48	450	1.35	18.8	7.15	726	1.01	10.7	-130.2	4.23	Clear	No odor
1241	7.48	450	2.70	18.7	7.14	728	0.37	3.9	-134.3	2.16	Clear	No odor
1244	7.48	450	4.05	18.7	7.13	720	0.23	2.5	-135.3	2.59	Clear	No odor
1247	7.48	450	5.40	18.5	7.13	719	0.25	2.7	-135.9	2.04	Clear	No odor
Final Values:		1247	5.40	18.5	7.13	719	0.25	2.7	-135.9	2.04	Clear	

BTP
6-26-19

Final Controller Settings:	
Setting ID:	104
Pressure (PSI):	30
Ambient Air (°C):	29

Sample ID:	ALF-GW-PMW07B-20190626	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/26/2019	*Field Blank ID:*	NA
Collection Time:	12:50	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.4	*Equipment Blank ID:*	NA
Sample Depth (feet):	55.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.14	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	7.54	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	12:54
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	46.0	**Bottom of Screen (ft. btoc):**	56.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/26/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/26/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	6/27/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	7.03
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	124.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	116.97 / 289.05
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	117.0
Well ID:	PMW-07C	**Method of Purging:**	Low - Flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/26/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1150	7.15	475	0	18.4	7.67	355.9	0.49	5.2	-63.5	5.44	Clear	No odor
1153	7.15	475	1.43	18.3	7.54	352.6	0.27	2.7	-82.8	5.26	Clear	No odor
1156	7.15	475	2.85	8.3	7.47	350.4	0.22	2.3	-90.5	6.07	Clear	No odor
1159	7.15	475	4.28	18.2	7.43	348.6	0.19	2.0	-94.4	5.14	Clear	No odor
								BTP 6-26-19				
												Final Controller Settings:
												Setting ID: 106
												Pressure (PSI): 70
Final Values:		1159	4.275	18.2	7.43	348.6	0.19	2.0	-94.4	5.14	Clear	**Ambient Air (°C):** 28

Sample ID:	ALF-GW-PMW07C-20190626	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/26/2019	*Field Blank ID:*	NA
Collection Time:	12:02	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.275	*Equipment Blank ID:*	NA
Sample Depth (feet):	117.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	6.89	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	7.15	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	12:06
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	108.0	**Bottom of Screen (ft. btoc):**	118.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/26/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/26/2019	**Signature:**	
FTL/Designee Review by:	Courtnae Ramser	**Date:**	6/27/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/20/19	**Initial Depth to Water (feet):**	13.23
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	45.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	31.77 / 78.51
			if water column is < 4.5 L contact Field Coordinator
Project Number:	~~175577013~~ 175578046 (MD 7/15/19)		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	32.0
Well ID:	PMW-10A	**Method of Purging:**	low-flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0939	13.24	250	0	19.9	7.57	532.7	2.23	25.7	-139.8	0.48	Clear	No odor
0942	13.24	250	0.75	19.8	7.51	530.6	2.09	23.0	-142.1	0.36	Clear	No odor
0945	13.24	250	1.50	19.8	7.49	529.9	1.75	18.5	-142.9	0.38	Clear	No odor
0948	13.24	250	2.25	19.7	7.48	530.3	1.63	17.2	-144.1	0.29	Clear	No odor
0951	13.24	250	3.00	19.6	7.47	530.4	1.37	14.2	-142.9	0.38	Clear	No odor
0954	13.24	250	3.75	19.7	7.46	530.8	1.14	12.0	-142.4	0.33	Clear	No odor
0957	13.24	250	4.50	19.7	7.45	530.0	1.04	11.0	-142.1	0.26	Clear	No odor
1000	13.24	250	5.25	19.8	7.46	529.6	0.95	9.3	-142.2	0.27	Clear	No odor
Final Values:		1000	5.25	19.8	7.46	529.6	0.95	9.3	-142.2	0.27	Clear	

BTP 6-19-19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	18
Ambient Air (°C):	27

Sample ID:	ALF-GW-PMW10A-20190619	**QA/QC Sample Collected:**	No
Method of Sampling:	dedicated bladder pump	*MS/MSD/LD collected:*	No
Sample Date:	6/19/2019	*Field Blank ID:*	NA
Collection Time:	10:03	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.25	*Equipment Blank ID:*	NA
Sample Depth (feet):	32.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.47	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	13.24	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:11
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	18.0	**Bottom of Screen (ft. btoc):**	39.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/19/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/20/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	~~TVA TDEC Order~~TVA ALF RI CS 6/20/19	**Initial Depth to Water (feet):**	16.95
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	75.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	58.05 / 143.45
Project Number:	~~175577013~~ 175578046 (MD 7/15/19)		*if water column is < 4.5 L contact Field Coordinator
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	68.0
Well ID:	PMW-10B	**Method of Purging:**	low-flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1120	17.28	175	0	17.3	7.44	881	0.46	0.4	-192.7	1.39	Clear	No odor
1123	17.28	175	0.53	20.8	7.40	874	0.16	1.8	-198.6	1.46	Clear	No odor
1126	17.28	175	1.05	20.7	7.40	873	0.14	1.5	-200.4	1.07	Clear	No odor
1129	17.28	175	1.58	20.7	7.41	872	0.12	1.3	-201.4	1.45	Clear	No odor
1132	17.28	175	2.10	20.5	7.41	870	0.12	1.3	-201.7	1.29	Clear	No odor
1135	17.28	175	2.63	20.8	7.41	871	0.10	1.1	-201.6	1.70	Clear	No odor
1138	17.28	175	3.15	20.7	7.42	870	0.09	1.0	-200.4	1.47	Clear	No odor
1141	17.28	175	3.68	20.6	7.41	871	0.09	1.0	-198.7	1.41	Clear	No odor
							BTP					
							6-19-19					
												Final Controller Settings:
												Setting ID: 103
												Pressure (PSI): 33
Final Values:		1141	3.675	20.6	7.41	871	0.09	1.0	-198.7	1.41	Clear	**Ambient Air (°C):** 28

Sample ID:	ALF-GW-PMW10B-20190619 CS 6/20/2019	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	dedicated bladder pump	*Field Blank ID:*	ALF-GW-FB01-20190619
Sample Date:	6/19/2019	*Field Duplicate ID:*	NA
Collection Time:	11:44	*Equipment Blank ID:*	ALF-GW-EB01-20190619
Total Volume Purged (L):*	3.675	*Filter Blank ID:*	ALF-GW-FLB02-20190619
Sample Depth (feet):	68.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Analytical Minneapolis supplied, Fill date: 6-13-19
Follow up turbidity value (NTU):	1.72	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	17.30	*Filter Lot #:*	None
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	None	*Other Filtered Samples Collected:*	NA
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	11:52
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	59.0	**Bottom of Screen (ft. btoc):**	69.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/19/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/20/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	17.01
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	175.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	157.99 / 390.41
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	148.0
Well ID:	PMW-10C	**Method of Purging:**	low-flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0817	17.01	420	0	18.9	6.78	441.7	0.17	1.8	-54.3	3.59	Clear	No odor
0820	17.01	420	1.26	18.9	6.88	441.6	0.14	1.5	-91.6	2.18	Clear	No odor
0823	17.01	420	2.52	18.9	6.91	441.3	0.13	1.3	-95.2	1.22	Clear	No odor
0826	17.01	420	3.78	18.9	6.92	441.1	0.12	1.2	-98.7	0.55	Clear	No odor
Final Values:		0826	3.78	18.9	6.92	441.1	0.12	1.2	-98.7	0.55	Clear	

BTP
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Final Controller Settings:	
Setting ID:	56 (CPM2)
Pressure (PSI):	80
Ambient Air (°C):	27

Sample ID:	ALF-GW-PMW10C-20190620	**QA/QC Sample Collected:**	Yes
Method of Sampling:	dedicated bladder pump	*MS/MSD/LD collected:*	Yes
Sample Date:	6/20/2019	*Field Blank ID:*	NA
Collection Time:	8:29	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.78	*Equipment Blank ID:*	NA
Sample Depth (feet):	148.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.44	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	17.04	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	8:39
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	139.0	**Bottom of Screen (ft. btoc):**	149.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	6
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/20/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/24/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	10.85
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	35.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	24.15 / 59.68
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	27.0
Well ID:	PMW-11A	**Method of Purging:**	low-flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/21/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1109	10.87	315	0	20.4	7.11	636	1.16	13.4	114.7	6.98	Clear	No odor
1112	10.87	315	0.95	20.4	7.07	638	0.84	9.3	81.1	2.81	Clear	No odor
1115	10.87	315	1.89	20.5	7.06	637	0.72	7.7	71.0	2.06	Clear	No odor
1118	10.87	315	2.84	20.4	7.06	638	0.70	6.2	64.2	1.67	Clear	No odor
1121	10.87	315	3.78	20.4	7.04	643	0.64	6.3	57.0	1.70	Clear	No odor
Final Values:		1121	3.78	20.4	7.04	643	0.64	6.3	57.0	1.70	Clear	

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Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	20
Ambient Air (°C):	29

Sample ID:	ALF-GW-PMW11A-20190621	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/21/2019	*Field Blank ID:*	NA
Collection Time:	11:23	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.78	*Equipment Blank ID:*	NA
Sample Depth (feet):	27.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.41	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	10.90	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:27
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	13.0	**Bottom of Screen (ft. btoc):**	34.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/21/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/21/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	12.80
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	65.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	52.20 / 128.99
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	63.0
Well ID:	PMW-11B	**Method of Purging:**	low-flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/21/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1205	12.90	*275	0	21.6	7.29	767	0.78	7.9	-139.0	5.14	Clear	No odor
1208	12.90	275	0.83	21.2	7.16	762	0.20	2.1	-144.8	6.64	Clear	No odor
1211	12.90	275	1.65	21.2	7.14	756	0.16	1.8	-145.0	5.75	Clear	No odor
1214	12.90	275	2.48	21.2	7.14	754	0.15	1.7	-145.8	4.41	Clear	No odor
							BTP 6-21-19					
Final Values:		1214	2.475	21.2	7.14	754	0.15	1.7	-145.8	4.41	Clear	

Final Controller Settings:

Setting ID:	103
Pressure (PSI):	35
Ambient Air (°C):	29

Sample ID:	ALF-GW-PMW11B-20190621	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/21/2019	*Field Blank ID:*	NA
Collection Time:	12:17	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.475	*Equipment Blank ID:*	NA
Sample Depth (feet):	63.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.88	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	12.93	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	12:23
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	54.0	**Bottom of Screen (ft. btoc):**	64.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/21/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/21/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	12.91
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	256.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	243.09 / 600.7
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	144.0
Well ID:	PMW-11C	**Method of Purging:**	low-flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/21/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1259	13.07	200	0	22.5	7.34	508.5	0.67	6.8	-69.4	3.81	Clear	No odor
1302	13.07	200	0.60	21.8	7.20	499.7	0.24	2.8	-85.6	5.74	Clear	No odor
1305	13.07	200	1.20	21.8	7.18	496.4	0.21	2.2	-93.6	4.14	Clear	No odor
1308	13.07	200	1.80	21.7	7.18	494.5	0.16	1.7	-99.9	4.15	Clear	No odor
Final Values:		1308	1.80	21.7	7.18	494.5	0.16	1.7	-99.9	4.15	Clear	

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6-21-19

Final Controller Settings:	
Setting ID:	106
Pressure (PSI):	80
Ambient Air (°C):	30

Sample ID:	ALF-GW-PMW11C-20190621	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/21/2019	*Field Blank ID:*	NA
Collection Time:	13:11	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.80	*Equipment Blank ID:*	NA
Sample Depth (feet):	144.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.86	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	13.09	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:16
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	135.0	**Bottom of Screen (ft. btoc):**	145.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/21/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/21/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/25/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	30.89
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	57.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	26.11 / 64.52
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	49.0
Well ID:	PMW-14A	**Method of Purging:**	low-flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1000	31.00	350	0	19.4	7.07	628	0.27	3.0	-122.8	1.21	Clear	No odor
1003	31.00	350	1.05	19.4	7.02	627	0.23	2.8	-124.9	1.21	Clear	No odor
1006	31.00	350	2.10	19.4	7.00	627	0.22	2.4	-125.4	0.85	Clear	No odor
1009	31.00	350	3.15	19.4	7.01	627	0.21	2.5	-125.6	0.74	Clear	No odor
Final Values:		1009	3.15	19.4	7.01	627	0.21	2.5	-125.6	0.74	Clear	

BTP
6-20-19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	30
Ambient Air (°C):	27

Sample ID:	ALF-GW-PMW14A-20190620	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/20/2019	*Field Blank ID:*	NA
Collection Time:	10:12	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.15	*Equipment Blank ID:*	NA
Sample Depth (feet):	49.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.90	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	31.02	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:16
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	35.0	**Bottom of Screen (ft. btoc):**	56.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/20/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/24/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	35.08
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	87.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	51.92 / 128.3
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	85.0
Well ID:	PMW-14B	**Method of Purging:**	low-flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1116	35.08	275	0	19.5	7.03	689	0.10	1.2	-156.2	6.94	Clear	No odor
1119	35.08	275	0.83	19.4	7.02	688	0.08	0.9	-160.5	4.62	Clear	No odor
1122	35.08	275	1.65	19.5	7.01	688	0.07	0.9	-160.0	2.65	Clear	No odor
1125	35.08	275	2.48	19.5	7.01	688	0.07	0.1	-161.0	2.80	Clear	No odor
Final Values:		1125	2.48	19.5	7.01	688	0.07	0.1	-161	2.80	Clear	

BiG
6-20-19

Final Controller Settings:	
Setting ID:	104
Pressure (PSI):	45
Ambient Air (°C):	27

Sample ID:	ALF-GW-PMW14B-20190620	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Bladder Pump	*MS/MSD/LD collected:*	No
Sample Date:	6/20/2019	*Field Blank ID:*	NA
Collection Time:	11:28	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.48	*Equipment Blank ID:*	NA
Sample Depth (feet):	85.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.33	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	35.08	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	None
Tubing Lot #:	None	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	NA
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:33
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	76.0	**Bottom of Screen (ft. btoc):**	86.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/20/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/24/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF RI	**Initial Depth to Water (feet):**	35.06
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	167.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	131.94 / 326.04
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	156.0
Well ID:	PMW-14C	**Method of Purging:**	low-flow
Well Type:	PMW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	6/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1219	35.06	350	0	19.1	6.73	388.9	0.31	3.2	-29.3	4.91	Clear	No odor
1222	35.06	350	1.05	19.0	6.74	386.2	0.21	2.2	-65.6	2.82	Clear	No odor
1225	35.06	350	2.10	18.9	6.87	387.0	0.20	2.1	-98.7	2.24	Clear	No odor
1228	35.06	350	3.15	18.8	6.93	386.7	0.16	1.8	-110.9	1.21	Clear	No odor
1231	35.06	350	4.20	18.8	6.96	384.8	0.16	1.7	-115.5	1.11	Clear	No odor
							BTG 6-20-19					
Final Values:		1231	4.2	18.8	6.96	384.8	0.16	1.7	-115.5	1.11	Clear	

Final Controller Settings:	
Setting ID:	57 (CPM2)
Pressure (PSI):	72
Ambient Air (°C):	27

Sample ID:	ALF-GW-PMW14C-20190620	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Dedicated Bladder Pump	*Field Blank ID:*	ALF-GW-FB03-20190620
Sample Date:	6/20/2019	*Field Duplicate ID:*	NA
Collection Time:	12:34	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	4.2	*Filter Blank ID:*	NA
Sample Depth (feet):	156.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Analytical Minneapolis supplied, Fill date: 6-14-19
Follow up turbidity value (NTU):	1.12	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	35.06	*Filter Lot #:*	None
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	None	*Other Filtered Samples Collected:*	NA
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	12:40
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	147.0	**Bottom of Screen (ft. btoc):**	157.0
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	32871
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	1070

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**Arsenic Speciation**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	060319-2AFW	052019-2CGU	060319-2EEY	042919--2ADT	052019-2CGU	19-0061
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	6/20/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	6/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	6/24/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	7/18/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	21.48
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	170.5
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	149.02 / 1472.98
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	165.5
Well ID:	ACC-1A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0950	21.48	250	0	20.5	5.92	548	2.04	22.6	-40.8	5.56	Clear	No odor
0953	21.48	250	0.75	20.4	6.02	565	0.67	7.4	-70.5	3.04	Clear	No odor
0956	21.48	250	1.50	20.6	6.10	565	0.58	6.5	-76.7	2.17	Clear	No odor
0959	21.48	250	2.25	20.6	6.19	564	0.50	5.6	-83.0	1.86	Clear	No odor
1002	21.48	250	3.00	20.8	6.29	566	0.47	5.2	-90.0	1.10	Clear	No odor
1005	21.49	250	3.75	20.5	6.30	566	0.41	4.5	-89.9	1.55	Clear	No odor
Final Values:		1005	3.75	20.5	6.30	566	0.41	4.5	-89.9	1.55	Clear	

JMM 9/11/19

Final Controller Settings:	
Setting ID:	106
Pressure (PSI):	90
Ambient Air (°C):	29

Sample ID:	ALF-GW-ACC1A-20190911	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	9/11/2019	*Field Blank ID:*	NA
Collection Time:	10:08	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.75	*Equipment Blank ID:*	NA
Sample Depth (feet):	165.5	*Filter Blank ID:*	ALF-GW-FLB01-20190911
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.15	*DI water lot #:*	Pace Minneapolis, Fill date: 09/04/2019
Depth to Water After Sampling (feet):	21.50	*Filter purged for minimum two minutes:*	Yes
Analysis:	RI	*Filter Lot #:*	A1942
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:12
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	160.1	**Bottom of Screen (ft. btoc):**	170.1
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	029667

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/11/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	9/23/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	24.35
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	130.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	106.45 / 1052.2
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	126.0
Well ID:	ACC-3A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1456	24.35	400	0	19.8	6.44	798	2.00	21.0	-40.4	5.84	Clear	No odor
1459	24.35	400	1.20	19.6	6.35	796	0.60	6.4	-63.1	3.88	Clear	No odor
1502	24.35	400	2.40	19.6	6.39	794	0.45	4.9	-75.0	3.32	Clear	No odor
1505	24.35	400	3.60	19.6	6.49	794	0.34	3.7	-88.4	2.97	Clear	No odor
1508	24.35	400	4.80	19.8	6.54	794	0.32	3.4	-93.5	2.63	Clear	No odor
Final Values:		1508	4.80	19.8	6.54	794	0.32	3.4	-93.5	2.63	Clear	

JOM 9/11/19

Final Controller Settings:	
Setting ID:	105
Pressure (PSI):	70
Ambient Air (°C):	33

Sample ID:	ALF-GW-ACC3A-20190911	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/11/2019	*Field Blank ID:*	NA
Collection Time:	15:11	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.8	*Equipment Blank ID:*	NA
Sample Depth (feet):	126.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.38	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	24.35	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	15:15
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	120.4	**Bottom of Screen (ft. btoc):**	130.4
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	029667

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/11/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	9/23/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	26.48
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	143.9
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	117.42 / 1160.63
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	139.0
Well ID:	ACC-5A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1345	26.48	200	0	22.3	7.11	645	1.17	13.3	-89.1	1.27	Clear	No odor
1348	26.48	200	0.60	22.0	6.44	639	0.87	10.0	-31.2	2.09	Clear	No odor
1351	26.48	200	1.20	22.0	6.27	632	0.68	7.7	-22.2	2.89	Clear	No odor
1354	26.48	200	1.80	21.9	6.28	631	0.55	6.3	-33.1	3.14	Clear	No odor
1357	26.48	200	2.40	21.7	6.30	629	0.50	5.6	-42.4	3.62	Clear	No odor
1400	26.48	200	3.00	21.9	6.36	629	0.40	4.6	-50.0	3.59	Clear	No odor
1403	26.48	200	3.60	21.8	6.37	629	0.37	4.3	-52.9	3.09	Clear	No odor
Final Values:		1403	3.60	21.8	6.37	629	0.37	4.3	-52.9	3.09	Clear	

JMM 9/11/19

Final Controller Settings:	
Setting ID:	107
Pressure (PSI):	82
Ambient Air (°C):	33

Sample ID:	ALF-GW-ACC5A-20190911	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Low flow	*Field Blank ID:*	ALF-GW-FB01-20190911
Sample Date:	9/11/2019	*Field Duplicate ID:*	NA
Collection Time:	14:06	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	3.6	*Filter Blank ID:*	NA
Sample Depth (feet):	139.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	Yes	*DI water lot #:*	Pace Minneapolis, Fill date: 09/04/2019
Follow up turbidity value (NTU):	2.12	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	26.48	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	14:10
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	133.5	**Bottom of Screen (ft. btoc):**	143.5
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	029667

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/11/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	9/23/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	26.55
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	60.6
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	34.05 / 336.57
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	55.5
Well ID:	ACC-5B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1245	26.55	400	0	20.7	6.64	808	1.38	15.1	-27.0	7.47	Clear	No odor
1248	26.55	400	1.20	20.6	6.43	805	0.81	9.0	-35.1	3.46	Clear	No odor
1251	26.55	400	2.40	20.5	6.45	806	0.53	5.8	-43.7	1.28	Clear	No odor
1254	26.55	400	3.60	20.4	6.49	802	0.42	4.7	-48.6	1.25	Clear	No odor
1257	26.55	400	4.80	20.4	6.53	802	0.36	4.0	-52.4	1.87	Clear	No odor
1300	26.55	400	6.00	20.3	6.55	802	0.33	3.6	-53.7	1.01	Clear	No odor
Final Values:		1300	6.00	20.3	6.55	802	0.33	3.6	-53.7	1.01	Clear	

JOM 9/11/19

Final Controller Settings:	
Setting ID:	105
Pressure (PSI):	30
Ambient Air (°C):	33

Sample ID:	ALF-GW-ACC5B-20190911	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/11/2019	*Field Blank ID:*	NA
Collection Time:	13:03	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6	*Equipment Blank ID:*	NA
Sample Depth (feet):	55.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.21	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	26.55	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:07
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	50.2	**Bottom of Screen (ft. btoc):**	60.2
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	029667

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/11/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	9/23/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	29.40
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	50.7
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	21.30 / 210.54
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	49.0
Well ID:	ALF-201	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1330	29.40	160	0	24.2	6.77	776	1.25	14.8	33.9	10.6	Clear	no odor
1333	29.57	160	0.48	24.4	6.73	775	1.05	12.5	20.8	8.99	Clear	no odor
1336	29.45	160	0.96	24.4	6.75	774	0.99	11.8	16.0	8.30	Clear	no odor
1339	29.60	160	1.44	24.4	6.72	773	0.94	11.3	15.7	7.16	Clear	no odor
Final Values:		1339	1.44	24.4	6.72	773	0.94	11.3	15.7	7.16	Clear	

CS 9/19/19

Final Controller Settings:	
Setting ID:	105
Pressure (PSI):	25
Ambient Air (°C):	30

Sample ID:	ALF-GW-ALF201-20190912 CS 9/19/19	**QA/QC Sample Collected:**	No
		MS/MSD/LD collected:	No
Method of Sampling:	low-flow	*Field Blank ID:*	NA
Sample Date:	9/12/2019	*Field Duplicate ID:*	NA
Collection Time:	13:45	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	1.44	*Filter Blank ID:*	NA
Sample Depth (feet):	49.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
Follow up turbidity value (NTU):	2.08	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	29.83	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:59
If No, Provide Explanation	NA CS 9/19/19	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	23.3	**Bottom of Screen (ft. btoc):**	49.9
Color:	Clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	~~17551~~ 1126 MD 10/2/19

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/12/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/19/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	10/2/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	29.81
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	130.7
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	100.89 / 997.24
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	126.0
Well ID:	ALF-201A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1217	29.81	192	0	22.9	6.58	638	0.85	9.8	-70.0	3.65	Clear	no odor
1220	29.81	192	0.58	22.7	6.69	642	0.69	7.9	-86.4	3.75	Clear	no odor
1223	29.81	192	1.15	22.8	6.82	645	0.56	6.5	-98.3	3.30	Clear	no odor
1226	29.81	192	1.73	22.7	6.89	645	0.49	5.7	-104.3	2.82	Clear	no odor
1229	29.81	192	2.30	22.8	6.94	644	0.43	5.0	-108.9	4.32	Clear	no odor
1232	29.81	192	2.88	22.6	6.95	644	0.39	4.5	-110.1	3.92	Clear	no odor
Final Values:		1232	2.88	22.6	6.95	644	0.39	4.5	-110.1	3.92	Clear	

CS 9/19/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	80
Ambient Air (°C):	30

Sample ID:	ALF-GW-ALF201A-20190912 CS 9/19/19	**QA/QC Sample Collected:**	Yes
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/12/2019	*Field Blank ID:*	NA
Collection Time:	12:35	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.88	*Equipment Blank ID:*	ALF-GW-EB02-20190912
Sample Depth (feet):	126.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	4.44	*DI water lot #:*	MN-090419-01
Depth to Water After Sampling (feet):	29.81	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 9/19/19	*Sample on-Ice: Time:*	12:44
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	120.3	**Bottom of Screen (ft. btoc):**	130.3
Color:	Clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	~~17551~~ 1126 MD 10/2/19

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	4	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/12/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/19/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/2/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	30.39
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.3
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	63.91 / 631.71
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.0
Well ID:	ALF-201B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0825	30.40	480	0	21.1	6.54	725	0.55	5.4	-104.4	5.32	clear	no odor
0828	30.40	480	1.44	21.1	6.63	726	0.31	3.2	-117.9	8.38	clear	no odor
0831	30.40	480	2.88	21.1	6.65	730	0.23	2.5	-120.7	3.07	clear	no odor
0834	30.40	480	4.32	21.1	6.68	735	0.23	2.3	-123.9	6.05	clear	no odor
Final Values:		0834	4.32	21.1	6.68	735	0.23	2.3	-123.9	6.05	clear	

CS 9/19/19

Final Controller Settings:	
Setting ID:	102
Pressure (PSI):	60
Ambient Air (°C):	28

Sample ID:	ALF-GW-ALF201B-20190913 CS 9/19/19	**QA/QC Sample Collected:**	No
		MS/MSD/LD collected:	No
Method of Sampling:	low-flow	*Field Blank ID:*	NA
Sample Date:	9/13/2019	*Field Duplicate ID:*	NA
Collection Time:	8:40	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	4.32	*Filter Blank ID:*	NA
Sample Depth (feet):	89.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
Follow up turbidity value (NTU):	0.83	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	30.40	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	8:50
If No, Provide Explanation	NA CS 9/19/19	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	83.9	**Bottom of Screen (ft. btoc):**	93.9
Color:	clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	~~17551~~ 1126 MD 10/2/19

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/13/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/19/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/2/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	16.62
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	44.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	28.18 / 278.54
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	43.0
Well ID:	ALF-202	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1310	16.56	420	0	20.3	7.92	558	0.45	4.8	-161.1	1.88	clear	no odor
1313	16.56	420	1.26	20.1	7.90	558	0.35	3.4	-172.1	0.93	clear	no odor
1316	16.56	420	2.52	20.2	7.88	558	0.34	3.2	-173.8	1.06	clear	no odor
Final Values:		1316	2.52	20.2	7.88	558	0.34	3.2	-173.8	1.06	clear	

CS 10/2/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	35
Ambient Air (°C):	36

Sample ID:	ALF-GW-ALF202-20190918	**QA/QC Sample Collected:**	Yes
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/18/2019	*Field Blank ID:*	ALF-GW-FB02-20190918
Collection Time:	13:20	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.52	*Equipment Blank ID:*	NA
Sample Depth (feet):	43.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.51	*DI water lot #:*	~~NA~~ wet-mn-091219-1 CS 10/2/19
Depth to Water After Sampling (feet):	16.56	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 10/2/19	*Sample on-Ice: Time:*	13:30
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	23.4	**Bottom of Screen (ft. btoc):**	44.6
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	22000

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/18/2019	**Signature:**	Emily S
Sampler Name:	Casey Mullett	**Date:**	9/18/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/2/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	28.94
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	150.5
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	121.56 / 1201.55
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	145.5
Well ID:	ALF-202A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1217	28.94	150	0	24.0	7.09	530	0.71	8.4	-90.3	2.40	clear	no odor
1220	28.94	150	0.45	24.1	6.97	551	0.69	8.2	-91.5	2.39	clear	no odor
1223	28.94	150	0.90	24.5	6.93	562	0.63	7.4	-94.8	4.25	clear	no odor
1226	28.94	150	1.35	24.9	6.92	564	0.62	7.2	-95.0	3.76	clear	no odor
Final Values:		1226	1.35	24.9	6.92	564	0.62	7.2	-95.0	3.76	clear	**Final Controller Settings:**
												Setting ID: 107
												Pressure (PSI): 80
												Ambient Air (°C): 36

CS 10/2/19

Sample ID:	ALF-GW-ALF202A-20190918	**QA/QC Sample Collected:**	No
Method of Sampling:	low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/18/2019	*Field Blank ID:*	NA
Collection Time:	12:30	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.35	*Equipment Blank ID:*	NA
Sample Depth (feet):	145.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	4.97	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	28.94	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 10/2/19	*Sample on-Ice: Time:*	12:38
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	140.1	**Bottom of Screen (ft. btoc):**	150.1
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	22000

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/18/2019	**Signature:**	Emily Scheiben
Sampler Name:	Casey Mullett	**Date:**	9/18/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/2/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	29.50
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.5
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	65.00 / 642.49
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.5
Well ID:	ALF-202B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
			NA	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1135	29.50	500	0	19.9	7.00	613	0.39	4.0	-91.8	3.80	clear	no odor
1138	29.50	500	1.50	19.9	7.10	615	0.26	2.5	-125.2	1.12	clear	no odor
1141	29.50	500	3.00	19.8	7.14	616	0.13	1.7	-136.0	1.50	clear	no odor
Final Values:		1141	3.00	19.8	7.14	616	0.13	1.7	-136.0	1.50	clear	**Final Controller Settings:**
												Setting ID: 103
												Pressure (PSI): 75
												Ambient Air (°C): 36

CS 10/2/19

Sample ID:	ALF-GW-ALF202B-20190918	**QA/QC Sample Collected:**	No
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/18/2019	*Field Blank ID:*	NA
Collection Time:	11:50	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.0	*Equipment Blank ID:*	NA
Sample Depth (feet):	89.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.35	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	29.50	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 10/2/19	*Sample on-Ice: Time:*	12:00
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	84.1	**Bottom of Screen (ft. btoc):**	94.1
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	22000

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/12/2019	**Signature:**	Emily Scheiben
Sampler Name:	Casey Mullett	**Date:**	9/12/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/2/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	Matthew Dower

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	29.37
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	54.1
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	24.73 / 244.44
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	52.0
Well ID:	ALF-203	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0940	29.87	100	0	23.0	10.03	1070	1.00	11.6	-60.2	1.33	tan	no odor
0943	29.89	100	0.30	23.3	10.01	1072	0.87	10.2	-69.6	1.42	tan	no odor
0946	29.91	100	0.60	23.4	10.01	1074	0.80	9.3	-72.1	1.30	tan	no odor
0949	29.90	100	0.90	23.4	10.07	1073	0.74	8.7	-74.1	1.22	tan	no odor
0952	29.91	100	1.20	23.4	10.03	1074	0.71	8.3	-76.8	1.18	tan	no odor
Final Values:		0952	1.20	23.4	10.03	1074	0.71	8.3	-76.8	1.18	tan	

CS 9/19/19

Final Controller Settings:	
Setting ID:	100
Pressure (PSI):	25
Ambient Air (°C):	31

Sample ID:	ALF-GW-ALF203-20190913 CS 9/19/19	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	low-flow	*Field Blank ID:*	ALF-GW-FB02-20190913
Sample Date:	9/13/2019	*Field Duplicate ID:*	NA
Collection Time:	9:58	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	1.2	*Filter Blank ID:*	NA
Sample Depth (feet):	52.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	MN-090419-01
Follow up turbidity value (NTU):	1.91	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	30.03	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	10:04
If No, Provide Explanation	NA CS 9/19/19	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	33.1	**Bottom of Screen (ft. btoc):**	54.1
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	~~17551~~ 1126 MD 10/2/19

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	4	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/1/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/19/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/2/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	32.94
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	122.7
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	89.76 / 887.23
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	118.0
Well ID:	ALF-203A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1050	32.93	300	0	19.9	6.37	345.6	0.38	3.9	-41.1	4.76	clear	no odor
1053	32.93	300	0.90	19.9	6.34	346.7	0.32	3.2	-52.2	3.67	Clear	no odor
1058	32.93	300	2.40	19.9	6.31	346.6	0.25	2.7	-59.1	5.10	clear	no odor
Final Values:		1058	2.40	19.9	6.31	346.6	0.25	2.7	-59.1	5.10	clear	

CS 9/19/19

Final Controller Settings:	
Setting ID:	102
Pressure (PSI):	70
Ambient Air (°C):	32

Sample ID:	ALF-GW-ALF203A-20190913 CS 9/19/19	**QA/QC Sample Collected:**	No
		MS/MSD/LD collected:	No
Method of Sampling:	low-flow	*Field Blank ID:*	NA
Sample Date:	9/13/2019	*Field Duplicate ID:*	NA
Collection Time:	11:05	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	2.4	*Filter Blank ID:*	NA
Sample Depth (feet):	118.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
Follow up turbidity value (NTU):	5.78	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	32.94	*Filter Lot #:*	na
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	11:15
If No, Provide Explanation	NA CS 9/19/19	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	112.3	**Bottom of Screen (ft. btoc):**	122.3
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	~~17551~~ 1126 MD 10/2/19

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/13/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/19/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/2/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	33.35
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.3
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	60.95 / 602.46
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.0
Well ID:	ALF-203B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1243	33.44	200	0	21..5	7.02	458.5	0.33	3.7	-132.2	9.94	Clear	No Odor
1246	33.44	200	0.60	21.6	7.08	459.8	0.30	3.6	-136.7	4.17	Clear	No Odor
1249	33.44	200	1.20	21.3	7.11	458.9	0.29	3.3	-139.2	6.50	Clear	No Odor
Final Values:		1249	1.20	21.3	7.11	458.9	0.29	3.3	-139.2	6.50	Clear	

CS 10/1/19

Final Controller Settings:	
Setting ID:	102
Pressure (PSI):	55
Ambient Air (°C):	36

Sample ID:	ALF-GW-ALF203B-20190916	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	low-flow	*Field Blank ID:*	NA
Sample Date:	9/16/2019	*Field Duplicate ID:*	ALF-GW-DUP02-20190916
Collection Time:	12:55	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	1.20	*Filter Blank ID:*	NA
Sample Depth (feet):	89.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
Follow up turbidity value (NTU):	1.70	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	33.41	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:05
If No, Provide Explanation	NA CS 10/1/19	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	83.9	**Bottom of Screen (ft. btoc):**	93.9
Color:	Clear	**Odor:**	none
WL Meter Manufacturer:	Heron	**Model:**	dipper T
Serial No:	15845		
Controller Unit Manufacturer:	QED	**Model:**	mp-50
Serial No:	~~17551~~ 1126 MD 10/4/19		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/16/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/16/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	30.14
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	59.2
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	29.06 / 287.24
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	49.0
Well ID:	ALF-204	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1358	30.45	100	0	22.1	6.74	475.8	1.06	12.2	-33.9	4.41	Clear	No odor
1401	30.45	100	0.30	22.2	6.67	469.2	0.74	8.4	-78.3	3.48	Clear	No odor
1404	30.45	100	0.60	22.3	6.65	466.7	0.65	7.3	-97.6	3.63	Clear	No odor
1407	30.45	100	0.90	21.9	6.66	466.5	0.54	6.2	-110.5	3.37	Clear	No odor
1410	30.45	100	1.20	22.0	6.69	464.9	0.51	5.8	-121.3	3.13	Clear	No odor
1413	30.45	100	1.50	21.7	6.73	465.5	0.50	5.7	-129.5	3.70	Clear	No odor
Final Values:		1413	1.50	21.7	6.73	465.5	0.50	5.7	-129.5	3.70	Clear	

JOM 9/17/19

Final Controller Settings:	
Setting ID:	107
Pressure (PSI):	25
Ambient Air (°C):	35

Sample ID:	ALF-GW-ALF204-20190917	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/17/2019	*Field Blank ID:*	NA
Collection Time:	14:16	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.5	*Equipment Blank ID:*	NA
Sample Depth (feet):	49.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.98	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	30.58	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:19
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	49.0	**Bottom of Screen (ft. btoc):**	59.2
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/17/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/3/2019	**Signature:**	

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	30.13
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	120.7
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	90.57 / 895.23
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	116.0
Well ID:	ALF-204A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1506	30.15	300	0	18.3	6.62	361.8	1.05	10.9	25.1	10.5	Clear	No odor
1509	30.15	300	0.90	18.1	6.66	359.1	0.44	4.7	-45.8	7.88	Clear	No odor
1512	30.15	300	1.80	17.9	6.69	357.8	0.39	4.1	-61.9	4.97	Clear	No odor
1515	30.15	300	2.70	17.9	6.74	356.7	0.36	3.9	-74.4	4.27	Clear	No odor
Final Values:		1515	2.70	17.9	6.74	356.7	0.36	3.9	-74.4	4.27	Clear	**Final Controller Settings:**
												Setting ID: 106
												Pressure (PSI): 62
												Ambient Air (°C): 37

JMW 9/17/19

Sample ID:	ALF-GW-ALF204A-20190917	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Low flow	*Field Blank ID:*	NA
Sample Date:	9/17/2019	*Field Duplicate ID:*	NA
Collection Time:	15:18	*Equipment Blank ID:*	ALF-GW-EB01-20190917
Total Volume Purged (L):*	2.7	*Filter Blank ID:*	NA
Sample Depth (feet):	116.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Minneapolis, Fill date: 9/12/19
Follow up turbidity value (NTU):	2.60	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	30.16	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	15:20
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	110.3	**Bottom of Screen (ft. btoc):**	120.3
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/17/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/3/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	30.14
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.1
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	63.96 / 632.21
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.0
Well ID:	ALF-204B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0844	30.14	400	0	17.0	5.37	296.5	1.34	13.8	147.1	4.34	Clear	No odor
0847	30.14	400	1.20	16.8	5.64	294.3	0.65	6.6	110.1	3.40	Clear	No odor
0850	30.14	400	2.40	16.8	5.80	295.0	0.51	5.3	89.5	2.76	Clear	No odor
0853	30.14	400	3.60	16.7	5.97	294.5	0.44	4.5	73.7	2.19	Clear	No odor
0856	30.14	400	4.80	16.7	6.19	294.3	0.35	3.6	47.7	1.79	Clear	No odor
0859	30.14	400	6.00	16.7	6.30	294.0	0.33	3.5	30.5	1.30	Clear	No odor
0902	30.14	400	7.20	16.7	6.37	291.1	0.30	3.1	19.8	1.21	Clear	No odor
0905	30.14	400	8.40	16.7	6.45	293.7	0.28	2.9	5.8	1.03	Clear	No odor
Final Values:		0905	8.40	16.7	6.45	293.7	0.28	2.9	5.8	1.03	Clear	

JCM 9/18/19

Final Controller Settings:	
Setting ID:	102
Pressure (PSI):	60
Ambient Air (°C):	23

Sample ID:	ALF-GW-ALF204B-20190918	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/18/2019	*Field Blank ID:*	NA
Collection Time:	09:08	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	8.40	*Equipment Blank ID:*	NA
Sample Depth (feet):	89.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.92	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	30.15	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	09:12
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	83.7	**Bottom of Screen (ft. btoc):**	93.7
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/18/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	33.62
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	55.6
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	21.98 / 217.26
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	54.0
Well ID:	ALF-205	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1103	33.90	100	0	21.9	6.55	892	2.08	23.3	29.4	1.76	Clear	No odor
1106	33.93	100	0.30	21.7	6.57	894	1.85	18.7	20.7	1.48	Clear	No odor
1109	33.96	100	0.60	21.5	6.63	895	1.19	13.5	6.4	0.54	Clear	No odor
1112	33.99	100	0.90	21.3	6.69	897	1.07	12.0	-3.9	0.54	Clear	No odor
1115	34.02	100	1.20	21.3	6.71	895	0.96	10.8	-10.2	0.58	Clear	No odor
1118	34.05	100	1.50	21.2	6.75	898	0.86	9.7	-14.5	0.37	Clear	No odor
1121	34.08	100	1.80	21.1	6.76	897	0.81	9.0	-19.5	0.73	Clear	No odor
1124	34.11	100	2.10	21.3	6.81	897	0.76	8.6	-25.2	0.40	Clear	No odor
Final Values:		1124	2.10	21.3	6.81	897	0.76	8.6	-25.2	0.40	Clear	**Ambient Air (°C):** 33

JMN 9/18/19

Final Controller Settings:
Setting ID: 101
Pressure (PSI): 28

Sample ID:	ALF-GW-ALF205-20190918
Method of Sampling:	Low flow
Sample Date:	9/18/2019
Collection Time:	11:27
Total Volume Purged (L):*	2.10
Sample Depth (feet):	54.0
Heavy Equipment in Area:	No
Follow up turbidity value (NTU):	0.44
Depth to Water After Sampling (feet):	34.26
Analysis:	RI
Tubing Lot #:	NA
Stability Reached (Y/N):	Yes
If No, Provide Explanation	NA

QA/QC Sample Collected:	Yes
MS/MSD/LD collected:	No
Field Blank ID:	ALF-GW-FB01-20190918
Field Duplicate ID:	NA
Equipment Blank ID:	NA
Filter Blank ID:	NA
Tubing Blank ID:	NA
DI water lot #:	Pace Minneapolis, Fill date: 9/12/19
Filter purged for minimum two minutes:	No
Filter Lot #:	NA
Filter Sample Metals:	No
Other Filtered Samples Collected:	As_Spec
Sample on-Ice: Time:	11:30
Drawdown Stabilized < 0.3 ft:	Yes

Top of Screen (ft. btoc):	34.5	**Bottom of Screen (ft. btoc):**	55.5
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/18/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	32.32
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	112.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	80.08 / 791.55
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	107.0
Well ID:	ALF-205A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0958	32.33	320	0	18.2	6.22	300.5	0.88	9.2	63.9	12.3	Clear	No odor
1001	32.33	320	0.96	18.1	6.17	300.5	0.60	6.2	39.0	4.51	Clear	No odor
1004	32.33	320	1.92	18.0	6.23	300.5	0.47	5.0	14.7	2.71	Clear	No odor
1007	32.33	320	2.88	18.0	6.35	300.4	0.39	4.2	-10.6	2.22	Clear	No odor
1010	32.33	320	3.84	18.0	6.47	300.3	0.33	3.5	-31.2	2.00	Clear	No odor
1013	32.33	320	4.80	18.0	6.53	300.2	0.32	3.2	-45.7	1.60	Clear	No odor
1016	32.33	320	5.76	18.0	6.57	300.2	0.28	3.0	-55.9	1.31	Clear	No odor
Final Values:		1016	5.76	18.0	6.57	300.2	0.28	3.0	-55.9	1.31	Clear	

JOM 9/18/19

Final Controller Settings:	
Setting ID:	106
Pressure (PSI):	60
Ambient Air (°C):	31

Sample ID:	ALF-GW-ALF205A-20190918	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/18/2019	*Field Blank ID:*	NA
Collection Time:	10:19	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.76	*Equipment Blank ID:*	NA
Sample Depth (feet):	107.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.76	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	32.33	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:22
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	102.0	**Bottom of Screen (ft. btoc):**	112.0
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/18/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	32.65
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	86.5
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	53.85 / 532.28
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	81.5
Well ID:	ALF-205B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1216	32.65	400	0	18.6	6.66	276.3	0.91	9.7	32.3	4.43	Clear	No odor
1219	32.65	400	1.20	18.4	6.64	275.0	0.51	5.4	-13.1	3.15	Clear	No odor
1222	32.65	400	2.40	18.5	6.67	274.6	0.40	4.3	-34.5	2.73	Clear	No odor
1225	32.65	400	3.60	18.4	6.72	273.9	0.34	3.6	-51.6	2.40	Clear	No odor
1228	32.65	400	4.80	18.3	6.77	273.6	0.31	3.2	-65.3	1.78	Clear	No odor
Final Values:		1228	4.80	18.3	6.77	273.6	0.31	3.2	-65.3	1.78	Clear	

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Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	52
Ambient Air (°C):	36

Sample ID:	ALF-GW-ALF205B-20190918	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/18/2019	*Field Blank ID:*	NA
Collection Time:	12:31	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.80	*Equipment Blank ID:*	NA
Sample Depth (feet):	81.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.04	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	32.65	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	12:36
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	76.1	**Bottom of Screen (ft. btoc):**	86.1
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/18/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	37.18
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	64.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	27.22 / 269.05
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	54.0
Well ID:	ALF-206	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1319	37.19	220	0	19.8	7.04	302.0	2.45	26.5	47.1	2.95	Clear	No odor
1322	37.19	220	0.66	19.5	6.82	295.7	1.86	20.1	15.2	1.25	Clear	No odor
1325	37.19	220	1.32	19.2	6.81	295.3	1.22	13.0	-21.7	1.08	Clear	No odor
1328	37.19	220	1.98	19.1	6.82	295.2	0.87	9.3	-41.3	1.01	Clear	No odor
1331	37.19	220	2.64	19.0	6.85	295.4	0.68	7.3	-54.9	0.75	Clear	No odor
1334	37.19	220	3.30	18.9	6.85	295.8	0.59	6.3	-67.1	0.71	Clear	No odor
1337	37.19	220	3.96	18.8	6.89	298.3	0.51	5.5	-77.8	0.75	Clear	No odor
1340	37.19	220	4.62	18.5	6.88	303.2	0.47	5.0	-83.9	0.70	Clear	No odor
1343	37.19	220	5.28	18.4	6.85	312.1	0.43	4.6	-89.8	0.65	Clear	No odor
Final Values:		1343	5.28	18.4	6.85	312.1	0.43	4.6	-89.8	0.65	Clear	

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Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	28
Ambient Air (°C):	36

Sample ID:	ALF-GW-ALF206-20190918	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/18/2019	*Field Blank ID:*	NA
Collection Time:	13:46	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.28	*Equipment Blank ID:*	NA
Sample Depth (feet):	54.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.58	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	37.19	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:49
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	54.0	**Bottom of Screen (ft. btoc):**	64.2
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/18/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA GROUNDWATER SAMPLING FORM

Project Name:	Allen -RI	**Initial Depth to Water (feet):**	**26.30**
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	48.80
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	22.50 / 222.4
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	47.0
Well ID:	ALF-210	**Method of Purging:**	low-flow
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (uS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0935	26.87	100	0	22.3	6.71	798	1.01	12.1	-27.3	246		no odor/tan
0938	26.88	100	0.30	22.3	6.73	799	1.00	11.6	-25.8	238	tan	no odor/tan
0941	26.90	100	0.60	22.3	6.73	800	0.99	11.3	-24.8	225	tan	no odor/tan
0944	26.94	100	0.90	22.3	6.74	799	0.97	11.1	-24.5	214	tan	no odor/tan
0947	26.94	100	1.20	22.4	6.75	798	0.93	11.1	-25.0	209	tan	no odor/tan
0950	26.96	100	1.50	22.6	6.75	798	0.93	10.8	-25.1	207	tan	no odor/tan
0953	26.97	100	1.80	22.9	6.68	798	1.10	13.2	-24.9	192	tan	no odor/tan
0956	26.98	100	2.10	22.5	6.74	797	0.98	11.1	-25.0	187	tan	no odor/tan
0959	26.98	100	2.40	22.7	6.75	798	0.91	10.6	-24.7	185	tan	no odor/tan
1002	26.99	100	2.70	22.8	6.75	797	0.89	10.2	-24.5	175	tan	no odor/tan
1005	26.99	100	3.00	22.9	6.75	797	0.86	10.2	-24.6	172	tan	no odor/tan
1008	27.00	100	3.30	22.8	6.76	798	0.87	10.0	-24.6	167	tan	no odor/tan
1011	27.00	100	3.60	22.8	6.76	798	0.85	10.0	-24.2	166	tan	no odor/tan
1014	27.00	100	3.90	23.0	6.76	796	0.84	9.7	-24.1	156	tan	no odor/tan
1017	27.01	100	4.20	23.0	6.76	798	0.84	9.7	-23.7	146	tan	no odor/tan
1020	27.01	100	4.50	22.9	6.76	797	0.83	9.6	-23.7	130	tan	no odor/tan
1023	27.02	100	4.80	22.9	6.76	796	0.82	9.9	23.5	122	tan	no odor/tan
1026	27.02	100	5.10	22.8	6.73	797	1.01	11.3	-23.5	108	tan	no odor/tan
1029	27.02	100	5.40	22.8	6.75	796	0.89	10.2	-21.7	100	tan	no odor/tan
1032	27.02	100	5.70	22.8	6.75	798	0.81	9.5	-22.6	95.8	tan	no odor/tan
1035	27.02	100	6.00	22.8	6.75	798	0.80	10.1	-22.8	91.9	tan	no odor/tan
1038	27.03	100	6.30	22.7	6.75	800	0.82	9.3	-22.5	86.5	tan	no odor/tan
1041	27.02	100	6.60	22.8	6.74	799	0.77	9.1	-22.6	81.2	tan	no odor/tan
1044	27.02	100	6.90	22.7	6.75	800	0.78	9.0	-22.7	81.7	tan	no odor/tan
1047	27.02	100	7.20	22.7	6.75	798	0.78	9.0	-22.8	81.4	tan	no odor/tan
1050	27.02	100	7.50	22.7	6.75	799	0.78	9.1	-23.2	74.9	tan	no odor/tan
1053	27.03	100	7.80	22.8	6.75	799	0.77	8.9	-23.5	76.3	tan	no odor/tan
1056	27.04	100	8.10	22.8	6.75	798	0.76	8.7	-23.7	77.6	tan	no odor/tan
1059	27.03	100	8.40	22.8	6.70	799	0.98	11.1	-21.0	79.2	tan	no odor/tan
1102	27.03	100	8.70	22.9	6.75	798	0.82	9.5	-22.8	79.0	tan	no odor/tan
1105	27.04	100	9.00	22.9	6.75	799	0.78	9.1	-23.9	70.5	tan	no odor/tan
1108	27.04	100	9.30	22.9	6.75	799	0.79	9.1	-24.1	68.4	tan	no odor/tan
1111	27.03	100	9.60	23.0	6.75	799	0.75	8.7	-24.6	70.3	tan	no odor/tan
1114	27.03	100	9.90	22.8	6.76	797	0.08	8.9	-24.5	68.9	tan	no odor/tan
1117	27.03	100	10.20	23.1	6.75	797	0.75	8.8	-24.9	66.6	tan	no odor/tan
1120	27.02	100	10.50	23.1	6.75	798	0.75	9.0	-24.9	70.0	tan	no odor/tan
1123	27.02	100	10.80	23.1	6.75	799	0.82	9.6	-25.0	71.0	tan	no odor/tan
1126	27.02	100	11.10	23.2	6.74	799	0.85	9.8	-25.2	69.0	tan	no odor/tan
												Final Controller Settings:
					CS 9/18/19							**Setting ID:** 103
												Pressure (PSI): 21
Final Values:		1126	11.10	23.2	6.74	799	0.85	9.8	-25.2	69.0	tan	**Ambient Air (°C):** 33

Sample ID:	ALF-GW-ALF210-20190911	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	low flow	*Field Blank ID:*	NA
Sample Date:	9/11/2019	*Field Duplicate ID:*	NA
Collection Time:	11:36	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	11.1	*Filter Blank ID:*	~~ALF-FLB02-20190911~~ ALF-GW-FLB02-20190911 cs 9/18/19
Sample Depth (feet):	47.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	pace minneapolis fill date 090419
Follow up turbidity value (NTU):	49.00	*Filter purged for minimum two minutes:*	Yes
Depth to Water After Sampling (feet):	27.02	*Filter Lot #:*	A1942
Analysis:	ALF-RI	*Filter Sample Metals:*	Yes
Tubing Lot #:	not available	*Other Filtered Samples Collected:*	As spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	11:42
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	27.2		48.1
Color:	tan	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	dipperT	**Serial No:**	15845 MD 10/2/19
Controller Unit Manufacturer:	QED	**Model:**	Mp-50	**Serial No:**	1126 MD 10/2/2019

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey	081919-2eey
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic
Volume (mL):	250	250	1000	500	250
No. of Bottles Collected:	2	1	2	1	1
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved

Lead Sampler Name:	Emily Scheiben	**Date:**	9/11/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	10/2/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA GROUNDWATER SAMPLING FORM

Project Name:	TVA ALF-RI	**Initial Depth to Water (feet):**	26.82
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	130.40
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	103.58 / 1023.83
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	125.0
Well ID:	ALF-210a	**Method of Purging:**	low flow
Well Type:	MD	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)	
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*			
1320	26.83	128	0	22.6	6.90	1082	0.23	2.7	-107.8	4.32	clear	none	
1323	26.83	128	0.38	22.5	6.91	1079	0.21	2.5	-112.3	4.43	clear	none	
1326	26.83	128	0.77	22.5	6.94	1078	0.20	2.4	-114.7	3.97	clear	none	
												Final Controller Settings:	
						CS 9/18/19						**Setting ID:**	104
												Pressure (PSI):	60
Final Values:		1326	0.768	22.5	6.94	1078	0.2	2.4	-114.7	3.97	clear	**Ambient Air (°C):**	33

Sample ID:	ALF-GW-ALF210A-20190911	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	low-flow	*Field Blank ID:*	~~ALF-FB02-20190911~~ ALF-GW-FB02-20190911 CS 9/18/19
Sample Date:	9/11/2019	*Field Duplicate ID:*	NA
Collection Time:	13:32	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	0.768	*Filter Blank ID:*	NA
Sample Depth (feet):	125.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	pace minneapolis, fill date 090419
Follow up turbidity value (NTU):	3.82	*Filter purged for minimum two minutes:*	~~No~~ Yes CS 9/18/19
Depth to Water After Sampling (feet):	26.83	*Filter Lot #:*	NA
Analysis:	ALF-RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	~~NA~~ As_Spec CS 9/18/19
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:46
If No, Provide Explanation	NA CS 9/18/19	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	120.0	**Bottom of Screen (ft. btoc):**	130.0
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	heron	**Model:**	dipperT	**Serial No:**	15845 MD 10/2/19
Controller Unit Manufacturer:	Qed	**Model:**	mp-50	**Serial No:**	1126 MD 10/2/2019

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey	081919-2eey
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic
Volume (mL):	250	250	1000	500	250
No. of Bottles Collected:	2	1	2	1	1
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved

Lead Sampler Name:	Emily Scheiben	**Date:**	9/11/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	10/2/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	36.06
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	67.9
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	31.84 / 314.72
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	67.0
Well ID:	ALF-212	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (uS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0944	36.22	152	0	22.5	6.64	639	1.77	20.1	-35.7	6.23	Clear	No odor
0947	36.22	152	0.46	22.5	6.55	644	1.12	13.1	-73.4	4.52	Clear	No odor
0950	36.22	152	0.91	22.6	6.61	645	0.97	11.3	-85.2	3.51	Clear	No odor
0953	36.22	152	1.37	22.6	6.70	648	0.76	8.4	-98.7	3.73	Clear	No odor
0956	36.22	152	1.82	22.5	6.74	650	0.66	7.8	-104.8	3.00	Clear	No odor
0959	36.22	152	2.28	22.7	6.78	650	0.58	6.6	-112.4	3.00	Clear	No odor
1002	36.22	152	2.74	22.7	6.81	650	0.57	6.3	-115.5	2.79	Clear	No odor
1005	36.22	152	3.19	22.8	6.81	651	0.51	5.9	-117.6	2.50	Clear	No odor
1008	36.22	152	3.65	22.8	6.84	651	0.48	5.6	-119.8	2.17	Clear	No odor
1011	36.22	152	4.10	22.9	6.84	652	0.46	5.3	-121.3	2.43	Clear	No odor
Final Values:		1011	4.104	22.9	6.84	652	0.46	5.3	-121.3	2.43	Clear	

9/13/19

Final Controller Settings:	
Setting ID:	101
Pressure (PSI):	32
Ambient Air (°C):	28

Sample ID:	ALF-GW-ALF212-20190913	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/13/2019	*Field Blank ID:*	ALF-GW-FB01-20190913
Collection Time:	10:14	*Field Duplicate ID:*	ALF-GW-DUP01-20190913
Total Volume Purged (L):*	4.104	*Equipment Blank ID:*	NA
Sample Depth (feet):	67.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.33	*DI water lot #:*	Pace Minneapolis, Fill date: 9/4/19
Depth to Water After Sampling (feet):	36.22	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:17
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	51.8	**Bottom of Screen (ft. btoc):**	67.8
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	029667

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/13/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	9/23/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	48.24
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	169.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	121.56 / 1201.55
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	165.0
Well ID:	ALF-212A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0843	48.24	350	0	18.9	5.74	573	0.92	9.4	-15.3	3.07	Clear	No odor
0846	48.24	350	1.05	19.0	5.95	577	0.58	6.1	-40.6	7.13	Clear	No odor
0849	48.24	350	2.10	18.8	6.11	577	0.46	5.0	-60.0	5.97	Clear	No odor
0852	48.24	350	3.15	18.8	6.24	576	0.39	4.2	-77.7	5.56	Clear	No odor
0855	48.24	350	4.20	19.0	6.38	575	0.34	3.6	-91.6	2.35	Clear	No odor
0858	48.24	350	5.25	18.8	6.43	573	0.30	3.4	-97.4	5.45	Clear	No odor
0901	48.24	350	6.30	18.8	6.50	571	0.27	2.9	-103.4	1.83	Clear	No odor
Final Values:		0901	6.30	18.8	6.50	571	0.27	2.9	-103.4	1.83	Clear	

JCM 9/13/19

Final Controller Settings:	
Setting ID:	58 (CPM2)
Pressure (PSI):	80
Ambient Air (°C):	26

Sample ID:	ALF-GW-ALF212A-20190913	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/13/2019	*Field Blank ID:*	NA
Collection Time:	09:04	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6.3	*Equipment Blank ID:*	NA
Sample Depth (feet):	165.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.27	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	48.24	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	09:07
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	159.4	**Bottom of Screen (ft. btoc):**	169.4
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	029667

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/13/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	9/23/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	50.18
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	81.3
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	31.12 / 307.6
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	71.0
Well ID:	ALF-213	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0953	50.21	180	0	20.3	5.78	363.5	2.09	23.1	108.2	2.90	Clear	No odor
0956	50.21	180	0.54	20.1	5.86	373.6	1.69	18.6	78.1	2.88	Clear	No odor
0959	50.21	180	1.08	20.1	6.13	420.6	1.07	11.7	23.0	3.46	Clear	No odor
1002	50.21	180	1.62	20.1	6.25	437.5	0.95	10.4	1.1	2.72	Clear	No odor
1005	50.21	180	2.16	20.1	6.38	453.1	0.83	9.2	-22.0	2.04	Clear	No odor
1008	50.21	180	2.70	20.0	6.50	463.9	0.74	8.1	-44.9	1.66	Clear	No odor
1011	50.21	180	3.24	20.2	6.55	468.6	0.61	6.7	-60.8	1.12	Clear	No odor
1014	50.21	180	3.78	20.2	6.63	473.9	0.53	5.9	-75.5	0.84	Clear	No odor
1017	50.21	180	4.32	20.1	6.69	479.4	0.47	5.0	-89.8	0.63	Clear	No odor
1020	50.21	180	4.86	20.0	6.69	480.5	0.45	4.8	-94.0	0.77	Clear	No odor
1023	50.21	180	5.40	19.9	6.71	482.2	0.39	4.3	-99.8	0.56	Clear	No odor
Final Values:		1023	5.40	19.9	6.71	482.2	0.39	4.3	-99.8	0.56	Clear	**Final Controller Settings:**
												Setting ID: 103
												Pressure (PSI): 38
												Ambient Air (°C): 27

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Sample ID:	ALF-GW-ALF213-20190920	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/20/2019	*Field Blank ID:*	ALF-GW-FB01-20190920
Collection Time:	10:26	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.40	*Equipment Blank ID:*	NA
Sample Depth (feet):	71.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.62	*DI water lot #:*	Pine Minneapolis Fill Date 9\17\2019
Depth to Water After Sampling (feet):	20.22	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:30
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	71.0	**Bottom of Screen (ft. btoc):**	81.2
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/20/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/7/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/9/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	50.79
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	162.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	112.01 / 1107.16
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	157.75
Well ID:	ALF-213A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1158	50.79	400	0	18.6	6.13	301.2	1.12	11.7	24.8	3.54	Clear	No odor
1201	50.79	400	1.20	18.3	6.13	298.7	0.73	7.7	14.6	3.82	Clear	No odor
1204	50.79	400	2.40	18.2	6.22	296.9	0.52	5.4	-3.8	3.73	Clear	No odor
1207	50.79	400	3.60	18.1	6.39	296.5	0.41	4.3	-25.2	1.78	Clear	No odor
1210	50.79	400	4.80	18.1	6.47	296.3	0.37	3.9	-36.4	1.34	Clear	No odor
1213	50.79	400	6.00	18.1	6.56	295.8	0.33	3.5	-50.0	1.35	Clear	No odor
Final Values:		1213	6.00	18.1	6.56	295.8	0.33	3.5	-50.0	1.35	Clear	

Final Controller Settings:

Setting ID:	103
Pressure (PSI):	80
Ambient Air (°C):	29

Sample ID:	ALF-GW-ALF213A-20190920	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/20/2019	*Field Blank ID:*	NA
Collection Time:	12:16	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6.00	*Equipment Blank ID:*	NA
Sample Depth (feet):	157.75	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.72	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	50.79	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	12:20
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	152.4	**Bottom of Screen (ft. btoc):**	162.4
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/20/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/7/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	10/9/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	50.83
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	121.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	70.97 / 701.5
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	116.75
Well ID:	ALF-213B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1112	50.89	250	0	19.7	7.09	781	2.09	22.1	-2.7	1.13	Clear	No odor
1115	50.89	250	0.75	19.0	6.59	783	0.83	8.8	-20.9	7.00	Clear	No odor
1118	50.89	250	1.50	19.0	6.58	782	0.67	7.1	-34.6	6.86	Clear	No odor
1121	50.89	250	2.25	18.8	6.67	781	0.53	5.9	-56.8	6.12	Clear	No odor
1124	50.89	250	3.00	18.9	6.71	779	0.48	5.1	-70.5	5.30	Clear	No odor
1127	50.89	250	3.75	18.7	6.77	781	0.43	4.5	-83.5	4.51	Clear	No odor
1130	50.89	250	4.50	18.8	6.78	779	0.40	4.3	-86.6	4.10	Clear	No odor
Final Values:		1130	4.50	18.8	6.78	779	0.40	4.3	-86.6	4.10	Clear	**Final Controller Settings:**
												Setting ID: 58 (CPM2)
												Pressure (PSI): 80
												Ambient Air (°C): 28

9/20/19

Sample ID:	ALF-GW-ALF213B-20190920	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/20/2019	*Field Blank ID:*	NA
Collection Time:	11:33	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.50	*Equipment Blank ID:*	NA
Sample Depth (feet):	116.75	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.86	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	50.89	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:36
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	111.4	**Bottom of Screen (ft. btoc):**	121.4
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/20/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/20/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/7/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/9/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA TDEC Order	**Initial Depth to Water (feet):**	27.70
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	54.90
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	27.20 / 268.86
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	45.0
Well ID:	ALF-214	**Method of Purging:**	low-flow
Well Type:	Mw	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1510	27.70	200	0	21.5	7.09	464.2	0.85	9.2	10.3	3.69	clear	no odor
1513	27.70	200	0.60	21.5	7.13	463.9	0.71	7.9	5.0	1.62	clear	no odor
1516	27.70	200	1.20	21.5	7.16	462.7	0.63	7.1	-0.5	1.43	clear	no odor
1519	27.70	200	1.80	21.4	7.19	462.6	0.58	6.6	-2.6	2.11	clear	no odor
1522	27.70	200	2.40	21.4	7.19	463.4	0.57	6.6	-5.0	3.01	clear	no odor
												Final Controller Settings:
						CS 9/18/19						**Setting ID:** 103
												Pressure (PSI): 25
Final Values:		1522	2.40	21.4	7.19	463.4	0.57	6.6	-5.0	3.01	clear	**Ambient Air (°C):** 33

Sample ID:	ALF-GW-ALF214-20190911	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	low-flow	*Field Blank ID:*	NA
Sample Date:	9/11/2019	*Field Duplicate ID:*	NA
Collection Time:	15:30	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	2.4	*Filter Blank ID:*	NA
Sample Depth (feet):	45.0	*Tubing Blank ID:*	ALF-GW-TB02-20190911
Heavy Equipment in Area:	No	*DI water lot #:*	pace minneapolis, fill date 090419
Follow up turbidity value (NTU):	3.65	*Filter purged for minimum two minutes:*	~~No~~ Yes CS 9/18/19
Depth to Water After Sampling (feet):	26.70	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	~~NA~~ As_Spec CS 9/18/19
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	15:39
If No, Provide Explanation	n/a	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	34.5	**Bottom of Screen (ft. btoc):**	54.5
Color:	clear	**Odor:**	no color

WL Meter Manufacturer:	heron	**Model:**	dipperT	**Serial No:**	15845 MD 10/2/19
Controller Unit Manufacturer:	qed	**Model:**	mp-50	**Serial No:**	1126 MD 10/2/2019

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey	081919-2eey
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic
Volume (mL):	250	250	1000	500	250
No. of Bottles Collected:	2	1	2	1	1
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved

Lead Sampler Name:	Emily Scheiben	**Date:**	9/11/2019	**Signature:**	
Sampler Name:	casey mullett	**Date:**	9/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	10/2/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	28.19
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	133.0
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	104.81 / 1035.99
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	~~133~~ 130.0 CS 11/19/19
Well ID:	ALF-214A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0917	28.19	176	0	20.8	6.32	1162	0.67	7.3	-57.9	2.50	Clear	no odor
0920	28.19	176	0.53	20.7	6.36	1156	0.54	6.1	-63.4	2.09	clear	no odor
0923	28.19	176	1.06	20.8	6.37	1146	0.52	6.0	-67.1	3.28	clear	no odor
0926	28.19	176	1.58	20.6	6.39	1141	0.43	4.7	-68.3	2.12	clear	no odor
0929	28.19	176	2.11	20.6	6.40	1136	0.38	4.3	-70.1	2.21	clear	no odor
0932	28.19	176	2.64	20.6	6.41	1129	0.36	4.0	-71.9	2.15	clear	no odor
Final Values:		0932	2.64	20.6	6.41	1129	0.36	4.0	-71.9	2.15	clear	

CS 9/19/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	75
Ambient Air (°C):	28

Sample ID:	ALF-GW-ALF214A-20190912	**QA/QC Sample Collected:**	No
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/12/2019	*Field Blank ID:*	NA
Collection Time:	~~0:00~~ 09:38 CS 9/19/19	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.64	*Equipment Blank ID:*	NA
Sample Depth (feet):	~~133~~ 130 CS 11/19/19	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.41	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	28.19	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	na
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 9/19/19	*Sample on-Ice: Time:*	9:48
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	~~84.1~~ 122.6 CS 11/19/19	**Bottom of Screen (ft. btoc):**	~~94.1~~ 132.6 CS 11/19/19
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	~~17551~~ 1126 MD 10/2/19

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/12/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/12/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/19/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	10/2/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	28.00
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	93.3
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	65.30 / 645.45
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	88.0
Well ID:	ALF-214B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1045	28.00	140	0	22.0	6.50	794	0.95	11.2	-80.5	7.50	Clear	no odor
1048	28.00	140	0.42	22.2	6.57	787	0.90	10.3	-89.9	6.24	Clear	no odor
1051	28.00	140	0.84	22.2	6.63	785	0.83	9.5	-95.6	6.63	Clear	no odor
Final Values:		1051	0.84	22.2	6.63	785	0.83	9.5	-95.6	6.63	Clear	

CS 9/19/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	55
Ambient Air (°C):	30

Sample ID:	ALF-GW-ALF214B-20190912	**QA/QC Sample Collected:**	Yes
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/12/2019	*Field Blank ID:*	ALF-GW-FB02-20190912
Collection Time:	10:57	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	0.84	*Equipment Blank ID:*	NA
Sample Depth (feet):	88.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.59	*DI water lot #:*	MN-090419-01
Depth to Water After Sampling (feet):	28.00	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 9/19/19	*Sample on-Ice: Time:*	11:10
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	82.9	**Bottom of Screen (ft. btoc):**	92.9
Color:	Clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	~~17551~~ 1126 MD 10/2/19

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	4	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/12/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/19/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	10/2/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	12.96
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	30.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	17.44 / 172.38
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	25.0
Well ID:	ALF-215	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0925	13.02	300	0	19.5	5.94	410.2	1.13	12.2	34.2	1.06	Clear	No odor
0928	13.02	300	0.90	19.5	6.00	411.3	0.91	9.9	15.0	0.97	Clear	No odor
0931	13.02	300	1.80	19.5	6.18	413.1	0.60	6.6	-19.9	1.00	Clear	No odor
0934	13.02	300	2.70	19.5	6.31	414.4	0.51	5.6	-35.4	0.71	Clear	No odor
0937	13.02	300	3.60	19.5	6.40	415.1	0.45	4.9	-44.3	1.16	Clear	No odor
0940	13.02	300	4.50	19.5	6.46	415.9	0.40	4.3	-50.0	0.69	Clear	No odor
0943	13.02	300	5.40	19.6	6.50	417.0	0.37	4.0	-54.0	0.58	Clear	No odor
Final Values:		0943	5.40	19.6	6.5	417	0.37	4.0	-54	0.58	Clear	**Ambient Air (°C):** 27

JOM 9/12/19

Final Controller Settings:

Setting ID:	103
Pressure (PSI):	12

Sample ID:	ALF-GW-ALF215-20190912	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/12/2019	*Field Blank ID:*	NA
Collection Time:	09:46	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.4	*Equipment Blank ID:*	NA
Sample Depth (feet):	25.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.17	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	13.02	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	09:50
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	20.0	**Bottom of Screen (ft. btoc):**	30.0
Color:	Clear	**Odor:**	no odor
WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T
Serial No:	20448		
Controller Unit Manufacturer:	QED	**Model:**	MP50
Serial No:	029667		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/12/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	9/23/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	23.44
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	60.00
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	36.56 / 361.38
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	50.0
Well ID:	ALF-216	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1132	23.44	280	0	20.9	6.66	850	1.65	18.7	-73.9	11.7	Clear	No odor
1135	23.44	280	0.84	20.5	6.42	844	0.82	8.9	-86.7	7.61	Clear	No odor
1138	23.44	280	1.68	20.5	6.39	842	0.57	6.3	-96.1	6.38	Clear	No odor
1141	23.44	280	2.52	20.3	6.41	842	0.46	5.8	-104.0	6.82	Clear	No odor
1144	23.44	280	3.36	20.3	6.46	840	0.38	4.2	-110.7	3.73	Clear	No odor
1147	23.44	280	4.20	20.4	6.47	837	0.32	3.6	-113.7	2.64	Clear	No odor
Final Values:		1147	4.20	20.4	6.47	837	0.32	3.6	-113.7	2.64	Clear	

JDM 9/11/19

Final Controller Settings:	
Setting ID:	104
Pressure (PSI):	28
Ambient Air (°C):	30

Sample ID:	ALF-GW-ALF216-20190911	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/11/2019	*Field Blank ID:*	NA
Collection Time:	11:50	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.2	*Equipment Blank ID:*	NA
Sample Depth (feet):	50.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.67	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	23.44	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:53
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	39.6	**Bottom of Screen (ft. btoc):**	59.6
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	029667

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/11/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	9/23/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA TDEC Order	**Initial Depth to Water (feet):**	30.93
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	71.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	40.87 / 403.98
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	60.75
Well ID:	ALF-217	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1120	31.04	200	0	19.9	6.97	676	0.49	5.4	-86.1	3.71	clear	no odor
1123	31.04	200	0.60	19.7	7.03	675	0.34	3.7	-107.1	1.15	clear	no odor
1126	31.04	200	1.20	19.6	7.08	675	0.28	3.1	-116.6	1.09	clear	no odor
Final Values:		1126	1.20	19.6	7.08	675	0.28	3.1	-116.6	1.09	clear	

EJ 9-20-19

Final Controller Settings:	
Setting ID:	104
Pressure (PSI):	35
Ambient Air (°C):	30

Sample ID:	ALF-GW-ALF217-20190920 MD 10/9/19	**QA/QC Sample Collected:**	Yes
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/20/2019	*Field Blank ID:*	ALF-GW-FB02-20190920
Collection Time:	11:35	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.20	*Equipment Blank ID:*	NA
Sample Depth (feet):	60.75	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.75	*DI water lot #:*	091719-01
Depth to Water After Sampling (feet):	31.04	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 10/7/19	*Sample on-Ice: Time:*	11:50
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	49.4	**Bottom of Screen (ft. btoc):**	71.4
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	~~904346~~ 15845 MD 10/9/19
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	022000 MD 10/9/19

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B
Bottle Lot Number	081219-2AFW	071519-2BXB	0819192eey	080519-2ADT	071519-2BXB
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic
Volume (mL):	250	250	1000	500	250
No. of Bottles Collected:	2	4	4	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved

Lead Sampler Name:	Emily Scheiben	**Date:**	9/20/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/20/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/7/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/9/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA TDEC Order	**Initial Depth to Water (feet):**	50.16
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	192.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	142.64 / 1409.92
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	187.75
Well ID:	ALF-217A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0930	50.29	240	0	19.4	6.76	697	1.95	20.8	-133.5	4.05	Clear	no odor
0933	50.29	240	0.72	19.4	6.78	696	1.83	19.4	-134.7	3.63	Clear	no odor
0936	50.29	240	1.44	19.2	6.81	635	1.63	17.4	-135.6	3.00	Clear	no odor
0939	50.29	240	2.16	19.2	6.83	692	1.38	14.6	-136.0	3.33	Clear	no odor
0942	50.29	240	2.88	19.4	6.86	698	0.34	3.6	-139.2	1.96	Clear	no odor
0945	50.29	240	3.60	19.3	6.87	698	0.25	2.7	-141.2	3.67	Clear	no odor
0948	50.29	240	4.32	19.2	6.88	698	0.19	2.3	-142.4	2.61	Clear	no odor
Final Values:		0948	4.32	19.2	6.88	698	0.19	2.3	-142.4	2.61	Clear	

EJ 9-20-19

Final Controller Settings:	
Setting ID:	106
Pressure (PSI):	80
Ambient Air (°C):	28

Sample ID:	ALF-GW-ALF217A-20190920	**QA/QC Sample Collected:**	No
Method of Sampling:	Low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/20/2019	*Field Blank ID:*	NA
Collection Time:	9:53	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.32	*Equipment Blank ID:*	NA
Sample Depth (feet):	187.75	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	4.76	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	50.29	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 10/7/19	*Sample on-Ice: Time:*	10:00
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	182.4	**Bottom of Screen (ft. btoc):**	192.4
Color:	Clear	**Odor:**	None
WL Meter Manufacturer:	Heron	**Model:**	Dipper T
Serial No:	~~904346~~ 15845 MD 10/9/19		
Controller Unit Manufacturer:	QED	**Model:**	MP-50
Serial No:	022000 MD 10/9/19		

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B
Bottle Lot Number	081219-2AFW	071519-2BXB	0819192eey	080519-2ADT	071519-2BXB
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic
Volume (mL):	250	250	1000	500	250
No. of Bottles Collected:	1	2	2	1	1
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved

Lead Sampler Name:	Emily Scheiben	**Date:**	9/20/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/20/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/7/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/9/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	TVA TDEC Order	**Initial Depth to Water (feet):**	49.93
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	131.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	81.87 / 809.24
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	126.75
Well ID:	ALF-217B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/20/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1035	49.93	200	0	19.9	6.60	808	0.51	6.6	-73.8	4.28	Clear	no odor
1038	49.93	200	0.60	19.7	6.73	772	0.38	4.2	-98.9	4.36	Clear	no odor
1041	49.93	200	1.20	19.8	6.73	766	0.30	3.8	-105.9	6.08	Clear	no odor
1044	49.93	200	1.80	19.8	6.79	761	0.28	3.0	-112.7	7.02	Clear	no odor
Final Values:		1044	1.80	19.8	6.79	761	0.28	3.0	-112.7	7.02	Clear	

EJ 9-20-19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	75
Ambient Air (°C):	29

Sample ID:	ALF-GW-ALF217B-20190920	**QA/QC Sample Collected:**	No
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/20/2019	*Field Blank ID:*	NA
Collection Time:	10:55	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.80	*Equipment Blank ID:*	NA
Sample Depth (feet):	126.75	*Filter Blank ID:*	NA
Heavy Equipment in Area:	Yes	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	5.86	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	49.93	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 10/7/19	*Sample on-Ice: Time:*	11:05
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	121.4	**Bottom of Screen (ft. btoc):**	131.4
Color:	Clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	~~904346~~ 15845 MD 10/9/19
Controller Unit Manufacturer:	QED	**Model:**	MP-50	**Serial No:**	022000 MD 10/9/19

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B
Bottle Lot Number	081219-2AFW	071519-2BXB	0819192eey	080519-2ADT	071519-2BXB
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic
Volume (mL):	250	250	1000	500	250
No. of Bottles Collected:	1	2	2	1	1
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved

Lead Sampler Name:	Emily Scheiben	**Date:**	9/20/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/20/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/7/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/9/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	34.08
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	81.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	47.72 / 117.92
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	77.0
Well ID:	P-4	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	2.0	**Date:**	9/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			NA	NA	± 0.1	± 5%	< 0.5 mg/L or ± 10%	NA	NA	± 10% or < 10 NTU		
1455	34.08	480	0	18.0	7.04	230.5	0.26	2.7	-85.3	3.30	clear	no odor
1458	34.08	480	1.44	17.7	7.13	230.3	0.20	2.1	-107.3	2.85	clear	no odor
1501	34.08	480	2.88	17.7	7.12	230.3	0.18	1.8	-109.9	2.70	clear	no odor
Final Values:		1501	2.88	17.7	7.12	230.3	0.18	1.8	-109.9	2.70	clear	Ambient Air (°C): 37

CS 10/1/19

Final Controller Settings:
Setting ID: 103
Pressure (PSI): 55

Sample ID:	~~ALF-GS-P4-20190916~~ ALF-GW-P4-20190916 CS 10/1/19	**QA/QC Sample Collected:**	Yes
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	Yes
Sample Date:	9/16/2019	*Field Blank ID:*	ALF-GW-FB02-20190916
Collection Time:	15:10	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	~~17.7~~ 2.88 MD 10/4/19	*Equipment Blank ID:*	NA
Sample Depth (feet):	77.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.31	*DI water lot #:*	WET-MN-091219-1
Depth to Water After Sampling (feet):	34.10	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
		Other Filtered Samples Collected:	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	15:20
If No, Provide Explanation	NA CS 10/1/19	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	71.7	**Bottom of Screen (ft. btoc):**	81.8
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	~~17551~~ 1126 MD 10/4/19

Analytes:	Metals	Anions	Radium 226/ 228	TDS	Alkalinity	As Spec
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/16/2019	**Signature:**	[signature]
Sampler Name:	Casey Mullett	**Date:**	9/16/2019	**Signature:**	[signature]
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	[signature]
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	[signature]

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	28.11
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	50.1
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	21.99 / 217.36
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	41.0
Well ID:	P-4S	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1613	28.11	440	0	18.1	7.28	377.2	0.55	5.6	-17.4	4.39	Clear	no odor
1616	28.11	440	1.32	18.0	7.24	376.5	0.44	4.7	-25.6	3.91	Clear	no odor
1619	28.11	440	2.64	18.0	7.24	375.2	0.34	3.6	-31.2	2.28	Clear	no odor
1622	28.11	440	3.96	17.8	7.22	375.3	0.34	3.5	-34.2	3.98	Clear	no odor
Final Values:		1622	3.96	17.8	7.22	375.3	0.34	3.5	-34.2	3.98	Clear	

CS 10/1/19

Final Controller Settings:	
Setting ID:	102
Pressure (PSI):	35
Ambient Air (°C):	36

Sample ID:	ALF-GW-P4S-20190916	**QA/QC Sample Collected:**	No
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/16/2019	*Field Blank ID:*	NA
Collection Time:	16:25	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.96	*Equipment Blank ID:*	NA
Sample Depth (feet):	41.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.81	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	20.11	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 10/1/19	*Sample on-Ice: Time:*	16:35
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	29.7	**Bottom of Screen (ft. btoc):**	~~39.7~~ 49.7 CS 11/19/19
Color:	Clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	~~17551~~ 1126 MD 10/4/19

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/16/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/16/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	19.93
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	40.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	20.47 / 202.33
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	29.0
Well ID:	PMW-02A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1500	20.14	400	0	21.0	10.36	992	0.27	3.0	-45.8	29.6	tan	no odor
1503	20.14	400	1.20	20.8	10.38	994	0.22	2.3	-676.0	27.3	tan	no odor
1506	20.14	400	2.40	20.6	10.39	992	0.18	2.0	-76.1	27.7	tan	no odor
Final Values:		1506	2.40	20.6	10.39	992	0.18	2.0	-76.1	27.7	tan	

CS 10/1/19

Final Controller Settings:	
Setting ID:	102
Pressure (PSI):	28
Ambient Air (°C):	35

Sample ID:	ALF-GW-PMW02A-20190917 CS 10/1/19	**QA/QC Sample Collected:**	Yes
Method of Sampling:	low- flow	*MS/MSD/LD collected:*	No
Sample Date:	9/17/2019	*Field Blank ID:*	NA
Collection Time:	15:11	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.40	*Equipment Blank ID:*	ALF-EB02-20190917
Sample Depth (feet):	29.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	32.70	*DI water lot #:*	wet-mn-091219-1
Depth to Water After Sampling (feet):	20.01	*Filter purged for minimum two minutes:*	Yes
Analysis:	RI	*Filter Lot #:*	A1942
Tubing Lot #:	NA	*Filter Sample Metals:*	Yes
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 10/1/19	*Sample on-Ice: Time:*	15:23
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	19.0	**Bottom of Screen (ft. btoc):**	40.0
Color:	tan	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	22000

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	4	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/17/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/17/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	31.42
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	58.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	27.38 / 270.64
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	54.0
Well ID:	PMW-02B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1400	31.88	100	0	22.7	6.37	399.1	0.91	10.6	-87.9	7.61	clear	no odor
1403	31.88	100	0.30	22.9	6.43	394.1	0.86	9.9	-96.4	8.08	clear	no odor
1406	31.88	100	0.60	23.0	6.47	393.0	0.79	9.3	-101.9	8.14	clear	no odor
Final Values:		1406	0.60	23.0	6.47	393.0	0.79	9.3	-101.9	8.14	clear	

CS 10/1/19

Final Controller Settings:	
Setting ID:	99
Pressure (PSI):	28
Ambient Air (°C):	36

Sample ID:	ALF-GW-PMW02B-20190917 CS 10/1/19	**QA/QC Sample Collected:**	No
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/17/2019	*Field Blank ID:*	NA
Collection Time:	14:10	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	0.60	*Equipment Blank ID:*	NA
Sample Depth (feet):	54.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	5.88	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	31.95	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 10/1/19	*Sample on-Ice: Time:*	14:25
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	48.4	**Bottom of Screen (ft. btoc):**	58.4
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	22000

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/17/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	31.00
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	129.7
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	98.70 / 975.59
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	124.0
Well ID:	PMW-02C	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1307	31.57	240	0	19.1	5.96	330.3	0.33	3.5	-22.7	6.88	clear	no odor
1310	31.57	240	0.72	19.1	6.03	330.1	0.27	3.0	-35.5	7.21	clear	no odor
1313	31.57	240	1.44	19.0	6.13	329.7	0.22	2.5	-50.4	3.81	clear	no odor
Final Values:		1313	1.44	19.0	6.13	329.7	0.22	2.5	-50.4	3.81	clear	

CS 10/1/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	75
Ambient Air (°C):	35

Sample ID:	ALF-GW-PMW02C-20190917 CS 10/1/19	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	low-flow	*Field Blank ID:*	ALF-GW-FB02-20190917
Sample Date:	9/17/2019	*Field Duplicate ID:*	NA
Collection Time:	13:20	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	1.44	*Filter Blank ID:*	NA
Sample Depth (feet):	124.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	wet-mn-091219-1
Follow up turbidity value (NTU):	2.22	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	3157.00	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:30
If No, Provide Explanation	NA CS 10/1/19	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	119.3	**Bottom of Screen (ft. btoc):**	129.3
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	22000

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	4	2	4	2	4	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/17/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	23.79
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	40.7
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	16.91 / 167.15
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	29.0
Well ID:	PMW-04A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1115	23.79	330	0	20.3	7.26	739	0.28	3.2	-55.9	2.32	clear	no odor
1118	23.79	330	0.99	20.3	7.25	739	0.31	3.3	-59.6	1.24	clear	no odor
1121	23.79	330	1.98	20.5	7.24	740	0.33	3.6	-62.2	1.49	clear	no odor
												Final Controller Settings:
												Setting ID: 98
												Pressure (PSI): 25
Final Values:		1121	1.98	20.5	7.24	740	0.33	3.6	-62.2	1.49	clear	**Ambient Air (°C):** 33

CS 10/1/19

Sample ID:	ALF-GW-PMW04A-20190917	**QA/QC Sample Collected:**	No
		MS/MSD/LD collected:	Yes
Method of Sampling:	low- flow	*Field Blank ID:*	NA
Sample Date:	9/17/2019	*Field Duplicate ID:*	NA
Collection Time:	11:30	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	1.98	*Filter Blank ID:*	NA
Sample Depth (feet):	29.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
Follow up turbidity value (NTU):	0.71	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	23.76	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	11:40
If No, Provide Explanation	NA CS 10/1/19	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	19.3	**Bottom of Screen (ft. btoc):**	40.3
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	22000

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	6	3	6	3	3	6
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/17/2019	**Signature:**	[signature]
Sampler Name:	Casey Mullett	**Date:**	9/17/2019	**Signature:**	[signature]
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	[signature]
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	[signature]

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	32.31
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	62.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	30.09 / 297.42
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	57.0
Well ID:	PMW-04B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1025	32.37	500	0	18.0	6.67	697	0.31	3.2	-165.9	4.15	clear	no odor
1028	32.37	500	1.50	18.0	6.69	691	0.22	2.2	-167.6	2.62	clear	no odor
1031	32.37	500	3.00	18.0	6.71	684	0.15	1.6	-170.1	4.28	clear	no odor
Final Values:		1031	3.0	18.0	6.71	684	0.15	1.6	-170.1	4.28	clear	

CS 10/1/19

Final Controller Settings:	
Setting ID:	102
Pressure (PSI):	35
Ambient Air (°C):	32

Sample ID:	ALF-GW-PMW04B-20190917	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	low-flow	*Field Blank ID:*	NA
Sample Date:	9/17/2019	*Field Duplicate ID:*	ALF-GW-DUP03-20190917
Collection Time:	10:40	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	3.0	*Filter Blank ID:*	NA
Sample Depth (feet):	57.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
Follow up turbidity value (NTU):	4.28	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	32.37	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	10:50
If No, Provide Explanation	NA CS 10/1/19	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	52.0	**Bottom of Screen (ft. btoc):**	62.0
Color:	clear	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	22000

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	4	2	4	2	2	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/17/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/17/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	32.27
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	129.7
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	97.43 / 963.04
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	124.0
Well ID:	PMW-04C	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0845	32.27	240	0	18.8	5.99	342.6	0.92	9.5	-47.2	5.93	clear	no odor
0848	32.27	240	0.72	18.9	6.04	342.5	0.84	9.0	-50.8	5.47	clear	no odor
0851	32.27	240	1.44	18.8	6.06	341.7	0.63	6.6	-59.9	4.58	clear	no odor
0854	32.27	240	2.16	18.8	6.19	341.0	0.52	5.8	-80.6	5.17	clear	no odor
0857	32.27	240	2.88	18.8	6.30	334.2	0.47	5.2	-95.2	4.35	clear	no odor
0900	32.27	240	3.60	18.9	6.41	343.0	0.62	6.8	-109.1	4.49	clear	no odor
0903	32.27	240	4.32	18.8	6.48	340.1	0.46	4.9	-115.4	3.08	clear	no odor
0906	32.27	240	5.04	18.8	6.54	339.9	0.37	4.5	-121.9	3.77	clear	no odor
0909	32.27	240	5.76	18.8	6.60	339.9	0.37	4.2	-124.0	3.08	clear	no odor
Final Values:		0909	5.76	18.8	6.60	339.9	0.37	4.2	-124.0	3.08	clear	

CS 10/1/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	70
Ambient Air (°C):	27

Sample ID:	ALF-GW-PMW04C-20190917	**QA/QC Sample Collected:**	No
		MS/MSD/LD collected:	No
Method of Sampling:	low-flow	*Field Blank ID:*	NA
Sample Date:	9/17/2019	*Field Duplicate ID:*	NA
Collection Time:	9:15	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	5.76	*Filter Blank ID:*	NA
Sample Depth (feet):	124.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
Follow up turbidity value (NTU):	4.01	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	32.27	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	9:20
If No, Provide Explanation	NA CS 10/1/19	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	119.3	**Bottom of Screen (ft. btoc):**	129.3
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	~~17551~~ 1126 MD 10/4/19

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/17/2019	**Signature:**	
Sampler Name:	Casey Mullett	**Date:**	9/17/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	17.15
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	29.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	12.15 / 120.1
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	24.0
Well ID:	PMW-07A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0837	17.33	440	0	19.5	7.88	915	0.29	3.2	-151.5	5.06	clear	no odor
0840	17.33	440	1.32	19.5	8.21	913	0.43	3.0	-172.8	3.58	clear	no odor
0843	17.33	440	2.64	19.6	8.43	910	0.30	3.1	-182.2	2.69	clear	no odor
0847	17.33	440	4.40	19.7	8.48	910	0.19	2.0	-181.9	2.36	clear	no odor
0850	17.33	440	5.72	19.8	8.44	912	0.10	2.1	-176.3	1.96	clear	no odor
Final Values:		0850	5.72	19.8	8.44	912	0.10	2.1	-176.3	1.96	clear	**Ambient Air (°C):** 27

CS 10/2/2019

Final Controller Settings:
Setting ID: 103
Pressure (PSI): 18

Sample ID:	ALF-GW-PMW07A-20190918	**QA/QC Sample Collected:**	No CS 10/2/19
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/18/2019	*Field Blank ID:*	NA
Collection Time:	8:55	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.72	*Equipment Blank ID:*	NA
Sample Depth (feet):	24.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.68	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	17.33	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 10/2/19	*Sample on-Ice: Time:*	9:05
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	18.9	**Bottom of Screen (ft. btoc):**	28.9
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	22000

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/18/2019	**Signature:**	Emily Scheiben
Sampler Name:	Casey Mullett	**Date:**	9/18/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/2/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	Matthew Dower

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	30.53
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	59.9
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	29.37 / 290.31
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	55.0
Well ID:	PMW-07B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
0925	30.89	440	0	18.2	7.24	529.2	0.27	2.9	-116.8	3.75	clear	no odor
0928	30.89	440	1.32	18.1	7.19	530.3	0.24	2.4	-120.7	4.63	clear	no odor
0931	30.89	440	2.64	18.2	7.16	531.2	0.18	2.0	-128.0	6.31	clear	no odor
Final Values:		0931	2.64	18.2	7.16	531.2	0.18	2.0	-128	6.31	clear	

CS 10/2/2019

Final Controller Settings:	
Setting ID:	104
Pressure (PSI):	30
Ambient Air (°C):	28

Sample ID:	ALF-GW-PMW07B-20190918	**QA/QC Sample Collected:**	No
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/18/2019	*Field Blank ID:*	NA
Collection Time:	9:38	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.64	*Equipment Blank ID:*	NA
Sample Depth (feet):	55.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.89	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	30.70	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	na
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 10/2/19	*Sample on-Ice: Time:*	9:50
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	49.5	**Bottom of Screen (ft. btoc):**	59.5
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	22000

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/18/2019	**Signature:**	Emily Scheiben
Sampler Name:	Casey Mullett	**Date:**	9/18/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherladn	**Date:**	10/2/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	Matthew Dower

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	30.63
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	122.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	92.17 / 911.05
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	117.0
Well ID:	PMW-07C	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1015	30.64	200	0	20.2	6.57	340.1	0.52	5.8	2.7	4.98	clear	no odor
1018	30.64	200	0.60	20.3	6.61	338.2	0.40	4.5	-18.6	2.91	clear	no odor
1021	30.64	200	1.20	20.4	6.72	337.5	0.35	3.8	-37.9	4.02	clear	no odor
1024	30.64	200	1.80	20.4	6.80	336.7	0.30	3.4	-51.0	2.74	clear	no odor
1027	30.64	200	2.40	20.4	6.90	336.6	0.27	3.0	-65.5	2.48	clear	no odor
Final Values:		1027	2.40	20.4	6.90	336.6	0.27	3.0	-65.5	2.48	clear	

CS 10/2/19

Final Controller Settings:	
Setting ID:	105
Pressure (PSI):	70
Ambient Air (°C):	32

Sample ID:	ALF-GW-PMW07C-20190918 CS 10/2/19	**QA/QC Sample Collected:**	No
Method of Sampling:	low-flow	*MS/MSD/LD collected:*	No
Sample Date:	9/18/2019	*Field Blank ID:*	NA
Collection Time:	10:35	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.40	*Equipment Blank ID:*	NA
Sample Depth (feet):	117.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	3.30	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	30.61	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA CS 10/2/19	*Sample on-Ice: Time:*	10:28
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	112.5	**Bottom of Screen (ft. btoc):**	122.5
Color:	clear	**Odor:**	none

WL Meter Manufacturer:	Heron	**Model:**	dipper T	**Serial No:**	15845
Controller Unit Manufacturer:	QED	**Model:**	mp-50	**Serial No:**	22000

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	081919-2eey	081919-2eey	081919-2eey	081919-2eey		19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Emily Scheiben	**Date:**	9/18/2019	**Signature:**	Emily Scheiben
Sampler Name:	Casey Mullett	**Date:**	9/18/2019	**Signature:**	Casey Mullett
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/2/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/4/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	18.19
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	44.0
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	25.81 / 255.12
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	32.0
Well ID:	PMW-10A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1407	18.20	280	0	21.6	7.33	515.0	1.15	13.1	27.4	0.87	Clear	No odor
1410	18.20	280	0.84	21.5	7.15	510.7	0.80	9.0	-6.5	0.78	Clear	No odor
1413	18.20	280	1.68	21.4	7.12	510.2	0.58	6.6	-47.3	0.71	Clear	No odor
1416	18.20	280	2.52	21.1	7.14	511.1	0.50	5.7	-65.8	0.77	Clear	No odor
1419	18.20	280	3.36	21.0	7.16	510.2	0.49	5.4	-76.0	0.76	Clear	No odor
1422	18.20	280	4.20	21.1	7.19	510.0	0.41	4.6	-83.1	0.74	Clear	No odor
Final Values:		1422	4.20	21.1	7.19	510	0.41	4.6	-83.1	0.74	Clear	

JOM 9/12/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	18
Ambient Air (°C):	34

Sample ID:	ALF-GW-PMW10A-20190912	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/12/2019	*Field Blank ID:*	NA
Collection Time:	14:25	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.2	*Equipment Blank ID:*	ALF-GW-EB01-20190912
Sample Depth (feet):	32.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.12	*DI water lot #:*	Pace Minneapolis, Fill date: 9/4/19
Depth to Water After Sampling (feet):	18.20	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:28
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	22.6	**Bottom of Screen (ft. btoc):**	43.6
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	029667

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/12/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	9/23/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	30.24
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	73.3
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	43.06 / 425.62
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	~~55~~ 68.0 CS 11/19/19
Well ID:	PMW-10B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1243	30.45	120	0	23.7	6.79	793	1.07	12.7	-63.3	2.92	Clear	No odor
1246	30.45	120	0.36	23.5	6.61	795	0.73	8.6	-99.7	2.51	Clear	No odor
1249	30.45	120	0.72	23.1	6.67	794	0.63	7.3	-122.0	2.65	Clear	No odor
1252	30.45	120	1.08	23.3	6.75	793	0.55	6.4	-137.4	2.69	Clear	No odor
1255	30.45	120	1.44	23.8	6.86	794	0.48	5.7	-149.0	2.26	Clear	No odor
1258	30.45	120	1.80	24.1	6.93	795	0.45	5.2	-156.4	2.02	Clear	No odor
1301	30.45	120	2.16	23.5	7.01	797	0.42	5.0	-163.2	2.38	Clear	No odor
Final Values:		1301	2.16	23.5	7.01	797	0.42	5.0	-163.2	2.38	Clear	**Ambient Air (°C):** 33

JDM 9/12/19

Final Controller Settings:

Setting ID:	100
Pressure (PSI):	35

Sample ID:	ALF-GW-PMW10B-20190912	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/12/2019	*Field Blank ID:*	ALF-GW-FB01-20190912
Collection Time:	13:04	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.16	*Equipment Blank ID:*	NA
Sample Depth (feet):	~~55.0~~ 68.0 CS 11/19/19	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.84	*DI water lot #:*	Pace Minneapolis, Fill date: 9/4/19
Depth to Water After Sampling (feet):	30.47	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	13:07
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	62.9	**Bottom of Screen (ft. btoc):**	72.9
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	029667

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/12/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	9/23/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	30.28
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	152.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	122.12 / 1207.09
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	148.0
Well ID:	PMW-10C	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1056	30.28	380	0	20.4	6.31	480.4	0.91	9.9	-45.0	5.58	Clear	No odor
1059	30.29	380	1.14	20.4	6.35	482.2	0.55	6.0	-67.1	1.93	Clear	No odor
1102	30.29	380	2.28	20.4	6.46	483.1	0.44	4.9	-83.9	1.62	Clear	No odor
1105	30.29	380	3.42	20.4	6.54	482.1	0.37	4.1	-93.1	1.03	Clear	No odor
1108	30.29	380	4.56	20.4	6.61	482.6	0.33	3.6	-99.6	1.18	Clear	No odor
Final Values:		1108	4.56	20.4	6.61	482.6	0.33	3.6	-99.6	1.18	Clear	

JOM 9/12/19

Final Controller Settings:	
Setting ID:	108
Pressure (PSI):	80
Ambient Air (°C):	31

Sample ID:	ALF-GW-PMW10C-20190912	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	Yes
Sample Date:	9/12/2019	*Field Blank ID:*	NA
Collection Time:	11:11	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.56	*Equipment Blank ID:*	NA
Sample Depth (feet):	148.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.78	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	30.31	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	11:15
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	142.0	**Bottom of Screen (ft. btoc):**	152.0
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	029667

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	6
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/12/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	9/18/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	9/23/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	15.05
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	38.0
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	22.95 / 226.85
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	27.0
Well ID:	PMW-11A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0906	15.06	300	0	21.7	5.99	579	0.98	11.1	87.4	1.06	Clear	No odor
0909	15.06	300	0.90	21.7	6.13	576	0.60	6.7	34.2	0.81	Clear	No odor
0912	15.06	300	1.80	21.7	6.31	576	0.47	5.4	-8.2	0.57	Clear	No odor
0915	15.06	300	2.70	21.7	6.44	577	0.41	4.7	-36.9	0.62	Clear	No odor
0918	15.06	300	3.60	21.6	6.55	577	0.36	4.2	-57.1	0.53	Clear	No odor
0921	15.06	300	4.50	21.8	6.62	578	0.33	3.7	-74.0	0.48	Clear	No odor
0924	15.06	300	5.40	21.8	6.66	577	0.31	3.6	-82.0	0.49	Clear	No odor
Final Values:		0924	5.40	21.8	6.66	577	0.31	3.6	-82	0.49	Clear	**Ambient Air (°C):** 26

Final Controller Settings:
Setting ID: 103
Pressure (PSI): 18

Sample ID:	ALF-GW-PMW11A-20190917	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/17/2019	*Field Blank ID:*	NA
Collection Time:	9:27	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.4	*Equipment Blank ID:*	NA
Sample Depth (feet):	27.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.50	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	15.06	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	9:30
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	16.6	**Bottom of Screen (ft. btoc):**	37.6
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/17/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	10/3/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	26.45
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	67.7
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	41.25 / 407.73
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	63.0
Well ID:	PMW-11B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
0956	26.45	340	0	21.1	6.42	506.3	0.59	6.6	-51.0	2.47	Clear	No odor
0959	26.45	340	1.02	21.1	6.50	508.8	0.43	4.9	-80.1	2.14	Clear	No odor
1002	26.45	340	2.04	21.0	6.59	509.9	0.37	4.1	-95.2	1.52	Clear	No odor
1005	26.45	340	3.06	21.0	6.74	512.2	0.31	3.6	-115.1	1.34	Clear	No odor
1008	26.45	340	4.08	21.0	6.79	513.5	0.30	3.4	-123.9	1.19	Clear	No odor
1011	26.45	340	5.10	21.1	6.88	517.0	0.28	3.0	-134.1	1.01	Clear	No odor
Final Values:		1011	5.10	21.1	6.88	517	0.28	3.0	-134.1	1.01	Clear	

9/17/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	35
Ambient Air (°C):	32

Sample ID:	ALF-GW-PMW11B-20190917	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/17/2019	*Field Blank ID:*	NA
Collection Time:	10:14	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.1	*Equipment Blank ID:*	NA
Sample Depth (feet):	63.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	0.77	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	26.45	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	10:17
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	57.3	**Bottom of Screen (ft. btoc):**	67.3
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/17/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	10/3/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	26.52
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	149.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	122.88 / 1214.6
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	144.0
Well ID:	PMW-11C	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1100	26.56	120	0	24.3	6.87	459.1	1.09	13.4	-34.8	1.88	Clear	No odor
1103	26.56	120	0.36	24.3	6.87	455.8	0.76	8.9	-70.4	1.06	Clear	No odor
1106	26.56	120	0.72	24.0	6.72	463.7	0.72	7.8	-75.8	2.11	Clear	No odor
1109	26.56	120	1.08	23.8	6.48	498.3	0.56	6.4	-62.3	4.04	Clear	No odor
1112	26.57	120	1.44	24.0	6.44	523.0	0.47	5.5	-64.5	5.91	Clear	No odor
1115	26.59	120	1.80	24.0	6.50	532.0	0.42	5.0	-71.8	6.38	Clear	No odor
1118	26.59	120	2.16	24.0	6.59	548.0	0.36	4.4	-82.6	6.64	Clear	No odor
1121	26.59	120	2.52	24.2	6.64	552.0	0.34	4.0	-89.8	7.06	Clear	No odor
1124	26.59	120	2.88	24.3	6.71	555.0	0.31	3.7	-99.4	6.62	Clear	No odor
1127	26.59	120	3.24	24.4	6.74	556.0	0.31	3.7	-104.1	6.59	Clear	No odor
Final Values:		1127	3.24	24.4	6.74	556	0.31	3.7	-104.1	6.59	Clear	

JMM 9/17/19

Final Controller Settings:	
Setting ID:	106
Pressure (PSI):	95
Ambient Air (°C):	32

Sample ID:	ALF-GW-PMW11C-20190917	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Low flow	*Field Blank ID:*	ALF-GW-FB01-20190917
Sample Date:	9/17/2019	*Field Duplicate ID:*	NA
Collection Time:	11:30	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	3.24	*Filter Blank ID:*	NA
Sample Depth (feet):	144.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Minneapolis, Fill date: 9/12/19
Follow up turbidity value (NTU):	8.61	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	26.63	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	NA
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	11:33
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	139.0	**Bottom of Screen (ft. btoc):**	149.0
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/17/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/1/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/3/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	35.65
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	59.9
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	24.25 / 239.7
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	49.0
Well ID:	PMW-14A	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1535	35.80	280	0	21.0	6.66	635	1.37	15.3	-2.8	3.41	Clear	No odor
1538	35.80	280	0.84	20.8	6.62	635	0.91	10.1	-44.9	2.00	Clear	No odor
1541	35.80	280	1.68	20.9	6.62	635	0.76	8.6	-61.2	1.44	Clear	No odor
1544	35.80	280	2.52	20.8	6.70	638	0.62	6.8	-79.9	1.41	Clear	No odor
1547	35.80	280	3.36	20.8	6.71	638	0.53	5.8	-85.5	0.98	Clear	No odor
1550	35.80	280	4.20	20.9	6.76	638	0.47	5.1	-93.5	0.83	Clear	No odor
1553	35.80	280	5.04	20.9	6.79	640	0.43	4.8	-97.7	0.73	Clear	No odor
1556	35.80	280	5.88	20.8	6.81	640	0.39	4.4	-100.7	0.78	Clear	No odor
Final Values:		1556	5.88	20.8	6.81	640	0.39	4.4	-100.7	0.78	Clear	

9/16/19

Final Controller Settings:	
Setting ID:	103
Pressure (PSI):	30
Ambient Air (°C):	37

Sample ID:	ALF-GW-PMW14A-20190916	**QA/QC Sample Collected:**	No
Method of Sampling:	low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/16/2019	*Field Blank ID:*	NA
Collection Time:	15:59	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.88	*Equipment Blank ID:*	NA
Sample Depth (feet):	49.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	1.77	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	35.82	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	16:02
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	38.5	**Bottom of Screen (ft. btoc):**	59.5
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/16/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/16/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/3/2019	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	10/3/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	49.11
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	89.9
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	40.79 / 403.19
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	85.0
Well ID:	PMW-14B	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*	*NA*	
1454	49.12	400	0	19.7	6.31	656	1.03	10.8	-33.7	4.16	Clear	No odor
1457	49.12	400	1.20	19.4	6.39	654	0.42	4.5	-98.6	4.84	Clear	No odor
1500	49.12	400	2.40	19.4	6.46	653	0.37	4.0	-107.0	3.33	Clear	No odor
1503	49.12	400	3.60	19.5	6.54	653	0.32	3.4	-119.3	2.77	Clear	No odor
Final Values:		1503	3.60	19.5	6.54	653	0.32	3.4	-119.3	2.77	Clear	

9/16/19

Final Controller Settings:	
Setting ID:	104
Pressure (PSI):	50
Ambient Air (°C):	37

Sample ID:	ALF-GW-PMW14B-20190916	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Low flow	*Field Blank ID:*	ALF-GW-FB01-20190916
Sample Date:	9/16/2019	*Field Duplicate ID:*	NA
Collection Time:	15:06	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	3.6	*Filter Blank ID:*	NA
Sample Depth (feet):	85.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Minneapolis, Fill date: 9/12/19
Follow up turbidity value (NTU):	2.19	*Filter purged for minimum two minutes:*	No
Depth to Water After Sampling (feet):	49.12	*Filter Lot #:*	NA
Analysis:	RI	*Filter Sample Metals:*	No
Tubing Lot #:	NA	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	15:10
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	79.5	**Bottom of Screen (ft. btoc):**	89.5
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/16/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/16/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/3/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/3/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	49.09
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	162.3
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	113.21 / 1119.02
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	156.0
Well ID:	PMW-14C	**Method of Purging:**	Permanent Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	9/16/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 5%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 10 NTU*		
1355	49.09	320	0	19.3	5.53	364.5	0.66	7.3	19.0	4.32	Clear	No odor
1358	49.09	320	0.96	19.4	5.83	365.9	0.49	5.3	-23.2	4.96	Clear	No odor
1401	49.09	320	1.92	19.2	5.96	365.8	0.45	4.9	-40.7	4.39	Clear	No odor
1404	49.09	320	2.88	19.2	6.14	364.6	0.41	4.4	-61.0	3.75	Clear	No odor
1407	49.09	320	3.84	19.3	6.24	365.0	0.40	4.3	-73.7	4.80	Clear	No odor
1410	49.09	320	4.80	19.0	6.38	364.1	0.35	3.9	-85.2	3.52	Clear	No odor
1413	49.09	320	5.76	19.2	6.42	364.6	0.32	3.6	-92.8	3.41	Clear	No odor
1416	49.09	320	6.72	19.2	6.45	364.4	0.29	3.2	-96.9	3.20	Clear	No odor
Final Values:		1416	6.72	19.2	6.45	364.4	0.29	3.2	-96.9	3.20	Clear	

JCM 9/16/19

Final Controller Settings:	
Setting ID:	57 (CPM2)
Pressure (PSI):	80
Ambient Air (°C):	36

Sample ID:	ALF-GW-PMW14C-20190916	**QA/QC Sample Collected:**	No
Method of Sampling:	Low flow	*MS/MSD/LD collected:*	No
Sample Date:	9/16/2019	*Field Blank ID:*	NA
Collection Time:	14:19	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6.72	*Equipment Blank ID:*	NA
Sample Depth (feet):	156.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
Follow up turbidity value (NTU):	2.10	*DI water lot #:*	NA
Depth to Water After Sampling (feet):	49.09	*Filter purged for minimum two minutes:*	No
Analysis:	RI	*Filter Lot #:*	NA
Tubing Lot #:	NA	*Filter Sample Metals:*	No
Stability Reached (Y/N):	Yes	*Other Filtered Samples Collected:*	As_Spec
If No, Provide Explanation	NA	*Sample on-Ice: Time:*	14:22
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	151.9	**Bottom of Screen (ft. btoc):**	161.9
Color:	Clear	**Odor:**	No odor

WL Meter Manufacturer:	Heron Instruments	**Model:**	Dipper-T	**Serial No:**	20448
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1575

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	072919-2AFW	071519-2BXV	081919-2EEY	080519-2ADT	071519-2BXV	19-0183
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	9/16/2019	**Signature:**	
Sampler Name:	John Myer	**Date:**	9/16/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	10/3/2019	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	10/3/2019	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	17.70
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	170.5
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	152.80 / 1510.34
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	165.5
Well ID:	ACC-1A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0938	17.72	175	0	18.0	6.96	550.5	1.87	16.0	-20.5	2.04	Clear	No odor
0941	17.72	175	0.5	16.8	6.60	557.3	0.46	4.7	-48.2	1.73	Clear	No odor
0944	17.72	175	1.1	17.1	6.64	558.7	0.30	3.0	-61.7	2.75	Clear	No odor
0947	17.72	175	1.6	17.2	6.69	560.2	0.23	2.4	-67.5	1.39	Clear	No odor
Final Purge Values:		0947	1.6	17.2	6.69	560.2	0.23	2.4	-67.5	1.39	Clear	

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Final Controller Settings	
Setting ID:	106
Pressure (PSI):	105
Ambient Air (°C):	2

Sample ID:	ALF-GW-ACC1A-20191211	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/11/2019	*Field Blank ID:*	NA
Collection Time:	9:50	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.6	*Equipment Blank ID:*	NA
Sample Depth (feet):	165.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	9:54
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	160.1	**Bottom of Screen (ft. btoc):**	170.1

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
17.72	17.2	6.72	564.8	0.21	2.2	-67.7	0.98	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/11/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/11/2019	**Signature:**	Cassidy Sutherland
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/14/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	20.48
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	130.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	110.32 / 1090.45
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	126.0
Well ID:	ACC-3A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1413	20.50	410	0	17.9	6.86	816	0.27	2.7	-50.9	2.43	Clear	No odor
1416	20.50	410	1.2	18.0	6.80	819	0.18	2.0	-64.0	2.38	Clear	No odor
1419	20.50	410	2.5	18.0	6.81	820	0.18	1.9	-71.5	2.43	Clear	No odor
1422	20.50	410	3.7	18.1	6.81	820	0.14	1.5	-73.6	2.45	Clear	No odor
Final Purge Values:		1422	3.7	18.1	6.81	820	0.14	1.5	-73.6	2.45	Clear	

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Final Controller Settings	
Setting ID:	105
Pressure (PSI):	70
Ambient Air (°C):	9

Sample ID:	ALF-GW-ACC3A-20191211	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/11/2019	*Field Blank ID:*	NA
Collection Time:	14:25	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.7	*Equipment Blank ID:*	NA
Sample Depth (feet):	126.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	14:28
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	120.4	**Bottom of Screen (ft. btoc):**	130.4

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
20.5	17.9	6.8	821	0.15	1.7	-63	1.68	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/11/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	22.05
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	143.9
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	121.85 / 1204.42
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	139.0
Well ID:	ACC-5A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1302	22.09	400	0	18.6	6.54	639	0.25	2.7	16.4	5.79	Clear	No odor
1305	22.09	400	1.2	18.6	6.57	640	0.21	2.2	-18.6	3.25	Clear	No odor
1308	22.09	400	2.4	18.7	6.56	639	0.16	1.6	-31.1	2.65	Clear	No odor
1311	22.09	400	3.6	18.7	6.60	640	0.14	1.5	-36.4	2.29	Clear	No odor
1314	22.09	400	4.8	18.6	6.60	641	0.15	1.7	-40.1	1.98	Clear	No odor
1317	22.09	400	6.0	18.6	6.60	640	0.13	1.5	-45.2	1.77	Clear	No odor
Final Purge Values:			1317	6.0	18.6	6.60	640	0.13	1.5	-45.2	1.77	Clear

12-11-19

Final Controller Settings	
Setting ID:	106
Pressure (PSI):	95
Ambient Air (°C):	9

Sample ID:	ALF-GW-ACC5A-20191211	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Low Flow	*Field Blank ID:*	ALF-GW-FB01-20191211
Sample Date:	12/11/2019	*Field Duplicate ID:*	NA
Collection Time:	13:20	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	6.0	*Filter Blank ID:*	NA
Sample Depth (feet):	139.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Analytical Minneapolis, Fill date: 12/04/2019
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:23
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	133.5	**Bottom of Screen (ft. btoc):**	143.5

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
22.05	18.7	6.61	6.6	640	1.9	-38.2	2.44	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/11/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	22.22
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	60.6
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	38.38 / 379.36
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	55.5
Well ID:	ACC-5B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1156	22.25	415	0	18.4	6.89	835	0.44	4.9	-24.7	1.64	Clear	No odor
1159	22.25	415	1.2	18.6	6.80	837	0.29	3.1	-44.9	1.19	Clear	No odor
1202	22.25	415	2.5	18.6	6.80	840	0.24	2.4	-49.7	2.33	Clear	No odor
1205	22.25	415	3.7	18.6	6.82	842	0.19	2.0	-53.6	1.45	Clear	No odor
Final Purge Values:		1205	3.7	18.6	6.82	842	0.19	2.0	-53.6	1.45	Clear	

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Final Controller Settings	
Setting ID:	105
Pressure (PSI):	32
Ambient Air (°C):	8

Sample ID:	ALF-GW-ACC5B-20191211	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/11/2019	*Field Blank ID:*	NA
Collection Time:	12:08	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.7	*Equipment Blank ID:*	NA
Sample Depth (feet):	55.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	NA
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	12:11
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	50.2	**Bottom of Screen (ft. btoc):**	60.2

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
22.25	18.5	6.81	848	0.19	1.9	-45.8	0.61	Odor:	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/11/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	24.09
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	50.70
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	26.61 / 263.03
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	49.0
Well ID:	ALF-201	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0833	24.09	140	0	19.0	7.61	712	1.06	11.4	-0.5	8.58	clear	no odor
0836	24.09	140	0.42	19.2	7.39	710	0.77	7.9	-11.0	7.35	clear	no odor
0839	24.09	140	0.84	19.2	7.20	705	0.45	4.8	-20.8	6.64	clear	no odor
0842	24.09	140	1.26	19.2	7.14	702	0.32	3.5	-27.7	4.98	clear	no odor
0845	24.09	140	1.68	19.3	7.08	701	0.29	3.1	-29.4	4.89	clear	no odor
0848	24.09	140	2.10	19.3	7.07	701	0.27	2.9	-31.1	4.77	clear	no odor
Final Purge Values:		0848	2.1	19.3	7.07	701	0.27	2.9	-31.1	4.77	clear	

AS 12/13/19

Final Controller Settings	
Setting ID:	105
Pressure (PSI):	25
Ambient Air (°C):	8

Sample ID:	ALF-GW-ALF201-20191213	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/13/2019	*Field Blank ID:*	NA
Collection Time:	8:51	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.1	*Equipment Blank ID:*	NA
Sample Depth (feet):	49.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	NA
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	9:01
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	23.3	**Bottom of Screen (ft. btoc):**	49.9

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
24.09	19.3	7.16	698	0.15	1.6	-18.9	4.7	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/13/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	24.60
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	130.70
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	106.10 / 1048.74
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	126.0
Well ID:	ALF-201A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0940	24.60	420	0	19.0	7.46	713	0.71	7.4	-43.1	2.10	clear	no odor
0943	24.60	420	1.26	19.6	7.38	725	0.69	7.2	-52.6	2.26	clear	no odor
0946	24.60	420	2.52	19.6	7.29	724	0.65	6.7	-67.1	2.92	clear	no odor
0949	24.60	420	3.78	19.6	7.26	725	0.60	6.3	-73.1	2.52	clear	no odor
Final Purge Values:		0949	3.78	19.6	7.26	725	0.6	6.3	-73.1	2.52	clear	

AS 12/13/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	85
Ambient Air (°C):	8

Sample ID:	ALF-GW-ALF201A-20191213	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/13/2019	*Field Blank ID:*	NA
Collection Time:	9:52	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.78	*Equipment Blank ID:*	NA
Sample Depth (feet):	126.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	NA
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	9:57
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	120.3	**Bottom of Screen (ft. btoc):**	130.3

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	**Color:**	clear
24.6	19.7	7.34	725	0.88	9.1	-76.8	2.52	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616-T
Controller Unit Manufacturer:	Micro Purge Basics	**Model:**	MP-10	**Serial No:**	1742

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/13/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	24.78
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	69.52 / 687.17
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.0
Well ID:	ALF-201B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1027	24.78	500	0	19.7	7.38	749	0.20	2.2	-78.7	2.48	clear	no odor
1030	24.78	500	1.50	19.8	7.28	750	0.16	1.8	-82.6	1.62	clear	no odor
1033	24.78	500	3.00	19.8	7.22	748	0.14	1.5	-88.9	1.32	clear	no odor
1036	24.78	500	4.50	19.8	7.17	747	0.13	1.4	-91.2	1.04	clear	no odor
Final Purge Values:		1036	4.5	19.8	7.17	747	0.13	1.4	-91.2	1.04	clear	

AS 12/13/19

Final Controller Settings	
Setting ID:	101
Pressure (PSI):	65
Ambient Air (°C):	8

Sample ID:	ALF-GW-ALF201B-20191213	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/13/2019	*Field Blank ID:*	ALF-GW-FB02-20191213
Collection Time:	10:39	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.5	*Equipment Blank ID:*	NA
Sample Depth (feet):	89.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	Pace Minneapolis fill date 12/4/19
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	NA
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	10:44
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	83.9	**Bottom of Screen (ft. btoc):**	93.9

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
24.78	19.8	7.2	749	0.3	3.3	-81.3	0.98	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/13/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	14.68
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	44.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	30.12 / 297.72
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	43.0
Well ID:	ALF-202	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1139	14.73	500	0	18.5	7.79	558.9	0.16	1.6	-75.5	0.88	clear	no odor
1142	14.73	500	1.5	18.5	7.81	557.9	0.11	1.1	-110.6	0.79	clear	no odor
1145	14.73	500	3.0	18.6	7.84	555.0	0.10	1.0	-132.2	0.73	clear	no odor
1148	14.73	500	4.5	18.6	7.86	553.9	0.07	0.8	-151.4	0.77	clear	no odor
Final Purge Values:		1148	4.5	18.6	7.86	553.9	0.07	0.8	-151.4	0.77	clear	

AS 12/19/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	25
Ambient Air (°C):	3

Sample ID:	ALF-GW-ALF202-20191219	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/19/2019	*Field Blank ID:*	NA
Collection Time:	11:52	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.5	*Equipment Blank ID:*	NA
Sample Depth (feet):	43.0	*Filter Blank ID:*	NA
		Tubing Blank ID:	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	N/A
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	11:56
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	23.4	**Bottom of Screen (ft. btoc):**	44.6

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
14.73	18.6	7.84	552.7	2.3	23.5	-91.4	0.79	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/19/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/15/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	23.78
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	150.5
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	126.72 / 1252.56
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	145.5
Well ID:	ALF-202A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1157	23.80	100	0	17.0	6.90	525.0	0.22	2.2	51.3	5.66	Clear	No odor
1200	23.80	100	0.3	17.0	6.55	528.0	0.18	1.8	41.7	5.79	Clear	No odor
1203	23.80	100	0.6	17.0	6.70	529.2	0.15	1.5	33.7	7.86	Clear	No odor
1206	23.80	100	0.9	17.0	6.63	530.5	0.12	1.2	11.0	8.23	Clear	No odor
1209	23.80	100	1.2	17.0	6.64	530.1	0.11	1.1	1.4	5.61	Clear	No odor
1212	23.80	100	1.5	17.0	6.66	529.8	0.10	1.1	-2.5	6.41	Clear	No odor
1215	23.80	100	1.8	17.0	6.68	529.9	0.10	1.0	-11.2	4.78	Clear	No odor
1218	23.80	100	2.1	17.0	6.68	529.8	0.10	1.0	-14.8	4.55	Clear	No odor
1221	23.80	100	2.4	16.9	6.71	531.5	0.10	1.0	-21.0	4.45	Clear	No odor
1224	23.80	100	2.7	16.9	6.73	531.1	0.10	1.0	-27.6	3.90	Clear	No odor
Final Purge Values:		1224	2.7	16.9	6.73	531.1	0.1	1.0	-27.6	3.90	Clear	

Final Controller Settings	
Setting ID:	102
Pressure (PSI):	80
Ambient Air (°C):	8

Sample ID:	ALF-GW-ALF202A-20191219	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/19/2019	*Field Blank ID:*	NA
Collection Time:	12:27	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.7	*Equipment Blank ID:*	NA
Sample Depth (feet):	145.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	12:32
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	140.1	**Bottom of Screen (ft. btoc):**	150.1

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
23.8	17.8	6.97	533.8	0.26	2.7	94.2	3.59	Odor:	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/19/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/15/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	24.42
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.5
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	70.08 / 692.7
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.5
Well ID:	ALF-202B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1042	24.42	460	0	17.9	7.99	641	0.30	3.0	-121.1	2.43	clear	no odor
1045	24.42	460	1.4	17.9	7.89	644	0.28	2.9	-124.0	1.90	clear	no odor
1048	24.42	460	2.8	17.9	7.80	651	0.17	1.7	-128.9	1.61	clear	no odor
1051	24.42	460	4.1	17.9	7.71	657	0.11	1.1	-127.6	0.88	clear	no odor
Final Purge Values:		1051	4.1	17.9	7.71	657	0.11	1.1	-127.6	0.88	clear	

AS 12/19/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	60
Ambient Air (°C):	1

Sample ID:	ALF-GW-ALF202B-20191219	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/19/2019	*Field Blank ID:*	NA
Collection Time:	10:54	*Field Duplicate ID:*	ALF-GW-DUP03-20191219 MD 1/16/20
Total Volume Purged (L):*	4.1	*Equipment Blank ID:*	NA
Sample Depth (feet):	89.5	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	N/A
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	10:59
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	~~83.9~~ 84.1 CS 2/6/20	**Bottom of Screen (ft. btoc):**	~~93.9~~ 94.1 CS 2/6/20

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
24.42	18	7.36	663	0.25	2.5	-81.1	0.59	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/19/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/15/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	20.89
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	54.10
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	33.21 / 328.26
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	52.0
Well ID:	ALF-203	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1130	20.89	120	0	17.3	10.11	856	0.39	3.9	-77.9	1.38	amber	no odor
1133	20.89	120	0.36	17.5	10.28	859	0.32	3.5	-86.3	1.68	amber	no odor
1136	20.89	120	0.72	17.6	10.37	863	0.27	2.9	-96.0	1.30	amber	no odor
1139	20.89	120	1.08	17.6	10.45	866	0.22	2.5	-100.7	1.24	amber	no odor
Final Purge Values:		1139	1.08	17.6	10.45	866	0.22	2.5	-100.7	1.24	amber	

AS 12/13/19

Final Controller Settings	
Setting ID:	100
Pressure (PSI):	25
Ambient Air (°C):	8

Sample ID:	ALF-GW-ALF203-20191213	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/13/2019	*Field Blank ID:*	NA
Collection Time:	11:42	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.08	*Equipment Blank ID:*	NA
Sample Depth (feet):	52.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	NA
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	11:48
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	33.1	**Bottom of Screen (ft. btoc):**	54.1

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	amber
20.89	17.5	10.51	863	2.88	30.1	-98.2	1.21	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/13/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	22.45
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	122.70
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	100.25 / 990.92
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	118.0
Well ID:	ALF-203A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1234	22.45	360	0	17.5	8.40	353.2	0.20	2.1	-55.4	2.58	clear	no odor
1237	22.45	360	1.08	17.4	8.33	359.7	0.14	1.4	-67.8	1.61	clear	no odor
1240	22.45	360	2.16	17.4	8.28	354.8	0.14	1.4	-71.7	1.79	clear	no odor
1243	22.45	360	3.24	17.4	8.19	354.2	0.12	1.3	-75.5	1.71	clear	no odor
Final Purge Values:		1243	3.24	17.4	8.19	354.2	0.12	1.3	-75.5	1.71	clear	

AS 12/13/19

Final Controller Settings	
Setting ID:	102
Pressure (PSI):	75
Ambient Air (°C):	8

Sample ID:	ALF-GW-ALF203A-20191213	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/13/2019	*Field Blank ID:*	NA
Collection Time:	12:45	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.24	*Equipment Blank ID:*	NA
Sample Depth (feet):	118.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	NA
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	12:50
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	112.3	**Bottom of Screen (ft. btoc):**	122.3

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
22.45	17.4	7.54	358.8	0.13	1.4	-69	2.52	Odor:	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/13/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	22.48
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.30
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	71.82 / 709.9
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.0
Well ID:	ALF-203B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1323	22.48	450	0	17.2	7.30	468	0.71	7.7	-86.2	5.65	clear	no odor
1326	22.48	450	1.35	17.2	7.34	467	0.68	6.9	-106.5	4.56	clear	no odor
1329	22.48	450	2.70	17.2	7.37	467	0.63	6.6	-115.4	4.77	clear	no odor
1332	22.48	450	4.05	17.2	7.38	468	0.58	6.1	-121.1	3.94	clear	no odor
Final Purge Values:		1332	4.05	17.2	7.38	467.5	0.58	6.1	-121.1	3.94	clear	

AS 12/13/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	55
Ambient Air (°C):	9

Sample ID:	ALF-GW-ALF203B-20191213	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/13/2019	*Field Blank ID:*	NA
Collection Time:	13:35	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.05	*Equipment Blank ID:*	ALF-GW-EB02-20191213
Sample Depth (feet):	89.0	*Filter Blank ID:*	NA
		Tubing Blank ID:	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Minneapolis fill date 12/4/19
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	NA
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:40
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	83.9	**Bottom of Screen (ft. btoc):**	93.9

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
22.48	17.4	7.43	469.3	12.1	1.13	-146.9	3.97	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/13/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	19.82
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	59.2
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	39.38 / 389.25
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	49.0
Well ID:	ALF-204	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1037	20.15	100	0	15.1	6.80	434.2	0.66	6.4	16.4	12.0	Clear	No odor
1040	20.18	100	0.30	15.1	6.97	441.1	0.28	2.8	-46.6	4.01	Clear	No odor
1043	20.20	100	0.60	15.2	6.86	439.8	0.27	2.6	-51.1	4.19	Clear	No odor
1046	20.20	100	0.90	15.3	6.85	429.4	0.26	2.7	-62.7	4.15	Clear	No odor
1049	20.20	100	1.20	15.4	6.84	438.9	0.24	2.6	-70.1	3.19	Clear	No odor
Final Purge Values:		1049	1.2	15.4	6.84	438.9	0.24	2.6	-70.1	3.19	Clear	

KN 12/18/19

Final Controller Settings	
Setting ID:	98
Pressure (PSI):	25
Ambient Air (°C):	2

Sample ID:	ALF-GW-ALF204-20191218	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Pump	*MS/MSD/LD collected:*	No
Sample Date:	12/18/2019	*Field Blank ID:*	NA
Collection Time:	10:52	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.2	*Equipment Blank ID:*	NA
Sample Depth (feet):	49.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	NA
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	10:57
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	49.0	**Bottom of Screen (ft. btoc):**	59.2

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
20.16	15.4	5.56	434.9	0.49	4.9	-3.7	4.87	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/18/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	19.85
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	120.7
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	100.85 / 996.85
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	116.0
Well ID:	ALF-204A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1155	19.85	300	0	15.1	6.90	369.0	0.60	6.0	-34.3	5.16	Clear	No odor
1158	19.85	300	0.9	15.3	6.82	369.9	0.18	1.8	-41.1	3.99	Clear	No odor
1201	19.85	300	1.8	15.3	6.83	370.4	0.15	1.5	-47.6	4.07	Clear	No odor
1204	19.85	300	2.7	15.3	6.82	370.7	0.13	1.3	-49.9	4.04	Clear	No odor
1207	19.85	300	3.6	15.3	6.82	370.2	0.13	1.3	-53.7	3.89	Clear	No odor
Final Purge Values:		1207	3.6	15.3	6.82	370.2	0.13	1.3	-53.7	3.89	Clear	

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	65
Ambient Air (°C):	2

Sample ID:	ALF-GW-ALF204A-20191218	**QA/QC Sample Collected:**	No
Method of Sampling:	Dedicated Pump	*MS/MSD/LD collected:*	No
Sample Date:	12/18/2019	*Field Blank ID:*	NA
Collection Time:	12:10	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.6	*Equipment Blank ID:*	NA
Sample Depth (feet):	116.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	12:13
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	110.3	**Bottom of Screen (ft. btoc):**	120.3

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
1985	15.5	6.08	371	0.14	1.4	-42.2	2.68	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/18/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	19.86
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	94.1
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	74.24 / 733.82
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	89.0
Well ID:	ALF-204B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1249	19.90	500	0	15.4	6.77	236.4	0.14	1.4	-24.1	2.79	Clear	No odor
1252	19.90	500	1.5	15.5	6.73	286.5	0.10	1.0	-25.3	1.89	Clear	No odor
1255	19.90	500	3.0	15.5	6.71	286.6	0.08	0.8	-30.4	1.48	Clear	No odor
1258	19.90	500	4.5	15.5	6.73	288.2	0.07	0.7	-34.5	1.33	Clear	No odor
1301	19.90	500	6.0	15.5	6.75	288.2	0.07	0.7	-35.8	1.10	Clear	No odor
Final Purge Values:			1301	6.0	15.5	6.75	288.2	0.07	0.7	-35.8	1.10	Clear

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Final Controller Settings	
Setting ID:	102
Pressure (PSI):	60
Ambient Air (°C):	3

Sample ID:	ALF-GW-ALF204B-20191218	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Pump	*MS/MSD/LD collected:*	No
Sample Date:	12/18/2019	*Field Blank ID:*	NA
Collection Time:	13:04	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6.0	*Equipment Blank ID:*	ALF-GW-EB01-20191218
Sample Depth (feet):	89.0	*Filter Blank ID:*	NA
		Tubing Blank ID:	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Analytical Minneapolis, Fill date: 09/17/2019
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:07
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	83.7	**Bottom of Screen (ft. btoc):**	93.7

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
19.9	15.6	6.19	293.2	0.23	2.2	18.8	1.06	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/18/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	23.70
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	55.6
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	31.90 / 315.31
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	54.0
Well ID:	ALF-205	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0840	24.14	100	0	14.9	7.17	870	0.36	3.6	186.5	1.50	Clear	No odor
0843	24.17	100	0.3	15.5	7.20	868	0.27	2.7	179.1	0.98	Clear	No odor
0846	24.22	100	0.6	15.4	7.19	864	0.24	2.4	162.6	0.68	Clear	No odor
0849	24.31	100	0.9	15.4	7.22	862	0.24	2.4	147.7	0.93	Clear	No odor
Final Purge Values:		0849	0.9	15.4	7.22	862	0.24	2.4	147.7	0.93	Clear	

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	25
Ambient Air (°C):	1

Sample ID:	ALF-GW-ALF205-20191219	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/19/2019	*Field Blank ID:*	NA
Collection Time:	8:52	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	0.9	*Equipment Blank ID:*	NA
Sample Depth (feet):	54.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	8:57
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	34.5	**Bottom of Screen (ft. btoc):**	55.5

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
24.52	15.3	7.3	848	0.49	4.9	12.6	1.1	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/19/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/15/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	22.24
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	112.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	90.16 / 891.18
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	107.0
Well ID:	ALF-205A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1034	22.24	500	0	15.9	7.17	307.5	0.22	2.1	-7.4	3.52	Clear	No odor
1037	22.24	500	1.5	15.9	7.19	307.8	0.16	1.6	-15.4	3.09	Clear	No odor
1040	22.24	500	3.0	15.9	7.21	307.7	0.14	1.4	-22.9	2.79	Clear	No odor
1043	22.24	500	4.5	15.9	7.26	307.7	0.15	1.4	-23.7	2.82	Clear	No odor
1046	22.24	500	6.0	16.0	7.26	307.7	0.13	1.4	-15.6	2.56	Clear	No odor
Final Purge Values:		1046	6.0	16.0	7.26	307.7	0.13	1.4	-15.6	2.56	Clear	

Final Controller Settings	
Setting ID:	106
Pressure (PSI):	60
Ambient Air (°C):	2

Sample ID:	ALF-GW-ALF205A-20191219	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/19/2019	*Field Blank ID:*	NA
Collection Time:	10:49	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6.0	*Equipment Blank ID:*	NA
Sample Depth (feet):	107.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	10:52
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	102.0	**Bottom of Screen (ft. btoc):**	112.0

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
22.24	16.0	7.02	308.3	0.09	1.0	13.2	1.37	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/19/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/15/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	22.60
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	86.5
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	63.90 / 631.62
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	81.5
Well ID:	ALF-205B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0942	22.60	500	0	16.2	7.30	271.2	0.16	1.6	-59.3	2.54	Clear	No odor
0945	22.60	500	1.5	16.2	7.33	271.4	0.06	0.5	-66.1	1.88	Clear	No odor
0948	22.60	500	3.0	16.2	7.33	271.5	0.05	0.5	-70.0	1.86	Clear	No odor
0951	22.60	500	4.5	16.2	7.34	271.3	0.05	0.6	-75.5	1.84	Clear	No odor
0954	22.60	500	6.0	16.2	7.36	271.6	0.06	0.6	-78.1	1.51	Clear	No odor
Final Purge Values:			0954	6.0	16.2	7.36	271.6	0.06	0.6	-78.1	1.51	Clear

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	50
Ambient Air (°C):	2

Sample ID:	ALF-GW-ALF205B-20191219	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/19/2019	*Field Blank ID:*	ALF-GW-FB01-20191219
Collection Time:	9:57	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6.0	*Equipment Blank ID:*	NA
Sample Depth (feet):	81.5	*Filter Blank ID:*	NA
		Tubing Blank ID:	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Analytical Minneapolis, Fill date: 09/12/2019
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*QA/QC Sample Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	10:00
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	76.1	**Bottom of Screen (ft. btoc):**	86.1

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
22.6	16.3	7.27	270.8	0.2	2	-41.8	1.16	Odor:	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/19/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/15/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	27.57
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	64.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	36.83 / 364.04
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	54.0
Well ID:	ALF-206	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0922	27.60	360	0	15.2	6.46	315.7	0.76	7.4	170.4	1.80	Clear	No odor
0925	27.60	360	1.1	15.2	6.73	315.5	0.26	2.6	67.9	1.08	Clear	No odor
0928	27.60	360	2.2	15.3	6.84	315.7	0.21	2.2	-3.5	0.85	Clear	No odor
0931	27.60	360	3.2	15.2	6.84	316.0	0.20	2.0	-29.9	0.84	Clear	No odor
0934	27.60	360	4.3	15.2	6.83	316.1	0.18	1.8	-41.6	0.69	Clear	No odor
Final Purge Values:			0934	4.3	15.2	6.83	316.1	0.18	1.8	-41.6	0.69	Clear

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	30
Ambient Air (°C):	0

Sample ID:	ALF-GW-ALF206-20191218	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Dedicated Pump	*MS/MSD/LD collected:*	No
Sample Date:	12/18/2019	*Field Blank ID:*	ALF-GW-FB01-20191218
Collection Time:	9:37	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.3	*Equipment Blank ID:*	NA
Sample Depth (feet):	54.0	*Filter Blank ID:*	NA
		Tubing Blank ID:	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Analytical Minneapolis, Fill date: 09/17/2019
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	9:41
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	54.0	**Bottom of Screen (ft. btoc):**	64.2

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
27.6	15.2	6.62	315.7	0.18	1.8	-42.7	0.64	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/18/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	19.83
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	48.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	28.97 / 286.35
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	47.0
Well ID:	ALF-210	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0948	19.83	100	0	16.6	7.59	798	2.05	21.0	-24.5	47.1	clear	no odor
0951	19.90	100	0.3	16.3	7.27	796	2.11	21.5	-20.5	44.6	clear	no odor
0954	19.90	100	0.6	16.4	7.04	793	1.89	18.1	-18.3	42.9	clear	no odor
0957	19.90	100	0.9	16.4	6.98	793	1.75	17.4	-19.1	38.5	clear	no odor
1000	19.90	100	1.2	16.6	6.94	793	1.65	16.8	-18.4	38.0	clear	no odor
1003	19.92	100	1.5	16.5	6.90	794	1.64	16.7	-18.9	38.7	clear	no odor
1006	19.92	100	1.8	16.3	6.85	793	1.53	15.8	-20.3	34.4	clear	no odor
1009	19.93	100	2.1	16.5	6.82	791	1.43	14.6	-21.3	32.5	clear	no odor
1012	19.93	100	2.4	16.5	6.81	793	1.33	13.6	-21.9	29.7	clear	no odor
1015	19.94	100	2.7	16.5	6.80	791	1.25	12.8	-22.7	27.7	clear	no odor
1018	19.95	100	3.0	16.4	6.80	792	1.22	12.5	-23.0	25.3	clear	no odor
1021	19.97	100	3.3	16.6	6.78	790	1.18	11.5	-24.1	23.7	clear	no odor
1024	19.98	100	3.6	16.6	6.78	791	1.07	10.9	-24.7	22.1	clear	no odor
1027	19.98	100	3.9	16.7	6.78	789	1.01	10.5	-25.7	22.6	clear	no odor
1030	19.99	100	4.2	16.7	6.78	790	0.99	10.2	-25.7	20.6	clear	no odor
1033	20.03	100	4.5	16.7	6.77	789	0.93	9.6	-28.0	20.2	clear	no odor
1036	20.03	100	4.8	16.7	6.79	789	0.87	8.9	-28.2	19.8	clear	no odor
1039	20.03	100	5.1	16.7	6.77	788	0.84	8.7	-28.5	20.5	clear	no odor
1042	20.04	100	5.4	16.8	6.76	788	0.82	8.5	-27.7	20.9	clear	no odor
1045	20.04	100	5.7	16.7	6.75	787	0.81	8.4	-27.9	21.4	clear	no odor
												Final Controller Settings
												Setting ID: 104
												Pressure (PSI): 21
Final Purge Values:		1045	5.7	16.7	6.75	787	0.81	8.4	-27.9	21.4	clear	**Ambient Air (°C):** 8

AS 12/12/19

Sample ID:	ALF-GW-ALF210-20191212	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/12/2019	*Field Blank ID:*	NA
Collection Time:	10:48	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.7	*Equipment Blank ID:*	NA
Sample Depth (feet):	47.0	*Filter Blank ID:*	ALF-GW-~~FLT02~~FLB02 MD 1/15/20-20191212
Heavy Equipment in Area:	No	*Tubing Blank ID:*	ALF-GW-TB02-20191212
		DI water lot #:	Pace Minneapolis fill date 12/4/19
Analysis:	RI	*Filter purged for minimum 500 mL:*	Yes
Tubing Lot #:	N/A	*Filter Lot #:*	H1826
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	Yes
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	10:58
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	27.2	**Bottom of Screen (ft. btoc):**	48.1

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
20.06	17.2	7.09	791	1.8	18.7	4.4	21.1	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	4	1	2	1	1	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/12/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	19.78
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	130.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	110.62 / 1093.42
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	125.0
Well ID:	ALF-210A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1328	19.78	132	0	18.2	7.74	1015	0.67	6.9	-88.8	3.79	clear	no odor
1331	19.78	132	0.4	18.1	7.51	1074	0.51	6.6	-71.7	4.27	clear	no odor
1334	19.78	132	0.8	18.3	7.24	1108	0.61	6.4	-74.6	3.92	clear	no odor
1337	19.78	132	1.2	18.3	7.15	1133	0.47	5.1	-80.1	2.88	clear	no odor
1340	19.78	132	1.6	18.3	7.10	1149	0.47	5.1	-84.6	3.28	clear	no odor
1343	19.78	132	2.0	18.3	7.06	1152	0.41	4.4	-87.1	3.60	clear	no odor
Final Purge Values:		1343	2.0	18.3	7.06	1152	0.41	4.4	-87.1	3.60	clear	

AS 12/11/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	60
Ambient Air (°C):	9

Sample ID:	ALF-GW-ALF210A-20191211	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/11/2019	*Field Blank ID:*	ALF-GW-FB02-20191211
Collection Time:	13:46	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.0	*Equipment Blank ID:*	NA
Sample Depth (feet):	125.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	Pace Minneapolis fill date 12/4/19
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	NA
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	13:56
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	120.0	**Bottom of Screen (ft. btoc):**	130.0

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
19.78	18.3	7.09	1162	1.21	13	-81	2.4	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/11/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	34.69
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	67.9
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	33.21 / 328.26
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	67.0
Well ID:	ALF-212	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1333	34.84	240	0	17.8	6.89	565.5	0.65	6.9	-54.3	5.60	Clear	No odor
1336	34.84	240	0.7	17.9	6.87	564.9	0.38	0.4	-75.1	5.41	Clear	No odor
1339	34.84	240	1.4	18.0	6.88	563.7	0.24	2.6	-92.4	5.29	Clear	No odor
1342	34.84	240	2.2	18.0	6.89	564.6	0.19	2.1	-101.6	5.22	Clear	No odor
1345	34.84	240	2.9	17.9	6.90	563.8	0.17	1.8	-106.6	3.92	Clear	No odor
1348	34.84	240	3.6	18.0	6.90	565.0	0.16	1.7	-110.9	3.72	Clear	No odor
1351	34.84	240	4.3	17.9	6.91	564.8	0.16	1.7	-114.2	3.53	Clear	No odor
Final Purge Values:		1351	4.3	17.9	6.91	564.8	0.16	1.7	-114.2	3.53	Clear	

Bryan Pennell 12-13-19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	37
Ambient Air (°C):	8

Sample ID:	ALF-GW-ALF212-20191213	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/13/2019	*Field Blank ID:*	NA
Collection Time:	13:54	*Field Duplicate ID:*	ALF-GW-DUP01-20191213
Total Volume Purged (L):*	4.3	*Equipment Blank ID:*	NA
Sample Depth (feet):	67.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	13:58
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	51.8	**Bottom of Screen (ft. btoc):**	67.8

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
34.91	17.9	6.93	564.7	0.11	1.1	-98.5	3.43	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/13/2019	**Signature:**	Bryan Pennell
Sampler Name:	Ismael Arroyo	**Date:**	12/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	42.37
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	169.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	127.43 / 1259.57
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	165.0
Well ID:	ALF-212A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1237	42.52	450	0	17.3	6.78	526.3	0.18	1.7	-68.2	2.53	Clear	No odor
1240	45.52	450	1.4	17.3	6.72	527.6	0.10	1.0	-80.9	1.97	Clear	No odor
1243	45.52	450	2.7	17.2	6.72	529.5	0.07	0.9	-89.3	1.64	Clear	No odor
1246	45.52	450	4.1	17.3	6.72	530.7	0.06	0.8	-93.6	1.26	Clear	No odor
Final Purge Values:		1246	4.1	17.3	6.72	530.7	0.06	0.8	-93.6	1.26	Clear	

12-13-19

Final Controller Settings	
Setting ID:	58 (CPM2)
Pressure (PSI):	80
Ambient Air (°C):	8

Sample ID:	ALF-GW-ALF212A-20191213	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/13/2019	*Field Blank ID:*	NA
Collection Time:	12:49	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.1	*Equipment Blank ID:*	NA
Sample Depth (feet):	165.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	12:53
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	159.4	**Bottom of Screen (ft. btoc):**	169.4

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
42.52	17.6	6.74	537.1	0.24	2.8	-91.9	0.82	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/13/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	41.29
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	81.3
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	40.01 / 395.48
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	71.0
Well ID:	ALF-213	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1302	41.32	210	0	17.1	7.36	378.9	1.39	14.2	-76.9	4.51	Clear	No odor
1305	41.32	210	0.6	17.0	6.91	374.0	0.94	9.8	-97.0	1.64	Clear	No odor
1308	41.32	210	1.3	17.1	6.60	373.1	0.63	6.5	-109.3	2.52	Clear	No odor
1311	41.32	210	1.9	17.1	6.94	372.0	0.42	4.3	-120.7	2.45	Clear	No odor
1314	41.32	210	2.5	16.9	6.96	373.0	0.33	3.3	-128.0	1.59	Clear	No odor
1317	41.32	210	3.2	16.9	6.98	373.0	0.26	2.7	-134.7	1.12	Clear	No odor
Final Purge Values:		1317	3.2	16.9	6.98	373.0	0.26	2.7	-134.7	1.12	Clear	

12-12-19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	38
Ambient Air (°C):	11

Sample ID:	ALF-GW-ALF213-20191212	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/12/2019	*Field Blank ID:*	NA
Collection Time:	13:20	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.2	*Equipment Blank ID:*	NA
Sample Depth (feet):	71.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	13:24
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	71.0	**Bottom of Screen (ft. btoc):**	81.2

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
42.32	17.0	6.98	375.6	0.13	1.3	-141.7	0.94	Odor:	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/12/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	41.83
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	162.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	120.92 / 1195.23
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	157.75
Well ID:	ALF-213A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1456	41.85	425	0	16.6	6.68	302.2	0.31	3.1	-34.6	3.27	Clear	No odor
1459	41.85	425	1.3	16.6	6.64	302.7	0.21	2.1	-62.6	2.34	Clear	No odor
1502	41.85	425	2.6	16.6	6.74	302.9	0.18	1.8	-82.4	1.49	Clear	No odor
1505	41.85	425	3.8	16.6	6.79	302.9	0.15	1.5	-98.2	1.23	clear	No odor
Final Purge Values:		1505	3.8	16.6	6.79	302.9	0.15	1.5	-98.2	1.23	clear	

12-12-19

Final Controller Settings	
Setting ID:	80
Pressure (PSI):	103
Ambient Air (°C):	12

Sample ID:	ALF-GW-ALF213A-20191212	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/12/2019	*Field Blank ID:*	NA
Collection Time:	15:08	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.8	*Equipment Blank ID:*	ALF-GW-EB01-20191212
Sample Depth (feet):	157.8	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	Pace Analytical Minneapolis, Fill date: 12/04/2019
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
		Filter Sample Metals:	No
		Other Filtered Samples Collected:	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	15:12
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	152.4	**Bottom of Screen (ft. btoc):**	162.4

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
41.85	16.5	6.85	311.9	0.12	1.2	-91.8	0.68	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/12/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	41.86
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	121.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	79.89 / 789.67
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	116.8
Well ID:	ALF-213B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1401	41.86	320	0	16.8	6.37	776	0.48	4.8	-9.5	6.28	Clear	No odor
1404	41.86	320	1.0	16.8	6.67	787	0.29	2.8	-71.3	7.79	Clear	No odor
1407	41.86	320	1.9	16.8	6.80	789	0.21	2.2	-94.4	7.26	Clear	No odor
1410	41.86	320	2.9	16.7	6.85	790	0.18	1.9	-106.8	5.87	Clear	No odor
1413	41.86	320	3.8	16.7	6.88	790	0.18	1.8	-114.7	4.22	Clear	No odor
1416	41.86	320	4.8	16.7	6.90	791	0.17	1.6	-119.6	3.01	Clear	No odor
1419	41.86	320	5.8	16.7	6.89	791	0.16	1.7	-120.5	2.89	Clear	No odor
Final Purge Values:		1419	5.8	16.7	6.89	791	0.16	1.7	-120.5	2.89	Clear	

12-12-19

Final Controller Settings	
Setting ID:	58 (CPM2)
Pressure (PSI):	80
Ambient Air (°C):	12

Sample ID:	ALF-GW-ALF213B-20191212	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/12/2019	*Field Blank ID:*	NA
Collection Time:	14:22	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	5.8	*Equipment Blank ID:*	NA
Sample Depth (feet):	116.8	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	14:26
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	111.4	**Bottom of Screen (ft. btoc):**	121.4

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
41.86	16.6	6.87	789	0.12	1.2	-109.2	1.67	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/12/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	22.15
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	54.9
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	32.75 / 323.72
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	45.0
Well ID:	ALF-214	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1238	22.15	260	0	18.1	7.62	676	0.59	6.3	52.6	1.76	clear	no odor
1241	22.15	260	0.8	18.1	7.51	675	0.49	5.2	44.1	0.94	clear	no odor
1244	22.15	260	1.6	18.1	7.46	676	0.47	5.1	38.9	0.90	clear	no odor
1247	22.15	260	2.3	18.1	7.37	676	0.43	4.6	34.1	0.88	clear	no odor
Final Purge Values:		1247	2.3	18.1	7.37	676	0.43	4.6	34.1	0.88	clear	

AS 12/12/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	25
Ambient Air (°C):	12

Sample ID:	ALF-GW-ALF214-20191212	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/12/2019	*Field Blank ID:*	NA
Collection Time:	12:50	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.3	*Equipment Blank ID:*	NA
Sample Depth (feet):	45.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	NA
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:00
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	34.5	**Bottom of Screen (ft. btoc):**	54.5

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
22.15	18.1	7.32	684	0.22	2.4	31.4	0.47	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/12/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	22.25
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	133.0
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	110.75 / 1094.7
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	130.0
Well ID:	ALF-214A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1330	22.25	220	0	18.1	7.04	1047	0.23	2.5	-59.3	1.43	clear	no odor
1333	22.25	220	0.7	17.9	6.99	1065	0.18	1.9	-10.5	1.47	clear	no odor
1336	22.25	220	1.3	18.0	6.89	1085	0.19	2.0	-23.5	1.58	clear	no odor
1339	22.25	220	2.0	18.0	6.81	1089	0.15	1.6	-30.0	1.62	clear	no odor
Final Purge Values:		1339	2.0	18	6.81	1089	0.15	1.6	-30	1.62	clear	

AS 12/12/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	70
Ambient Air (°C):	13

Sample ID:	ALF-GW-ALF214A-20191212	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/12/2019	*Field Blank ID:*	NA
Collection Time:	13:42	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.0	*Equipment Blank ID:*	NA
Sample Depth (feet):	130.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	NA
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:52
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	122.6	**Bottom of Screen (ft. btoc):**	132.6

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
22.25	19.9	6.69	1076	0.4	4.2	-27.7	1.26	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/12/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	22.12
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	93.3
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	71.18 / 703.57
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	88.0
Well ID:	ALF-214B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1422	22.12	280	0	17.7	6.71	779	0.28	3.1	-27.1	7.67	clear	no odor
1425	22.12	280	0.8	17.8	6.70	788	0.18	1.9	-48.8	3.30	clear	no odor
1428	22.12	280	1.7	17.8	6.71	794	0.16	1.7	-69.9	2.36	clear	no odor
1431	22.12	280	2.5	17.8	6.78	797	0.14	1.5	-80.9	2.09	clear	no odor
Final Purge Values:		1431	2.5	17.8	6.78	797	0.14	1.5	-80.9	2.09	clear	

AS 12/12/19

Final Controller Settings	
Setting ID:	55
Pressure (PSI):	103
Ambient Air (°C):	10

Sample ID:	ALF-GW-ALF214B-20191212	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/12/2019	*Field Blank ID:*	ALF-GW-FB02-20191212
Collection Time:	14:34	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.5	*Equipment Blank ID:*	NA
Sample Depth (feet):	88.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	Pace Minneapolis fill date 12/4/19
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	NA
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	14:39
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	82.9	**Bottom of Screen (ft. btoc):**	92.9

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
22.12	17.8	6.87	804	0.1	1.1	-84.1	1.43	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/12/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	11.55
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	30.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	18.85 / 186.32
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	25.0
Well ID:	ALF-215	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1125	11.59	125	0	15.7	7.05	354.5	1.22	12.1	28.1	0.75	Clear	No odor
1128	11.59	125	0.4	15.9	6.98	353.8	0.73	7.3	-57.9	0.86	Clear	No odor
1131	11.59	125	0.8	15.7	6.97	352.8	0.76	7.6	-69.7	0.85	Clear	No odor
1134	11.59	125	1.1	15.7	6.97	352.3	0.62	6.3	-73.5	0.85	Clear	No odor
1137	11.59	125	1.5	15.7	6.96	352.0	0.58	5.7	-74.8	0.86	Clear	No odor
1140	11.59	125	1.9	15.4	6.96	351.6	0.56	5.7	-76.3	0.87	Clear	No odor
1143	11.59	125	2.3	15.4	6.97	351.6	0.57	5.6	-77.7	0.85	Clear	No odor
Final Purge Values:		1143	2.3	15.4	6.97	351.6	0.57	5.6	-77.7	0.85	Clear	

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	15
Ambient Air (°C):	1

Sample ID:	ALF-GW-ALF215-20191217	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/17/2019	*Field Blank ID:*	NA
Collection Time:	11:46	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.3	*Equipment Blank ID:*	NA
Sample Depth (feet):	25.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	11:48
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	20.0	**Bottom of Screen (ft. btoc):**	30.0

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
11.61	15.4	7.28	348.8	0.77	7.7	-45.9	0.99	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/17/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	20.21
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	60.0
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	39.79 / 393.3
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	50.0
Well ID:	ALF-216	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/11/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1106	20.27	400	0	18.0	6.83	866	0.30	3.1	-89.5	4.21	Clear	No odor
1109	20.27	400	1.2	18.0	6.76	868	0.15	1.8	-94.0	2.44	Clear	No odor
1112	20.27	400	2.4	18.0	6.77	870	0.20	2.1	-98.0	1.01	Clear	No odor
1115	20.27	400	3.6	18.0	6.74	871	0.16	1.7	-100.8	0.62	Clear	No odor
Final Purge Values:		1115	3.6	18	6.74	871	0.16	1.7	-100.8	0.62	Clear	

12-11-19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	30
Ambient Air (°C):	7

Sample ID:	ALF-GW-ALF216-20191211	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/11/2019	*Field Blank ID:*	NA
Collection Time:	11:18	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.6	*Equipment Blank ID:*	NA
Sample Depth (feet):	50.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	11:20
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	39.6	**Bottom of Screen (ft. btoc):**	59.6

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
20.27	18	6.77	870	0.13	1.4	-93.1	1.73	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/11/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/11/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	29.06
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	71.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	42.69 / 421.97
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	60.8
Well ID:	ALF-217	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1127	29.10	200	0	17.1	6.75	629	0.42	4.3	-36.3	1.59	Clear	No odor
1130	29.10	200	0.6	17.4	6.82	631	0.30	3.1	-65.4	0.99	Clear	No odor
1133	29.11	200	1.2	17.4	6.99	633	0.27	2.8	-88.4	0.68	Clear	No odor
1136	29.11	200	1.8	17.3	6.99	633	0.24	2.6	-97.2	0.52	Clear	No odor
1139	29.11	200	2.4	17.5	7.00	633	0.22	2.3	-102.1	0.51	Clear	No odor
Final Purge Values:		1139	2.4	17.5	7.00	633	0.22	2.3	-102.1	0.51	Clear	

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Final Controller Settings	
Setting ID:	104
Pressure (PSI):	34
Ambient Air (°C):	11

Sample ID:	ALF-GW-ALF217-20191212	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/12/2019	*Field Blank ID:*	NA
Collection Time:	11:42	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.4	*Equipment Blank ID:*	NA
Sample Depth (feet):	60.8	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	11:46
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	49.4	**Bottom of Screen (ft. btoc):**	71.4

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
29.11	17.4	7.03	632	0.13	1.4	-99.9	0.28	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/12/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	42.19
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	192.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	150.56 / 1488.2
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	187.8
Well ID:	ALF-217A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0926	42.38	305	0	16.5	6.49	616	0.43	4.4	-61.6	3.47	Clear	No odor
0929	43.26	305	0.9	16.6	6.64	608	0.27	2.8	-104.5	4.42	Clear	No odor
0932	43.26	305	1.8	16.7	6.69	607	0.25	2.6	-113.8	3.06	Clear	No odor
0935	43.26	305	2.7	16.7	6.71	605	0.27	2.7	-117.1	2.40	Clear	No odor
Final Purge Values:		0935	2.7	16.7	6.71	605	0.27	2.7	-117.1	2.40	Clear	

Final Controller Settings	
Setting ID:	106
Pressure (PSI):	80
Ambient Air (°C):	4

Sample ID:	ALF-GW-ALF217A-20191212	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/12/2019	*Field Blank ID:*	NA
Collection Time:	9:38	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.7	*Equipment Blank ID:*	NA
Sample Depth (feet):	187.8	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	9:42
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	182.4	**Bottom of Screen (ft. btoc):**	192.4

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
43.28	16.7	6.75	605	0.13	1.4	-115.2	1.02	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/12/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	42.15
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	131.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	89.60 / 885.65
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	126.8
Well ID:	ALF-217B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/12/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1034	42.17	310	0	16.8	6.76	878	0.27	2.5	-71.5	6.48	Clear	No odor
1037	42.17	310	0.9	16.7	6.75	882	0.15	1.5	-94.2	2.86	Clear	No odor
1040	42.17	310	1.9	16.8	6.75	884	0.14	1.5	-103.8	1.40	Clear	No odor
1043	42.17	310	2.8	16.8	6.78	887	0.14	1.4	-111.1	2.16	Clear	No odor
1046	42.17	310	3.7	16.8	6.77	890	0.13	1.4	-115.6	2.08	Clear	No odor
Final Purge Values:		1046	3.7	16.8	6.77	890	0.13	1.4	-115.6	2.08	Clear	

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Final Controller Settings	
Setting ID:	103
Pressure (PSI):	75
Ambient Air (°C):	9

Sample ID:	ALF-GW-ALF217B-20191212	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Low Flow	*Field Blank ID:*	ALF-GW-FB01-20191212
Sample Date:	12/12/2019	*Field Duplicate ID:*	NA
Collection Time:	10:49	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	3.7	*Filter Blank ID:*	NA
Sample Depth (feet):	126.8	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Analytical Minneapolis, Fill date: 12/04/2019
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	10:53
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	121.4	**Bottom of Screen (ft. btoc):**	131.4

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
42.17	16.9	6.82	883	0.09	1.0	-110.2	1.43	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/12/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/12/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/10/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	24.00
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	81.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	57.80 / 142.83
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	77.0
Well ID:	P-4	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	2.0	**Date:**	12/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0933	24.00	450	0	15.8	7.81	326.6	0.37	3.7	-41.4	2.23	clear	no odor
0936	24.00	450	1.4	15.8	7.72	467.0	0.31	3.2	-50.3	1.34	clear	no odor
0939	24.00	450	2.7	15.8	7.65	467.3	0.23	2.4	-54.5	1.08	clear	no odor
0942	24.00	450	4.1	15.9	7.56	467.5	0.17	1.8	-60.8	0.94	clear	no odor
Final Purge Values:		0942	4.1	15.9	7.56	467.5	0.17	1.8	-60.8	0.94	clear	

AS 8/17/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	55
Ambient Air (°C):	9

Sample ID:	ALF-GW-P4-20191217	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	Yes
Sample Date:	12/17/2019	*Field Blank ID:*	NA
Collection Time:	9:45	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.1	*Equipment Blank ID:*	NA
Sample Depth (feet):	77.0	*Filter Blank ID:*	NA
		Tubing Blank ID:	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	NA
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	9:55
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	71.7	**Bottom of Screen (ft. btoc):**	81.8

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
24	15.1	7.3	335.7	0.14	1.4	-56.9	1.07	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	6
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/17/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	17.64
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	50.1
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	32.46 / 320.85
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	41.0
Well ID:	P-4S	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1049	17.64	460	0	17.5	7.28	530.3	0.25	2.4	-5.4	0.75	clear	no odor
1052	17.64	460	1.4	17.6	7.32	529.9	0.18	1.8	-10.8	0.70	clear	no odor
1055	17.64	460	2.8	17.6	7.30	529.8	0.16	1.6	-12.3	0.64	clear	no odor
1059	17.64	460	4.6	17.6	7.26	528.8	0.14	1.4	-13.8	0.59	clear	no odor
Final Purge Values:		1059	4.6	17.6	7.26	528.8	0.14	1.4	-13.8	0.59	clear	

AS RI/17/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	30
Ambient Air (°C):	6

Sample ID:	ALF-GW-P4S-20191217	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/17/2019	*Field Blank ID:*	NA
Collection Time:	11:02	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.6	*Equipment Blank ID:*	NA
Sample Depth (feet):	41.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	NA
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	11:07
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	29.7	**Bottom of Screen (ft. btoc):**	49.7

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
17.64	17.3	7.17	523.3	2.66	27.4	-14.8	0.66	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/17/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	16.76
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	40.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	23.67 / 233.96
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	29.0
Well ID:	PMW-02A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1040	16.76	500	0	18.2	10.52	914	0.28	2.9	-56.2	6.01	amber	no odor
1043	16.76	500	1.5	18.3	10.54	917	0.19	1.9	-60.4	5.70	amber	no odor
1046	16.76	500	3.0	18.5	10.62	918	0.17	1.8	-46.7	5.59	amber	no odor
1049	16.76	500	4.5	18.5	10.69	918	0.15	1.5	-38.8	5.51	amber	no odor
1052	16.76	500	6.0	18.6	10.70	918	0.13	1.4	-35.7	5.40	amber	no odor
1055	16.76	500	7.5	18.6	10.71	919	0.12	1.3	-32.5	5.37	amber	no odor
1058	16.76	500	9.0	18.6	10.72	917	0.11	1.2	-29.9	5.43	amber	no odor
1101	16.76	500	10.5	18.7	10.73	916	0.12	1.3	-27.9	5.40	amber	no odor
1104	16.76	500	12.0	18.7	10.73	916	0.11	1.1	-26.9	5.41	amber	no odor
1107	16.76	500	13.5	18.7	10.73	916	0.12	1.3	-26.1	5.67	amber	no odor
1110	16.76	500	15.0	18.8	10.71	917	0.16	1.7	-25.6	6.08	amber	no odor
1113	16.76	500	16.5	18.8	10.69	920	0.18	1.9	-25.2	6.45	amber	no odor
1116	16.76	500	18.0	18.8	10.65	924	0.19	2.0	-24.5	6.89	amber	no odor
1119	16.76	500	19.5	18.8	10.63	927	0.19	2.0	-24.1	7.00	amber	no odor
1122	16.76	500	21.0	18.9	10.60	931	0.19	2.0	-23.6	7.35	amber	no odor
1125	16.76	500	22.5	18.9	10.59	933	0.18	1.9	-23.1	7.57	amber	no odor
1128	16.76	500	24.0	18.9	10.58	934	0.18	1.8	-22.6	7.73	amber	no odor
1131	16.76	500	25.5	18.9	10.57	935	0.17	1.8	-22.0	7.95	amber	no odor
1134	16.76	500	27.0	18.8	10.58	936	0.16	1.6	-21.4	8.02	amber	no odor
Final Purge Values:		1134	27.0	18.8	10.58	936	0.16	1.6	-21.4	8.02	amber	

AS 12/18/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	80
Ambient Air (°C):	-2

Sample ID:	ALF-GW-PMW02A-20191218	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/18/2019	*Field Blank ID:*	NA
Collection Time:	11:37	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	27.0	*Equipment Blank ID:*	NA
Sample Depth (feet):	29.0	*Filter Blank ID:*	NA
		Tubing Blank ID:	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
		Filter purged for minimum 500 mL:	Yes
Analysis:	RI	*Filter Lot #:*	H1826
		Filter Sample Metals:	Yes
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	11:42
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	19.0	**Bottom of Screen (ft. btoc):**	40.0

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	amber
16.76	18.7	10.56	930	0.2	2.4	-11.3	7.96	Odor:	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/18/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	21.50
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	58.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	37.30 / 368.69
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	54.0
Well ID:	PMW-02B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1244	21.50	120	0	16.4	8.51	670	0.33	3.3	-116.9	9.04	clear	no odor
1247	21.50	120	0.4	16.3	8.38	672	0.26	2.6	-117.5	8.78	clear	no odor
1250	21.50	120	0.7	16.4	8.19	679	0.22	2.2	-117.9	7.20	clear	no odor
1253	21.50	120	1.1	16.2	7.81	690	0.17	1.8	-119.9	6.57	clear	no odor
1256	21.50	120	1.4	15.8	7.72	692	0.17	1.7	-122.7	5.54	clear	no odor
1259	21.50	120	1.8	16.1	7.59	692	0.21	2.1	-115.0	5.67	clear	no odor
1302	21.50	120	2.2	16.0	7.49	691	0.33	3.3	-111.3	5.09	clear	no odor
1305	21.50	120	2.5	16.1	7.43	697	0.32	3.2	-113.7	4.88	clear	no odor
1308	21.50	120	2.9	16.1	7.40	700	0.30	3.0	-116.5	4.26	clear	no odor
1311	21.50	120	3.2	16.1	7.37	703	0.26	2.6	-119.0	3.73	clear	no odor
Final Purge Values:		1311	3.2	16.1	7.37	703	0.26	2.6	-119	3.73	clear	

AS 12/18/19

Final Controller Settings	
Setting ID:	102
Pressure (PSI):	25
Ambient Air (°C):	0

Sample ID:	ALF-GW-PMW02B-20191218	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/18/2019	*Field Blank ID:*	NA
Collection Time:	13:14	*Field Duplicate ID:*	ALF-GW-FB02-20191218
Total Volume Purged (L):*	3.2	*Equipment Blank ID:*	NA
Sample Depth (feet):	54.0	*Filter Blank ID:*	NA
		Tubing Blank ID:	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Minneapolis 12/16/19
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	NA
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:24
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	48.4	**Bottom of Screen (ft. btoc):**	58.4

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
21.5	16.1	7.47	701	0.3	3	-90.2	2.31	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/18/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	21.13
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	129.7
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	108.54 / 1072.86
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	124.0
Well ID:	PMW-02C	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0910	21.13	440	0	15.6	7.96	393.3	0.34	3.4	35.2	5.79	clear	no odor
0913	21.13	440	1.3	15.6	7.57	394.7	0.21	2.1	-32.5	4.16	clear	no odor
0916	21.13	440	2.6	15.6	7.53	393.0	0.20	2.0	-50.8	4.14	clear	no odor
0919	21.13	440	4.0	15.6	7.49	392.5	0.17	1.7	-76.6	3.81	clear	no odor
Final Purge Values:		0919	4.0	15.6	7.49	392.5	0.17	1.7	-76.6	3.81	clear	

AS 12/18/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	80
Ambient Air (°C):	-1

Sample ID:	ALF-GW-PMW02C-20191218	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/18/2019	*Field Blank ID:*	NA
Collection Time:	9:24	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.0	*Equipment Blank ID:*	NA
Sample Depth (feet):	124.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	NA
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	9:29
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	119.3	**Bottom of Screen (ft. btoc):**	129.3

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
21.13	15.8	7.64	387.7	0.16	1.6	-11.8	2.52	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/18/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	18.55
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	40.74
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	22.19 / 219.34
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	29.0
Well ID:	PMW-04A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1151	18.55	460	0	18.3	7.40	894	0.38	4.0	25.1	1.14	clear	no odor
1154	18.55	460	1.4	18.5	7.39	893	0.26	2.8	22.5	1.07	clear	no odor
1157	18.55	460	2.8	18.5	7.39	892	0.25	2.6	21.8	1.02	clear	no odor
1200	18.55	460	4.1	18.5	7.38	888	0.18	1.8	21.1	0.98	clear	no odor
Final Purge Values:		1200	4.1	18.5	7.38	888	0.18	1.8	21.1	0.98	clear	

12/17/19

AS

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	20
Ambient Air (°C):	3

Sample ID:	ALF-GW-PMW04A-20191217	**QA/QC Sample Collected:**	yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	Yes
Sample Date:	12/17/2019	*Field Blank ID:*	NA
Collection Time:	12:03	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.1	*Equipment Blank ID:*	NA
Sample Depth (feet):	29.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	NA
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	12:08
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	19.3	**Bottom of Screen (ft. btoc):**	~~29.3~~ 40.3 CS 2/6/20

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
18.55	18.5	7.74	845	0.09	0.1	27	1.11	**Odor:**	No Odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	6
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/17/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	23.44
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	62.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	38.96 / 385.1
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	57.0
Well ID:	PMW-04B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1310	23.44	460	0	16.3	7.60	663	0.10	1.0	-123.7	1.62	clear	no odor
1313	23.44	460	1.4	16.3	7.54	667	0.09	1.0	-132.0	0.97	clear	no odor
1316	23.44	460	2.8	16.3	7.46	673	0.09	1.0	-139.7	1.19	clear	no odor
1319	23.44	460	4.1	16.3	7.43	676	0.08	0.9	-142.6	1.01	clear	no odor
Final Purge Values:		1319	4.1	16.3	7.43	676	0.08	0.9	-142.6	1.01	clear	

AS 12/17/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	30
Ambient Air (°C):	3

Sample ID:	ALF-GW-PMW04B-20191217	**QA/QC Sample Collected:**	yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	no
Sample Date:	12/17/2019	*Field Blank ID:*	NA
Collection Time:	13:22	*Field Duplicate ID:*	ALF-GW-DUP02-20191217
Total Volume Purged (L):*	4.1	*Equipment Blank ID:*	NA
Sample Depth (feet):	57.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	NA
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	13:27
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	52.0	**Bottom of Screen (ft. btoc):**	62.0

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
23.44	16.2	7.29	690	0.05	0.6	-129.9	0.71	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/17/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	22.21
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	129.7
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	107.52 / 1062.78
Project Number:	175578046		**if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	124.0
Well ID:	PMW-04C	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1420	22.21	480	0	15.5	7.26	411.1	0.31	3.2	-25.5	4.51	clear	no odor
1423	22.21	480	1.4	15.9	7.17	408.0	0.24	2.4	-40.4	4.48	clear	no odor
1426	22.21	480	2.9	15.8	7.22	406.7	0.15	1.5	-67.8	4.59	clear	no odor
1429	22.21	480	4.3	15.9	7.27	405.5	0.13	1.3	-79.6	4.88	clear	no odor
Final Purge Values:		1429	4.3	15.9	7.27	405.5	0.13	1.3	-79.6	4.88	clear	

12/17/19

AS

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	85
Ambient Air (°C):	7

Sample ID:	ALF-GW-PMW04C-20191217	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/17/2019	*Field Blank ID:*	ALF-GW-FB02-20191217
Collection Time:	14:32	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.3	*Equipment Blank ID:*	NA
Sample Depth (feet):	124.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	Pace Minneapolis 12/16/19
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	NA
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	14:36
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	119.3	**Bottom of Screen (ft. btoc):**	129.3

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
22.21	15.8	7.32	403.2	0.11	1	-75.9	4.88	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/17/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	13.73
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	29.3
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	15.59 / 154.1
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	24.0
Well ID:	PMW-07A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0939	13.78	200	0	17.6	8.71	892	0.51	5.1	-18.8	3.35	clear	no odor
0942	13.78	200	0.6	17.7	8.78	904	0.48	4.8	-32.2	3.00	clear	no odor
0945	13.78	200	1.2	17.6	8.87	906	0.49	4.9	-38.6	2.97	clear	no odor
0948	13.78	200	1.8	17.8	8.96	902	0.49	4.9	-39.4	2.81	clear	no odor
Final Purge Values:		0948	1.8	17.8	8.96	902	0.49	4.9	-39.4	2.81	clear	

AS 12/19/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	18
Ambient Air (°C):	-1

Sample ID:	ALF-GW-PMW07A-20191219	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/19/2019	*Field Blank ID:*	NA
Collection Time:	9:51	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.8	*Equipment Blank ID:*	NA
Sample Depth (feet):	24.0	*Filter Blank ID:*	NA
		Tubing Blank ID:	NA
Heavy Equipment in Area:	No	*DI water lot #:*	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	N/A
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	9:56
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	18.9	**Bottom of Screen (ft. btoc):**	28.9

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
13.78	18.5	9.21	911	0.22	2.2	-3.6	2.21	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/19/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/15/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	20.13
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	59.88
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	39.75 / 392.91
			**if water column is < 4.5 L contact Field Coordinator*
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	55.0
Well ID:	PMW-07B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/19/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0832	20.33	200	0	15.8	7.58	723	0.33	3.4	-43.1	5.29	clear	no odor
0835	20.33	200	0.60	16.0	7.48	742	0.23	2.3	-75.5	4.40	clear	no odor
0838	20.33	200	1.20	16.2	7.39	747	0.20	2.0	-85.5	4.43	clear	no odor
0841	20.33	200	1.80	16.2	7.31	758	0.22	2.2	-101.5	3.78	clear	no odor
Final Purge Values:		0841	1.8	16.2	7.31	758	0.22	2.2	-101.5	3.78	clear	

AS 12/19/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	30
Ambient Air (°C):	-2

Sample ID:	ALF-GW-PMW07B-20191219	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/19/2019	*Field Blank ID:*	ALF-GW-FB02-20191219
Collection Time:	~~8:44~~ 8:43 CS 1/15/20	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.8	*Equipment Blank ID:*	ALF-GW-EB02-20191219
Sample Depth (feet):	55.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	Pace Minneapolis 12/16/19
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	N/A
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	8:49
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	49.5	**Bottom of Screen (ft. btoc):**	59.5

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
20.33	16	7.38	765	0.23	2.3	-68.9	2.08	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	6
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/19/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/19/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/15/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	20.25
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	122.8
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	102.53 / 1013.45
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	117.0
Well ID:	PMW-07C	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/18/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1437	20.24	440	0	16.8	7.54	392.9	0.33	3.3	4.7	2.36	clear	no odor
1440	20.24	440	1.3	16.8	7.44	391.1	0.23	2.3	-27.9	2.45	clear	no odor
1443	20.24	440	2.6	16.7	7.43	390.2	0.19	2.0	-86.7	2.95	clear	no odor
1446	20.24	440	4.0	16.8	7.43	389.2	0.13	1.3	-63.2	2.55	clear	no odor
Final Purge Values:		1446	4.0	16.8	7.43	389.2	0.13	1.3	-63.2	2.55	clear	

AS 12/18/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	80
Ambient Air (°C):	2

Sample ID:	ALF-GW-PMW07C-20191218	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/18/2019	*Field Blank ID:*	NA
Collection Time:	14:49	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	4.0	*Equipment Blank ID:*	NA
Sample Depth (feet):	117.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	NA
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	14:54
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	112.5	**Bottom of Screen (ft. btoc):**	122.5

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	clear
20.24	19.2	7.54	45.4	0.12	1.2	-48.7	2.53	**Odor:**	no odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper-T	**Serial No:**	3616
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1256

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	1104192EI2	445250	1119051	243975	445250	NA
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Andrew Stevens	**Date:**	12/18/2019	**Signature:**	
Sampler Name:	Trent VanEgtern	**Date:**	12/18/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	16.69
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	44.0
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	27.26 / 269.45
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	32.0
Well ID:	PMW-10A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0852	16.71	300	0	18.2	7.14	423.7	0.50	5.0	126.4	0.77	Clear	No odor
0855	16.71	300	0.9	18.3	7.06	424.4	0.39	4.1	-8.1	0.57	Clear	No odor
0858	16.71	300	1.8	18.3	7.07	423.5	0.32	3.5	-36.2	0.47	Clear	No odor
0901	16.71	300	2.7	18.3	7.10	422.5	0.28	3.1	-60.3	0.55	Clear	No odor
Final Purge Values:		0901	2.7	18.3	7.10	422.5	0.28	3.1	-60.3	0.55	Clear	

12-13-19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	18
Ambient Air (°C):	7

Sample ID:	ALF-GW-PMW10A-20191213	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/13/2019	*Field Blank ID:*	NA
Collection Time:	9:04	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	2.7	*Equipment Blank ID:*	NA
Sample Depth (feet):	32.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	9:07
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	22.6	**Bottom of Screen (ft. btoc):**	43.6

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)		
16.71	18.2	7.21	420.8	0.19	18.1	-53.8	0.44	**Color:**	Clear
								Odor:	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/13/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	25.16
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	73.3
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	48.12 / 475.64
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	68.0
Well ID:	PMW-10B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0946	25.28	150	0	17.0	6.74	763	0.48	4.7	-35.8	2.19	Clear	No odor
0949	25.28	150	0.5	17.0	6.81	780	0.30	3.1	-87.6	2.22	Clear	No odor
0952	25.28	150	0.9	17.1	6.86	783	0.27	2.7	-105.9	2.17	Clear	No odor
0955	25.28	150	1.4	17.1	6.93	784	0.24	2.5	-121.5	1.89	clear	No odor
0958	25.28	150	1.8	17.1	6.97	787	0.24	2.5	-134.4	1.93	Clear	No odor
Final Purge Values:			0958	1.8	17.1	6.97	787	0.24	2.5	-134.4	1.93	Clear

12-13-19

Final Controller Settings	
Setting ID:	104
Pressure (PSI):	35
Ambient Air (°C):	7

Sample ID:	ALF-GW-PMW10B-20191213	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/13/2019	*Field Blank ID:*	ALF-GW-FB01-20191213
Collection Time:	10:01	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.8	*Equipment Blank ID:*	NA
Sample Depth (feet):	68.0	*Filter Blank ID:*	NA
		Tubing Blank ID:	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Analytical Minneapolis, Fill date: 12/04/2019
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	10:06
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	62.9	**Bottom of Screen (ft. btoc):**	72.9

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
25.3	16.9	7.06	779	0.24	2.4	-124.9	1.66	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/13/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	25.25
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	152.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	127.17 / 1257
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	148.0
Well ID:	PMW-10C	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/13/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1057	25.25	400	0	18.0	6.89	465.9	0.19	2.0	-85.0	2.22	Clear	No odor
1100	25.25	400	1.2	18.1	6.87	465.3	0.15	1.6	-96.6	1.95	Clear	No odor
1103	25.25	400	2.4	18.0	6.87	464.8	0.11	1.2	-102.5	1.52	Clear	No odor
1106	25.25	400	3.6	18.0	6.86	464.5	0.11	1.2	-105.0	0.95	Clear	No odor
Final Purge Values:		1106	3.6	18.0	6.86	464.5	0.11	1.2	-105.0	0.95	Clear	

12-13-19

Final Controller Settings	
Setting ID:	56 (CPM2)
Pressure (PSI):	75
Ambient Air (°C):	8

Sample ID:	ALF-GW-PMW10C-20191213	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	Yes
Sample Date:	12/13/2019	*Field Blank ID:*	NA
Collection Time:	11:09	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	3.6	*Equipment Blank ID:*	NA
Sample Depth (feet):	148.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	11:12
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	142.0	**Bottom of Screen (ft. btoc):**	152.0

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
25.25	18.1	6.88	467.4	0.11	1.3	-80.9	0.57	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	3	3	6	3	3	6
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/13/2019	**Signature:**	
Sampler Name:	Ismael Arroyo	**Date:**	12/13/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	Cassidy Sutherland
DL/SME Review by:	Matthew Dower	**Date:**	1/15/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	13.50
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	38.0
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	24.54 / 242.56
Project Number:	175578046		**if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	27.0
Well ID:	PMW-11A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1442	13.50	350	0	18.5	7.31	549.6	0.30	3.2	-80.7	13.2	Clear	No odor
1445	13.50	350	1.1	18.5	7.17	552.9	0.21	2.3	-77.7	12.5	Clear	No odor
1448	13.50	350	2.1	18.4	7.10	554.1	0.19	2.0	-75.5	12.0	Clear	No odor
1451	13.50	350	3.2	18.6	7.11	555.0	0.18	1.9	-75.8	12.0	Clear	No odor
1454	13.50	350	4.2	18.6	7.08	558.9	0.17	1.8	-82.3	12.3	Clear	No odor
1457	13.50	350	5.3	18.7	7.08	557.5	0.15	1.7	-87.0	12.1	Clear	No odor
1500	13.50	350	6.3	18.6	7.07	557.1	0.14	1.5	-89.9	10.9	Clear	No odor
1503	13.50	350	7.4	18.6	7.08	556.0	0.14	1.5	-91.5	10.6	Clear	No odor
1506	13.50	350	8.4	18.6	7.08	557.2	0.14	1.5	-94.1	10.1	Clear	No odor
1509	13.50	350	9.5	18.7	7.08	556.9	0.13	1.5	-96.1	9.99	Clear	No odor
1512	13.50	350	10.5	18.7	7.05	557.5	0.14	1.5	-97.7	10.3	Clear	No odor
1515	13.51	350	11.6	18.7	7.08	554.8	0.13	1.4	-99.9	9.41	Clear	No odor
1518	13.52	350	12.6	18.8	7.08	556.7	0.13	1.4	-100.7	9.67	Clear	No odor
1521	13.52	350	13.7	18.9	7.07	558.6	0.13	1.3	-100.6	9.59	Clear	No odor
1524	13.52	350	14.7	18.6	7.04	554.6	0.12	1.3	-102.8	9.05	Clear	No odor
1527	13.52	350	15.8	18.8	7.07	555.8	0.12	1.3	-102.0	9.18	Clear	No odor
1530	13.52	350	16.8	18.7	7.07	553.6	0.12	1.3	-102.2	8.55	Clear	No odor
1533	13.52	350	17.9	18.8	7.04	554.8	0.12	1.3	-102.5	8.61	Clear	No odor
1536	13.52	350	18.9	18.8	7.07	560.5	0.12	1.3	-102.1	8.55	Clear	No odor
1539	13.52	350	20.0	18.7	7.02	557.0	0.12	1.2	-101.4	8.32	Clear	No odor
1542	13.52	350	21.0	18.8	7.02	554.0	0.12	1.2	-101.8	8.19	Clear	No odor
1545	13.52	350	22.1	18.7	7.04	557.7	0.11	1.2	-105.9	8.48	Clear	No odor
1548	13.52	350	23.1	18.7	7.06	558.2	0.12	1.3	-107.6	8.54	Clear	No odor
1552	13.52	350	24.5	18.7	7.06	555.8	0.11	1.2	-108.1	8.63	Clear	No odor
												Final Controller Settings
												Setting ID: 98
												Pressure (PSI): 20
Final Purge Values:		1552	24.5	18.7	7.06	555.8	0.11	1.2	-108.1	8.63	Clear	**Ambient Air (°C):** 1

KN 12/17/19

Sample ID:	ALF-GW-PMW11A-20191217	**QA/QC Sample Collected:**	Yes
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/17/2019	*Field Blank ID:*	NA
Collection Time:	15:55	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	24.5	*Equipment Blank ID:*	NA
Sample Depth (feet):	27.0	*Filter Blank ID:*	ALF-GW-FLB01-20191217
Heavy Equipment in Area:	No	*Tubing Blank ID:*	ALF-GW-TUB01-20191217
		DI water lot #:	Pace Analytical Minnepolis, Fill date: 12/04/2109
Analysis:	RI	*Filter purged for minimum 500 mL:*	Yes
Tubing Lot #:	N/A	*Filter Lot #:*	H1826
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	Yes
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	16:00
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	16.6	**Bottom of Screen (ft. btoc):**	37.6

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
13.52	18.3	7.29	553.8	0.43	4.8	-45.2	6.77	Odor:	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	4	1	2	1	1	4
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/17/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	21.90
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	67.7
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	45.84 / 453.1
Project Number:	175578046		*if water column is < 4.5 L contact Field Coordinator*
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	63.0
Well ID:	PMW-11B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1350	21.90	200	0	17.2	7.07	563.6	0.41	4.1	-89.3	1.53	Clear	No odor
1353	21.90	200	0.6	17.3	7.03	573.4	0.24	2.5	-96.8	1.20	Clear	No odor
1356	21.90	200	1.2	17.4	7.01	578.4	0.20	2.0	-107.5	1.00	Clear	No odor
1359	21.90	200	1.8	17.4	7.01	578.6	0.19	2.0	-111.0	0.83	Clear	No odor
Final Purge Values:		1359	1.8	17.4	7.01	578.6	0.19	2.0	-111.0	0.83	Clear	

12/17/19

Final Controller Settings	
Setting ID:	103
Pressure (PSI):	30
Ambient Air (°C):	1

Sample ID:	ALF-GW-PMW11B-20191217	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/17/2019	*Field Blank ID:*	NA
Collection Time:	14:02	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.8	*Equipment Blank ID:*	NA
Sample Depth (feet):	63.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
Analysis:	RI	*Filter purged for minimum 500 mL:*	No
Tubing Lot #:	N/A	*Filter Lot #:*	None
Stability Reached (Y/N):	Yes	*Filter Sample Metals:*	No
If No, Provide Explanation	NA	*Other Filtered Samples Collected:*	As_Spec
		Sample on-Ice: Time:	14:06
		Drawdown Stabilized < 0.3 ft:	Yes
Top of Screen (ft. btoc):	57.3	**Bottom of Screen (ft. btoc):**	67.3

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
21.9	17.6	7.03	580.0	0.3	3.2	-117.3	0.58	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/17/2019	**Signature:**	
Sampler Name:	Kevin Ngyen	**Date:**	12/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	21.64
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	149.4
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	127.77 / 1262.94
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	144.0
Well ID:	PMW-11C	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1245	21.84	300	0	18.1	6.83	563.4	0.30	3.2	-46.6	6.16	Clear	Rotten egg-like odor
1248	21.84	300	0.9	18.2	6.85	567.4	0.20	2.1	-65.7	6.03	Clear	Rotten egg-like odor
1251	21.84	300	1.8	18.2	6.87	567.8	0.17	1.8	-76.1	6.75	Clear	Rotten egg-like odor
1254	21.84	300	2.7	18.2	6.91	569.0	0.14	1.5	-89.9	7.37	Clear	Rotten egg-like odor
1257	21.84	300	3.6	18.2	6.88	568.6	0.12	1.3	-93.7	6.93	Clear	Rotten egg-like odor
1300	21.85	300	4.5	18.2	6.86	568.2	0.12	1.3	-95.6	6.12	Clear	Rotten egg-like odor
1303	21.85	300	5.4	18.4	6.83	568.5	0.11	1.2	-98.0	6.53	Clear	Rotten egg-like odor
1306	21.85	300	6.3	18.3	6.80	567.5	0.10	1.1	-99.8	4.92	Clear	Rotten egg-like odor
1309	21.86	300	7.2	18.3	6.79	567.2	0.09	1.0	-100.6	4.45	Clear	Rotten egg-like odor
1312	21.86	300	8.1	18.4	6.78	566.6	0.10	1.1	-101.2	3.89	Clear	Rotten egg-like odor
Final Purge Values:		1312	8.1	18.4	6.78	566.6	0.10	1.1	-101.2	3.89	Clear	

Final Controller Settings	
Setting ID:	106
Pressure (PSI):	80
Ambient Air (°C):	1

Sample ID:	ALF-GW-PMW11C-20191217	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/17/2019	*Field Blank ID:*	NA
Collection Time:	13:15	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	8.1	*Equipment Blank ID:*	NA
Sample Depth (feet):	144.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	13:18
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	139.0	**Bottom of Screen (ft. btoc):**	149.0

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
21.86	17.7	7.02	560.5	0.29	2.9	-101.4	3.60	**Odor:**	Rotton egg-like odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/17/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	33.90
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	59.9
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	26.04 / 257.39
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	49.0
Well ID:	PMW-14A	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0810	33.97	200	0	15.7	6.81	686	0.43	4.2	168.8	1.23	Clear	No odor
0813	33.97	200	0.6	15.6	6.78	686	0.34	3.3	76.5	0.97	Clear	No odor
0816	33.97	200	1.2	15.8	6.81	682	0.27	2.7	-9.2	1.17	Clear	No odor
0819	33.97	200	1.8	15.9	6.84	682	0.25	2.5	-39.5	0.89	Clear	No odor
Final Purge Values:		0819	1.8	15.9	6.84	682	0.25	2.5	-39.5	0.89	Clear	

Final Controller Settings	
Setting ID:	99
Pressure (PSI):	30
Ambient Air (°C):	0

Sample ID:	ALF-GW-PMW14A-20191217	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/17/2019	*Field Blank ID:*	NA
Collection Time:	8:22	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	1.8	*Equipment Blank ID:*	NA
Sample Depth (feet):	49.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	8:26
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	38.5	**Bottom of Screen (ft. btoc):**	59.5

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
33.98	15.8	7.12	670	0.43	4.3	-15.4	1.14	**Odor:**	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/17/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	44.07
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	89.9
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	45.80 / 452.71
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	85.0
Well ID:	PMW-14B	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
0905	44.07	325	0	15.9	6.78	655	0.33	3.3	-32.1	3.35	Clear	No odor
0908	44.07	325	1.0	16.2	6.57	673	0.14	1.4	-58.2	2.41	Clear	No odor
0911	44.07	325	2.0	16.3	6.83	676	0.11	1.1	-93.1	1.90	Clear	No odor
0914	44.07	325	2.9	16.5	6.90	678	0.10	0.9	-109.1	1.54	Clear	No odor
0917	44.07	325	3.9	16.5	6.92	677	0.09	0.9	-119.7	1.28	Clear	No odor
Final Purge Values:			0917	3.9	16.5	6.92	677	0.09	0.9	-119.7	1.28	Clear

Final Controller Settings	
Setting ID:	104
Pressure (PSI):	45
Ambient Air (°C):	1

Sample ID:	ALF-GW-PMW14B-20191217	**QA/QC Sample Collected:**	Yes
		MS/MSD/LD collected:	No
Method of Sampling:	Low Flow	*Field Blank ID:*	ALF-GW-FB01-20191217
Sample Date:	12/17/2019	*Field Duplicate ID:*	NA
Collection Time:	9:20	*Equipment Blank ID:*	NA
Total Volume Purged (L):*	3.9	*Filter Blank ID:*	NA
Sample Depth (feet):	85.0	*Tubing Blank ID:*	NA
Heavy Equipment in Area:	No	*DI water lot #:*	Pace Analytical Minneapolis, Fill date: 12/04/2019
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	9:23
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	79.5	**Bottom of Screen (ft. btoc):**	89.5

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
44.07	16.3	6.96	669	0.31	3.2	-103.7	1.54	Odor:	No odor

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	2	2	4	2	2	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/17/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

TVA TDEC ORDER GROUNDWATER SAMPLING FORM

Project Name:	ALF RI Order	**Initial Depth to Water (feet):**	44.05
Plant Name:	Allen Fossil Plant ALF	**Total Depth of Well (feet):**	162.3
Plant Address:	2574 Steam Plant Rd, Memphis, TN 38109	**Total Water Column (feet) / (L)*:**	118.22 / 1168.54
			if water column is < 4.5 L contact Field Coordinator
Project Number:	175578046		
Goal/Task:	Groundwater Investigation	**Pump Intake Depth (feet):**	156.0
Well ID:	PMW-14C	**Method of Purging:**	Dedicated Pump
Well Type:	MW	**Measuring Point (toc, tor, etc.):**	toc
Well Diameter (inches):	4.0	**Date:**	12/17/2019

Time	Depth to Water (ft btoc)	Flow Rate (mL/min)	Volume (L)*	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color (visual)	Comments/Observations During Purging (sediment, odor, etc.)
Stabilization Criteria			*NA*	*NA*	*± 0.1*	*± 3%*	*< 0.5 mg/L or ± 10%*	*NA*	*NA*	*± 10% or < 5 NTU*	*NA*	
1009	44.09	500	0	16.7	7.18	365.1	0.14	1.4	-45.9	7.92	Clear	No odor
1012	44.09	500	1.5	16.5	6.97	365.8	0.10	1.0	-70.8	5.02	Clear	No odor
1015	44.09	500	3.0	16.8	6.94	365.7	0.09	0.9	-78.8	2.17	Clear	No odor
1018	44.09	500	4.5	16.9	6.88	366.6	0.08	0.8	-84.9	1.40	Clear	No odor
1021	44.09	500	6.0	16.8	6.86	366.7	0.08	0.8	-88.6	1.07	Clear	No odor
Final Purge Values:		1021	6.0	16.7	6.86	366.7	0.08	0.8	-88.6	1.07	Clear	

Final Controller Settings	
Setting ID:	55 (CMP2)
Pressure (PSI):	80
Ambient Air (°C):	1

Sample ID:	ALF-GW-PMW14C-20191217	**QA/QC Sample Collected:**	No
Method of Sampling:	Low Flow	*MS/MSD/LD collected:*	No
Sample Date:	12/17/2019	*Field Blank ID:*	NA
Collection Time:	10:24	*Field Duplicate ID:*	NA
Total Volume Purged (L):*	6.0	*Equipment Blank ID:*	NA
Sample Depth (feet):	156.0	*Filter Blank ID:*	NA
Heavy Equipment in Area:	No	*Tubing Blank ID:*	NA
		DI water lot #:	NA
		Filter purged for minimum 500 mL:	No
Analysis:	RI	*Filter Lot #:*	None
		Filter Sample Metals:	No
Tubing Lot #:	N/A	*Other Filtered Samples Collected:*	As_Spec
Stability Reached (Y/N):	Yes	*Sample on-Ice: Time:*	10:27
If No, Provide Explanation	NA	*Drawdown Stabilized < 0.3 ft:*	Yes
Top of Screen (ft. btoc):	151.9	**Bottom of Screen (ft. btoc):**	161.9

Post-sampling Parameters

Depth to Water (ft btoc)	Temp. (°C)	pH (SU)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)	Color:	Clear
44.09	16.6	6.88	365.1	0.2	2.1	-88.7	1.04	**Odor:**	None

WL Meter Manufacturer:	Heron	**Model:**	Dipper T	**Serial No:**	3558-T
Controller Unit Manufacturer:	QED	**Model:**	MP50	**Serial No:**	1854

Analytes:	**Metals**	**Anions**	**Radium 226/ 228**	**TDS**	**Alkalinity**	**As Spec**
Method:	SW 846 6020A/7470A	SW 846 9056A SM2320B	EPA 903.0/904.0 (21-day ingrowth)	SM 2540C	SM2320B	As Spec
Bottle Lot Number	102819-2EIZ	110419-2EIX	111819-2EEY	102119-2ADT	110419-2EIX	19-0208
Bottle Type:	Plastic	Plastic	Plastic	Plastic	Plastic	Glass
Volume (mL):	250	250	1000	500	250	10
No. of Bottles Collected:	1	1	2	1	1	2
Preservative:	HNO_3	Unpreserved	HNO_3	Unpreserved	Unpreserved	EDTA

Lead Sampler Name:	Bryan Pennell	**Date:**	12/17/2019	**Signature:**	
Sampler Name:	Kevin Nguyen	**Date:**	12/17/2019	**Signature:**	
FTL/Designee Review by:	Cassidy Sutherland	**Date:**	1/14/2020	**Signature:**	
DL/SME Review by:	Matthew Dower	**Date:**	1/16/2020	**Signature:**	

*Does not include volume purged during establishment of stable flow rate

APPENDIX C
GEOCHEMICAL EVALUATION OF ALLUVIAL AQUIFER BACKGROUND GROUNDWATER QUALITY FOR ALLEN FOSSIL PLANT TECHNICAL MEMORANDUM

GEOCHEMICAL EVALUATION OF ALLUVIAL AQUIFER BACKGROUND GROUNDWATER QUALITY FOR ALLEN FOSSIL PLANT TECHNICAL MEMORANDUM

Prepared for:

Tennessee Valley Authority
Allen Fossil Plant
Memphis, Tennessee

Prepared by:

Stantec Consulting Services Inc.

1340 Treat Boulevard Suite 300
Walnut Creek CA 94597-7966

July 2, 2020

SIGN-OFF SHEET

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GEOCHEMICAL EVALUATION OF ALLUVIAL AQUIFER BACKGROUND GROUNDWATER QUALITY FOR ALLEN FOSSIL PLANT TECHNICAL MEMORANDUM

July 2, 2020

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Figure 3 ACC Plant Wells Radial Diagrams

Figure 4 ALF Wells Radial Diagrams

Figure 5 ACC Plant and ALF Monitoring Wells Calcium-Boron Cross Plot

1.0 INTRODUCTION

This Technical Memorandum was prepared by Stantec Consulting Services, Inc. (Stantec) to summarize the results of a geochemical evaluation of groundwater analytical data from the Allen Combined Cycle (ACC) Plant monitoring wells located at the Tennessee Valley Authority (TVA) Allen Fossil Plant (ALF) in Memphis, Tennessee. These Alluvial aquifer wells, composed of ACC-1A, ACC-3A, ACC-5A, ACC-5B, and ALF-216 (collectively referred to herein as the ACC Plant wells) are used as background monitoring wells in the Remedial Investigation (RI) and Groundwater Interim Response Action (IRA) groundwater monitoring program at the East Ash Disposal Area (EADA) (**Figure 1**). The purpose of the evaluation presented in this technical memorandum was to determine whether there is geochemical evidence that the groundwater in the background ACC Plant wells is influenced by EADA coal combustion residuals (CCR).

Representative site-specific background threshold values (BTVs) were established for CCR Rule Appendix III and Appendix IV constituents, Tennessee Department of Environment and Conservation (TDEC) Appendix I Metals, and additional water quality criteria by MacStat (2020) and Stantec (2020). Groundwater quality in downgradient wells was subsequently evaluated based on comparisons to these established BTVs. The Stantec statistical evaluation memorandum provided a review of the derived BTVs and the results of the statistical comparison of these BTVs to groundwater quality observed in downgradient wells (Stantec, 2020).

2.0 HYDROGEOLOGY

Geologic mapping indicates that the EADA is immediately underlain by fill and Quaternary age (Holocene-upper Pleistocene) alluvium deposits. The upper portion of this alluvium unit is composed of fine- to medium-grained silty sand with intervals of clay, clayey silty sand, clayey sand, sandy silt, clayey silt, and silty clay that compose an upper alluvium deposit and an underlying interbedded “blue clay” zone ranging in thickness from one to 27 ft. Because of the fine-grained, less permeable nature of the blue clay zone, groundwater elevations were found to be mounded within this zone (i.e., elevated by several feet relative to the underlying, more permeable sandy intervals of the Alluvial aquifer). The section of alluvium underlying the blue clay zone is more uniform than the upper section and is dominated by sands with less than 5% fines. This section of fine- to coarse-grained sand with trace to common fine- to coarse-grained gravel compose the sandy zone of the shallow Alluvial aquifer. The sand lithology of the underlying intermediate and deep intervals of the Alluvial aquifer becomes more poorly sorted, with coarser-grained sands and increasing occurrences of gravelly sand and sandy gravel at depth.

The EADA is located in an area of Shelby County where the regional groundwater flow direction is toward the north or northwest (Brahana and Broshears, 2001). Locally, the horizontal groundwater flow directions in the shallow, intermediate, and deep intervals of the Alluvial aquifer at the EADA are influenced by the stage height of adjacent McKellar Lake to the north, which ranges between approximately 175 to 220 feet elevation. Site-specific transducer data recorded between September 2017 and December 2018 indicates groundwater elevation fluctuations at individual wells ranged up to 40 ft with an average of approximately 25 ft variation over time across the ALF. During relatively low lake levels, groundwater flow direction was generally northward toward McKellar Lake at the EADA. During relatively high lake levels, the groundwater flow direction was southward from the lake toward the EADA. These trends were observed throughout the 2019 groundwater monitoring period. High lake levels (e.g., 209.89 ft elevation [April 2019], 212.53 ft elevation [June 2019], and 205.25 ft elevation [December 2019]) resulted in groundwater flow to the south to south-southeast toward the EADA. Lower lake levels (e.g., 189.58 ft elevation [September 2019]) resulted in groundwater flow to the north to north-northeast toward McKellar Lake.

Because the five designated background wells at the ACC Plant (the ACC Plant wells) appear to be situated downgradient of the EADA in those periods of relatively high McKellar Lake levels, the groundwater geochemistry represented by the ACC Plant wells was reviewed to evaluate whether it represents background conditions or has been influenced by CCR.

The following sections summarize the results of the geochemical analysis.

3.0 GEOCHEMICAL EVALUATION

Stantec evaluated the general ion chemistry of groundwater from the ACC Plant wells using Piper diagrams and radial plots. In addition, cross plots were developed to evaluate whether the groundwater chemistry of ACC wells appeared to be influenced by CCR constituents from the EADA. This section summarizes the groundwater analytical data set, the general ion parameters that were characterized, the methods used to evaluate the general ion chemistry, and the cross plots used during the evaluation.

The background groundwater quality analysis relied on analytical data available from the five ACC Plant wells (ACC-1A, ACC-3A, ACC-5A, ACC-5B, and ALF-216) covering the period between October 2017 and December 2019. For comparison, a subset of wells located near the southern border of the EADA were selected for evaluation, including wells known to be impacted by CCR. These wells are: ALF-201, ALF-201A, ALF-201B; ALF-202, ALF-202A, ALF-202B; ALF-212, ALF-212A; and ALF-214, ALF-214A, and ALF-214B (see Table 3-1 in Stantec, 2019 for well screen elevation details for the ACC-series and ALF-series monitoring wells).

The general ion chemistry was analyzed using Piper and radial diagrams to illustrate the distribution of major ions (calcium, magnesium, potassium, sodium, bicarbonate, carbonate, chloride, and sulfate). Piper diagrams (**Figure 2** for ACC Plant and ALF wells) and radial plots (**Figure 3** for ACC Plant wells and **Figure 4** for ALF wells) were developed using data from the December 2019 groundwater monitoring event. Seasonal fluctuations resulted in only minor differences to the ionic signatures.

3.1 PIPER DIAGRAMS

On the Piper diagrams, ACC Plant wells are represented by solid symbols and EADA monitoring wells are represented by open symbols. The ACC Plant wells cluster with a similar water type that is dominated by calcium and bicarbonate. EADA well ALF-214 has a similar distribution to the ACC wells, but ALF-202 (known to be impacted with CCR constituents) has a higher proportion of sulfate, an indicator of CCR influence. Major ion distributions of other EADA wells exist between the two endmembers.

3.2 RADIAL DIAGRAMS

The radial diagrams are provided as **Figures 3** and **4. Figure 3** indicates there are minor changes in the relative distribution of ions within the ACC Plant wells that may be representative of natural variability within flow zones at different depths of the Alluvial aquifer. These ACC Plant wells indicated a calcium-bicarbonate water type with a relatively similar distribution. **Figure 4** indicates a different major ion distribution, as represented by the differences in shape, for some of the EADA wells that have been impacted by CCR constituents. For example, ALF-202 exhibits more of a mixed magnesium and calcium-sulfate water type and shape, that is distinctly different from the ACC Plant wells that are predominantly calcium-bicarbonate water type. The other ALF wells exhibit variable major ion chemistry ranging from calcium-bicarbonate to a mixed calcium-sulfate-bicarbonate type depending on the extent of CCR influence.

3.3 CROSS PLOTS

Cross plots were used to evaluate the geochemical signature of the groundwater observed in the ACC Plant wells compared to the groundwater around the EADA. A cross plot between calcium and boron was selected for this analysis because calcium is a common dominant cation observed in all of the wells and boron is a highly mobile CCR constituent that has the greatest potential to migrate from the EADA to the ACC Plant wells under a southward groundwater flow gradient. **Figure 5** is the calcium-boron cross plot that includes both the ACC Plant and EADA wells. The oval on the figure highlights the ACC Plant wells that do not appear to contain boron above background concentrations. The calcium-boron cross plot shows no correlation between calcium and boron for ACC Plant wells (i.e., the wells all plot along the same boron concentration independent of calcium concentration), indicating that the ACC Plant wells were not influenced by boron from the EADA. In contrast, the EADA well calcium concentrations vary with boron concentration, as would be expected given that calcium is a constituent in CCR. The lack of boron correlation with calcium across the ACC Plant wells, suggests that the influence of CCR constituents observed in some EADA wells does not extend to the ACC Plant wells.

4.0 SUMMARY

Based on an assessment of geochemical conditions, the periodic reversals of groundwater flow gradients caused by fluctuations in McKellar Lake do not appear to have resulted in migration of CCR constituents from the EADA into the area around the ACC Plant wells, indicating that the ACC Plant wells are representative of upgradient background conditions. The following is a summary of the geochemical evaluation findings:

- All ACC Plant wells have similar ion chemistry that is predominantly calcium-bicarbonate water type, which differs significantly from some EADA wells that exhibit influence of CCR constituents (see **Figures 2**, **3**, and **4**).
- A cross plot between calcium and boron for the ACC Plant and EADA wells shows no correlation between calcium and boron for ACC Plant wells indicating that the influence of CCR constituents observed in some EADA wells does not extend to the ACC Plant wells (see **Figure 5**).

5.0 REFERENCES

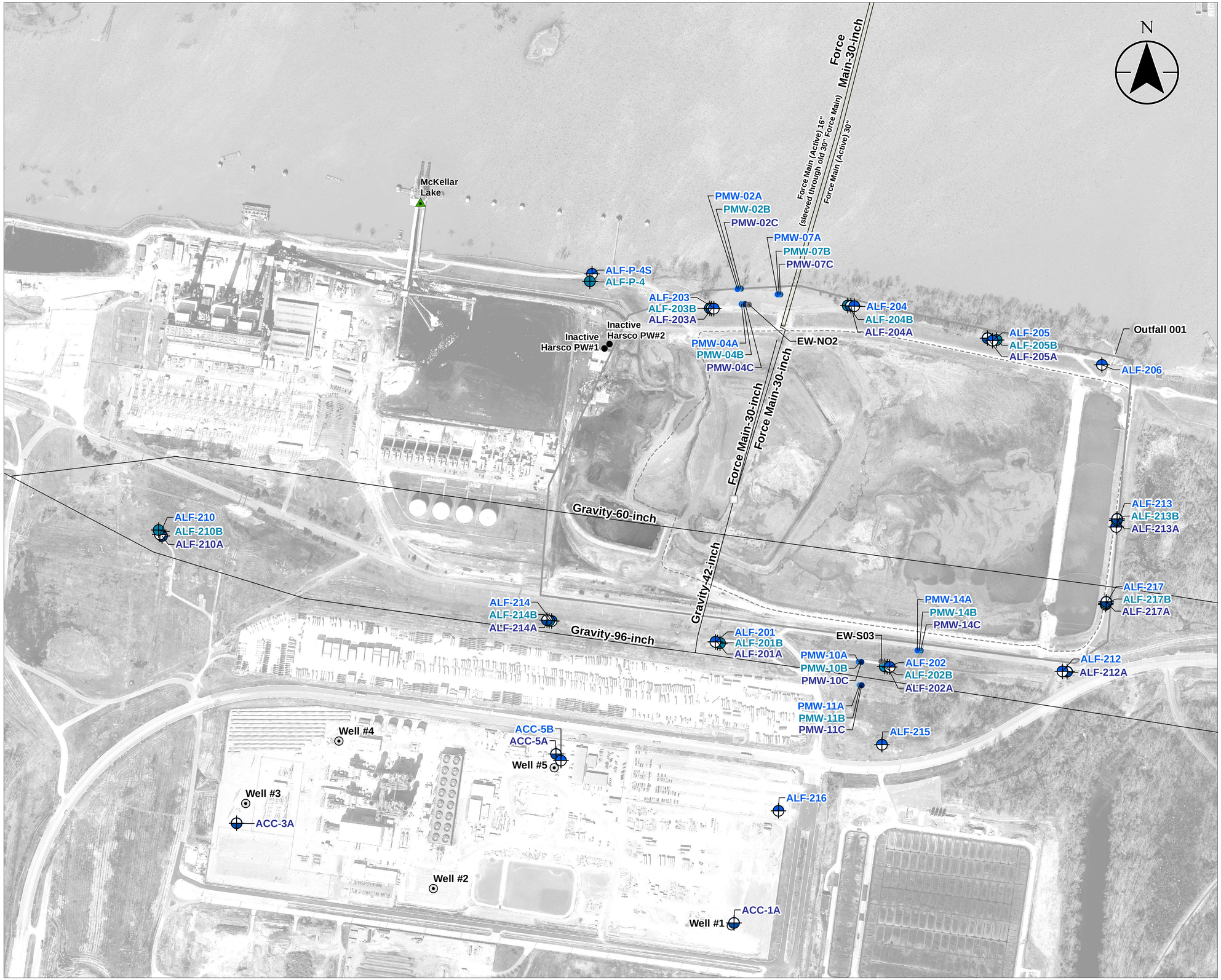
Brahana, J.V. and R.E. Broshears, 2001. Hydrogeology and ground-water flow in the Memphis and Fort Pillow aquifers in the Memphis area, Tennessee, *Water-Resources Investigations Report 89-4131*, 56 p.

Cameron, K., 2020. 2019 Statistical Analysis Report for Allen Fossil Plant Remedial Investigation, MacStat Consulting, Ltd, January 29, 2020 [Appendix to Draft 2019 *Remedial Investigation & Interim Response Action Groundwater Monitoring Annual Report for TVA ALF*].

Stantec Consulting Services Inc., 2019. *Updated TVA Allen Fossil Plant – East Ash Disposal Area – Remedial Investigation Report*, May 31, 2018

Stantec Consulting Services, Inc. 2020. Draft 2019 Statistical Evaluation of Background Groundwater Quality for Allen Fossil Plant Technical Memorandum [Appendix to Draft 2019 *Remedial Investigation & Interim Response Action Groundwater Monitoring Annual Report for TVA ALF*].

FIGURES



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U:\TVA-EP\175577395\gis\mxds\ACC\ALF_1_MonitoringWells.mxd Revised: 2020-04-09 By: mbaugh

Figure No.
1

Title
Allen Fossil Plant and ACC Plant Well Locations

Client/Project
Tennessee Valley Authority
Allen Fossil Plant

Project Location
Memphis, Tennessee

175577013
Prepared by LT on 2020-04-09
Technical Review by JJ on 2020-04-09

0 250 500 750 1,000 Feet
1:3,000 (At original document size of 22x34)

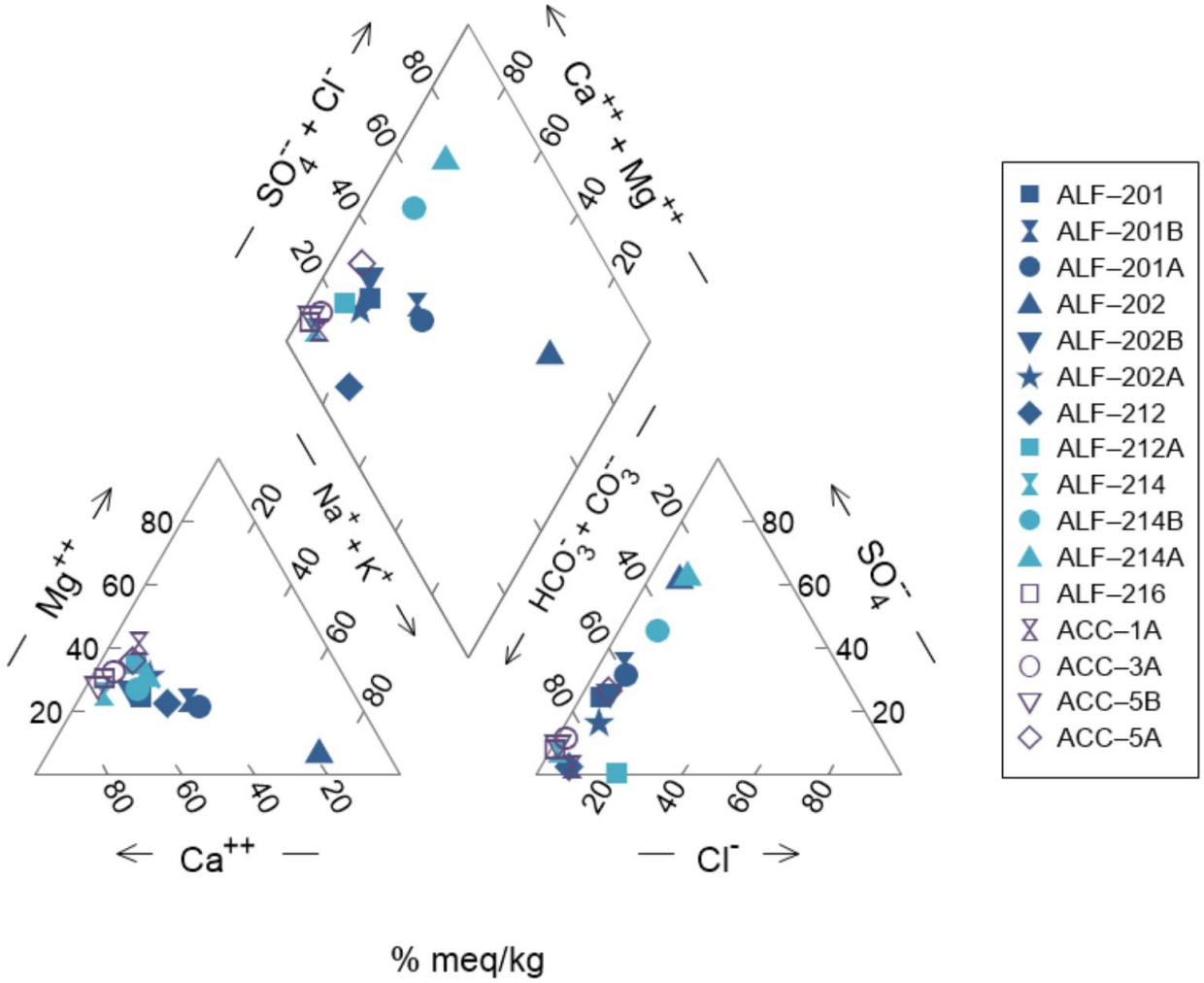
Legend

- Inactive Harsco Production Wells (PW)
- McKellar Lake Gauging Station
- Performance Monitoring Well (PMW) (Shallow)
- Performance Monitoring Well (PMW) (Intermediate)
- Performance Monitoring Well (PMW) (Deep)
- IRA Extraction Well (EW)
- Monitoring Well (Shallow)
- Monitoring Well (Intermediate)
- Monitoring Well (Deep)
- Production Well (Memphis Sand)
- Sewer Manhole Location of Force Main Transition to Gravity
- Sanitary Sewer Pipes
- East Ash Pond Boundary
- 2019 Imagery Boundary

Wells are screened in the Alluvial Aquifer unless otherwise noted.

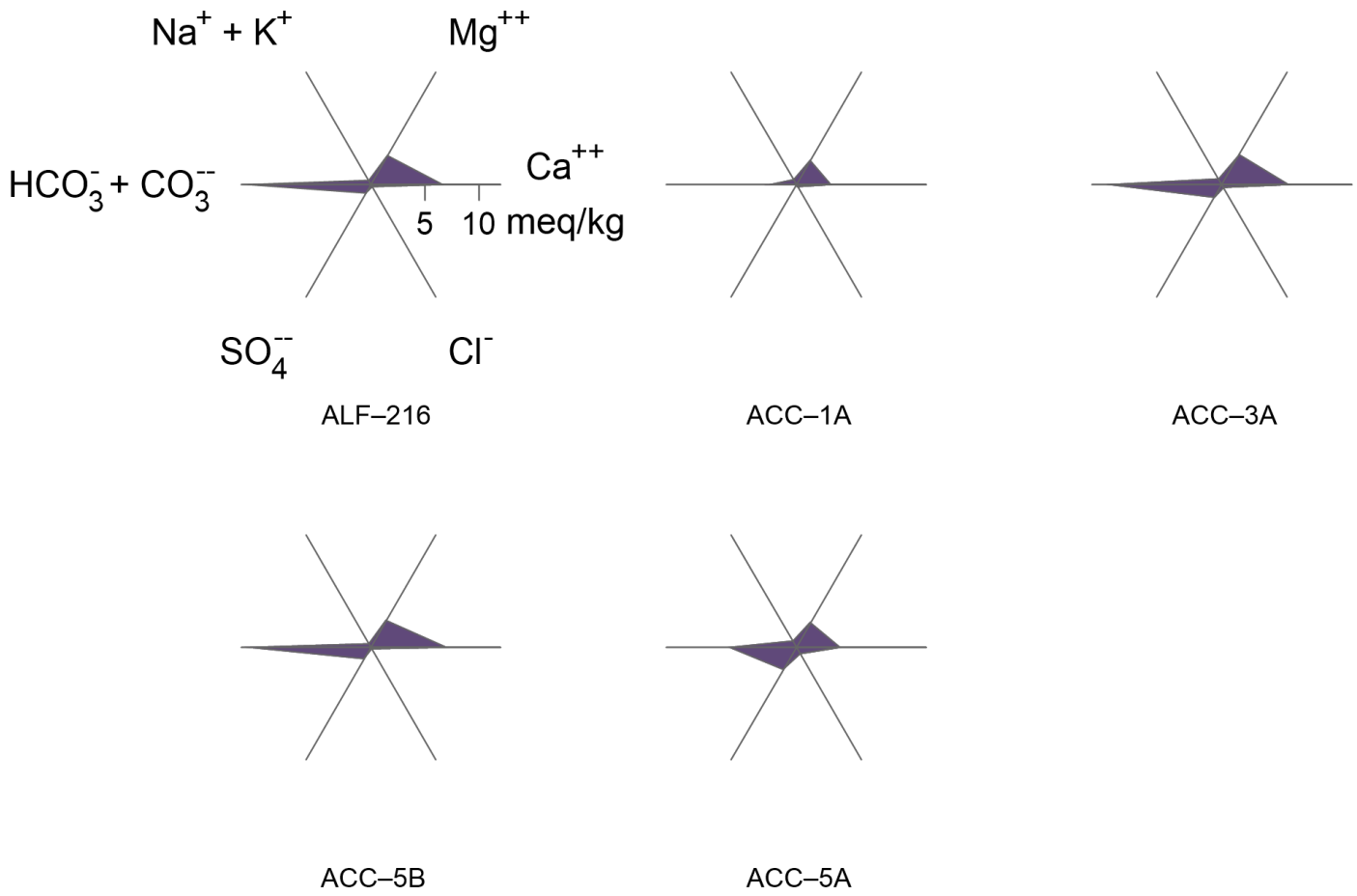
Notes
1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Imagery Provided by TVA dated 3/15/2018 and 6/4/2019

Stantec TVA

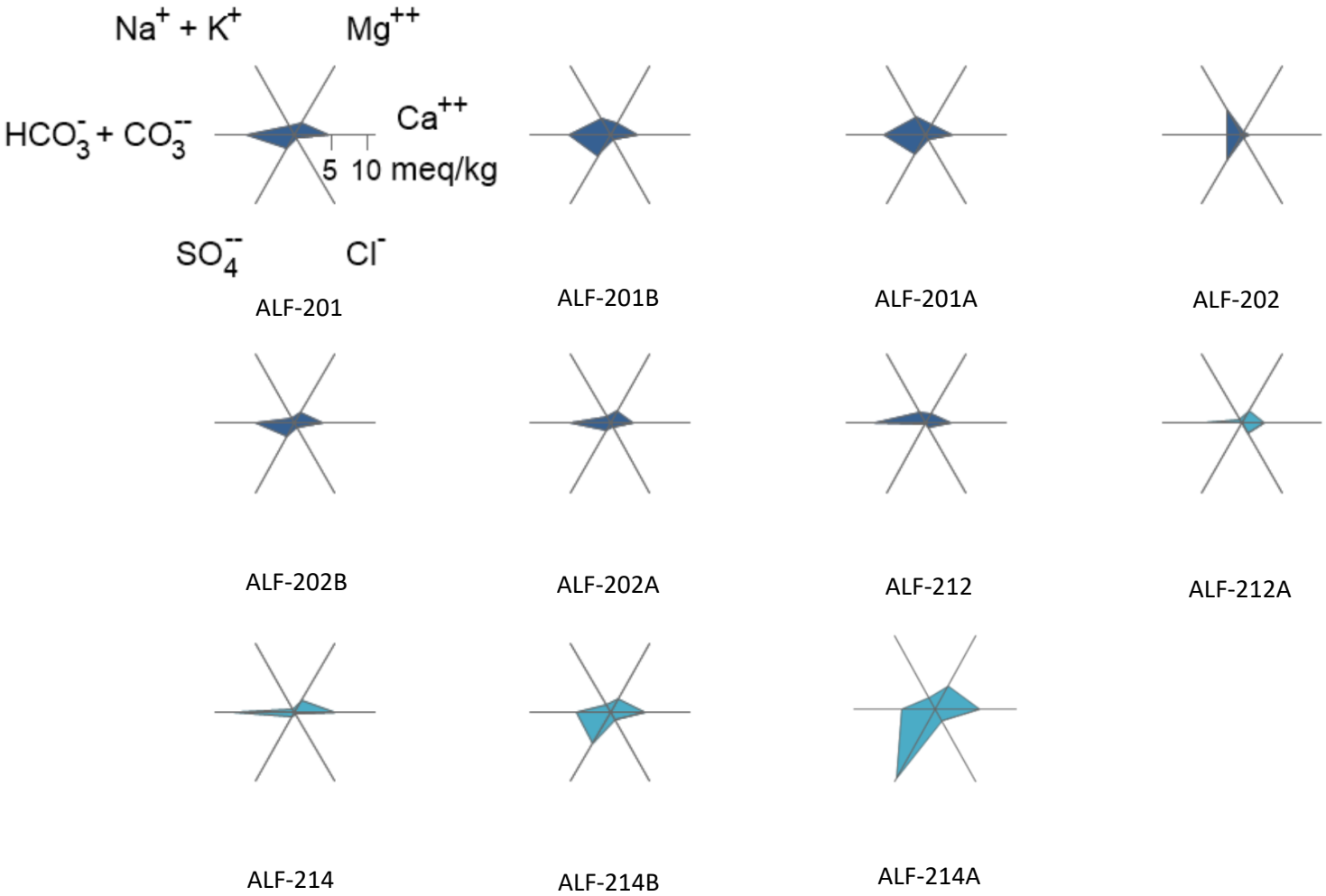


Stantec

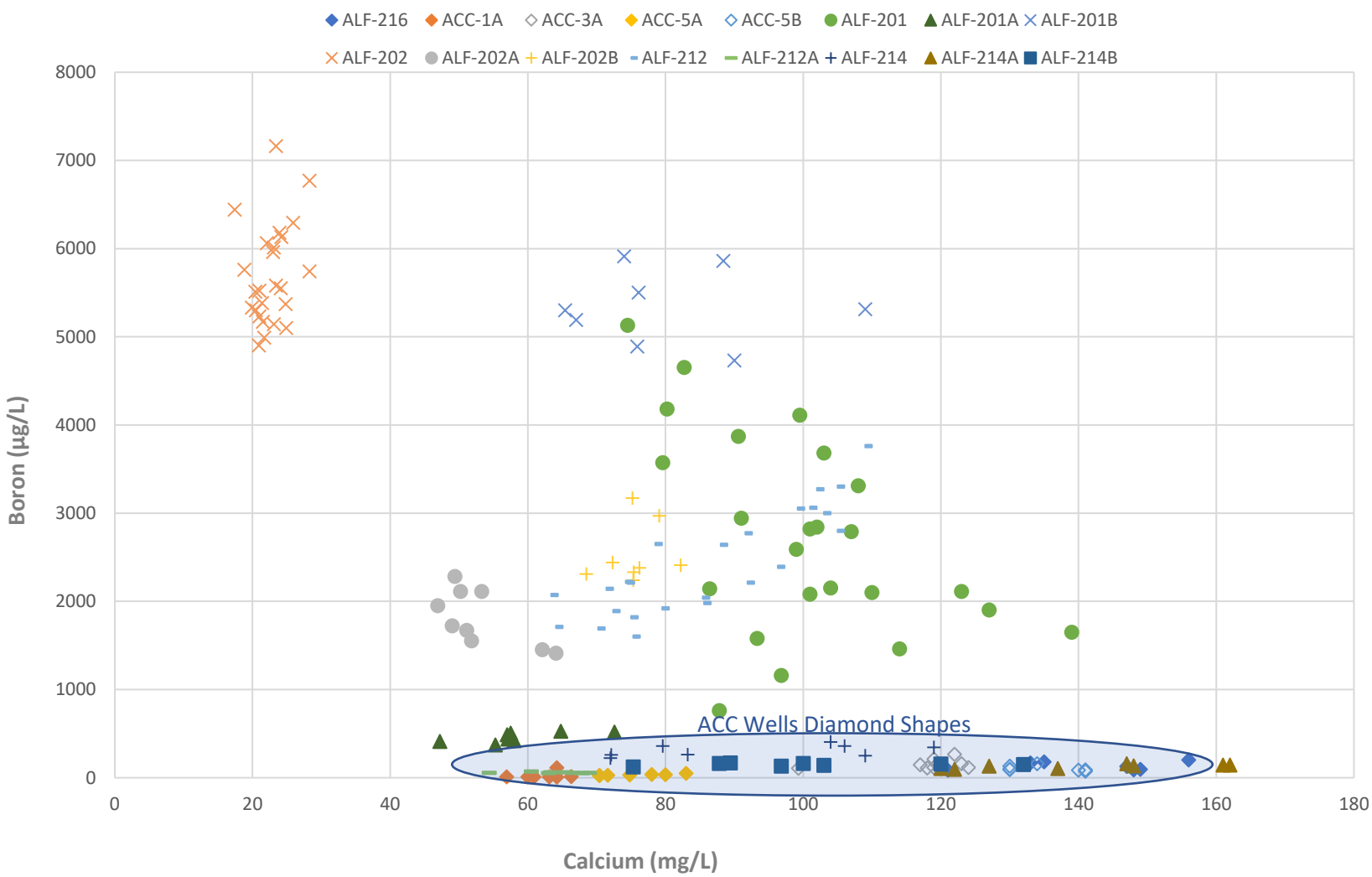
Title	Piper Diagram for Select Groundwater Monitoring Wells - Dec 2019		
Project Name	ALF Background Evaluation	Project No. 175578046	FIGURE
Client Name	TVA Allen Fossil Plant	Date 6/30/2020	2



Stantec	Title: **Radial Diagram for Background Monitoring Wells - Dec 2019**		
	Project Name: ALF Background Evaluation	Project No.: 175578046	FIGURE
	Client Name: TVA Allen Fossil Plant	Date: 6/30/2020	3



Stantec	Title: **Radial Diagram for Select Monitoring Wells - Dec 2019**		
	Project Name: ALF Background Evaluation	Project No.: 175578046	FIGURE
	Client Name: TVA Allen Fossil Plant	Date: 6/30/2020	4



Stantec

TVA

Title	**Calcium-Boron Cross Plot**		
Project Name	ALF Background Evaluation	Project No. 175578046	FIGURE
Client Name	TVA Allen Fossil Plant	Date 6/30/2020	5

APPENDIX D
2019 STATISTICAL EVALUATION OF BACKGROUND GROUNDWATER QUALITY FOR ALLEN FOSSIL PLANT TECHNICAL MEMORANDUM

Stantec

TECHNICAL MEMORANDUM

2019 Statistical Evaluation of Background Groundwater Quality for Allen Fossil Plant

Prepared for:

Tennessee Valley Authority
Allen Fossil Plant
Memphis, Tennessee

Prepared by:

Stantec Consulting Services Inc.

March 13, 2020

SIGN-OFF SHEET

This document entitled 2019 Statistical Evaluation of Background Groundwater Quality for Allen Fossil Plant, was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of the Tennessee Valley Authority (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

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Vice President

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APPENDICES

Appendix A 2019 Statistical Analysis Report for Allen Fossil Plant Remedial Investigation

1.0 INTRODUCTION

This Technical Memorandum was prepared by Stantec Consulting (Stantec) to summarize the results of a statistical evaluation performed by MacStat Consulting Ltd., documented in a report entitled "2019 Statistical Analysis Report for Allen Fossil Plant Remedial Investigation." The purpose of the statistical evaluation was to support groundwater evaluations associated with the Remedial Investigation and Groundwater Interim Response Action around the East Ash Disposal Area, located at the Tennessee Valley Authority (TVA) Allen Fossil Plant (ALF) in Memphis, Tennessee.

Representative site-specific background groundwater concentrations were established for CCR Rule Appendix III and Appendix IV constituents, Tennessee Department of Environment and Conservation (TDEC) Appendix I Metals, and additional water quality criteria. Groundwater quality in downgradient wells was subsequently evaluated based on comparisons to these established background groundwater values. This memorandum provides a review of the derived background groundwater values and the results of the statistical comparison of these values to groundwater quality observed in downgradient wells. A summary of the statistical methods applied to complete these analyses is also provided. Additional details regarding these statistical methods are provided in the MacStat report which has been included as **Appendix A** of this memorandum.

This evaluation supersedes background values used for comparison purposes in earlier reports. The values presented herein represent one point in time and may be updated in the future as appropriate.

2.0 EVALUATION OF BACKGROUND GROUNDWATER QUALITY

Statistical methods were applied to establish representative site-specific background groundwater concentrations for CCR Rule Appendix III and Appendix IV constituents, TDEC Appendix I Metals and additional water quality criteria. This section summarizes the data used, the statistical approach applied, and the results of this background groundwater quality analysis.

2.1 BACKGROUND GROUNDWATER MONITORING NETWORK

The background groundwater quality analysis relied on data available from five wells that are hydraulically upgradient of the ALF coal combustion residual (CCR) units and do not exhibit constituents typically associated with CCR-impacted groundwater (e.g., boron, sulfate) (**Table 1, Figure 1**). All wells are located within the Alluvial aquifer at various depths.

Table 1. Background Groundwater Monitoring Network Wells for Allen Fossil Plant

Well ID	Screen Elevation (ft msl)	Screen Depth (ft bgs)
ALF 216	177.6-157.6	35.3-55.3
ACC-1A	54.7-44.7	156.2-166.2
ACC-3A	98.7-88.7	117-127
ACC-5A	86.8-76.8	129.8-139.8
ACC-5B	170.1-160.1	45.9-55.9

2.2 SAMPLING EVENTS INCLUDED IN BACKGROUND GROUNDWATER QUALITY STATISTICAL ANALYSES

Background groundwater quality statistical analyses were conducted using validated analytical data collected from the following seven sampling events performed at ALF: September 2017, October 2017, November 2017, November 2018, April 2019, June 2019, and September 2019. Stantec collected groundwater samples; Pace Laboratories performed the laboratory analysis; and Environmental Standards Inc. provided Data Quality Assurance.

2.3 BACKGROUND CONSTITUENTS

Site-specific background concentrations were established for the constituents listed in **Table 2.**

Table 2. Background Groundwater Constituents Assessed for Allen Fossil Plant

CCR Rule Appendix III Constituents	CCR Rule Appendix IV Constituents	TDEC Appendix I Metals	Additional Constituents
Boron	Antimony	Copper	Magnesium
Calcium	Arsenic	Nickel	Potassium
Chloride	Barium	Silver	Sodium
Fluoride	Beryllium	Vanadium	Alkalinity as Bicarbonate
Sulfate	Cadmium	Zinc	Alkalinity as Carbonate
pH (SU)	Chromium (total)		
Total Dissolved Solids	Cobalt		
	Fluoride		
	Lead		
	Lithium		
	Mercury (inorganic)		
	Molybdenum		
	Selenium		
	Thallium		
	Radium 226 & 228		

2.4 STATISTICAL METHODS

For each evaluated constituent, data collected from the five background groundwater monitoring wells identified in **Section 2.1** were relied on to calculate representative site-specific background concentrations following accepted statistical procedures and methods as described in the USEPA document "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. Unified Guidance" (Unified Guidance – USEPA, 2009). A brief summary of the methods used is provided below.

1. Outlier testing. Data from all five wells were pooled and screened for outliers. Two outliers were confirmed in total, one for Total Dissolved Solids (TDS) and one for zinc (see **Appendix A**). These outliers were excluded from further analysis.

2. Testing for normality. The pooled baseline data (with identified outliers excluded) were analyzed to determine whether they could be fit to a known statistical model. This was achieved by applying a series of mathematical transformations to the data and then testing the transformed data for normality using Filliben's normality test. For datasets that were normal or could be normalized using a mathematical transformation, the best-fitting model for that dataset is identified in **Table 1**. The remaining datasets, for which no suitable normalizing distribution was identified, are identified in **Table 1** as non-parametric.

3. Calculation of tolerance limits or tolerance intervals. Per the Unified Guidance, upper tolerance limits (UTLs) were then generated using either parametric methods (for data that fit a known distribution) or non-parametric methods (if no suitable distribution was identified). When all data for a COC were non-detect, the UTL was set to the highest reported detection limit. For pH, a lower tolerance limit (LTL) was also calculated to create a tolerance interval.

2.5 BACKGROUND THRESHOLD VALUES

A mix of parametric and non-parametric methods were employed to calculate site-specific UTLs (and an LTL for pH). The choice of method was dependent solely on data characteristics. The background data set will be updated when additional samples are collected from the background groundwater monitoring network and re-evaluation is deemed necessary.

The resulting UTLs (and LTL for pH) are summarized in **Table 3**

Table 3. Background Groundwater Quality Tolerance Limits and Tolerance Intervals for Allen Fossil Plant

Constituent	Unit	Sample Size (n)	Percent Non-Detects	Distribution	Tolerance Limit Method	Confidence	95% LTL	95% UTL
CCR Rule Appendix III Constituents								
Boron	mg/L	33	21%	Normal	Parametric	0.95	NA	0.24
Calcium	mg/L	33	0%	Cube	Parametric	0.95	NA	160
Chloride	mg/L	33	0%	Log	Parametric	0.95	NA	23
Fluoride	mg/L	33	0%	Log	Parametric	0.95	NA	0.23
pH	SU	33	0%	Log	Parametric	0.95	6	7.7
Sulfate	mg/L	33	3%	Square Root	Parametric	0.95	NA	130
Total Dissolved Solids (TDS)	mg/L	32	0%	Square	Parametric	0.95	NA	620
CCR Rule Appendix IV Constituents								
Antimony	mg/L	33	97%	Non-parametric	Non-parametric	0.82	NA	0.0025
Arsenic	mg/L	33	0%	Log	Parametric	0.95	NA	0.0098
Barium	mg/L	33	0%	Normal	Parametric	0.95	NA	1.1
Beryllium	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0005
Cadmium	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0004
Chromium	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0025
Cobalt	mg/L	33	39%	Log	Parametric	0.95	NA	0.0071
Fluoride	mg/L	33	0%	Log	Parametric	0.95	NA	0.23
Lead	mg/L	33	85%	Non-parametric	Non-parametric	0.82	NA	0.0005
Lithium	mg/L	33	6%	Cube Root	Parametric	0.95	NA	0.034
Mercury	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0002
Molybdenum	mg/L	33	15%	Log	Parametric	0.95	NA	0.002
Rad226+228	pCi/L	33	0%	Tenth Root	Parametric	0.95	NA	3.8
Selenium	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0025
Thallium	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0005
TDEC Metals Appendix I Constituents								
Copper	mg/L	33	88%	Cube Root	Parametric	0.95	NA	0.0017
Nickel	mg/L	33	39%	Log	Parametric	0.95	NA	0.012
Silver	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.002
Vanadium	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	0.0015
Zinc	mg/L	32	63%	Cube Root	Parametric	0.95	NA	0.01
Additional Constituents								
Magnesium	mg/L	33	0%	Normal	Parametric	0.95	NA	47
Potassium	mg/L	33	0%	Square	Parametric	0.95	NA	3.5
Sodium	mg/L	33	0%	Log	Parametric	0.95	NA	21
Alkalinity, Bicarbonate (as CaCO3)	mg/L	33	0%	Cube	Parametric	0.95	NA	560
Alkalinity, Carbonate (as CaCO3)	mg/L	33	100%	Non-parametric	Non-parametric	0.82	NA	5

3.0 EVALUATION OF DOWNGRADIENT GROUNDWATER QUALITY

Statistical methods were applied to compare current groundwater conditions across the ALF groundwater monitoring network to the background groundwater conditions established in **Section 2.0**. This section summarizes the data used, the statistical approach applied, and the results of this statistical evaluation.

3.1 GROUNDWATER MONITORING NETWORK

A summary of the general locations and well depths of the groundwater monitoring network wells included in the statistical comparison to background groundwater conditions is provided in **Table 4**. The focus of this analysis was to compare concentrations of constituents in groundwater samples from downgradient wells to upper and lower (where applicable) tolerance limits that were developed based on background well concentrations. The wells used to determine the background concentrations (ALF 216, ACC-1A, ACC-3A, ACC-5A, and ACC-5B) were also included in this analysis.

Table 4. Summary of Groundwater Monitoring Network Wells for Allen Fossil Plant

Background Wells		South-Side Wells		North-Side Wells		East-Side Wells	
Well ID	Bottom of Well Elevation (ft NGVD 29)	Well ID	Bottom of Well Elevation (ft NGVD 29)	Well ID	Bottom of Well Elevation (ft NGVD 29)	Well ID	Bottom of Well Elevation (ft NGVD 29)
ALF-216	157	ALF-201	172	ALF-203	168	ALF-212	171
ACC-1A	44	ALF-201B	128	ALF-203B	128	ALF-212A	70
ACC-3A	88	ALF-201A	92	ALF-203A	100	ALF-213	159
ACC-5A	76	ALF-202	175	ALF-204	159	ALF-213A	119
ACC-5B	160	ALF-202B	126	ALF-204B	125	ALF-213B	78
		ALF-202A	70	ALF-204A	98	ALF-217	169
		ALF-210	171	ALF-205	165	ALF-217A	109
		ALF-210A	90	ALF-205B	135	ALF-217B	48
		ALF-214	166	ALF-205A	109		
		ALF-214B	128	ALF-206	162		
		ALF-214A	88	ALF-P4	138		
		ALF-215	186	ALF-P4S	166		
		ALF-PMW10A	178	ALF-PMW02A	180		
		ALF-PMW10B	149	ALF-PMW02B	161		
		ALF-PMW10C	70	ALF-PMW02C	90		
		ALF-PMW11A	180	ALF-PMW04A	180		
		ALF-PMW11B	150	ALF-PMW04B	159		
		ALF-PMW11C	69	ALF-PMW04C	91		
		ALF-PMW14A	180	ALF-PMW07A	190		
		ALF-PMW14B	151	ALF-PMW07B	159		
		ALF-PMW14C	78	ALF-PMW07C	96		

3.2 SAMPLING EVENTS INCLUDED IN EVALUATION

Data collected from the wells listed in **Table 4** between May 2017 and September 2019 were relied on to provide a statistical evaluation of current groundwater conditions across the ALF groundwater monitoring network to the background groundwater conditions established in **Section 2.0**. Stantec Consulting Services, Inc. (Stantec) collected groundwater samples; Pace Laboratories performed the laboratory analysis; and Environmental Standards Inc. provided Data Quality Assurance.

3.3 STATISTICAL METHODS

For each evaluated constituent, accepted statistical procedures and methods as described in the USEPA document "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. Unified Guidance" (Unified Guidance – USEPA, 2009) were applied to compare current groundwater conditions across the ALF groundwater monitoring network to the background groundwater conditions established in **Section 2.0**. A brief summary of the methods used is provided below.

1. Outlier testing. Data for each well-constituent pair were reviewed to identify possible outliers and outlier testing was applied as needed. In total, 18 outliers were identified and excluded from subsequent calculations (see **Appendix A**).

2. Constructing linear confidence bands for each well-constituent pair. For each well-constituent pair (with identified outliers excluded), a linear trend line was fit to the data and a confidence interval band corresponding to a 99% lower confidence limit was constructed. Where non-detect data were present, this process involved an adjustment made to incorporate the censored measurements. This adjustment is described in more detail in **Appendix A.**

3. Comparison of confidence interval bands to the derived background groundwater tolerance limits or tolerance intervals. Each confidence band was compared against the appropriate background threshold values (BTVs) derived in **Section 2.5**. For most constituents, a statistically significant increase (SSI) above the background concentration was only determined when the entire confidence band exceeded the BTV at the most recent sampling event. The only exception was for pH, for which an SSI was determined if the confidence band either fully exceeded the upper BTV or was fully below the lower BTV.

3.4 RESULTS

The final linear trend lines and confidence bands for each constituent and well, contrasted with the background threshold values determined in **Section 2.0** are provided in full in **Appendix A**. A summary of the results of this analysis is provided in **Table 5**. In this table, each well-constituent pair is color coded according to the following classifications:

- Green: Confidence band is below or within the BTV limits for the most recent sampling event.
- Yellow: The upper edge of the confidence band exceeds the BTV or the lower edge of the confidence band is at least 65% of the BTV for the most recent sampling event. For pH, a well could also receive a yellow classification if the confidence band was straddling or approaching the lower BTV.
- Red: Statistically significant increase (SSI) above the background concentration observed for the most recent sampling event (i.e., the entire confidence band exceeds the BTV or, for pH only, the entire confidence band falls below the lower BTV).

The following observations were made based on this evaluation (as summarized in **Table 5**):

- SSIs above background were not observed for the following constituents: antimony, barium, beryllium, bicarbonate, cadmium, calcium, chromium, cobalt, copper, lithium, magnesium, mercury, nickel, radium 226+228, selenium, silver, thallium, and zinc.

- SSIs above background were rarely observed (at two or fewer wells) for lead, pH, carbonate, TDS, and vanadium.

- The constituents with the largest number of wells with SSIs indicating a significant variation from background conditions include:
  - Chloride (4 wells)
  - Potassium (5 wells)
  - Sulfate (6 wells)
  - Arsenic (10 wells)
  - Sodium (15 wells)
  - Fluoride (19 wells)
  - Boron (22 wells)
  - Molybdenum (22 wells)

Table 5- Summary of Confidence Band Evaluation
Groundwater Data
TVA ALF, Memphis, TN

Well ID	Bottom of Well Elevation (ft bgs)	Antimony	Arsenic	Barium	Beryllium	Bicarbonate	Boron	Cadmium	Calcium	Carbonate	Chloride	Chromium	Cobalt	Copper	Fluoride	Lead	Lithium	Magnesium	Mercury	Molybdenum	Nickel	pH	Potassium	Rad226+228	Selenium	Silver	Sodium	Sulfate	TDS	Thallium	Vanadium	Zinc	Total Number of SSIs
Background Wells																																	
ALF-216	157	G	G	G	G	Y	Y	G	Y	Y	G	G	G	Y	G	G	G	Y	Y	G	G	G	G	G	G	G	G	G	Y	G	G	Y	0
ACC-1A	44	G	G	G	G	G	G	G	G	Y	G	G	G	Y	Y	G	G	G	Y	G	G	G	G	G	G	G	G	G	G	G	G	Y	0
ACC-3A	88	G	G	Y	G	G	Y	G	G	G	G	G	G	Y	G	G	G	G	G	G	G	Y	G	Y	G	G	G	G	Y	G	G	Y	0
ACC-5A	76	G	G	G	G	G	G	G	G	G	Y	G	G	Y	G	G	G	G	G	G	G	G	G	G	G	G	G	Y	G	G	G	Y	0
ACC-5B	160	G	G	G	G	Y	G	G	Y	G	G	G	G	G	Y	G	G	G	G	Y	Y	Y	G	G	G	G	G	G	Y	G	G	Y	0
South-Side Wells																																	
ALF-201	172	G	G	G	Y	G	Y	G	G	G	G	Y	G	G	Y	Y	G	G	G	Y	G	G	G	G	Y	G	Y	G	G	Y	G	G	0
ALF-201B	128	Y	G	G	Y	G	R	Y	G	G	G	Y	G	Y	R	Y	G	G	G	R	G	Y	Y	G	Y	Y	R	Y	G	Y	Y	Y	4
ALF-201A	92	G	G	G	Y	G	R	G	G	G	G	G	G	G	R	G	G	G	G	R	G	Y	G	G	G	G	R	G	G	G	G	G	4
ALF-202	175	G	R	G	G	G	R	G	G	G	G	G	G	Y	R	Y	G	G	G	R	G	Y	G	G	G	G	R	Y	G	G	Y	Y	5
ALF-202B	126	G	G	G	G	G	R	G	G	G	G	G	G	Y	Y	G	G	G	G	R	G	G	G	G	G	G	G	G	G	G	G	Y	2
ALF-202A	70	G	G	G	G	G	R	G	G	G	G	G	G	G	Y	G	G	G	G	R	G	G	G	G	G	G	G	G	G	G	G	Y	2
ALF-210	171	G	G	G	G	G	G	G	G	G	G	Y	G	G	Y	G	G	G	G	Y	G	G	G	G	G	G	G	G	Y	G	G	G	0
ALF-210A	90	Y	G	G	G	G	R	Y	Y	G	R	Y	G	Y	G	Y	G	G	G	Y	G	Y	R	G	Y	Y	R	R	R	Y	Y	Y	6
ALF-214	166	Y	G	G	Y	G	Y	Y	G	G	G	Y	G	Y	R	Y	G	G	G	Y	G	Y	G	G	Y	Y	G	G	G	Y	G	Y	1
ALF-214B	128	Y	G	G	Y	G	G	Y	G	G	R	Y	G	Y	G	Y	G	G	G	Y	G	G	G	G	Y	Y	R	R	G	Y	Y	Y	3
ALF-214A	88	Y	G	G	Y	G	G	Y	G	G	R	Y	G	Y	G	Y	G	G	G	Y	G	G	Y	G	Y	Y	R	R	R	Y	Y	Y	4
ALF-215	186	G	G	G	G	G	Y	G	G	G	G	G	Y	Y	Y	G	G	G	G	Y	G	G	G	G	G	G	G	G	G	G	G	G	0
North-Side Wells																																	
ALF-203	168	G	R	G	Y	G	R	Y	G	R	G	Y	G	Y	R	R	G	G	G	R	G	R	G	G	Y	Y	R	R	Y	Y	R	Y	10
ALF-203B	128	G	Y	G	Y	G	Y	G	G	G	G	G	G	G	Y	Y	G	G	G	Y	G	Y	G	G	G	G	Y	G	G	G	G	Y	0
ALF-203A	100	G	G	G	G	G	Y	G	G	G	G	G	G	Y	G	G	G	G	G	Y	G	Y	G	G	G	G	G	G	G	G	G	G	0
ALF-204	159	G	Y	G	Y	G	R	G	G	G	G	G	G	G	Y	Y	G	G	G	R	G	G	Y	G	G	G	G	G	G	Y	Y	Y	2
ALF-204B	125	G	G	G	G	G	R	G	G	G	G	G	G	G	Y	G	G	G	G	R	G	Y	G	G	G	G	G	G	G	G	G	Y	2
ALF-204A	98	G	G	G	G	G	G	G	G	G	G	G	G	G	Y	G	G	G	G	Y	G	G	G	G	G	G	G	G	G	G	G	Y	0
ALF-205	165	Y	G	G	Y	G	R	Y	G	G	G	Y	G	Y	R	Y	G	G	G	R	G	Y	Y	G	Y	G	R	G	Y	Y	Y	G	4
ALF-205B	135	Y	G	G	Y	G	G	Y	G	G	G	Y	G	Y	Y	Y	G	G	G	G	G	Y	G	G	Y	Y	G	G	G	Y	Y	Y	0
ALF-205A	109	Y	G	G	Y	G	G	Y	G	G	G	Y	G	Y	Y	Y	G	G	G	G	G	Y	G	G	Y	Y	G	G	G	Y	Y	Y	0
ALF-206	162	G	G	G	Y	G	G	G	G	G	G	G	G	G	R	Y	G	G	G	R	G	G	G	G	G	G	G	G	G	Y	G	G	2
ALF-P4	138	G	G	G	Y	G	G	G	G	G	G	G	G	G	R	Y	G	G	G	Y	G	Y	G	G	G	G	G	G	G	Y	G	G	1
ALF-P4S	166	G	G	G	G	G	G	G	G	G	G	G	G	G	R	G	G	G	Y	R	G	Y	G	G	Y	G	G	G	Y	G	G	Y	2
ALF-PMW02A	180	Y	R	G	Y	G	R	Y	G	R	G	Y	G	Y	R	Y	Y	G	Y	R	Y	Y	G	Y	Y	Y	R	R	Y	Y	Y	Y	7
ALF-PMW02B	161	G	Y	G	G	G	Y	G	G	Y	G	G	G	G	Y	G	G	G	Y	Y	G	G	Y	G	G	G	Y	Y	Y	G	Y	Y	0
ALF-PMW02C	90	G	G	G	G	G	Y	G	G	Y	G	G	G	G	Y	G	G	G	Y	Y	G	Y	G	Y	G	G	G	G	G	G	G	G	0
ALF-PMW04A	180	G	R	G	Y	G	R	Y	G	Y	G	G	G	Y	R	G	G	G	Y	R	Y	Y	R	Y	G	G	R	Y	Y	G	Y	Y	6
ALF-PMW04B	159	G	Y	G	G	G	R	G	G	Y	Y	G	G	Y	Y	G	G	G	Y	R	G	Y	Y	Y	G	G	Y	Y	G	G	Y	Y	2
ALF-PMW04C	91	G	G	G	G	G	G	G	G	Y	G	G	G	G	Y	G	G	G	Y	Y	G	Y	G	Y	G	G	G	G	G	G	G	G	0
ALF-PMW07A	190	G	Y	G	G	G	R	Y	G	Y	G	G	G	Y	R	Y	Y	G	Y	R	G	Y	Y	G	G	G	R	R	Y	G	Y	Y	5
ALF-PMW07B	159	G	Y	G	G	G	Y	G	G	Y	G	G	G	Y	Y	G	G	G	Y	Y	G	Y	Y	G	G	G	Y	G	G	G	Y	Y	0
ALF-PMW07C	96	G	G	G	G	G	Y	G	G	Y	G	G	G	Y	Y	Y	G	G	Y	Y	G	Y	G	G	G	G	G	G	G	G	G	Y	0
East-Side Wells																																	
ALF-212	171	G	Y	G	Y	G	R	G	G	G	G	G	G	G	R	Y	G	G	G	R	G	G	G	G	G	G	R	G	G	Y	Y	Y	4
ALF-212A	70	G	G	G	G	G	G	G	G	G	R	G	G	G	Y	G	G	G	G	G	G	Y	Y	G	G	G	G	G	G	G	G	Y	1
ALF-213	159	G	Y	G	Y	G	Y	G	G	G	G	G	G	G	R	Y	G	G	G	R	G	Y	Y	G	G	G	Y	G	G	Y	G	Y	2
ALF-213A	119	Y	G	G	Y	G	G	Y	G	Y	Y	Y	G	Y	Y	Y	G	G	Y	Y	G	G	Y	G	Y	Y	Y	G	Y	Y	Y	Y	0
ALF-213B	78	Y	G	G	Y	Y	G	Y	Y	Y	Y	Y	G	Y	Y	Y	G	Y	Y	Y	G	Y	Y	Y	Y	Y	Y	G	Y	Y	Y	Y	0
ALF-217	169	Y	R	G	Y	G	R	Y	G	Y	G	Y	G	Y	R	Y	G	G	Y	R	G	Y	R	Y	Y	Y	R	G	G	Y	Y	Y	6
ALF-217A	109	Y	Y	G	Y	G	G	Y	G	Y	Y	Y	G	Y	G	Y	Y	G	Y	Y	G	Y	Y	Y	Y	Y	Y	G	G	Y	Y	Y	0
ALF-217B	48	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	G	Y	Y	Y	G	Y	Y	Y	G	Y	Y	Y	Y	Y	G	G	Y	Y	Y	Y	0
ALF-PMW10A	178	G	R	G	Y	G	R	G	G	Y	G	G	G	Y	R	G	G	G	Y	R	G	Y	Y	G	G	G	Y	G	G	G	R	Y	5
ALF-PMW10B	149	G	R	G	G	Y	Y	G	Y	Y	G	G	G	Y	Y	G	Y	G	Y	Y	G	Y	R	G	G	G	Y	G	Y	G	G	Y	2
ALF-PMW10C	70	G	G	G	G	G	R	G	G	Y	G	G	G	Y	Y	G	G	G	Y	R	G	G	G	Y	G	G	Y	G	G	G	Y	Y	2
ALF-PMW11A	180	G	R	G	Y	G	R	G	G	Y	G	G	G	Y	R	G	G	G	Y	R	G	Y	G	G	G	G	R	Y	G	G	Y	Y	5
ALF-PMW11B	150	G	Y	G	G	Y	Y	G	Y	Y	Y	G	G	Y	Y	G	G	G	Y	Y	G	Y	Y	G	G	G	Y	Y	G	G	Y	Y	0
ALF-PMW11C	69	G	G	G	Y	G	Y	G	G	Y	G	G	G	Y	R	Y	G	G	Y	Y	G	G	G	Y	G	G	Y	G	G	G	Y	Y	1
ALF-PMW14A	180	Y	R	G	Y	G	R	Y	G	Y	G	Y	G	Y	R	Y	Y	G	Y	R	G	G	G	Y	Y	G	R	G	G	Y	Y	G	5
ALF-PMW14B	151	G	R	G	Y	G	R	G	G	Y	G	G	G	Y	Y	Y	G	G	Y	Y	G	G	R	Y	G	G	G	G	G	G	Y	Y	3
ALF-PMW14C	78	G	G	G	G	G	R	G	G	Y	G	G	G	Y	Y	G	G	G	Y	Y	G	Y	G	G	G	G	G	G	G	G	Y	Y	1
Total Number of SSIs		0	10	0	0	0	22	0	0	2	4	0	0	0	19	1	0	0	0	22	0	1	5	0	0	0	15	6	2	0	2	0	

R	Statistically Significant Increase (SSI)above background threshold value (BTV).
Y	(1) The upper edge of the confidence band is above the BTV or (2) the lower edge of the confidence band is at least 65% of the BTV.
G	Confidence band is below or within the BTV limits.

Bottom of Well Elevation (feet NGVD 29)

4.0 REFERENCES

USEPA, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. EPA 530-R-09-007

FIGURES

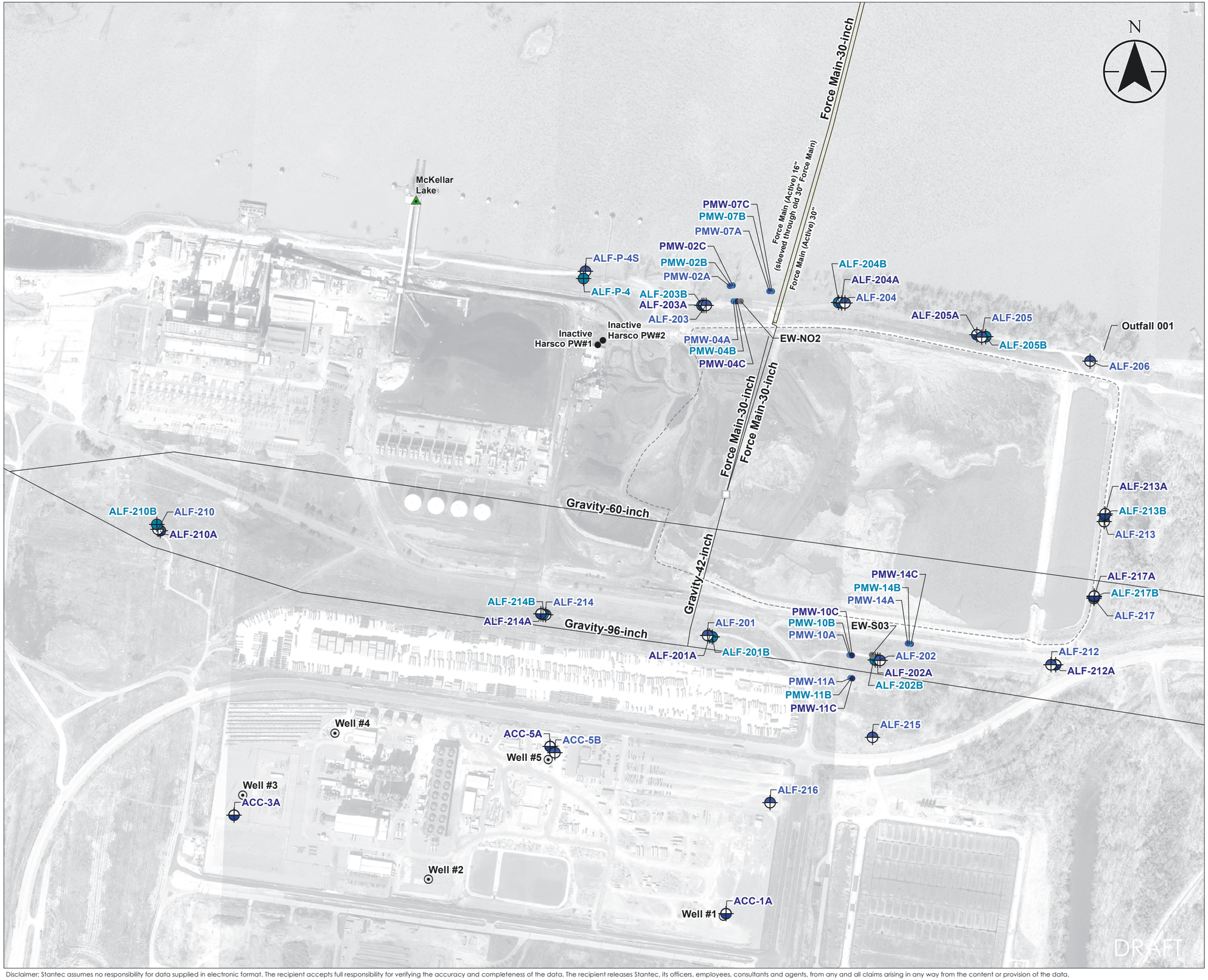

Figure No.
1

Title
Allen Fossil Plant and ACC Plant Well Locations

Client/Project
Tennessee Valley Authority
Allen Fossil Plant

Project Location
Memphis, Tennessee

175577013
Prepared by LT on 2019-10-31
Technical Review by JJ on 2019-10-31

0 250 500 750 1,000 Feet
1:3,000 (At original document size of 22x34)

Legend

- Inactive Harsco Production Wells (PW)
- McKellar Lake Gauging Station
- Performance Monitoring Well (PMW) (Shallow)
- Performance Monitoring Well (PMW) (Intermediate)
- Performance Monitoring Well (PMW) (Deep)
- IRA Extraction Well (EW)
- Monitoring Well (Shallow)
- Monitoring Well (Intermediate)
- Monitoring Well (Deep)
- Production Well (Memphis Sand)
- Sewer Manhole Location of Force Main Transition to Gravity
- Sanitary Sewer Pipes
- East Ash Pond Boundary

Wells are screened in the Alluvial Aquifer unless otherwise noted.

Notes
1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Imagery Provided by TVA (2018)

Stantec
TVA

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APPENDIX A

2019 Statistical Analysis Report for Allen Fossil Plant Remedial Investigation

Kirk Cameron, Ph.D
MacStat Consulting, Ltd
01/29/2020

2019

2019 Statistical Analysis Report for Allen Fossil Plant Remedial Investigation

Kirk Cameron, Ph.D.
MacStat Consulting, Ltd.

01/29/2020

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1. Introduction

This report describes the methodology used to compute the background statistics and to compare those statistics to compliance well data at the Tennessee Valley Authority (TVA) Allen Fossil Plant (ALF), for purposes of the Remedial Investigation (RI) process. A set of background statistics were constructed, as requested by the Tennessee Department of Environmental Quality (TDEQ), known as background threshold values (BTV). BTVs are typically used to estimate the magnitude and range of the background concentration distribution, so that areas or sites above background and in need of remediation can be delineated and prioritized.

At the ALF network, the sampling results used to compute the background statistics were obtained from a set of designated background wells (ALF-216, ACC-1A, ACC-3A, ACC-5A, and ACC-5B) using data collected from mid-2017 until September 2019. Groundwater samples were analyzed for 32 distinct constituents as required for the RI by TDEQ. Only non-filtered sample results were utilized for the statistical analysis.

Once the background limits were computed, they were compared to each of 55 well locations (including the background wells) for each constituent, in order to determine which well-constituent pairs, if any, exceeded the limits.

The 'R' Statistical Analysis package (www.r-project.org) in conjunction with R-Studio (www.rstudio.com) (both popular public domain software products) and other analytical tools were used in the production of the statistical values and graphs. ProUCL data dumps from TVA's EQuIS Professional and Enterprise Database were used to populate the R-based statistical analyses.

2. Statistical Analysis

The basic steps in the analysis included the following:

1) Developing background threshold values (BTVs) for each constituent;

2) Computing trends and associated confidence interval (CI) bands for each well location and constituent (i.e., each well-constituent pair); and

3) Comparing each CI band against its respective BTV to assess whether an exceedance occurred.

2.1. Developing Background Threshold Values (BTVs)

In cases where a background limit must be computed, USEPA's Unified Guidance recommends different strategies for computing a background-based standard (USEPA, Unified Guidance, 2009, Section 7.5). One of these strategies — a 95% confidence, 95% coverage upper tolerance limit (UTL) on background — was selected and used to compute the BTV on site-specific background data for each parameter. In the case of pH, a two-sided tolerance interval was computed instead.

To compute each upper tolerance limit (UTL), the following steps were taken:

1) The data were first summarized and modeled. The background data from the five background well locations were initially examined and graphed.

Time series plots of each well-constituent pair display the individual measurement results, while side-by-side boxplots, colored by gradient, allow visual comparisons between upgradient/ background wells versus downgradient locations.

2) All the background data from 2017 to 2019 were grouped and checked for possible outliers.

Outlier screening was performed visually on time series plots of the data, as well as systematically via a modified version of Tukey's boxplot rule. In a boxplot, the length of the box is the range of the central 50% of the sorted measurements. Tukey's original outlier rule states that any observation more than 1.5 box lengths above or below the edges of the boxplot classifies as a possible outlier. For stable, symmetric data distributions, Tukey's rule often works well.

Groundwater data is often skewed instead of symmetric, and may exhibit shorter (i.e., localized) or longer-term (non-linear) trends. Because of this reality, a modified version of Tukey's rule is generally needed to avoid classifying too many possible outliers. The modification consists of two parts: a) a possible outlier is only flagged if flagged both on the nominal scale of measurement as well as on the log-scale (i.e., when each observation is first mathematically transformed by taking a logarithm); and b) an outlier is only flagged if more than 3 box lengths above the edges of the boxplot. Together, these modifications better account for data skewness and localized trends in the background observations.

If any possible outliers are flagged, they are visually compared against observations at other well locations. If similar patterns or measurement ranges are common, the suspect values are kept in the data. If not, the suspected outliers are formally assessed using Rosner's outlier test. Any confirmed outliers are excluded from the UTL computations.

Two outliers were flagged and confirmed using this approach, one for TDS at well location 216, and one for zinc at location ACC5B. These values were excluded from the BTV calculations.

3) The grouped baseline data — excluding any confirmed outliers — were analyzed to determine whether they could be fit to a known statistical model. If so, a parametric UTL was computed; if not, a nonparametric UTL was constructed.

To fit potential statistical models, a series of normalizing mathematical transformations was applied to each baseline dataset. These transformations are known as power transformations, since they raise each observation to a mathematical power. The goal is to find, if possible, a transformation that normalizes the data on the transformed scale. Models tested ranged from the tenth root to the tenth power, and included the null transformation (power = 1), which assumes the data are normally distributed without transformation, the logarithm, which models the lognormal distribution, and the cube root, which closely mimics the gamma distribution.

The transformation which most nearly normalized the data was then formally tested using Filliben's probability plot correlation coefficient test. Filliben's test checks for normality of the transformed measurements by computing the correlation between the data and matched quantiles (i.e., z-scores) from a standard normal distribution. The process parallels fitting a line on a normal probability plot of the (transformed) data. The closer to a linear fit, the higher the correlation; the further from a linear fit, the smaller the correlation. Filliben's test formally assesses the strength of

the correlation to determine whether it is high enough to declare that the data are consistent with a normal distributional model.

Filliben's test yields a p-value measuring the statistical significance of the result. A p-value no less than 0.01 was judged as sufficient to assume normality of the (transformed) observations, while data with a Filliben's test p-value less than 0.01 were judged significantly non-normal. Datasets passing Filliben's test were assumed to have a parametric model corresponding to the transformation employed, e.g., data tested on the log-scale were assumed consistent with the lognormal distribution; data tested on the square root scale were assumed consistent with the square-root normal distribution, and so on.

Datasets which could not be sufficiently normalized, thus failing Filliben's test, were analyzed by nonparametric means. In many instances, this may occur when the data includes a large fraction of non-detects.

4) The final statistical model for each constituent was used to compute an upper tolerance limit (UTL) with 95% coverage and 95% confidence.

When a parametric model is appropriate, on the normalized scale, a UTL is computed using the standard normal theory equation:

$$UTL = \bar{x} + \kappa s$$

where $\bar{x}$ and s represent the mean and standard deviation of the (transformed) observations, and κ is a multiplier which depends on the number of baseline measurements, as well as the desired coverage and confidence levels. If the data have been transformed, the final UTL is derived by back-transforming the scaled UTL, e.g, for a log transformation, the result is exponentiated; for a square-root transformation, the result is squared, etc.

For nonparametric models, the normal theory equation does not apply. Instead, the UTL is selected as one of the largest of the sample values, typically the maximum. Because there is no multiplier as in the parametric case, the confidence level associated with a nonparametric UTL is computed 'after the fact,' based on the sample size and desired coverage level: the smaller the sample size, the lower the confidence; the bigger the sample size, the higher the confidence level.

Since nonparametric UTLs do not assume a known statistical model, unless the sample size is fairly large, the achieved confidence level can be much lower than the target of 95%. When this happens, the computed UTL may not be very accurate. A more accurate UTL would likely be larger than the one computed from the available sample data. Unfortunately, without a statistical model, and especially with a large percentage of non-detects, little improvement is possible in the UTL estimates unless a larger sample size is employed (i.e., additional data is collected from the background wells and added to the existing measurements).

Table 1 displays the estimated BTVs, calculated as UTLs (or a tolerance interval for pH).

Table 1. AFL Remedial Investigation BTVs

COC	n	Lower BTV	Upper BTV
Antimony	33		0.0025

Arsenic	33		0.0098
Barium	33		1.1404
Beryllium	33		0.0005
Bicarbonate	33		563.5139
Boron	33		0.2397
Cadmium	33		0.0004
Calcium	33		159.2463
Carbonate	33		5.0000
Chloride	33		22.9426
Chromium	33		0.0025
Cobalt	33		0.0071
Copper	33		0.0017
Fluoride	33		0.2278
Lead	33		0.0005
Lithium	33		0.0339
Magnesium	33		46.7174
Mercury	33		0.0002
Molybdenum	33		0.0020
Nickel	33		0.0123
pH	33	6.0067	7.6604
Potassium	33		3.5191
Rad226+228	33		3.7890
Selenium	33		0.0025
Silver	33		0.0020
Sodium	33		20.5168
Sulfate	33		129.0412
TDS	32		620.3322
Thallium	33		0.0005
Vanadium	33		0.0015
Zinc	32		0.0100

2.2. Computing Trend Lines and Confidence Interval Bands

USEPA's Unified Guidance recommends comparing some type of confidence interval (CI) against fixed limits like BTVs in order to assess whether or not the limit has been exceeded with statistical significance. If the entire interval exceeds the BTV, a statistically significant increase (SSI) is identified. If none of the interval, or only part, exceeds the BTV, no SSI is recorded.

The rationale behind this procedure is predicated on the following:

1) A confidence interval is typically designed to 'contain' or 'capture' a specific target or feature of the underlying groundwater population, usually the mean or median measurement value. An interval rather than a point estimate is utilized because that is the only way to ensure the target is captured with a high degree of statistical confidence.
2) When a confidence interval is entirely on one side or the other of a fixed numerical limit, the confidence is high that the desired population target is also to that side of the limit.
3) Because the target may exist anywhere in the range represented by the confidence interval, an interval that 'straddles' the fixed limit is not guaranteed to be either above or below the GWPS, and certainly not with high or known statistical confidence.

USEPA's logic ensures that a correct decision about the occurrence of an SSI can be made with high statistical assurance.

Since groundwater data are collected over time, and not all at once, some or most of the variation in the measurements may be due to a trend. To better account for this possibility, USEPA also recommends a variation on the confidence interval method known as a confidence interval band around a trend line. In this case, a (linear) trend line is first fit to the data, then a confidence band is constructed around the trend line. The confidence interval band can be compared against a BTV in much the same fashion as a confidence interval, only now a comparison can be made at different points in time by comparing the 'cross-section' of the band for a given sampling date. If the interval represented by the confidence band cross-section fully exceeds the BTV, an SSI is identified for that sampling event.

CI bands were constructed (as described below) for each well-constituent pair using all available sample data. Cross-sections of each band were then compared to the BTV for the most recent sampling event in each case for the purpose of identifying any SSIs. Note that in cases where the data are obviously trending, the CI band technique provides a much more powerful and accurate means of judging exceedances above BTVs. Ignoring a trend typically makes a standard confidence interval much too wide and uncertain to be of much use, due to the extra variation imparted by the trend. For data that are more stable, both methods will tend to give similar results.

2.2.2. Trend Lines Using Linear Regression

Unless there are extreme outliers and/or curvature in the data, linear regression provides a standard and well-tested method for estimating the linear portion of a trend. The slope of the regression line points to the magnitude and direction of the trend. There is also a standard method for computing a confidence band around a linear regression trend line. For instance, equations [21.24] and [21.25] of Section 21.3 in the Unified Guidance can be compactly written as

$$CB_{1-\alpha} = \hat{x}_0 \pm \sqrt{2 s_e^2 F_{1-\alpha,n-2} \left[\frac{1}{n} + \frac{(t_0 - \bar{t})^2}{(n-1)s_t^2} \right]}$$

where CB = confidence band, $\hat{x}_0$ is the regression line estimate at time t_0, s_e^2 is the mean squared error of the regression line, *F* is a quantile from the F-distribution with 2 and n–2 degrees of freedom, and $\bar{t}$ and s_t^2 represent the mean and standard deviation of the sampling dates.

For well-constituent pairs with no non-detects, linear regression and the formula above were used to construct each confidence band with 98% overall confidence, corresponding to a lower confidence limit with 99% confidence. When non-detects are present, the same formulas apply but an adjustment must be made for the censored measurements. The strategy adopted for this analysis involves the following steps:

1) Each non-detect is assumed to follow a triangle distribution centered at half the (sample-specific) reporting limit, and with limits extending from zero to the reporting limit. Then an imputation for each non-detect is randomly drawn from this distribution;

2) The combined set of detected values and imputed non-detects are used to estimate a linear regression trend line and associated confidence band with 98% statistical confidence;

3) Steps (1) and (2) are repeated 500 times, each time with a different set of random imputations, leading to 500 potentially different trend lines and confidence bands;

4) The 500 sets of trends lines and bands are averaged point-wise (i.e., at each time along a sequence of dates spanning the time range of the data) to compute the final trend and confidence band estimates.

By repeating this sequence of steps a large number of times (500), the uncertainty associated with the non-detects can be reasonably captured within the final CI band estimate.

2.2.3. Outliers

Prior to constructing any of the confidence interval (CI) bands, the data at each well-constituent pair were examined for possible outliers. As with the grouped background data, visual examination was done with time series plots and the modified Tukey's boxplot rule was utilized for initial screening. Eighteen additional observations were flagged and confirmed as outliers. These values were excluded from calculation of the CI bands.

2.3. Comparing Confidence Interval Bands Against GWPS

To assess whether any SSIs occurred, the confidence interval (CI) bands described in **Section 2.2** were compared against the constituent-specific BTVs described in **Section 2.1**. Of note, an SSI was identified if and only if the CI band fully exceeded the BTV at the *most recent* sampling event. This is consistent with the notion that a well-constituent pair is considered to exceed background only if its constituent levels currently exceed the BTV. This is best assessed by considering the cross-section of the CI band associated with the most recent sampling event.

3. Summary of Statistical Analysis

To facilitate an 'at-a-glance' summary of the statistical comparison results, **Attachment A** is a 'traffic light' matrix, showing a compact representation of each well location matched against each constituent. Green cells indicate that no SSI was observed. Red cells indicate the opposite: an SSI was flagged at the most recent sampling event. Yellow cells are warnings which indicate that a well-constituent pair should be closely watched. These cases have a CI band whose lower limit is at least 65% of the BTV. Often, the CI band cross-section straddles the BTV in yellow cells.

4. References

1) US Environmental Protection Agency (2009) *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance* - Office of Resource Conservation and Recovery EPA 530/R-09-007

2) US Environmental Protection Agency (2007) *Framework for Metals Risk Assessment* EPA 120/R-07/001 Office of the Science Advisor Risk Assessment Forum, Washington, DC 20460

Attachment A

coc	216	ACC1A	ACC3A	ACC5A	ACC5B	201	201A	201B	202	202A	202B	203	203A	203B	204	204A
Antimony	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Arsenic	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	RED	GREEN	GREEN	RED	GREEN	YELLOW	YELLOW	GREEN
Barium	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Beryllium	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	YELLOW	YELLOW	GREEN	GREEN	GREEN	YELLOW	GREEN	YELLOW	YELLOW	GREEN
Bicarbonate	YELLOW	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Boron	YELLOW	GREEN	YELLOW	GREEN	GREEN	YELLOW	RED	RED	RED	RED	RED	RED	YELLOW	YELLOW	RED	GREEN
Cadmium	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Calcium	YELLOW	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Carbonate	YELLOW	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	RED	GREEN	GREEN	GREEN	GREEN
Chloride	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Chromium	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Cobalt	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Copper	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	GREEN	GREEN	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	GREEN	GREEN	GREEN
Fluoride	GREEN	YELLOW	GREEN	GREEN	YELLOW	YELLOW	RED	RED	RED	YELLOW	YELLOW	RED	GREEN	YELLOW	YELLOW	YELLOW
Lead	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	YELLOW	YELLOW	GREEN	GREEN	RED	GREEN	YELLOW	YELLOW	GREEN
Lithium	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Magnesium	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Mercury	YELLOW	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Molybdenum	GREEN	GREEN	GREEN	GREEN	YELLOW	YELLOW	RED	RED	RED	RED	RED	RED	YELLOW	YELLOW	RED	YELLOW
Nickel	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
pH	GREEN	GREEN	YELLOW	GREEN	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	GREEN	GREEN	RED	YELLOW	YELLOW	GREEN	GREEN
Potassium	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN
Rad226+228	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Selenium	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Silver	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Sodium	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	RED	RED	RED	GREEN	GREEN	RED	GREEN	YELLOW	GREEN	GREEN
Sulfate	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	YELLOW	GREEN	GREEN	RED	GREEN	GREEN	GREEN	GREEN
TDS	YELLOW	GREEN	YELLOW	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Thallium	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	YELLOW	GREEN
Vanadium	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	YELLOW	GREEN	GREEN	RED	GREEN	GREEN	YELLOW	GREEN
Zinc	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	YELLOW

coc	204B	205	205A	205B	206	210	210A	212	212A	213	213A	213B	214	214A	214B	215
Antimony	GREEN	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	GREEN
Arsenic	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Barium	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Beryllium	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	GREEN
Bicarbonate	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Boron	RED	RED	GREEN	GREEN	GREEN	GREEN	RED	RED	GREEN	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	YELLOW
Cadmium	GREEN	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	GREEN
Calcium	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Carbonate	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	YELLOW	GREEN	GREEN	GREEN	GREEN
Chloride	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	RED	GREEN	RED	GREEN	YELLOW	YELLOW	GREEN	RED	RED	GREEN
Chromium	GREEN	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	GREEN	GREEN	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	GREEN
Cobalt	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW
Copper	GREEN	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW
Fluoride	YELLOW	RED	YELLOW	YELLOW	RED	YELLOW	GREEN	RED	YELLOW	RED	YELLOW	YELLOW	RED	GREEN	GREEN	YELLOW
Lead	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	GREEN
Lithium	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Magnesium	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Mercury	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	YELLOW	GREEN	GREEN	GREEN	GREEN
Molybdenum	RED	RED	GREEN	GREEN	RED	YELLOW	YELLOW	RED	GREEN	RED	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW
Nickel	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
pH	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	GREEN	GREEN	GREEN
Potassium	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	RED	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	GREEN	GREEN
Rad226+228	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Selenium	GREEN	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	GREEN
Silver	GREEN	GREEN	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	GREEN
Sodium	GREEN	RED	GREEN	GREEN	GREEN	GREEN	RED	RED	GREEN	YELLOW	YELLOW	YELLOW	GREEN	RED	RED	GREEN
Sulfate	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	RED	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	RED	RED	GREEN
TDS	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	RED	GREEN	GREEN	GREEN	YELLOW	YELLOW	GREEN	RED	GREEN	GREEN
Thallium	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	GREEN
Vanadium	GREEN	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	YELLOW	GREEN	GREEN	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	GREEN
Zinc	YELLOW	GREEN	YELLOW	YELLOW	GREEN	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	GREEN

coc	217	ALF-217A	ALF-217B	P4	P4S	PMW02A	PMW02B	PMW02C	PMW04A	PMW04B	PMW04C	PMW07A	PMW07B	PMW07C	PMW10A	PMW10B
Antimony	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Arsenic	RED	YELLOW	YELLOW	GREEN	GREEN	RED	YELLOW	GREEN	RED	YELLOW	GREEN	YELLOW	YELLOW	GREEN	RED	RED
Barium	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Beryllium	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN
Bicarbonate	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW
Boron	RED	GREEN	YELLOW	GREEN	GREEN	RED	YELLOW	YELLOW	RED	RED	GREEN	RED	YELLOW	YELLOW	RED	YELLOW
Cadmium	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Calcium	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW
Carbonate	YELLOW	YELLOW	YELLOW	GREEN	GREEN	RED	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW
Chloride	GREEN	YELLOW	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Chromium	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Cobalt	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Copper	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW
Fluoride	RED	GREEN	YELLOW	RED	RED	RED	YELLOW	YELLOW	RED	YELLOW	YELLOW	RED	YELLOW	YELLOW	RED	YELLOW
Lead	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	YELLOW	GREEN	GREEN
Lithium	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW
Magnesium	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Mercury	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW
Molybdenum	RED	YELLOW	YELLOW	YELLOW	RED	RED	YELLOW	YELLOW	RED	RED	YELLOW	RED	YELLOW	YELLOW	RED	YELLOW
Nickel	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
pH	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW
Potassium	RED	YELLOW	YELLOW	GREEN	GREEN	GREEN	YELLOW	GREEN	RED	YELLOW	GREEN	YELLOW	YELLOW	GREEN	YELLOW	RED
Rad226+228	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN
Selenium	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Silver	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Sodium	RED	YELLOW	GREEN	GREEN	GREEN	RED	YELLOW	GREEN	RED	YELLOW	GREEN	RED	YELLOW	GREEN	YELLOW	YELLOW
Sulfate	GREEN	GREEN	GREEN	GREEN	GREEN	RED	YELLOW	GREEN	YELLOW	YELLOW	GREEN	RED	GREEN	GREEN	GREEN	GREEN
TDS	GREEN	GREEN	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW
Thallium	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Vanadium	YELLOW	YELLOW	YELLOW	GREEN	GREEN	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	GREEN	RED	GREEN
Zinc	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW

coc	PMW10C	PMW11A	PMW11B	PMW11C	PMW14A	PMW14B	PMW14C
Antimony	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN
Arsenic	GREEN	RED	YELLOW	GREEN	RED	RED	GREEN
Barium	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Beryllium	GREEN	YELLOW	GREEN	YELLOW	YELLOW	YELLOW	GREEN
Bicarbonate	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Boron	RED	RED	YELLOW	YELLOW	RED	RED	RED
Cadmium	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN
Calcium	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Carbonate	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW
Chloride	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN
Chromium	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN
Cobalt	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Copper	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW
Fluoride	YELLOW	RED	YELLOW	RED	RED	YELLOW	YELLOW
Lead	GREEN	GREEN	GREEN	YELLOW	YELLOW	YELLOW	GREEN
Lithium	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN
Magnesium	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Mercury	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW
Molybdenum	RED	RED	YELLOW	YELLOW	RED	YELLOW	YELLOW
Nickel	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
pH	GREEN	YELLOW	YELLOW	GREEN	GREEN	GREEN	YELLOW
Potassium	GREEN	GREEN	YELLOW	GREEN	GREEN	RED	GREEN
Rad226+228	YELLOW	GREEN	GREEN	YELLOW	YELLOW	YELLOW	GREEN
Selenium	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN
Silver	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Sodium	YELLOW	RED	YELLOW	YELLOW	RED	GREEN	GREEN
Sulfate	GREEN	YELLOW	YELLOW	GREEN	GREEN	GREEN	GREEN
TDS	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Thallium	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN
Vanadium	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW
Zinc	YELLOW	YELLOW	YELLOW	YELLOW	GREEN	YELLOW	YELLOW