
To: Tennessee Valley Authority
Chattanooga, TN

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File: Updated GWPS and SSLs at the Allen
Fossil Plant East Ash Disposal Area
CCR Unit

Date: December 29, 2023

Reference: End of Year Update on Statistically Significant Levels (SSLs) (40 CFR § 257.98(a)) - CCR Rule Groundwater Monitoring - Allen Fossil Plant, East Ash Disposal Area CCR Unit

In accordance with the federal regulations for management of coal combustion residuals (CCR Rule; 40 Code of Federal Regulations [CFR] Part 257, Subpart D), the Tennessee Valley Authority (TVA) is currently conducting Corrective Action Groundwater Monitoring¹ at the East Ash Disposal Area CCR Unit at its Allen Fossil Plant (ALF) in Memphis, Tennessee. The East Ash Disposal Area consists of one CCR surface impoundment subject to the CCR Rule with a single-unit groundwater monitoring system screened in alluvium.

As required by the CCR Rule, the owner or operator of a CCR unit shall establish groundwater protection standards (GWPS) for Appendix IV parameters detected during Assessment Monitoring and determine if one or more Appendix IV parameters are detected at statistically significant levels (SSLs) above their GWPS. GWPS for all Appendix IV parameters were originally established and documented in a notice dated October 15, 2018, as required by 40 CFR § 257.95(d)(2) and are provided on Table 1.

As part of Corrective Action Groundwater Monitoring, the second semiannual monitoring event for 2023 occurred June 26-29, 2023, with the additional “resample” event occurring August 14-17, 2023. This technical memorandum presents GWPS and lower confidence bands (LCBs) that have been updated with data collected during the second semiannual monitoring event and resample event for 2023, as well as any identified SSLs after incorporating the additional data collected in 2023. The identification of SSLs was performed as a two-step process:

1. Historical sampling results (November 2016 through August 2023) for Appendix IV parameters from each downgradient well were compared directly to the updated GWPS. If sample concentrations were below the updated GWPS, no SSLs over the GWPS were identified.
2. Where the direct comparison indicated a concentration above the GWPS, further statistical analysis was performed to identify levels statistically greater than the GWPS, using procedures recommended in the United States Environmental Protection Agency (USEPA) Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (EPA 530/R-09-007; March 2009). Comparisons were made against a fixed GWPS via LCBs. For each situation where a parameter concentration was greater than the GWPS in step one, the 99% LCB of the fitted line in that monitoring well was calculated using CCR Rule monitoring data collected from November 2016 through August 2023. As recommended in the Unified Guidance, where the 99% LCB exceeds the GWPS at the last sampling event an SSL was identified for the constituent/well pair.

Based on the statistical analysis performed in 2023, there continues to be SSLs above the GWPS for arsenic in wells ALF-202, ALF-203, ALF-204, ALF-212, ALF-213, and ALF-217 and for molybdenum in wells ALF-202 and ALF-203. TVA will continue to conduct groundwater monitoring and reporting pursuant to 40 CFR § 257.98(a).

¹ TVA selected a remedy pursuant to 40 CFR § 257.97 on June 2, 2022.

Reference: End of Year Update on SSLs (40 CFR § 257.98(a)) – CCR Rule Groundwater Monitoring - Allen Fossil Plant, East Ash Disposal Area CCR Unit

TABLE 1: Statistically Significant Levels Above GWPS - ALF East Ash Disposal Area CCR Unit

Appendix IV Parameter	GWPS (a)	Updated GWPS (b)	Downgradient wells with analytical results above GWPS (c)	Updated LCBs (d)	SSL LCB > GWPS (e)
Antimony (µg/L)	6	6	None	NA	NA
Arsenic (µg/L)	17.6	10	ALF-202	297	Yes
			ALF-203	46.3	Yes
			ALF-204	20.6	Yes
			ALF-212	13.4	Yes
			ALF-213	24.1	Yes
			ALF-217	45.0	Yes
Barium (µg/L)	2,000	2,000	None	NA	NA
Beryllium (µg/L)	4	4	None	NA	NA
Cadmium (µg/L)	5	5	None	NA	NA
Chromium (µg/L)	100	100	None	NA	NA
Cobalt (µg/L)	6	6	ALF-213	2.1	No
Fluoride (mg/L)	4	4	ALF-202	1.33	No
			ALF-203	0.97	No
Lead (µg/L)	15	15	ALF-203	0.0 ^(f)	No
Lithium (µg/L)	40	40	None	NA	NA
Mercury (µg/L)	2	2	None	NA	NA
Molybdenum (µg/L)	100	100	ALF-201	0.0 ^(f)	No
			ALF-202	137.9	Yes
			ALF-203	327.7	Yes
			ALF-205	24.2	No
Radium-226+228 (pCi/L)	5	5	None	NA	NA
Selenium (µg/L)	50	50	None	NA	NA
Thallium (µg/L)	2	2	None	NA	NA

NA – Not applicable

- (a) GWPS documented in notice dated October 15, 2018 [reported in micrograms per liter (µg/L) except fluoride (mg/L) and radium 226+228 pCi/L]
- (b) GWPS updated as of December 12, 2023, with two additional sample results collected on June 26-29, 2023, and August 14-17, 2023 [reported in µg/L except fluoride (mg/L) and radium 226+228 pCi/L]
- (c) Downgradient wells with analytical results above GWPS November 2016 through August 2023 (per 40 CFR § 257.98(a))
- (d) Most recent value of 99% LCB on the mean of Appendix IV groundwater sampling events between November 2016 and August 2023 Upper confidence band (UCB) not shown as it is greater than LCB [reported in µg/L except fluoride (mg/L)]
- (e) SSL: “statistically significant level” over GWPS occurs when the updated LCB value at the last sampling event exceeds the updated GWPS
- (f) Negative lower confidence band values were reported as 0.0 µg/L