
To:	Tennessee Valley Authority Chattanooga, TN	From:	Matthew Dagon, LPG Indianapolis, IN
File:	Updated GWPS and SSLs at the Johnsonville Fossil Plant Active Ash 2 Pond CCR Unit	Date:	July 31, 2020

Reference: Update on Statistically Significant Levels (SSLs) - CCR Rule Groundwater Monitoring Johnsonville Fossil Plant, Active Ash 2 Pond

In accordance with the federal regulations for management of coal combustion residuals (CCR Rule; 40 CFR § 257, Subpart D), the Tennessee Valley Authority (TVA) is currently conducting Assessment Monitoring at the Active Ash 2 Pond CCR unit at its Johnsonville Fossil Plant (JOF) in New Johnsonville, Tennessee. The Active Ash Pond 2 consists of one CCR surface impoundment subject to the CCR Rule with a single-unit monitoring system.

As required by the CCR Rule (40 CFR § 257.95(g)), the owner or operator of a CCR unit shall establish groundwater protection standards (GWPSs) 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. GWPSs 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 ongoing Assessment Monitoring, the first semiannual assessment monitoring event for 2020 occurred January 21-23, 2020, with the additional “resample” event occurring March 4-6, 2020. This technical memorandum presents GWPSs and lower confidence bands (LCBs) that have been updated with data collected during the first semiannual monitoring event and resample event for 2020, as well as any identified SSLs after incorporating the additional data collected in 2020. The identification of SSLs was performed as a two-step process:

1. Historical sampling results (November 2016 through March 4-6, 2020) for Appendix IV parameters from each downgradient well were compared directly to the GWPS. If all 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 March 6, 2020. 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 2020, there continues to be an SSL above the GWPS for cobalt in wells 10-AP3 and JOF-103. These are the same SSLs at the same wells as were previously identified. TVA will continue to conduct groundwater monitoring and reporting pursuant to 40 CFR § 257.95.

Reference: Update on Statistically Significant Level (SSLs) at the Johnsonville Fossil Plant - Active Ash 2 Pond

TABLE 1: Statistically Significant Levels Above GWPSs - JOF Active Ash 2 Pond

Appendix IV Parameter	GWPS (a)	Updated GWPS (b)	Downgradient wells with analytical results above GWPS (c)	Updated LCBs (d)	SSL LCB > GWPS (e)
Antimony (mg/l)	0.006	0.006	None	NA	NA
Arsenic (mg/l)	0.01	0.01	None	NA	NA
Barium (mg/l)	2	2	None	NA	NA
Beryllium (mg/l)	0.004	0.004	None	NA	NA
Cadmium (mg/l)	0.005	0.005	10-AP3	0.0041	No
			JOF-103	0.0015	No
Chromium (mg/l)	0.1	0.1	None	NA	NA
Cobalt (mg/l)	0.006	0.006	10-AP3	0.0278	Yes
			JOF-103	0.0480	Yes
Fluoride (mg/l)	4	4	None	NA	NA
Lead (mg/l)	0.015	0.015	None	NA	NA
Lithium (mg/l)	0.04	0.04	JOF-103	0.0094	No
Mercury (mg/l)	0.002	0.002	None	NA	NA
Molybdenum (mg/l)	0.1	0.1	None	NA	NA
Radium-226+228 (pCi/l)	5	5	None	NA	NA
Selenium (mg/l)	0.05	0.05	None	NA	NA
Thallium (mg/l)	0.002	0.002	None	NA	NA

NA – Not applicable

- (a) GWPSs documented in notice dated 10/15/2018
- (b) GWPSs updated as of 06/17/2020 with results from 2 additional sampling events results from Wells B-9 and JOF-101 on January 21-22, 2020 and March 4, 2020
- (c) Downgradient wells with analytical results above GWPS November 2016 through March 6, 2020 (per 40 CFR § 257.95(b) and (d))
- (d) Most recent value of 99% lower confidence band (LCB) on the mean of Appendix IV groundwater sampling events between November 2016 and March 2020. Upper confidence band (UCB) not shown as it is greater than LCB.
- (e) SSL: “statistically significant level over GWPS” occurs when the updated LCB value at the last sampling event exceeds the updated GWPS