

## Executive Summary

Environmental Assessment Report – Rev. 2  
Kingston Fossil Plant

# Executive Summary

On August 6, 2015, the Tennessee Department of Environment and Conservation (TDEC) issued Commissioner’s Order No. OGC15-0177 (TDEC Order) to Tennessee Valley Authority (TVA) to establish a process for investigating, assessing, and remediating unacceptable risks from management of coal combustion residuals (CCR) at TVA coal-fired plants in the state of Tennessee. TVA constructed the Kingston Fossil Plant (KIF Plant) between 1951 and 1954 on approximately 100 acres and began generating power in 1954. There are three CCR management units<sup>1</sup> at the KIF Plant included in the TDEC Order: the Interim Ash Staging Area, Sluice Trench and Area East of Sluice Trench, and the Stilling Pond. Each of the TDEC Order CCR management units was previously closed in accordance with applicable regulations in effect at the time of closure.

In accordance with the TDEC Order, TVA and Stantec Consulting Services Inc. (Stantec), on behalf of TVA, prepared an Environmental Investigation Plan (EIP) for the KIF Plant to obtain and provide information requested by TDEC. As specified in the TDEC Order, the primary objective of the EIP was to “identify the extent of soil, surface water, and groundwater contamination by CCR” from onsite management of CCR material in impoundments and landfills. In addition, per TDEC’s information requests, the EIP included assessment of CCR management unit structural stability and integrity.

Between 2018 and 2021, TVA and Stantec conducted the TDEC Order environmental investigations (EI) for the KIF Plant TDEC Order CCR management units. The EI included characterization of the site hydrogeology and investigations of CCR material, groundwater, background soils, seeps, as well as a Water Use Survey. Investigations associated with surface streams, sediments, and ecology have been addressed as part of the Kingston Recovery Project (KRP), and the findings from those investigations and monitoring programs are incorporated herein. EI activities were implemented in accordance with the approved Sampling and Analysis Plans and Quality Assurance Project Plans, including TVA- and TDEC-approved programmatic and project-specific changes made following approval of the EIP. Based on a comprehensive quality assurance review, the EI data are usable and meet the objectives of the TDEC Order.

The EI data were evaluated along with information collected as part of previous investigations and other ongoing regulatory monitoring programs conducted between the 1970s and 2022, including the KRP. The objectives of the TDEC Order are similar to these other programs, including TDEC landfill permit requirements (Chapter 0400-11-01) and the United States Environmental Protection Agency rule (Title 40, Code of Federal Regulations Part 257, Subpart D) (CCR Rule), that cover certain CCR management units. Collectively, these data provide a broad-based characterization of the CCR management units to meet the objectives of the EIP. Geotechnical data were used for TDEC Order CCR management unit stability and integrity evaluations. EI environmental sample data were used to characterize the extent of potential impacts and were compared to constituent-specific TDEC-approved levels to identify CCR constituents that require further evaluation in the next phase of the TDEC Order, the Corrective Action/Risk Assessment (CARA) Plan.

This Environmental Assessment Report (EAR) describes the extent of surface stream water, sediment, and groundwater contamination from the KIF Plant TDEC Order CCR management units, and provides the information, data, and evaluations used to make those assessments. As described herein, more than 96% of the groundwater sample results from over 300 samples were below the approved levels. The KRP data included for evaluation of surface stream water, sediment and ecology were collected under a similar quality assurance program as the EI data and are considered to be

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<sup>1</sup> The term “CCR management unit” is used in this document generally and is not intended to be a designation under federal or state regulations.

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of comparable data quality for use in this EAR. The EI data indicate impacts to limited onsite groundwater areas. The extensive investigations conducted for the KRP and subsequent long-term monitoring program data indicate that there are no adverse impacts to ecological communities in the Emory, Clinch, and Tennessee Rivers from the KIF Plant or the residual ash in those rivers. The data from the EI and KRP will be used to evaluate the basis and methods for CCR management unit closure in the CARA Plan, including an evaluation of the performance of existing closure methods; modifications to the closure methodology will be identified, as needed, in the CARA Plan.

The following are the overall assessment findings based on data as presented in this EAR and the previous studies:

- Evaluation of the previous and ongoing extensive investigations conducted for the KRP indicate that surface stream water, sediment and biota tissue concentrations are below remedial objectives and declining, and there are no adverse impacts to benthic macroinvertebrate communities or fish health in the Clinch, Emory, and Tennessee Rivers, or to aerial-feeding insectivorous birds. TVA is continuing long-term monitoring activities to fully document these findings, as required by the United States Environmental Protection Agency and TDEC under the terms of the Comprehensive Environmental Response, Compensation, and Liability Act remedy.
- The TDEC Order CCR management units have adequate structural stability and slopes are stable under current static and seismic loading conditions, except for the seismic global slope stability at the Sluice Trench and Area East of Sluice Trench. TVA is currently evaluating mitigation alternatives, and it is anticipated that the mitigation design process will commence in parallel with the CARA phase of the TDEC Order program.
- No seeps were identified during the EI.
- All but one TDEC Appendix I and CCR Rule Appendix IV CCR constituent concentrations in onsite groundwater are below the TDEC-approved groundwater screening levels (GSLs), and groundwater impacts are limited to onsite areas downgradient along the perimeter of the TDEC Order CCR management units. However, additional assessments will be included in the CARA Plan to evaluate the need for corrective action for targeted onsite groundwater remediation at locations where statistically significant concentrations of cobalt above the GSL exist.
- Drainage improvements or potential corrective actions are expected to reduce concentrations of CCR constituents to below GSLs in groundwater at downgradient monitoring locations.
- The groundwater flow direction within the uppermost aquifer beneath the TDEC Order CCR management units is generally to the east-southeast towards Emory River and the Plant Intake Channel. Groundwater flow in the vicinity of the TDEC Order CCR management units is bounded to the east and southeast by the Emory River and the Plant Intake Channel. Pine Ridge to the west and upgradient of the plant serves as a topographic divide to groundwater flow.
- Based on the overall results of the water use survey, current and historical CCR management associated with the KIF Plant have not affected water supply wells or springs located in the vicinity of the KIF Plant.

Exhibit ES-1 shows overall findings of the investigation and the locations where the environmental assessments concluded that no further evaluation is needed. It also shows where further evaluation is needed in the CARA Plan for onsite groundwater. Onsite groundwater impacts will require further evaluation regardless of the CCR management unit closure method, and groundwater remediation can be accomplished along with closure in place or closure by removal.

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TVA continues to evaluate means to beneficially use CCR material in a manner consistent with regulatory requirements while maximizing value to the Tennessee Valley.

Upon TDEC approval of the EAR, and in accordance with the TDEC Order, TVA will further evaluate these findings and prepare a CARA Plan for submittal to TDEC. The CARA Plan, which will be subject to a public review and comment process, will evaluate whether unacceptable risks related to management of CCR material exist at the KIF Plant. The CARA Plan will also specify the actions TVA plans to take at the TDEC Order CCR management units and the basis of those actions. It will also incorporate other operational changes planned or in progress by TVA, including details for CCR beneficial use operations, modification of the TDEC Order CCR management units as needed to meet regulatory standards, and long-term closure and monitoring.



\* TVA is continuing long-term ecological monitoring in the Emory, Tennessee, and Clinch Rivers to confirm Kingston Recovery Project remedial objectives are met and that there are no adverse impacts to ecological communities.

\* Slopes are stable under current static conditions. Additional mitigation measures are being designed for seismic conditions.

NOTE: The KRP Ash Landfill is not part of this assessment and is regulated by the TDEC Division of Solid Waste Management.

Exhibit No.

ES-1

Title

Summary of Environmental Assessment Report Findings  
Kingston Fossil Plant

Client/Project

Tennessee Valley Authority  
Kingston Fossil (KIF) Plant TDEC Order

Project Location

Roane, Tennessee

175648043

Prepared by KB on 2023-05-17

### Key Findings

Nearly all of the environmental sample results were below the approved levels.

This means that TVA is managing its CCR units in a way that protects the ecological integrity of the Emory, Tennessee, and Clinch Rivers, and their aquatic communities.

### Assessment and Monitoring Findings

These symbols summarize the findings of the investigation and monitoring:



No action is needed.



Corrective action is being evaluated in this area.

### Next Steps

With TDEC acceptance of the environmental assessment, TVA will further evaluate certain areas for potential corrective action and will conduct a water use survey to better understand groundwater conditions around the Kingston Fossil Plant.

TVA will use these findings to prepare and submit a corrective action plan to TDEC. This plan, which will be released for public review and comment, will specify measures TVA plans to take to address unacceptable risks.

TVA's efforts will continue until regulators are satisfied, and monitoring of groundwater will continue for many years.