



**STATE OF TENNESSEE**  
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**  
NASHVILLE, TENNESSEE 37243-0435

**ROBERT J. MARTINEAU, JR.**  
COMMISSIONER

**BILL HASLAM**  
GOVERNOR

**MEMORANDUM**

**TO:** Lt. Gov. Ron Ramsey  
Speaker of the Tennessee Senate

Speaker Beth Harwell  
Speaker of the Tennessee House of Representatives

Senator Steve Southerland  
Chairman, Senate Energy, Agriculture & Natural Resources Committee

Representative Curtis Halford  
Chairman, House Agriculture & Natural Resources Committee

**FROM:** Robert J. Martineau, Jr., Commissioner  
Department of Environment and Conservation *RJM*

**DATE:** February 21, 2014

**RE:** Report on the storage of coal ash

Senate Joint Resolution 784 was adopted in 2010 by the Tennessee General Assembly and requires the Department of Environment and Conservation to annually report on TVA's progress in transitioning to dry coal ash storage.

Attached is your copy of the 2014 report. Please feel free to contact me or my staff if you have any questions.

# **REPORT ON STATUS OF TVA'S EMERGENCY PREPAREDNESS AND TRANSITION TO DRY COAL ASH STORAGE**

**(SJR784 of 2010)**

**2014 Report**

Prepared by:  
Tennessee Department of Environment and Conservation

Division of Water Resources  
&  
Division of Solid Waste Management

William R. Snodgrass Tennessee Tower  
312 Rosa L. Parks Ave.  
Nashville, TN 37243



## **TVA's Conversion to Dry Coal Combustion Waste Management**

TDEC is facilitating the conversion to dry ash management by requiring TVA to submit an Ash Pond Closure Plan through the NPDES renewal process. Each facility Closure Plan describes the steps to be taken to prevent contamination of surface waters from ash ponds when they are no longer actively used in the wet coal combustion residue (CCR) management process, but still may contain CCR materials and wastewater. NPDES permits containing this requirement have been reissued for Bull Run, Johnsonville, John Sevier, and Gallatin fossil plants. Initial Closure Plans for these four plants have been submitted by TVA to TDEC's Division of Water Resources and Division of Solid Waste Management. TDEC has approved three of these four initial plans, with the Gallatin plan still under review.

The following table summarizes TVA's current projected dates for completion of conversion from wet management of all TVA CCR (fly ash, bottom ash and gypsum) processing to dry processing. TVA advises us that these dates are subject to change based on changing economics, operational decisions, pending regulations, and project restrictions. While dates have changed from the previous report to the legislature, they are a result of priority shifts among the plant projects (including fossil plants in Alabama and Kentucky) and are not a change in TVA's overall commitment.

|                                 |  |
|---------------------------------|--|
| Allen Fossil Plant (ALF)        | Closure of the active ash pond during Fiscal Year 2020 (FY20).<br>Other conversion dates pending overall operation decisions of the ALF facility as a fossil plant.              |
| Bull Run Fossil Plant (BRF)     | Fly ash currently managed in a dry fly ash stack.<br>Conversion of the remaining CCRs to dry management during FY15.   |
| Cumberland Fossil Plant (CUF)   | Fly ash currently managed in a dry fly ash stack.<br>Conversion of the remaining CCRs to dry management during FY20.   |
| Gallatin Fossil Plant (GAF)     | Conversion to dry fly ash & gypsum management during FY15-17.<br>Conversion to dry bottom ash management during FY18-19.   |
| John Sevier Fossil Plant (JSF)  | Two units have been formally retired and two units idled (i.e., removed from service). All power generation from coal fired boilers and CCR production at the plant have ceased. |
| Johnsonville Fossil Plant (JOF) | The plant is forecasted to be idled by December 31, 2016 and then retired.<br>Wet CCR management is forecasted through December 31, 2016.  |
| Kingston Fossil Plant (KIF)     | Fly ash currently managed dry.<br>Conversion to dry gypsum management complete.<br>Conversion to dry bottom ash management during FY16.  |

\*The TVA fiscal calendar runs from October 1st to the following September 30th. (e.g., FY14 is October 1, 2013 to September 30, 2014.)

For the plants, which will cease operations – John Sevier and Johnsonville – discharges from the boilers to the ash ponds were discontinued in 2012 at John Sevier and are forecasted to

cease in 2016 at Johnsonville. Discharge to surface waters through the ash ponds at the facilities noted in this report will continue on an interim basis; therefore, the ponds will remain under the regulatory authority of the Division of Water Resources until TVA determines the final closure and associated actions for the ponds.

## Structural Stability

TVA utilized the Corps of Engineers' and Homeland Security's Safe Dams program to assess the impoundments for hazard potential and to describe the amount of damage that would result from failure of the dam. The hazard category is based on an evaluation of what the damage would be if the dam failed as opposed to the likelihood of failure. TVA has completed adjustment of pond configurations and water levels to eliminate any high hazard potential.

To address the likelihood of failure, TVA completed the global stability analysis and implemented structural improvements (see attached CCP Remediation Scorecard). The CCP Scorecard lists all TVA facilities including the Paradise and Shawnee fossil plants, both located in Western Kentucky and the Colbert and Widows Creek fossil plants located in Northern Alabama. Note that all Tennessee impoundments now meet the accepted global engineering safety factor for earthen dams of 1.5. This means that the forces keeping the impoundment in place are 1.5 times greater than those that would move it. Some additional improvement associated with modifications of several spillways and other repairs not directly related to the safety factor of the earthen dams are ongoing.

At Kingston, initial construction of the perimeter containment wall that encloses the ash landfill was completed in August 2013. Final mitigation work is expected to be complete in the second quarter of FY2014. Installation of the cap/cover to close the landfill is ongoing and projected to be complete in late 2014.

Shortly after the Kingston fossil plant ash pond failure, EPA initiated a nationwide assessment of coal ash management facilities. In September 2012, Dewberry & Davis, LLC prepared for EPA a series of draft reports evaluating the condition and potential for residue release from the TVA CCR management units at each facility, and a determination of the hazard potential classification for each unit. In those draft reports, there were CCR units at the Allen, Cumberland and Gallatin fossil plants that were given a poor hazard potential rating. Justification for the poor rating at the Allen and Cumberland fossil plants were related to inadequate documentation of seismic stability analyses. Since that time, TVA has performed extensive subsurface investigation and seismic analyses to address the EPA request for additional information. As a result, the units at each of the respected sites were re-rated as satisfactory. This is captured in the EPA's final reports, which were issued in June 2013.

## Independent Review Board

Because TVA has committed to close existing CCR impoundments and in the interim have improved the safety of all impoundments, the Department determined that the need for outside expertise would be very limited. The Department further determined that the expertise within the Divisions of Water Resources and Solid Waste Management will provide an adequate review of routine design documents. TDEC will seek assistance of outside expertise on more complex matters as the need arises. TDEC will also seek outside experts for peer review of proposed modifications to design criteria.

## CCP Remediation Score Card

Draft January, 2014

| TVA Fossil Plants | Facility         | Global Stability | Target to Clear | Non-Global Stability | Target to Clear Non-Global Stability | Hazard Classification | Target to Clear | Spillways Priority | Schedule |
|-------------------|------------------|------------------|-----------------|----------------------|--------------------------------------|-----------------------|-----------------|--------------------|----------|
| Allen             | Ash Disposal     |                  |                 |                      |                                      |                       | Close           |                    |          |
| Bull Run          | Ash Pond         |                  |                 |                      |                                      |                       | Close           |                    |          |
|                   | Gypsum           |                  |                 |                      |                                      |                       |                 |                    |          |
| Colbert           | Dry Stack        |                  |                 |                      |                                      | N/A                   | N/A             | N/A                | N/A      |
|                   | Bottom Ash       |                  |                 |                      |                                      |                       | Close           |                    |          |
| Cumberland        | Ash Pond         |                  |                 |                      |                                      |                       | Close           |                    |          |
|                   | Dry Stack        |                  |                 |                      |                                      | N/A                   | N/A             | N/A                | N/A      |
|                   | Gypsum           |                  |                 |                      |                                      |                       | Close           |                    |          |
| Gallatin          | Ash Disposal     |                  |                 |                      | Sep-15                               |                       | Close           |                    | Sep-14   |
| John Sevier       | Dry Stack        |                  |                 |                      | Close                                | N/A                   | N/A             | N/A                | N/A      |
|                   | Bottom Ash       |                  |                 |                      |                                      |                       | Close           |                    |          |
| Johnsonville      | Ash Disposal     |                  |                 |                      |                                      |                       | Close           |                    |          |
| Kingston          | Dike C           |                  |                 |                      |                                      |                       | Close           |                    |          |
| Paradise          | Ash Pond         |                  |                 |                      |                                      |                       |                 |                    |          |
|                   | Scrubber Complex |                  |                 |                      |                                      |                       |                 |                    |          |
| Shawnee           | Dry Stack        |                  |                 |                      |                                      | N/A                   | N/A             | N/A                | N/A      |
|                   | Ash Pond         |                  |                 |                      | Mar-14                               |                       | Close           |                    |          |
| Widows Creek      | Ash Pond*        |                  |                 |                      |                                      |                       | Close           |                    |          |
|                   | Gypsum           |                  |                 |                      |                                      |                       | Close           |                    |          |

\* Excludes Global Stability of Old Dredge Cell and Lower Stilling Pond (See Global Stability Plan tab)

|           |            |           |            |             |            |                  |            |
|-----------|------------|-----------|------------|-------------|------------|------------------|------------|
| >1.5      | On Sch     | >1.5      | On Sch     | Low         | On Sch     | Pond Closure     | On Sch     |
| 1.3 - 1.5 | At Risk    | 1.3 - 1.5 | At Risk    | Significant | At Risk    | Reduce Risk      | At Risk    |
| <1.3      | Behind Sch | <1.3      | Behind Sch | High        | Behind Sch | Work Immediately | Behind Sch |

## CCP Global Stability Plan (Completed August 1, 2011)

*Remediation Design/Construction - 24 Original Facilities Completed*

### Calendar Year

|            |                              | 2009 |  |  |         | 2010 |  |  |         | 2011    |  |         |  |
|------------|------------------------------|------|--|--|---------|------|--|--|---------|---------|--|---------|--|
| <b>ALF</b> | East Ash Pond                |      |  |  |         |      |  |  |         |         |  |         |  |
|            | East Stilling Pond           |      |  |  |         |      |  |  |         |         |  | June 28 |  |
| <b>BRF</b> | Main Ash Pond Area 2         |      |  |  |         |      |  |  |         |         |  | May 27  |  |
|            | Bottom Ash Disposal Area 1   |      |  |  |         |      |  |  |         |         |  |         |  |
|            | Gypsum Disposal Area 2A      |      |  |  |         |      |  |  |         |         |  | June 3  |  |
| <b>COF</b> | Disposal Area 5              |      |  |  |         |      |  |  |         |         |  |         |  |
|            | Ash Pond 4                   |      |  |  |         |      |  |  |         |         |  | June 15 |  |
| <b>CUF</b> | Dry Ash Stack                |      |  |  |         |      |  |  |         |         |  | June 4  |  |
|            | Ash Pond                     |      |  |  |         |      |  |  |         |         |  |         |  |
|            | Gypsum Storage Area          |      |  |  |         |      |  |  |         | Dec. 8  |  |         |  |
| <b>GAF</b> | Fly Ash Pond E               |      |  |  |         |      |  |  |         |         |  |         |  |
|            | Bottom Ash Pond A            |      |  |  |         |      |  |  |         |         |  |         |  |
|            | Stilling Pond B, C, and D    |      |  |  |         |      |  |  |         |         |  |         |  |
| <b>JSF</b> | Dry Fly Ash Stack            |      |  |  |         |      |  |  | Sept. 1 |         |  |         |  |
|            | Bottom Ash Disposal Area 2   |      |  |  |         |      |  |  |         |         |  |         |  |
|            | Ash Disposal Area J (Closed) |      |  |  |         |      |  |  | Sept. 1 |         |  |         |  |
| <b>JOF</b> | Ash Disposal Area 2          |      |  |  |         |      |  |  |         |         |  | June 16 |  |
| <b>KIF</b> | Dike C                       |      |  |  |         |      |  |  |         |         |  |         |  |
| <b>PAF</b> | Scrubber Sludge Complex      |      |  |  |         |      |  |  |         | Dec. 31 |  |         |  |
|            | Peabody Ash Pond             |      |  |  |         |      |  |  |         |         |  |         |  |
| <b>SHF</b> | Consolidated Waste Dry Stack |      |  |  |         |      |  |  |         |         |  |         |  |
|            | Ash Pond                     |      |  |  |         |      |  |  |         |         |  |         |  |
| <b>WCF</b> | Ash Pond Complex*            |      |  |  |         |      |  |  |         |         |  | Aug. 1  |  |
|            | Gypsum Stack Complex         |      |  |  | Oct. 29 |      |  |  |         |         |  |         |  |

\* Excludes Global Stability of Old Dredge Cell and Lower Stilling Pond (See Global Stability Plan tab)

*Additional Facilities - Active October 1, 2011*

### Global Factor of Safety

Draft Jun. 7, 2014

| Calendar Year      |  |  |  |      |  |  |  |      |                    |  |  |      |
|--------------------|--|--|--|------|--|--|--|------|--------------------|--|--|------|
| 2011               |  |  |  | 2012 |  |  |  | 2013 |                    |  |  | 2014 |
|                    |  |  |  |      |  |  |  |      |                    |  |  |      |
| Phase 1 Assessment |  |  |  |      |  |  |  |      | Phase 2 Assessment |  |  |      |
|                    |  |  |  |      |  |  |  |      |                    |  |  |      |
|                    |  |  |  |      |  |  |  |      |                    |  |  |      |
|                    |  |  |  |      |  |  |  |      |                    |  |  |      |
|                    |  |  |  |      |  |  |  |      |                    |  |  |      |

[illegible]

| Remediation Improvements Legend                     |
|---|
| Non-Global/Seepage FS or Repair Design/Construction |
| Spillway Design/Construction                        |
| Construction Complete                               |

**STATE OF TENNESSEE**

**SENATE JOINT RESOLUTION NO. 784**

**By Senators Burchett, Woodson, Yager, Herron, Marrero**

**and**

**Representatives Ferguson, Matlock, Hackworth, Winningham**

A RESOLUTION to direct the Department of Environment and Conservation to report on the status of the Tennessee Valley Authority's emergency preparedness and transition to dry coal ash storage.

WHEREAS, Tennessee experienced one of the worst man-caused ecological disasters in the December 22, 2008 coal ash dam failure and spill of more than 5.4 million cubic yards of coal ash at the Tennessee Valley Authority (TVA) coal plant at Kingston; and

WHEREAS, the TVA Inspector General, in a report dated June 12, 2009, found that TVA had not implemented the federal National Information Management System (NIMS) in accord with Presidential Homeland Security directives and that this failure "hampered communications and delayed certain emergency response actions following the spill"; and

WHEREAS, the Tennessee Department of Environment and Conservation (TDEC), in an Ash Spill Advisory Committee report entitled "Lessons Learned from TVA Dredge Cell Containment Facility Failure" released November 30, 2009, notes that the TVA Inspector General finding that TVA had not complied with NIMS and found that "emergency planning and preparedness are critical aspects for the safe management and operation of containment structures including CCW (Coal Combustion Waste)" and that "TVA should implement NIMS training and changes to the Emergency Response Plans (ERPs) to improve communications with other agencies should TVA encounter another emergency situation"; and

WHEREAS, the TDEC Ash Spill Advisory Committee report also states that "TVA should add emergency management personnel and risk assessment for all TVA owned and operated facilities" and that "because of their high risk to life, property or environmental damage from potential failure, TDEC should review their requirements for similarly permitted facilities and associated risk to determine commensurate levels of emergency planning and preparedness"; and

WHEREAS, TVA has six other coal-fired power plants in Tennessee with wet coal ash storage; and

WHEREAS, experts in coal ash agree that dry coal ash storage is preferable to wet coal ash storage; and

WHEREAS, TVA's response to its Inspector General, according to TDEC's Ash Spill Advisory Committee, was that TVA will fully implement the NIMS; and

WHEREAS, TVA has announced that it plans to move three of its coal plants from wet ash storage to dry ash storage by 2012 and to eventually close all its wet ash ponds; now, therefore,

BE IT RESOLVED BY THE SENATE OF THE ONE HUNDRED SIXTH GENERAL ASSEMBLY OF THE STATE OF TENNESSEE, THE HOUSE OF REPRESENTATIVES CONCURRING, that the Department of Environment and Conservation shall report to the 107th General Assembly no later than March 30, 2011, as to TVA's progress on NIMS implementation and emergency preparedness, including changes to the ERPs and emergency management personnel and risk assessment for all TVA owned and operated facilities in Tennessee.

BE IT FURTHER RESOLVED, that the Department of Environment and Conservation shall report annually, by February 1 of each year, on TVA's progress in transition to dry coal ash storage at each of its coal plants in Tennessee using information known to the department arising from the continued environmental restoration activities at the Kingston power plant and the affected lands and rivers, and the department's records arising from solid waste, air quality, and water pollution control or other permitting of TVA facilities and facilities which are used for the disposition or storage of coal ash produced from TVA power plants. New information respecting structural evaluations of all presently used coal ash storage facilities, both wet and dry landfills, which raise concerns as to safety or the release of pollutants to the environment, should be included. Annual reports are requested until the transition to dry coal ash storage is complete for all TVA plants in Tennessee.

BE IT FURTHER RESOLVED, that such annual reports shall also include a summary of the structural analyses and geotechnical investigations submitted to the department by TVA or derived from other sources as well as information on TDEC's progress on incorporating into the department's permitting processes the recommendations of the Advisory Committee that an independent evaluation board, including geotechnical and dam safety experts, be used to provide expert oversight during the design, construction, and closure plan development.

BE IT FURTHER RESOLVED, that nothing in this resolution shall be construed to require that TDEC conduct studies in addition to those studies which are necessary and appropriate as arising from the continued environmental restoration activities at the Kingston power plant and the affected lands and rivers, and the department's records arising from the transition to dry coal combustion products storage and the permitting of TVA facilities and facilities which are used for the disposition or storage of coal ash produced from TVA power plants. TDEC is authorized to seek to recover costs from TVA for the investigation, preparation, and presentation of these reports.

BE IT FURTHER RESOLVED, that a copy of this resolution be transmitted to the Commissioner of the Department of Environment and Conservation.

**ADOPTED: May 27, 2010**

  
RON RAMSEY  
SPEAKER OF THE SENATE

  
KENT WILLIAMS, SPEAKER  
HOUSE OF REPRESENTATIVES

**APPROVED: June 2, 2010**

  
PHIL BREDESEN, GOVERNOR