

Technical Bulletin

EPA Final Rules for Disposal of Coal Combustion Residuals from Electric Utilities

The U.S. Environmental Protection Agency (EPA) published its final rules governing disposal of coal combustion residuals (CCR) produced by electric utilities. The rules appear at 80 *Fed. Reg.* 21302 (April 17, 2015) and are effective on October 19, 2015.

The rules regulate CCR from electric utilities as a new category of Resource Conservation and Recovery Act (RCRA) Subtitle D (solid waste) facility that requires detailed location, design, operation, closure and post-closure care requirements to be met, or the facility will be considered an “open dump” subject to citizens’ suit enforcement under RCRA.

At the federal level, there will be no permits or enforcement of the final rules. EPA is encouraging states to amend their solid waste regulations to be at least as stringent as the final CCR rules, and compliance with a state program approved by EPA is expected to be a substantial factor for a court to consider in favor of dismissal of a citizens’ suit. How states implement these national minimum criteria will drive compliance. SCS is tracking state-by-state implementation closely and will provide further updates on a local basis.

The final CCR rules do not regulate beneficial use of CCR, other than to define the term. Under the rules, CCR must provide a functional benefit, be a substitute for a virgin material, and meet relevant specifications where available in order to be beneficial use. Where there are no standards, the CCR cannot be used in “excess quantities,” and if 12,400 tons or more are used for fill or other unencapsulated uses, the user has to document and make available on request a written demonstration that environmental releases

will meet relevant regulatory and “health-based benchmarks.” The terms in quotation marks here are not defined in the rules.

Location Criteria

The final CCR rules supplement the open dump criteria first published 35 years ago. For new CCR landfills, new and existing CCR surface impoundments, and all lateral expansions, the following location criteria must be met:

Groundwater. The base of the unit must be located at least five feet above groundwater, unless it can be demonstrated there will not be a connection between the base of the unit and the uppermost aquifer.

Wetlands. The unit must not be located in wetlands, unless a demonstration of necessity can be made.

Fault areas. The unit must not be located within 200 feet of the outermost damage zone of a fault that has had displacement in Holocene time, unless it can be demonstrated a shorter distance is protective.

Seismic impact zones. The unit cannot be located in a zone with a 2% or more probability of more than 0.1 g horizontal acceleration unless it can be demonstrated all structural components can withstand maximum horizontal acceleration.

Unstable areas. The unit cannot be located in an area with poor foundation conditions, susceptible to mass movements, in karst terrains or similar conditions unless the structure is designed to properly accommodate such conditions.

Each of these conditions must be certified by a qualified professional engineer.

Design Criteria

New landfills, new surface impoundments, and lateral expansions are required to have a composite liner consisting of an upper component 30-mil geomembrane (60-mil if HDPE) and a lower component having two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.

Alternative designs for the lower component of the composite liner (e.g., geosynthetic clay liner in place of compacted clay) can be used, provided that they meet certain requirements.

Existing impoundments are to determine if they have a clay liner (two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec), a composite liner, or an equivalent alternative liner. If they do not, or if no determination is made, they are an existing unlined CCR surface impoundment. If an unlined impoundment is found to have exceedances of groundwater assessment standards, it must stop receiving CCR and be closed or retrofitted.

New CCR landfills and lateral expansions of existing landfills must include leachate collection and removal systems. Liners and leachate collection and removal systems must be certified to be designed and constructed in accordance with the final rules.

CCR impoundments that have dikes above ground are subject to structural integrity criteria: (1) mark the impoundment with an identification sign, (2) periodically assess the hazard potential classification of the impoundment, (3) prepare an Emergency Action Plan (for high hazard and significant hazard potential impoundments only), and (4) maintain vegetation on dike slopes no higher than six inches.

Big and tall CCR impoundments—those with dikes 20 feet or higher, and those with more

than 20 acre-feet in volume with dikes 5 feet or higher—are subject to additional structural integrity requirements, including to (1) document the history of construction, (2) make periodic structural stability assessments, and (3) make periodic safety factor assessments. Assessments are required initially (timing varies depending on circumstances) and every five years. Failure to complete the assessment or to demonstrate the required factor of safety subjects the impoundment to closure requirements.

Operating Criteria

CCR landfills and surface impoundments must comply with several operating criteria.

Air criteria. Facilities must prepare and implement a CCR fugitive dust control plan to minimize dust, and must prepare an annual report of dust control to include a record of citizen complaints received.

Landfill run-on, run-off controls. Run-on and run-off resulting from a 24-hour, 25-year storm have to be controlled.

Impoundment flood control. Impoundments must be designed to manage inflows and outflows resulting from significant storm events—the maximum probable storm for high potential hazard impoundments, the 1,000-year storm for significant potential hazard impoundments, the 100-year storm for low potential hazard impoundments, and the 25-year storm for in-ground (no dike) impoundments.

Inspections. Weekly, monthly, and annual inspections of key CCR unit components are required to be performed by qualified inspectors and documented.

Groundwater Monitoring and Corrective Action

Active CCR units (those continuing to receive CCR on or after October 19, 2015)¹ must install an appropriate groundwater monitoring network and perform semi-annual detection and assessment monitoring (if necessary). Well locations must be adequate to determine background groundwater quality and the quality of groundwater passing the downgradient CCR waste boundary.

Detection monitoring must include boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids. If a statistically significant increase in the concentration of any of these parameters over background levels is observed, assessment monitoring is required.

Assessment monitoring includes 14 metal elements plus fluoride. If assessment monitoring shows any are detected at statistically significant levels above the groundwater protection standard (either the primary drinking water standard or background), the facility must file a notification in its operating record and commence evaluation of corrective measures.

After determining the nature and extent of any release from the CCR unit, the facility must assess corrective measures to prevent further releases, remediate any releases, and restore the affected area to original conditions. Before selecting a remedy, the facility must solicit public comments.

Closure, Post-Closure Care

All CCR units are required to have written closure and post-closure care plans and to keep the plans current. Two basic forms of

¹ The final CCR rules published on April 17, 2015 defined an active CCR surface impoundment as one that receives CCR on or after October 14, 2015, five days before the rule otherwise was effective. EPA corrected this discrepancy in a technical amendment published in 80 *Fed. Reg.* 37988 (July 2, 2015).

closure are allowed: (1) closure by removal of CCR (clean closure), and (2) closure leaving CCR in place.

If the unit is closed leaving CCR in place, a final cover must be designed and installed that is no more permeable than the liner under the unit. A minimum of 18 inches of soil compacted to a permeability no greater than 1×10^{-5} cm/sec is required for an infiltration layer, covered by a vegetative soil layer at least 6 inches thick. The rules provide for alternative cover designs if certain demonstrations can be made.

Final covers must be designed to accommodate anticipated settlement, and if the impoundment contains free liquids, they must be removed or solidified before the final cover is installed. There also may be a need to stabilize the CCR material so that it can support the final cap.

If CCR remains in the unit following closure, the unit is subject to post-closure care for 30 years, including maintenance of and repairs to final covers and other unit components, and semi-annual detection and/or assessment monitoring of groundwater.

Records and Public Website

The final rules rely heavily on utilities to post extensive information regarding unit location, design, operations, monitoring, and closure and post-closure care on a public website. Many of these documents must be certified or verified by a qualified professional engineer licensed in the jurisdiction where the CCR unit is located.

Generally, copies of much of the same information must be sent in the form of a notification to the appropriate state agency within 30 days of placing the information into the operating record for the facility.

It is likely that several non-governmental organizations will be tracking information sent to state agencies and posted to public

websites with a goal of bringing citizens suits where CCR facilities do not meet the criteria.

Compliance Timeline

Table 1 and Table 2 show the compliance timelines for existing CCR surface impoundments and landfills, respectively.

Table 1. Timeline for Existing CCR Impoundments

When	What
10/19/15	Fugitive dust control plan Initiate weekly inspections Initiate monthly monitoring of CCR unit instrumentation Conduct required recordkeeping Provide required notifications Establish CCR website
12/17/15	Install permanent marker
1/19/16	Complete the initial annual inspection
10/17/16	Document whether CCR unit is either a lined or unlined CCR surface impoundment Compile a history of construction, complete initial hazard potential classification assessment, initial structural stability assessment, and initial safety factor assessment Prepare initial inflow design flood control system plan Prepare written closure and post-closure care plans
4/17/17	Prepare emergency action plan
10/17/17	Install the groundwater monitoring system; develop the groundwater sampling and analysis program; initiate the detection monitoring program; and begin evaluating the groundwater monitoring data for statistically significant increases over background levels
10/17/18	Complete demonstration for placement above the uppermost aquifer Complete demonstrations for wetlands, fault areas, seismic impact zones, and unstable areas

Table 2. Timeline for Existing CCR Landfills

When	What
10/19/15	Fugitive dust control plan Initiate weekly inspections Conduct required recordkeeping Provide required notifications Establish CCR website
1/19/16	Complete the initial annual inspection
10/17/16	Prepare initial run-on and run-off control system plan Prepare written closure and post-closure care plans
10/17/17	Install the groundwater monitoring system; develop the groundwater sampling and analysis program; initiate the detection monitoring program; and begin evaluating the groundwater monitoring data for statistically significant increases over background levels
10/17/18	Complete demonstration for unstable areas

EPA says the timelines provide electric utilities with ample time to consider other pending EPA rules (e.g., Effluent Limitations Guidelines) before taking action.

How SCS Can Help

We help utilities manage CCR, including investigation and remediation of releases from CCR disposal sites, design of upgrades and closure for existing disposal impoundments and landfills, and design of new CCR management facilities. SCS can assist you with meeting compliance deadlines.

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