Gainesville Regional Utilities

Deerhaven Generating Station

Coal Combustion Residuals Surface Impoundment System Closure Plan
(Version 3.0)

Prepared for:
Gainesville Regional Utilities
Deerhaven Generating Station
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Gainesville, Florida 32653

Prepared by:

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1 Introduction

1.1.1 Overview

Gainesville Regional Utilities (GRU) owns and operates the Deerhaven Generating Station (site) located in Gainesville, Florida. Unit #2 at the site is a dual-fuel-fired boiler (i.e., natural gas and/or coal). When generated, the bottom ash from the coal combustion process at this unit is quenched and transported as ash sluice water to an onsite coal combustion residuals (CCR) surface impoundment system comprised of two ash cells (i.e., Ash Cell #1, Ash Cell #2). The ash cells are used to precipitate the bottom ash from the sluice water but are also used to temporarily retain non-CCR wastestreams such as cooling tower blowdown and other process waters from a variety of site operations before onsite water treatment; ash sluice water represents a very small fraction of the total process water received by the CCR surface impoundment system.

Construction records indicate that a slurry wall containment system was constructed around the periphery of the plant process water ponds and was keyed into an existent underlying natural clay layer. The surface impoundment system does not have an engineered bottom liner system. Historically, each ash cell has been dewatered approximately every 5-10 years, and the precipitated bottom ash is excavated and placed in an onsite CCR landfill. Figure 1 presents the CCR surface impoundment system and the CCR landfill locations with respect to other site features.

Per Title 40 of the Code of Federal Regulations, Part 257, Subpart D (CCR rule), the CCR surface impoundment system and the onsite CCR landfill are designated as CCR units. The CCR rule requires the preparation of a closure plan (§257.102(b)) for CCR units that can be implemented at any point during the active life of the CCR unit consistent with recognized and generally accepted good engineering practices. Innovative Waste Consulting Services LLC prepared the initial closure plan in 2016 (IWCS 2016a). Per the initial plan, GRU planned to close the impoundment system in 2046-2048. However, due to recent revisions in the federal regulations and retrofits implemented for the Unit 2 boiler, GRU plans to close the system by removing CCRs and repurposing the cells by 2024 for managing the wastestreams generated at the facility. GRU contracted Innovative Technical Solutions (ITS) to update the plan with the recent changes in the closure approach and timeline.

This CCR surface impoundment system closure plan has been developed to a level of detail required by the current CCR rule (i.e., the CCR rule as of September 2021) and based on the site-specific information currently available. If the CCR rule is amended or revised, or if there is a significant change in plant or surface impoundment system operation or design, this plan must be reevaluated and modified as necessary.

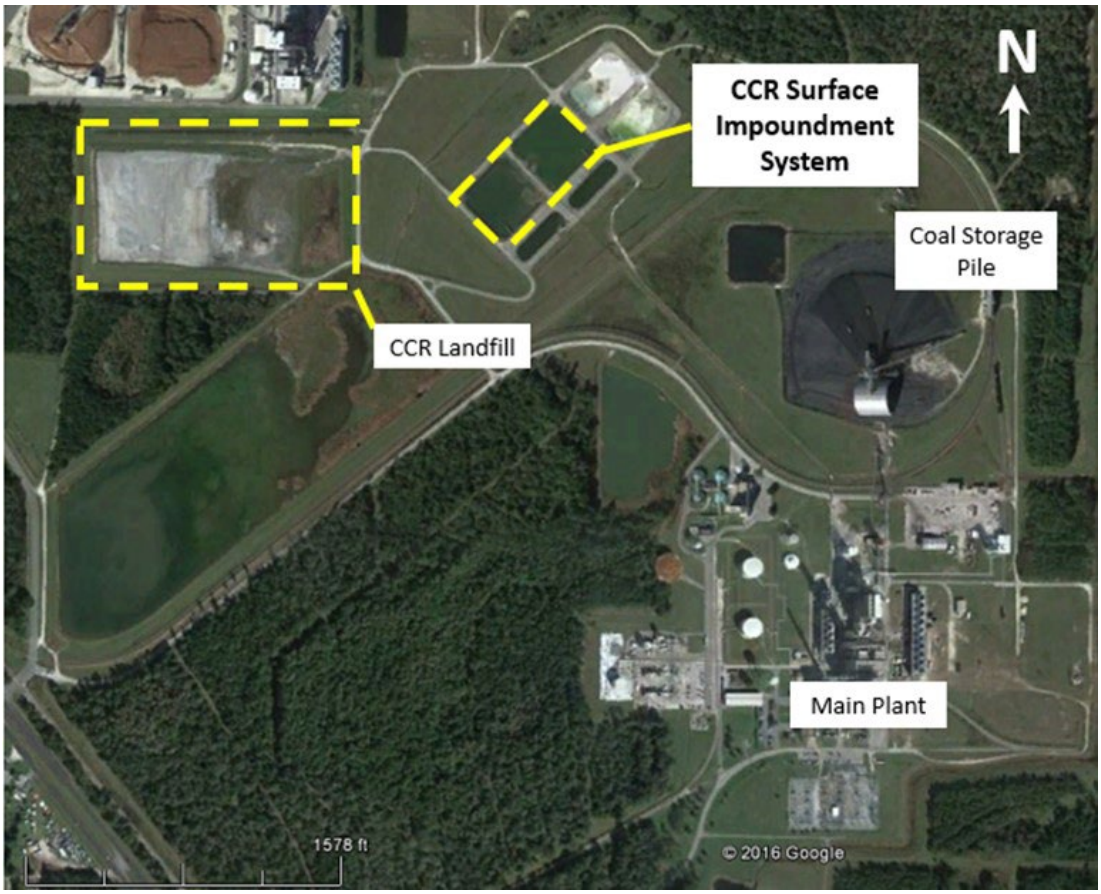


Figure 1. Deerhaven Generating Station CCR Surface Impoundment System and CCR Landfill Locations (Google, Inc. (2016) - 11/12/2015 Imagery Date)

1.1.2 Report Organization

This closure plan report is organized into eight sections. Section 1 presents an overview of the plan and its organization. Section 2 summarizes the events that would trigger closure plan implementation and discusses closure extension. Section 3 presents a detailed description and timeline of the closure process. Section 4 provides information on the amendment of the plan. Section 5 presents closure notifications, record keeping, and publicly-accessible internet site requirements. Section 6 briefly discusses the post-closure use of the surface impoundment system. Section 7 lists the references used in the development of this plan. Section 8 includes a certification that the initial closure plan meets the requirements of the CCR rule from the professional engineer who prepared or supervised all the aspects of the development of this plan.

2 Closure Plan Implementation

On August 28, 2020, the EPA issued revisions to the CCR rule that require the owner/operator of an existing unlined CCR surface impoundment to cease placing CCR and non-CCR wastestreams into such CCR surface impoundments as soon as technically feasible, but no later than April 11, 2021, and either retrofit or close them per the requirements of §257.102 (§257.101(a)). The recently promulgated criteria require closure or retrofitting of the existing unlined CCR surface impoundment system at DGS. The CCR surface impoundment system is located within a slurry wall system. It, however, is considered unlined pursuant to §257.71(a)(3). These regulations allow the owner/operator to continue placing CCR and non-CCR wastestreams into the unlined CCR surface impoundments until October 15, 2023 provided the owner or operator demonstrates the wastestream(s) must continue to be managed in that CCR surface impoundment because it is technically infeasible to complete the measures necessary to provide alternative disposal capacity onsite or offsite by April 11, 2021. GRU submitted a closure initiation deadline extension request to the EPA in November 2020, allowing GRU to continue using the existing CCR surface impoundment system under the provisions of §257.103(f)(1) due to the lack of onsite and offsite disposal options to manage the CCRs and non-CCRs wastestreams that are currently routed to the CCR impoundment system.

GRU proposed to retrofit the ash cells in the closure timeline extension request application. GRU notified EPA and ITS that GRU upgraded the Unit 2 boiler to primarily burn natural gas since the submission of the extension application and indicated that, with the implementation of these upgrades, the provisions of the CCR rule do not apply to the wastestreams generated at the facility. GRU decided to close the ash cells by removing in-place CCRs and decontaminating these cells. GRU plans to repurpose the ash cells for managing the wastestreams generated at the facility.

3 Surface Impoundment System Closure Closure Method [§257.102(b)(1)(i)]

Under §257.102(a), the CCR rule allows closure of CCR surface impoundments by leaving the CCR in place and installing a final cover system or by removing the CCR and decontaminating the CCR unit. GRU plans closure of the surface impoundment system through CCR removal and decontamination. The CCR surface impoundment system will be closed by relocating the in-place bottom ash to the onsite CCR landfill. Once decontaminated, if needed, the impoundment system will be repurposed for managing the wastestreams generated at the facility. Because of the recent upgrades at the plant, the provisions of 40 CFR 257 Subpart D do not apply to the wastestreams generated at the facility.

3.2 Closure Procedure Description [§257.102(b)(1)(ii)]

3.2.1 Overview

The following general steps will be taken to close the surface impoundment system:

1. **Dewatering** – impounded water in the ash cells will be gravity-drained and/or pumped to the adjacent pump back ponds.
2. **Bottom Ash Excavation** – all settled bottom ash in the ash cells will be excavated, transported, and deposited in the onsite CCR landfill.
3. **Decontamination** - Once the bottom ash is completely removed, if necessary, the ash cells will be decontaminated using the procedures outlined in Section 3.2.3.
4. **Final Grading** – Once any necessary decontamination of the ash cells is complete, clean soil will be used to regrade the cell bottom and side slope if needed. As needed, riprap armor and underlying filter blanket will be placed on the cell side slopes to repurpose it to manage the wastestreams generated at the facility.

3.2.2 Dewatering and Bottom Ash Excavation and Relocation

CCR and non-CCR wastestream placement in the first ash cell to be closed will cease following the rainy season (i.e., the rainy season ends in September). The cell will be dewatered by gravity-draining and/or pumping the decant water into the adjacent pump back pond.

Once the cell is dewatered, the GRU/contractor will excavate the bottom ash accumulated in the ash cell and relocate it to the onsite CCR landfill. GRU will remove all the sediments or contaminated soils that visually resemble the bottom ash.

If riprap or underlying filter blanket or soil layers are contaminated, the decontamination of these layers will occur concurrently with the bottom ash removal. If necessary and as possible, the riprap and filter blanket layers will be decontaminated in place. If in-place decontamination is not effective, underlying layers will be removed and decontaminated by washing with process water. The wash water will be treated and reused onsite. Ash relocation and, as necessary, decontamination will be completed concurrently with soil sample laboratory analyses. As discussed in Section 3.2.3, multiple rounds of sampling will be performed, if needed, to ensure the removal of all contaminated soils and sediments. The CCR closure and repurposing process for the second ash cell will begin after the first ash cell is returned to service to manage wastestreams generated at the facility.

3.2.3 Decontamination Plan

Rule §257.102(c) states that a closure of a CCR impoundment by removal requires the removal and decontamination of all areas affected by CCR. This decontamination is verified as completed after groundwater monitoring concentrations do not exceed the groundwater protection standards established pursuant to §257.95(h) for constituents listed in Appendix IV for two consecutive monitoring events.

Although the rule states that CCR must be removed and decontaminated, the level of removal or decontamination process is not specifically defined, nor is there a method provided for determining decontamination completion if no Appendix IV parameter was in exceedance before removal and decontamination. Therefore, the decontamination thresholds proposed for the surface impoundment system are based on State of Florida Soil Cleanup Target Levels (SCTLs) corresponding to leachability based on groundwater criteria. There are no leachability-based SCTLs for four Appendix IV parameters (arsenic, cobalt, lithium, and molybdenum). For these parameters, results will be compared to the SCTLs corresponding to the direct-exposure pathway for the industrial setting. There are no SCTLs for direct exposure or leachability pathways for radium 226/228. The synthetic precipitation leaching procedure (SPLP) will be conducted on the samples, and the extract will be analyzed for total radium 226/228. The results will be compared to the groundwater protection standard (GWPS).

The area below the impoundments will be considered decontaminated if the concentrations of the Appendix IV parameters measured in representative samples are below their respective Florida SCTL or GWPS. All contaminated material removed during the decontamination process will be placed in the onsite CCR landfill.

3.2.3.1 Visual Inspection Procedure

The visual inspection will be conducted to ensure all CCRs are removed. This visual inspection will begin with high-resolution aerial photos of the site. The color in these pictures will be visually inspected, and areas of concern will be identified. These areas and any additional areas or spots of CCR that are identified on a walkthrough inspection will be flagged. The excavation crew will then remove additional soil/CCR from these flagged areas. The inspection process will be repeated, and additional soil/CCR will be removed until all visible CCRs or the soil with color that does not match with background soil color are removed.

3.2.3.2 Soil Sampling Procedure

Samples of the underlying soils and filter blankets will be collected from the ash cell bottom and side slopes. Nine composite samples will be collected from the bottom surface of each ash cell and, as needed, from incremental 1-foot depths until the depth-specific 95% Lower Confidence Level (UCL) of the mean concentration for each of the Appendix IV parameters is below its respective standard presented in Table 1. According to the Incremental Sampling Methodology approach, nine discrete samples will be collected from uniformly-distributed locations in each composite sample area. In addition, nine grab samples of filter blanket on the interior slopes will be collected. The samples will be collected, stored, transported, and analyzed per the standard operating procedures provided by the GRU-contracted laboratory and EPA's SW-846 methods.

Samples corresponding to distinct depths will be sequentially analyzed. Surface samples will be analyzed for all the Appendix IV parameters. One-ft depth samples will be analyzed only if any 95% LCL of any of the parameters exceeds their respective standard in samples collected from the surface. Therefore, only the parameters that exceed the respective SCTL for the surface samples will be analyzed from samples taken at the next incremental 1-foot depth. When all nine composite samples for a particular depth are below the respective standards presented in Table 1, the cell bottom will be considered decontaminated. The side slopes will be considered decontaminated if the 95% LCL of the mean concentrations of filter blanket samples are below the respective standards presented in Table 1. However, if a groundwater exceedance occurs during the closure of the surface impoundment system, decontamination will not be considered complete until all Appendix IV parameters are below the respective protection standard in two consecutive groundwater monitoring sampling events.

Table 1. SCTL and SPLP Limits

Constituent	EPA Method	Standard	Protection Standard Limit	Unit
Antimony	6010/6020/3050	Leachability SCTL	5.4	mg/kg
Arsenic	1312	Direct-exposure SCTL	12	mg/kg
Barium	6010/6020/3050	Leachability SCTL	1600	mg/kg
Beryllium	6010/6020/3050	Leachability SCTL	63	mg/kg
Cadmium	6010/6020/3050	Leachability SCTL	7.5	mg/kg
Chromium	6010/6020/3050	Leachability SCTL	38	mg/kg
Cobalt	6010/6020/3050	Direct-exposure SCTL	42,000	mg/kg
Fluoride	9056	Direct-exposure SCTL	6000	mg/kg
Lead	6010/6020/3050	Direct-exposure SCTL	1,400	mg/kg
Lithium	6010/6020/3050	Direct-exposure SCTL	44,000	mg/kg
Mercury	7471	Leachability SCTL	2.1	mg/kg
Molybdenum	6010/6020/3050	Direct-exposure SCTL	11,000	mg/kg
Selenium	6010/6020/3050	Leachability SCTL	5.2	mg/kg
Thallium	6010/6020/3050	Leachability SCTL	2.8	mg/kg
Radium 226/228	1312/903.1/904.0	SPLP to GWPS	5	pCi/L

3.2.4 Final Grading

After all sediments and contaminated soils have been removed from the ash cell, the GRU/contractor will grade the pond bottom and side slopes and if necessary, add clean soil to match the grades shown in the as-built drawings (B&M 1981). After the proper grades are met, the riprap and filter blanket layers will be installed on the interior slopes if these layers are removed for decontamination.

3.3 Maximum CCR Inventory of the Surface Impoundment System [§257.102(b)(1)(iv,v)]

Based on the geometry of the ash cells as presented in the B&M (1981) as-built drawing set and as previously estimated in IWCS (2021a), the maximum CCR volume of the surface impoundment system was approximately 57,600 cubic yards. This volume corresponds to a liquid elevation of 191.1-191.4 feet

referenced to the National Geodetic Vertical Datum of 1929. Therefore, this volume represents an overestimation of the in-place CCR volume

3.4 Closure Schedule (§257.103(f)(1)(iv)(A)(3))

This section presents a description of the closure activities and closure construction schedule. The project activities for the proposed CCR impoundment cleanup project occur in the following three phases:

A. Construction services and material procurement

B. CCR removal and decontamination of the first ash cell

C. CCR removal and decontamination of the second ash cell

GRU expects the dewatering activity to take about a month as the water level is expected to be at the peak operating elevation at the end of the rainy season. The contracting services procurement process is expected to take three months. GRU/contractor will procure clean fill as needed to regrade the ash cells bottom after the bottom ash excavation and, as necessary, the ash cells decontamination process.

The second phase of the schedule involves removing in-place CCRs. This phase is expected to take approximately nine months. Several of this phase's activities will be performed concurrently with the construction services and materials procurement phase. Rain events can cause delays as these would interrupt cleanup activities, cause stormwater accumulation in the cleanup area, and cause interior slope erosion of the cell.

GRU will prepare a closure certification report documenting that the closure has been completed as per this closure plan and meets all grade specifications. The professional engineer will witness all the soil testing and test data documentation. All field and laboratory test data will be included in the closure certification report. GRU will resume the operation of the ash cell after the completion of the closure certification.

The third phase of the closure involves CCR removal and decontamination of Ash Cell #2. This phase is expected to start no later than October 2023 and conclude approximately nine months later in mid-2024. The placement of wastestreams in the second ash cell will cease no later than October 1, 2023. The operation of the second ash cell will resume after closure completion. Attachment A presents the proposed construction schedule.

4 Closure Plan Amendments

As required in §257.102(b)(3)(ii-iii), GRU will amend the closure plan:

- At least 60 days before a significant (anticipated) change in surface impoundment system operations that substantially affects the closure plan in effect; or
- No later than 60 days following an unanticipated event that requires a revision of the closure plan (before closure activities have started); or
- Within 30 days following an unanticipated event that requires a revision of the closure plan (after closure activities have started).

5 Notifications, Record Keeping, Publicly-accessible Internet Site

GRU will submit the following two notifications to FDEP at the beginning and end of the closure process:

1. **Notification of Intent to Close** (§257.102(g)) - No later than the date any closure activity is initiated, GRU will notify FDEP that notification of intent to close the surface impoundment system has been placed in GRU's operating record and a copy of this notification will be placed on the publicly-accessible internet site. If applicable, this notification must include a statement that closure is a result of failure to meet the requirements of the CCR rule (see 257.101(a)(2) and (b)(3) for more details).
2. **Notification of Closure Completion** (§257.102(h)) - Within 30 days of surface impoundment system closure completion, notification of closure completion will be prepared and certified by a qualified professional engineer verifying that the closure has been completed in accordance with the closure plan that meets the requirements of the CCR rule. GRU will notify FDEP that a notice of surface impoundment system closure has been placed in GRU's operating record, and a copy of this notification will be placed on the publicly-accessible internet site.

Table 1 presents a summary list of all closure-related documents that must be kept in the operating record, information on documentation deadlines, and (if applicable) details on required statements or certifications.

Please note that GRU must notify FDEP that a copy of every closure document included in Table 1 has been placed in the operating record and on GRU's publicly-accessible internet site. All notifications must be sent (i.e., emailed, postmarked) to FDEP before the close of business on the day the notification is required to be completed.

Table 2. Summary of Closure Documents and Deadlines

Document	Deadline Details	Certification/Statement Requirements
Initial Closure Plan	October 17, 2016	Professional Engineer Certification §257.102(b)(4)
Amended Closure Plan	See deadline details in Section 4.	Professional Engineer Certification §257.102(b)(4)
*Closure Initiation Extension Demonstration(s)	Before the deadline to initiate closure; see closure plan implementation discussion in Section 2.	Signed Statement by GRU's Representative
**Notification of Intent to Comply with Alternative Closure Requirements	Within six months of becoming required to close as a result of failure to meet the requirements of the CCR rule	N/A
**Annual Progress Report on Alternative CCR Disposal Capacity	*1st Progress Report* – 13 months after completing the Notification of Intent to Comply with Alternative Closure Requirements *Additional Progress Reports* – 12 months from completion of the previous annual progress report	N/A
Notification of Intent to Close	No later than the date any closure activity is initiated	If applicable, a statement that closure is a result of failure to meet the requirements of the CCR rule (see 257.101(a)(2) and (b)(3))
Closure Completion Extension Demonstration(s)	Before the end of the allowed 5-year closure timeframe	Signed Statement by GRU's Representative
Notification of Closure Completion	Within 30 days of closure completion	Professional Engineer Certification §257.102(f)(3)

Notes: *A closure initiation extension is not an option if the closure is required as a result of failure to meet the requirements of the CCR rule (§257.102(e)(4)(ii, iii)).

**Alternative closure is not an option if the closure is required due to failure to conduct or meet the requirements of the safety factor assessments required under §257.73(e).

6 Post-closure Use of the Surface Impoundment System

Once closure by removal and decontamination is complete, the surface impoundment system will be used for managing wastestreams such as cooling and other blowdown wastewater streams until the entire facility is decommissioned. Per §257.104(a)(2), post-closure care of the surface impoundment system is not required.

7 References

B&M (1980). Deerhaven Generating Station – Unit 2, Bid Documents, Contract 29C – Yard Structures III. Prepared for the City of Gainesville, Florida, by Burns and McDonnell.

B&M (1981). Construction Drawings. Deerhaven Generating Station Unit 2. City of Gainesville/Gainesville-Alachua County Regional Utilities Board. Prepared by Burns & McDonnell, Kansas City, Missouri

Google, Inc. (2015). Google Earth (Version 7.1.5.1557) [Software]. Build Date 5/20/2015. Accessed 26 July 2016.

GRU (2016). Gainesville Regional Utilities 2016 Ten-Year Site Plan. Submitted to the Florida Public Service Commission, 1 April 2016.

IWCS (2016). Coal Combustion Residuals Surface Impoundment System Closure Plan (Version 1.0), Deerhaven Generating Station, Prepared for Gainesville Regional Utilities, Prepared by Innovative Waste Consulting Services LLC, August 2016.

IWCS (2021a). Gainesville Regional Utilities Deerhaven Generating Station – Coal Combustion Residuals Units Annual Inspection Report (October 17, 2015 – January 8, 2016). Prepared by Innovative Waste Consulting Services, LLC.

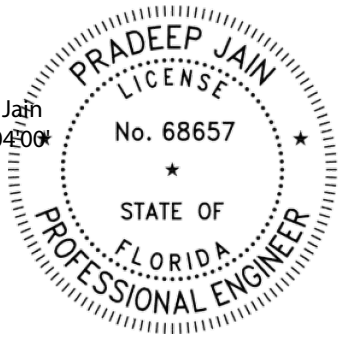
8 Professional Engineer Certification

This plan was prepared under the supervision, direction, and control of the undersigned registered professional engineer (PE). The undersigned PE is familiar with the requirements of 40 CFR 257.101, 40 CFR 257.102 ,and 40 CFR 257.104 (a)(2). The undersigned PE certifies that this CCR unit closure plan meets the requirements of 40 CFR 257.102(b).

Name of Professional Engineer: Pradeep Jain

Company: Innovative Technical Solutions

Signature: Pradeep Jain Digitally signed by Pradeep Jain Date: 2022.05.10 15:09:05 -04'00'



Date: May 10, 2022

PE Registration State: Florida

PE License No.: 68657

This item has been digitally signed and sealed by Pradeep Jain, PE, on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Attachment A. Closure Schedule

Activity	2022			2023												2024						
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Construction Service and Material Procurement																						
First Ash Cell Cleanup Activities																						
FDEP Review and Approval																						
Second Ash Cell Cleanup Activities																						
FDEP Review and Approval																						