Gainesville Regional Utilities
Deerhaven Generating Station

Coal Combustion Residual Units
Annual Inspection Report

(13 December 2017 – 12 December 2018)

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1 Introduction

The Deerhaven Generating Station (site) has two coal combustion residuals (CCR) units: a surface impoundment system and a landfill. The surface impoundment system is comprised of two ash ponds (i.e., Ash Cell #1, Ash Cell #2) located within the same slurry wall containment system. These ponds receive cooling tower blowdown and bottom ash sluice water from the site's coal-fired combustion unit (i.e., Unit #2) through a piping network which allows discharge to either pond. Cooling tower blowdown represents the largest discharge stream routed to these ponds and sluiced ash constitutes a relatively small portion of the discharges received by these ponds. As the water moves through the ash ponds, bottom ash settles and the decant water gravity drains to adjacent pump back ponds (i.e., Pump Back Cell #1, Pump Back Cell #2) through subsurface culverts, which run beneath the embankment separating each ash pond from its adjacent pump back pond. The culvert inlets are enclosed within stoplog structures (located inside the ash ponds near the embankment separating each ash pond from the adjacent pump back pond) to minimize ash entering the culverts. The adjacent pump back ponds are exclusively used to store decant water prior to treatment and re-use in plant operations. The slurry wall containment system is located beneath the peripheral embankment which encompasses the surface impoundment system, the pump back ponds, and two front-end treatment (FET) lime sludge ponds. The slurry wall is keyed into an existing, underlying clay layer. Figure 1 presents a layout view of the surface impoundment system and the two adjacent pump back ponds at the site. The locations of several piezometers used to qualitatively monitor for seepage through the exterior embankments are also shown.

Figure 1. Layout of the CCR Surface Impoundment System and Adjacent Pump Back Ponds (IWCS 2018a)

The CCR landfill primarily accepts flue gas desulfurization byproduct from the Unit #2 scrubbing process. The landfill also accepts the bottom ash that is periodically (i.e., approximately every 5 years) excavated from the surface impoundment system and lime sludge that is periodically dredged from front-end treatment sludge ponds. Occasionally, fly ash is also deposited in the landfill when it is not hauled offsite for beneficial use. The landfill is comprised of four cells (i.e., Cells 1-4), sequentially arranged from west to east. The bottom of each landfill cell is graded to drain contact water (i.e., water that contacts CCR) intercepted by the cell bottom. Perforated PVC pipes were installed at the base of the cells. Specifically, these pipes are located in the middle of each cell and between each cell intercept and gravity-drain the contact water to a drainage ditch located along the northern toe of the landfill (i.e., the Northern Drainage Ditch).

Similar to the surface impoundment system, a slurry wall containment system, which is keyed into an existing underlying clay layer, encompasses the landfill and Northern Drainage Ditch. A series of stormwater ditches located outside the slurry wall route stormwater to either a wetland area located just west of the landfill or to a stormwater pond located to the southeast of the landfill. Currently, Cell 1 and Cell 2 of the CCR landfill are actively receiving CCR and other non-CCR materials. Figure 2 presents an aerial layout of the CCR landfill at the site, facing west.

Figure 2. Aerial Image of CCR Landfill Facing West (IWCS 2018b)

Title 40 Code of Federal Regulations (CFR) 257.83(b) and 257.84(b) requires that CCR units be annually inspected by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of each CCR unit is consistent with recognized and generally accepted good engineering standards. 40 CFR 257.53 defines a qualified professional engineer as "an individual who is licensed by a state as a Professional Engineer to practice one or more disciplines of engineering and who is qualified by education, technical knowledge and experience to make the specific technical certifications required under this subpart. Professional engineers making these certifications must be currently licensed in the state where the CCR unit(s) is located". This report was prepared by Abhimanyu Kanneganti under the supervision of Pradeep Jain, who is a licensed professional engineer in the State of Florida (FL PE License No. 68657).

2 CCR Surface Impoundment System

2.1 Review of Relevant Information

2.1.1 Overview

The following documents have been reviewed by IWCS to understand the design and operation of the CCR surface impoundment system located at the site while preparing previous annual inspection reports:

- Construction drawings for the surface impoundment system certified as conforming to construction records (B&M 1981)
- Bid documents for the site including construction specifications for the surface impoundment system (B&M 1980)
- A Site Certification Application for Unit 2 (RUB 1977)
- A State of Florida Department of Environmental Regulation Electric Power Plant Site Certification Review FDER (1978)
- A slope stability and liquefaction potential analysis conducted for the surface impoundment system (UES 2015)
- A topographic survey of the surface impoundment system (DSI 2015)
- CCR Surface Impoundment System Hazard Potential Classification (UES 2016a)
- CCR Abutment and Base Surface Impoundment System Evaluation (UES 2016b)
- CCR Surface Impoundment System and Landfill Groundwater Monitoring Systems Design and Construction (UES 2017); UES completed the installation and development of the groundwater monitoring wells around each of the CCR units in March 2017.
- Groundwater Sampling and Analysis Plan for the Coal Combustion Residuals Units (IWCS 2017c); the plan provides details on the methodology to be used for sampling and analyzing groundwater data collected from the monitoring well networks of each CCR unit.

No modification has been made to the design and operational procedures of the surface impoundment system or the landfill since the last inspection. The following additional documents have been developed and reviewed since the previous annual inspection:

- Fifty-two (52) weekly (7-day) inspection worksheets

- Twelve (12) monthly (30-day) inspection worksheets

2.1.2 Review of Weekly and Monthly Inspection Worksheets

40 CFR 257.83(a)(1)(i) and (iii) respectively establish maximum time intervals for weekly (i.e., 7 days) and monthly (i.e., 30 days) inspections of the surface impoundment system. There were 12 and 4 instances where this maximum time interval was exceeded for weekly and monthly inspections, respectively.

Weekly and monthly inspection worksheets for the CCR surface impoundment system have been completed and placed in the operating record since 19 October 2015. IWCS reviewed the worksheets for all the weekly and monthly inspections conducted since the previous annual inspection. Documentation reporting that the deficiencies identified during the previous annual inspection have been addressed is available on GRU's publicly-accessible internet site (IWCS 2018d).

The following unusual conditions were noted in weekly and monthly inspection worksheets covering the current annual inspection period:

- <u>Animal Forage holes on Side Slopes</u> – one animal forage hole was observed on the outer side slope of Ash Cell #1 on 12 December 2017 (during the annual inspection). The forage hole was inspected by GRU forester on 20 December 2017 and was filled in on 5 January 2018.
- <u>Erosions</u> – Erosions around a splash block and interior slopes that were observed during the previous annual inspection were documented on the weekly inspection report until these were repaired on 3 March 2018.
- <u>Pipe Leak</u> – A pipe weld was observed leaking during the weekly inspection on 30 January 2018. The leak was repaired on 2 February 2018.
- <u>Elevated Ash Cell Water Levels</u> – The top of the peripheral berm surrounding each of the ash cells is at an elevation of 195 feet, referenced to the National Geodetic Vertical Datum of 1929 (NGVD29). The ash cells are operated with a normal maximum operating level of 193 feet (NGVD29) to provide 2 feet of freeboard in case of heavy rain/storm events. Water levels higher than 193 ft NGVD29 were observed once for Ash Cell #1 and two periods for Ash Cell#2 during the timespan covered by this report.

  The first period of elevated water levels occurred in August after an extended rain event; the water level of both ponds was observed to exceed the 193-foot (NGVD29) normal maximum operating level on 29 August 2018. The water levels continued to be above the normal maximum operating level until 5 October 2018 and 17 October 2018 for Ash Cell #1 and Ash Cell #2, respectively.

  The second period of elevated water levels was observed in December 2018; the levels in Ash Cell #2 was observed above the normal maximum operating level starting 3 December 2018 due to Unit 2 Air Heater washing.

  Operators closely monitored pond levels and adjusted process water and stormwater pumping to the ponds to reduce the ash pond levels expeditiously during these events.

During each monthly inspection, depth-to-liquid readings in the piezometers located on the embankments of Ash Cell #1 and Ash Cell #2 were measured. The water level measured in these piezometers are used to qualitatively assess potential embankment seepage areas; Piezometer P-2, P-3, and P-4 are used to monitor exterior embankments for Ash Cell #1 and P-1 is used to monitor the exterior embankment of Ash Cell #2. The liquid elevation in the piezometers was compared to the liquid elevation in each adjacent ash pond. Figure 3 and 4 present a comparison of the measured liquid levels for Ash Cell #1 and corresponding piezometers and Ash Cell #2 and corresponding piezometer, respectively. IWCS measurements on the day of the inspection were consistent with those measured by GRU during the most recent monthly inspection.

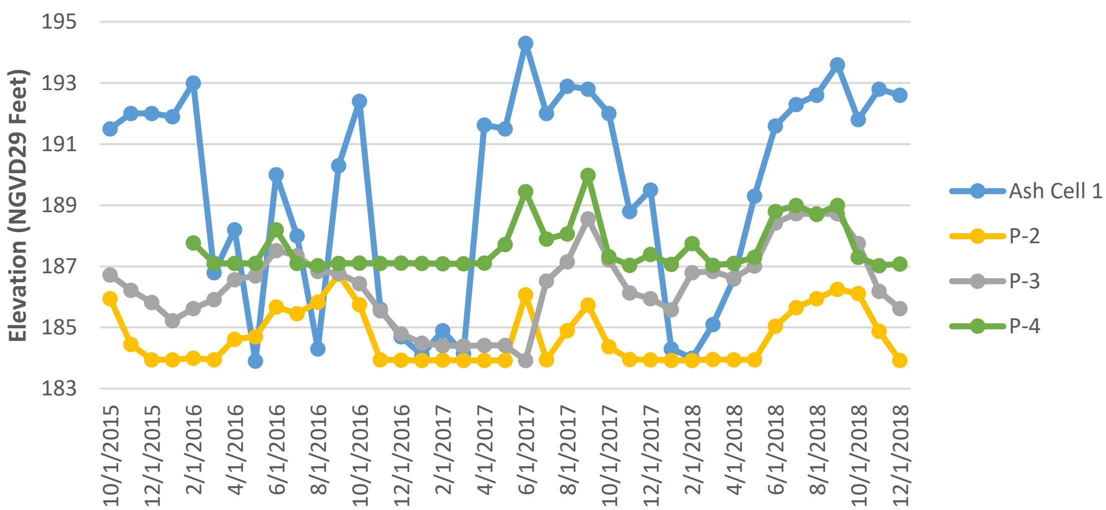

Figure 3. Liquid Elevations for Ash Cell #1 and Piezometers

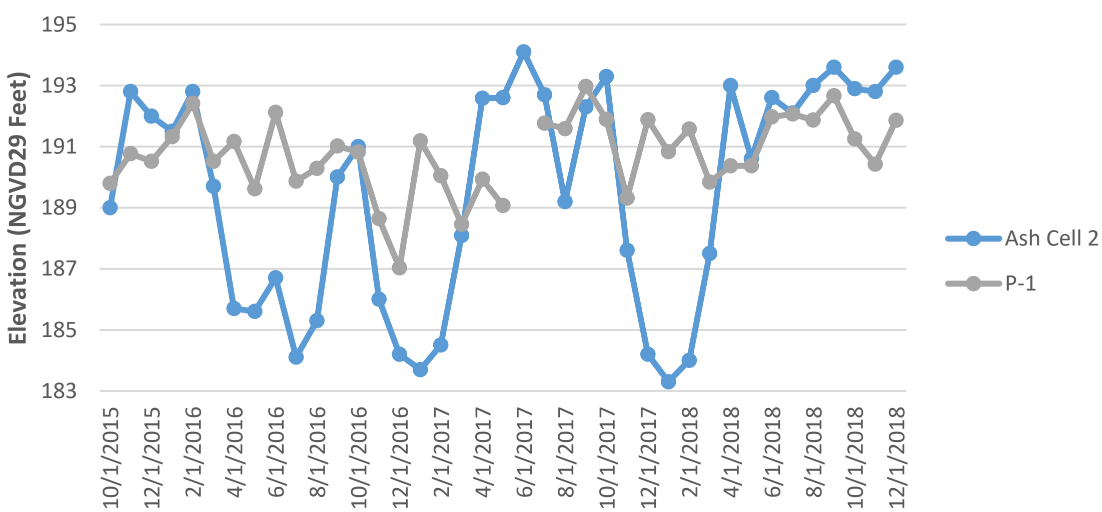

Figure 4. Liquid Elevations for Ash Cell #2 and Piezometer

2.2 Field Inspection

IWCS inspected the CCR surface impoundment system on 12 December 2018. The following section describes observations made during the inspection.

2.2.1 Signs of Distress or Malfunction of CCR Unit or Appurtenant Structures

No sign of distress or malfunction was observed for the visible sections of the ash ponds or the stoplog structures. Due to the elevated water levels in the ponds, the condition of the submerged interior slopes and the stoplogs could not be visually inspected.

2.2.2 Hydraulic Structures

Due to the elevated water levels in the ponds, IWCS was not able to inspect the subsurface culverts which connect each ash cell to its adjacent pump back pond. IWCS recommends that GRU conduct a dry/semi-dry inspection of the culverts to assess their structural integrity as soon as possible.

2.2.3 Geometrical Changes of CCR Unit

IWCS conducted a topographic survey of select features of the surface impoundment system on 5 December 2018. A comparison of the topographic conditions collected during this survey to those observed in the survey conducted by DSI (2015) does not suggest any significant deviations in geometry from those observed during the previous annual inspection. Appendix A includes a comparison between the elevations of the features during this inspection to those presented by DSI (2015). Please note that the survey equipment used by IWCS has a manufacturer-listed maximum accuracy of 4 inches. The surveyed elevations should be considered as rough approximations as the survey was not performed by a licensed surveyor.

2.2.4 Instrumentation Locations and Maximum Readings

Apart from a groundwater monitoring system (separately discussed in detail in annual groundwater monitoring and corrective action reports), the piezometers located adjacent to each of the two ash ponds are the only instruments used to monitor the surface impoundment system. Table 1 presents the location of the piezometers, along with their maximum recorded readings over the last annual inspection period. Please note that the easting and northing coordinates are referenced to US State Plane 1983 Florida North 0903. The maximum reading liquid elevations are referenced to NGVD29. As a point of comparison, the elevation of the top of the peripheral berm surrounding each of the ash cells is at an elevation of 195 feet NGVD29. The maximum elevations observed during the reporting period for P-1 and P-4 were slightly lower than those observed during the previous reporting period. The maximum elevations observed during the reporting period for P-2 and P-3 were 0.2 and 0.1 ft, respectively, higher than those observed during the previous reporting period.

Table 1. Location, Type, and Maximum Recorded Readings of Existing Instrumentation

Piezometer	Easting	Northing	Max Elevation (NGVD29)
P-1	2636972.5	284823.8	192.7
P-2	2636725.5	284571.1	186.3
P-3	2636691.7	284443.8	188.7
P-4	2636873.5	284259.3	189.0

2.2.5 *Elevation of CCR and Impounded Water*

Table 2 presents a comparison of the water levels observed on the day of inspection with the maximum and minimum levels recorded by GRU staff during weekly and monthly inspections; the water levels in the ponds are tracked with a staff gauge painted on one of the concrete walls of the stoplog structure in each ash pond. It should be noted that all liquid depths in each pond were calculated assuming the bottom of the ash ponds is located at 179 feet NGVD29, as indicated in the B&M (1981) drawing set. The surface of the settled bottom ash is not evenly distributed – the elevations presented in Table 2 correspond to the water elevation of the ponds.

Table 2. Maximum, Minimum and Present Depth and Elevation of CCR and Water

Location	Media	Parameter	Unit	12/12/18	Minimum of the Weekly and Monthly Measurements	Maximum of the Weekly and Monthly Measurements
Ash Cell #1	Water	Elevation	feet (NGVD29)	193.6	183.0	193.6
		Depth	feet	14.6	4.0	14.6
Ash Cell #2	Water	Elevation	feet (NGVD29)	193.9	181.9	193.6
		Depth	feet	14.9	2.9	14.6

2.2.6 *Storage Capacity and Volume of CCR and Impounded Water*

The CCR surface in the ash ponds was mostly inundated at the time of this inspection (as shown in Figure 1 aerial image); the current CCR storage capacity of the surface impoundment systems could not be estimated. However, based on construction records, it is estimated that the CCR surface impoundment system has a total volumetric capacity of 17.3 million gallons (or approximately 85,400 cubic yards) not including the capacity associated with the 2 feet of freeboard.

Based on the present (i.e., 12 December 2018) water elevations in each of the ash ponds, the total in-place volume of water and CCR in the ash ponds is roughly estimated as 18.5 million gallons (or approximately 91,500 cubic yards). The levels in the ponds were high due to Unit 2 Air Heater washing and probably due to the rain event that occurred approximately 36 hours before the inspection. GRU operators were aware of the issue and were taking necessary steps to bring the water levels down in Ash Cell #1 and Ash Cell #2

2.2.7 *Structural Weaknesses and Adverse Conditions*

IWCS visually inspected the external side slopes of the surface impoundment system and the pump back ponds to identify any potential indicators of structural weakness or any other adverse condition including signs of erosion; bulging; depressions; cracks; animal forage holes; boils; or excessive, turbid, or sediment-laden seepage. One animal forage hole was found on the external slopes of the surface impoundment system (Figure 5). As shown in Figure 5, the hole was approximately 12-14 inches deep. A large portion of the slopes could not be inspected as the vegetation height was more than 6 inches. The grass height on the western slopes of both Ash Cell #1 and Ash Cell #2 on 12 December 2018 was observed to be greater than the 6-inch requirement.

Figure 5. Forage Holes and Depths Observed on External Slopes of the Surface Impoundment System and Pump Back Ponds

2.2.8 Other Changes Affecting Stability or Operation

No other changes or circumstances, which may impact the stability or operation of the landfill, were noted during the inspection.

3 CCR Landfill

3.1 Review of Relevant Information

A total of 52 weekly CCR landfill inspection worksheets were reviewed; these worksheets covered the period from 12 December 2017 through 10 December 2018. 40 CFR 257.84(a)(1)(i) establishes a maximum time interval of 7 days for weekly inspections of the CCR landfill. There were 17 instances where this maximum time interval was exceeded.

The worksheets allow the inspector to categorize observations as *Acceptable*, *Area of Concern*, or *Needs Attention*. *Area of Concern* is defined in the worksheet as "may develop into a *Needs Attention* area if not addressed. Monitor situation and reevaluate during the next inspection. Address as necessary." It should be noted that an *Area of Concern* is not indicative of a problem but is used to proactively identify and monitor circumstances that have an elevated chance of developing into a problem. *Needs Attention* is defined in the worksheet as "currently or imminently presents a human health, operation or environmental hazard/problem. Address as soon as possible."

Seventy (7) *Needs Attention* observations were reported in the weekly inspection worksheets reviewed for this report. The majority of these issues appear to be because of the presence of loose ash piles that were not spread and compacted, and directly related to the heavy rains which occurred throughout June and July. Based on supervisor notes included in the inspection worksheets, it appears that these issues were addressed expeditiously and were generally resolved within a day of the observation.

The *Needs Attention* observations corresponded to the following 10 categories:

1) **Loose Piles of CCR (22 instances)** – loose piles of CCR accumulated on the landfill surface were observed – these piles have the potential to contribute to dust emissions. The presence of loose piles was a frequently occurring issue during the reporting period.
2) **Water Level Above Underdrain Outlets (18 instances)** – four underdrain pipes collect and transport CCR contact water to the Northern Drainage Ditch. A majority of these observations 11) correspond to June 24-October 1 timeframe. Heavy rain in July-Aug resulted in elevated water levels in the Northern Drainage Ditch and the ash ponds. The Northern Drainage Ditch was pumped down as soon as feasible following these observations.
3) **Northern Drainage Ditch (Ash Canal) Overtopping, Sediment Accumulation in Northern Drainage Ditch and Bank Erosion (8 instances)** – landfill operators noted the water levels in ash canals were high at multiple instances during the year. It appears that heavy rains were the cause of these issues. An erosion on the southeast part of the Northern Drainage Ditch slope was recorded as a *Need Attention* observation on two instances. It appears that these issues were addressed immediately following these observations.
4) **Ponding in Cell 4 (9 instances)** – Ponding in Cell 4 was a frequently observed issue. On 9 instances it was recorded as a *Need Attention* observation. CCR surfaces were graded to minimize ponding and promote drainage of contact water into the Northern Drainage Ditch. Although the issue was addressed immediately following the first observance, ponding was frequently observed in low lying areas of Cell 4.
5) **Inundated Downcomer Outlets (5 instances)**. The downcomers outlets were observed to be under water due to the elevated water level in the Northern Drainage Ditch on 5 occasions during July-September timeframe.
6) **Missing/Deteriorating Haybales (5 instances)** – hay bales are installed around the downcomers inlets to minimize CCR migration to the Northern Drainage Ditch. Missing/deteriorating hay bales were recorded as a *Need Attention* observation on 2 occasions. These issues were addressed within a week of the observation. Deteriorated hay bales were also observed during the annual inspection as well.
7) **Access Road Dust Emissions (1 instance)** – landfill operators noted that water was not applied to the road for dust suppression and the off-road truck movement was creating fugitive dust emissions on 9 July 2018. This issue was immediately addressed on the same day.

8) **Water Buildup in Stormwater Ditch (1 instance)** – Due to the high water level in the stormwater pond, water was observed to build up in the southern section of the stormwater ditch on 5 July 2018. The stormwater pond was dewatered to lower the water level in the pond.
9) **Uncovered/Exposed CCR on Exterior Slopes (1 instance)** –uncovered/exposed CCR at the western slope of CCR landfill was noted as a *Need Attention* issue. The supervisor mentioned that CCR was exposed as construction work was being done on the west berm to raise its height.
10) **Downcomer Sediment Traps (2 instances)** – the downcomer sediment traps cleaning was recorded as a *Need Attention* item during the last week of December 2017 and the first week of January 2018. The issue was addressed around the middle of January 2018.
11) **Exterior Slope Mowing (1 instance)** – mowing of the exterior side slopes was recorded as a Need Attention issue on one occasion in September 2018.

One hundred and six (106) "Areas of Concern" were noted. Grass and other vegetation height (20 instances), ponding of water in Cell 4 area (20 instances), elevated water levels in the Northern Drainage Ditch (17 instances), culverts and stormwater ditches clogged by vegetation (9 instances) and downcomer pipes clogging (9 instances) collectively accounted for the majority of these observations.

3.2 Field Inspection

IWCS inspected the CCR landfill on 12 December 2018. The following section describes observations made during the inspection event.

3.2.1 Signs of Distress or Malfunction

The Northern Drainage Ditch accepts CCR contact water from the landfill and gravity drains to a pump station located at its eastern extent. As shown in Figure 6, CCRs appeared to be transported into the ditch with the contact water exiting the landfill through the downcomers, which may be due to displaced hay bales and gaps between the hay bales around the downcomers inlets (Figure 7). Two downcomers are installed along the northern slope of the CCR landfill to gravity drain the contact water from the landfill to the Northern Ditch. IWCS observed displaced hay bales and resultant gaps between the hay bales; hay bales are placed around the downcomers inlets to control sediment intrusion into the downcomers and the drainage ditch; one hay bale appeared to completely obstruct the inlet of one of the downcomers (Figure 7). GRU is recommended to adjust/replace the existing hay bales to control sediment intrusion into the downcomers. IWCS observed erosion around one the downcomer pipes (Figure 8).

Figure 6. CCR in Northern Drainage Ditch

Figure 7. Damaged and Displaced Hay Bales in Cell 1

Figure 8. Erosion around Downcomer Outlets

The water level in the Northern Drainage Ditch was high and inundated all four underdrains (Figure 9). These underdrains route the contact water accumulated on the landfill bottom to the Northern Drainage Ditch. The water level in the Northern Ditch must be maintained below the outlet of the underdrains for efficient removal of the contact water from the landfill bottom. The Northern Drainage Ditch water level, if above the bottom elevation of the underdrains, impedes the flow of contact water from CCR landfill into the Northern Drainage Ditch and may lead to accumulation of the contact water within the landfill. Due to high water level, the extent of sediment built-up in the Northern Drainage Ditch could not be assessed.

Figure 9. An Inundated Underdrain

A small amount of ponded CCR contact water was observed in the northern end of the Cell 4 basin area. As described in the Run-on and Run-off Control System Plan (IWCS 2016b), this Cell 4 basin area is necessary for contact water storage in the event of a 24-hour, 25-year storm; ponding in this area represents a decrease in contingency storage capacity. Figure 10 shows the Cell 4 basin area with ponding. Although the amount of ponded water was small and does not appear to significantly impact the available storage capacity, GRU is recommended to grade the area for minimizing contact water ponding within the landfill footprint.

Figure 10. Ponding of Contact Water in the Northern Edge of the Cell 4 Basin Area

3.2.2 Geometrical Changes of CCR Landfill

In accordance with the landfill filling plan, the interior of Cell 1 and Cell 2 and the peripheral berm on the external side slopes of Cell 1 and Cell 2 are progressively raised by approximately 4 feet for each lift of deposited CCR. No changes in the geometry of the landfill indicative of structural instability or weakness were noted.

3.2.3 Volume of CCR

IWCS conducted a topographic survey of the landfill on 5 December 2018 and used AutoCAD Civil 3D 2013 cut-and-fill procedures to estimate the in-place CCR volume; the landfill bottom elevation was assumed to be 184 feet NGVD29 (as approximately shown in B&M 1981). Approximately 408,595 cubic yards of CCR and other materials (i.e., cover soil, FET lime sludge) have been deposited in the landfill to date. The topographic survey and the estimated in-place volume should be considered as a rough approximation as the survey was not performed by a licensed surveyor.

3.2.4 Structural Weaknesses and Adverse Conditions

IWCS performed a visual inspection of all exterior slopes of the CCR landfill for any appearance of actual or potential structural weakness including signs of erosion; bulging; depressions; cracks; animal forage holes; boils; or excessive, turbid, or sediment-laden seepage. No signs of structural weakness and adverse conditions were observed.

3.2.5 Other Changes Affecting Stability or Operation

No other changes or circumstances, which may impact the stability or operation of the landfill, were noted during the inspection.

4 Summary of Deficient Conditions and Recommendations

Table 3 presents a summary of the locations of each deficient condition observed during the annual inspection.

Table 3. Location Summary of Deficient Conditions Observed During the Annual Inspection

CCR Unit	Location	Condition
Surface Impoundment System	Ash Cells #1 and 2	Elevated water level
	South Outer Slope of Ash Cell #1	Animal forage hole (1)
CCR Landfill	Cell 1 Downcomers	CCRs are transported to the Northern Drainage Ditch through downcomers.
		Hay bales damaged and displaced
		Erosion near the outlet of a downcomer
	Underdrains	Water level in the Northern Drainage Ditch is above the underdrains
	Northern edge of Cell 4	Ponding

All deficiencies identified for the CCR units were brought to the attention of GRU on 17 December 2018.

IWCS makes the following recommendations to address the deficiencies identified during this annual inspection:

1. GRU should relocate resident animal(s) and backfill all animal forage holes in accordance with federal, state, and local law.

2. The water level in Ash Cell #1 and #2 were found to be greater than 193 ft NGVD29. IWCS recommends GRU to maintain water level in the ash cells less than 193 ft NGVD29 to ensure a freeboard of at least 2 ft.
3. The water level in Northern Drainage Ditch was observed to be above the underdrains. The water level must be maintained such that it is below the underdrain outlets.
4. Damaged hay bales at the inlet of downcomers must be replaced with the new ones and staked in place without any visible gap. GRU is recommended to monitor the downcomers inlets/outlets routinely to identify CCR migration, if any, into the Northern Drainage Ditch. The downcomers inlets and hay bales around the inlets should be routinely monitored to minimize chances of CCR migration into the Northern Drainage Ditch.
5. Sediments accumulated in the Northern Drainage Ditch should be excavated and relocated in the landfill.
6. IWCS recommends compacting soil and seeding/sodding the finished grades to address erosion around the downcomer with visible erosion.
7. GRU must take measures to ensure there is no ponding of water in Cell 4 area. The Cell 4 area would be needed to accommodate the stormwater run-off from 25-year 24-hour storm event. Ponding of water in Cell 4 area reduces the capacity of the cell to manage the stormwater run-off.
8. As part of the minimum list of annual inspection items, §257.83(b)(1)(iii) requires "a visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation". IWCS was unable to inspection the subsurface culverts which connect each ash cell with its adjacent pump back pond. Considering the age (i.e., approximately 37 years old) and the importance of these culverts to the safe and reliable operation of the plant, IWCS strongly recommends that these culverts be inspected as soon as possible.

Per §257.83(b)(5) and §257.84(b)(5), GRU is required to address these identified deficiencies as soon as feasible and document the corrective measures taken.

40 CFR 257.83(a)(1)(i) and (iii) respectively establish maximum time intervals for weekly (i.e., 7 days) and monthly (i.e., 30 days) inspections of the surface impoundment system. There were 12 and 4 instances where this maximum time interval was exceeded for weekly and monthly inspections for impoundment system, respectively. Similarly, 40 CFR 257.84(a)(1)(i) establishes a maximum time interval of 7 days for weekly inspections of the CCR landfill. There were 17 instances where this maximum time interval was exceeded. GRU is recommended to perform the weekly and monthly inspection within these maximum intervals.

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6 Professional Engineer Certification

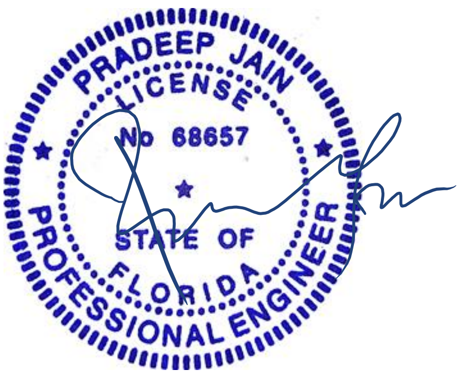
This plan was prepared under the supervision, direction and control of the undersigned, registered professional engineer (PE). The undersigned PE is familiar with the requirements of 40 CFR 257.83(b) and 84(b). The undersigned PE certifies that this CCR unit annual inspection report meets the requirements of 40 CFR 257.83(b) and 84(b).

Name of Professional Engineer: Pradeep Jain

Company: Innovative Waste Consulting Services, LLC

PE Registration State: Florida

PE License No.: 68657



Appendix A

Comparison Table of Surface Impoundment System Elevations from DSI (2015) and Elevations Observed by IWCS 5 December 2018

Surface Impoundment System Feature	5 December 2018 Elevation (feet NGVD29)	DSI (2015) Survey Elevation (feet NGVD29)
Top of Embankment - Ash Cell 1	195.1 – 195.7	194.9 - 195.9
Top of Embankment - Ash Cell 2	195.2 – 195.7	194.7 - 195.6
Top of Embankment - Pump Back Cell 1	188.1 – 188.3	187.6 - 188.7
Top of Embankment - Pump Back Cell 2	188.2 – 188.6	188.1 - 188.8
Stoplog Structure - Ash Cell 1	195.3	195.3
Stoplog Structure - Ash Cell 2	195.3	195.2
Stoplog Bridge Abutment - Ash Cell 1	194.8	194.8 - 194.9
Stoplog Bridge Abutment - Ash Cell 2	195	194.8 - 194.9
Top of North Splash Block Ash Cell 1	194.8	194.7
Top of South Splash Block Ash Cell 1	194.7	194.7
Top of North Splash Block Ash Cell 2	194.8	194.7
Top of South Splash Block Ash Cell 2	194.4	194.6 - 194.7
Electrical Equipment Building Retaining Walls	187.7 – 188.1	188.1 - 188.4
Ash Pipe Drain Pit	179.4	179.6 - 180.3
Ash Cell 1 Outer Embankment Toe	182.4 – 182.5	182.6 - 182.7
Ash Cell 2 Outer Embankment Toe	181.7 - 182	182.1 - 182.7