



Inspection Report

To: Steve Brown (New Castle Generating Station)
From: Richard Southorn, P.E., P.G., CPSWQ
Re: New Castle Plant Ash Landfill–Annual CCR Unit Inspection Report
Inspection Date: October 17, 2017
Report Date: January 16, 2018

INTRODUCTION

Title 40 Code of Federal Regulations (CFR) Part 257 addresses, in part, the management of Coal Combustion Residuals (CCR Rule, or Rule) in regulated units, including landfills. Specific to §257.84(b) of the Rule, existing and new CCR landfills must be inspected on an annual basis by a qualified professional engineer. For the New Castle Generating Station (operated by NRG Power Midwest LP), this inspection requirement applies to the existing New Castle Plant Ash Landfill (Ash Landfill). In support of this obligation, Mr. Richard Southorn (a qualified professional engineer with Aptim Environmental & Infrastructure, Inc. [APTIM]) conducted an on-site inspection of the Ash Landfill on October 17, 2017. The findings from this annual inspection are summarized in the remaining sections of this correspondence.

As required, this report will be placed in the New Castle facility's operating record per §257.105(g)(9), noticed to the State Director per §257.106(g)(7), and posted to the publicly accessible internet site per §257.107(g)(7). Placement of the prior annual inspection report into the facility's operating record was accomplished on January 18, 2017. Per §257.84(b)(4), the current report will be entered into the facility's operating record no later than January 18, 2018.

BACKGROUND

The Ash Landfill is situated north of the main generating station. Prior to landfill development in this portion of the property, an impoundment existed (occupying an area of approximately 120 acres) that was used for the disposal of sluiced fly ash and bottom ash; these operations took place from approximately 1939 to 1978. From 1978 to 1984 and following the installation of electrostatic precipitators at the station, "dry" fly ash was disposed on the dewatered impoundment area. Beginning in 1984, CCR materials (including "dry" fly ash and dredged bottom ash) have been placed in this area.

In 1997, the Pennsylvania Department of Environmental Protection (PADEP) issued Solid Waste Permit No. 300818 for the Ash Landfill, addressing Stages 1, 2, and 3A. In April 2008, a permit modification was issued for Stages 4, 5, 6, and 7, which together comprise a vertical expansion of the Ash Landfill over top of the previously PADEP permitted stages.

From 2008 through 2010, approximately 16.8 acres of layover liner system (liner between Stages 4 and underlying Stages 1, 2, and 3A) was placed within Stage 4. Approximately 17.9 acres of

final cover cap liner system was installed over the lower landfill slopes (southern and eastern perimeters) in 2008/2009; approximately 11.6 acres installed over Stage 1, 2, and/or 3A beneath the area designated for Stage 5 (not active) in 2010; and approximately 10.2 acres installed over Stage 1, 2, and/or 3A beneath the area designated for Stage 6 (not active) in 2013. Therefore, Stages 1, 2, and 3A were entirely capped and/or closed by 2013 with the layover liner system installation in Stage 4 and final cover cap placement in the areas designated for Stages 5 and 6.

Stage 4 is currently the active disposal area. The currently permitted Ash Landfill occupies an area of approximately 60 acres (see Figure in Attachment 1), and is operated/maintained in accordance with Permit No. 300818.

In June 2016, the New Castle Generating Station successfully completed a natural gas addition project and began operating with this new fuel source (the ability to run on coal has still been maintained). As a result, disposal of CCR materials in the Stage 4 area has been significantly reduced since approximately May 2016. However, the New Castle Generating Station plans to dispose of additional solid waste in 2018 and into the foreseeable future. In 2017, intermediate cover was installed over the majority of the previous active face of Stage 4.

With respect to the Ash Landfill, APTIM's evaluation has focused on the following items as outlined in §257.84(b)(1)(i-ii):

- *A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record; and*
- *A visual inspection of the CCR unit to identify signs of distress or malfunction.*

Specific to APTIM's preparation of the annual inspection report, and per §257.84(b)(2) (i-iv), the following aspects have been addressed:

- *Any changes in geometry of the structure since the previous annual inspection;*
- *The approximate volume of CCR contained in the unit at the time of the inspection;*
- *Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit; and*
- *Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.*

OPERATING RECORDS REVIEW

Principal items reviewed as part of this year's inspection included, but were not limited to: Design Drawings, 2016/2017 Weekly and Periodic Landfill Inspection Reports that have been completed since the 2016 inspection (November 17, 2016), 2016 Annual Landfill Operations Report, and Solid Waste Permit No. 300818. During the site inspection, Mr. Southorn interviewed facility personnel (Mr. Steve Brown) to verify the information contained within the operating record.

Environmental Control System Overview

- i. Bottom Liner System
 - a. The active disposal area overlies the previous disposal areas (Stages 1, 2, and 3A). An over liner consisting of the subbase layer, geosynthetic clay liner, and an engineered 60-mil textured HDPE geomembrane with a geocomposite drainage layer and leachate detection system was installed above Stages 1, 2, and 3A prior to placement of CCR materials in Stage 4. The top of Stages 1, 2, and 3A that was beneath the designated areas of Stages 5 and 6 was capped using two feet of final cover soil with vegetative cover; double-sided bonded geocomposite consisting of 220-mil geonet and 6 oz. geonet drainage layer; a 40-mil textured HDPE flexible membrane liner; and compacted subgrade.
- ii. Leachate Collection System
 - a. An underdrain system is used to collect leachate from the Ash Landfill; leachate collected in the underdrain system is routed to the Leachate Pond via dedicated perimeter ditches. From the Leachate Pond, the flows are discharged to the Beaver River via Outfall 009 in accordance with the New Castle Station's National Pollutant Discharge Elimination System (NPDES) Permit. There is a leachate leak detection system in place, located beneath the over liner.
- iii. Stormwater Management
 - a. "Non-contact" stormwater and surface water is drained downslope. The slopes drain to perimeter stormwater ditches (separate from the leachate ditches) which convey the water to a Sedimentation Pond. From this pond, the waters are discharged to the Beaver River via NPDES-permitted Outfall 006.
 - b. "Contact" stormwater from within the active disposal area is collected in the leachate underdrain system and routed to the Leachate Pond as described above.
- iv. Cover System
 - a. All perimeter slopes, as well as the plateaus of Stages 5 and 6, have a final cover installed and established vegetation where final cover is present.
 - b. The majority of Stage 4 has intermediate cover installed. This installation took place subsequent to the previous 2016 Annual Inspection.

Summary of Landfill Construction

- i. Significant portions of the Stage 4 active face that were open in 2016 have since been covered with intermediate cover in 2017. The installation of intermediate cover was completed due to the reduction in CCR material disposal volumes and to minimize the potential for fugitive dust emissions. The intermediate cover has been seeded and vegetation is currently healthy, but has not yet achieved full coverage. It is noted that Stage 4 exterior sideslopes have a final cover in place, and final cover areas have an established vegetative layer.
- ii. The active disposal area (Stage 4) has only received approximately 21 tons of CCR materials in 2017. As a result, the geometry of Stage 4 has not been significantly modified with the exception of the intermediate cover installation.

Review of Prior Inspections

- i. Weekly inspections: A review of weekly inspections has concluded that no significant deficiencies occurred at the facility that required remedial actions. Animal burrows are occasionally noted on inspection reports, but are addressed through backfilling in a timely manner.
- ii. Annual inspections: A review of the previous annual inspection report has determined that there were no deficiencies or releases, actual or potential structural weaknesses, or concern to the stability of the land form. All environmental control systems were in good operating condition and functioning as intended.

CCR Disposal

- i. Based on review of the 2016 Annual Landfill Operations Report and disposal quantities provided by Station personnel, the total in-place disposal quantity of CCR materials was estimated at approximately 1,373,918 tons (1,373,897 prior to 2017 plus 21 tons in 2017).

SITE INSPECTION

The site inspection was performed on October 17, 2017 by Mr. Southorn, and during which time efforts were focused on identification of standard geotechnical signs of distress or malfunction. Specific aspects such as slumping at the toe of slope, tensile cracking, abnormal or excessive erosion on the side slopes, slope bulging, groundwater/surface water seepage or ponding were assessed. If present, these readily visible signs are potential indicators of structural weakness of the CCR Landfill unit.

Visual Signs of Distress or Malfunction

No visual signs of distress or malfunction were observed during the inspection. Stormwater drainage features, slope appearance and stability, leachate conveyance mechanisms, and overall site conditions were assessed. Capped portions of the Ash Landfill exhibited well established vegetative cover.

The vegetation on intermediate cover of Stage 4 appears healthy, but has not yet achieved full coverage. It is understood that this is due to the relatively short growing time since seeding. The coverage is not identified as a concern as part of this report.

Review of Environmental Control Systems

With no evidence to the contrary, the bottom liner system at the active Stage 4 disposal area is believed to be in good operating condition and functioning as intended. At the time of the inspection, leachate and stormwater conveyance systems were operating as designed.

Review of Previously Recommended Actions

2016 Inspection Recommendation No. 1: Place intermediate cover on top of Stage 4 disposal area if anticipated to remain generally inactive throughout the coming year.

2017 Finding: Significant portions of the Stage 4 have had intermediate cover installed. The size of the active area is appropriate for the 2017 CCR material disposal rates.

2016 Inspection Recommendation No. 2: Continue to fill any animal burrows or holes observed during weekly inspections to prevent instability.

2017 Finding: Animal burrows are being identified during weekly inspections and being filled as appropriate.

2016 Inspection Recommendation No. 3: Ensure adequate access to the closed portions of the landfill to maintain the ability to perform weekly visual site structural inspections.

2017 Finding: The closed portion is accessible. Weekly site structural inspections have been completed appropriately.

2016 Inspection Recommendation No. 4: Continue operations and maintenance of stormwater drainage features and leachate collection systems.

2017 Finding: All stormwater drainage features, leachate discharge pipes, and conveyance channels were free of obstruction and functioning as intended.

CONCLUSIONS

Changes in geometry

As of the date of this inspection, only 21 tons of additional CCR materials had been placed in the active disposal area during 2017. During the previous annual inspection, CCR materials were being placed within the active disposal area at approximate elevations ranging between 829 and 840 feet mean sea level. No significant changes have been made to the geometry of the Ash Landfill site since the previous annual inspection.

In-Place CCR Disposal Quantities

Based on review of the 2016 Annual Landfill Operations Report and disposal quantities provided by Station personnel, the total in-place disposal quantity of CCR materials was estimated at approximately 1,373,918 tons (1,373,897 prior to 2017 plus 21 tons in 2017).

Appearances of an Actual or Potential Structural Weakness of CCR Unit

At the time of inspection, there were no signs of distress or malfunction that would indicate actual or potential structural weakness at the Ash Landfill.

Changes that may affect the stability or operation of the CCR Unit

There have been no changes to the Ash Landfill area that pose a threat or concern to the stability of the land form.

RECOMMENDATIONS

1. Continue to fill any animal burrows or holes observed during weekly inspections to prevent instability.
2. Monitor the vegetation on the Stage 4 intermediate cover for improved coverage.
3. Ensure adequate access to the closed portions of the landfill to maintain the ability to perform weekly visual site structural inspections.
4. Continue operations and maintenance of stormwater drainage features and leachate collection systems.

There were no deficiencies or releases identified during the 2017 annual inspection that required the owner or operator to perform corrective actions as required under §257.84(b)(5).

PROFESSIONAL ENGINEER'S CERTIFICATION

In accordance with §257.84(b) of the Rule, I hereby certify based on a review of available information within the facility's operating records and observations from my personal on-site inspection (including the photographs contained in Attachment 2), that the New Castle Plant Ash Landfill does not exhibit any appearances of actual/potential structural weakness that would be disruptive to the normal operations of the CCR Unit. The unit is being operated and maintained consistent with recognized and generally accepted good engineering standards and practices.

Certified by: Richard Southorn
Date: JAN 16, 2018

Richard Southorn, P.E., P.G, CPSWQ
Professional Engineer Registration No. PE085411
Aptim Environmental & Infrastructure, Inc.



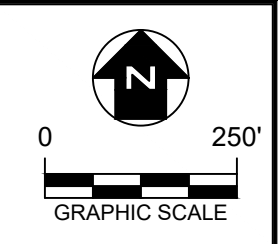
ATTACHMENTS

1. Site Map
2. Inspection Photo Log

REFERENCES

1. Application for Major Permit Modification and Permit Renewal, New Castle Plant Ash Landfill, April 2007 (including subsequent revisions).
2. PADEP Solid Waste Permit 300818, New Castle Plant Ash Landfill, April 23, 2008.
3. 2016 New Castle Generating Station Annual Landfill Operations Report.
4. Landfill Periodic Inspection Reports, November 2016-October 2017.
5. 40 Code of Federal Regulations Part 257.

Attachment 1
Site Map



LEGEND

← 2017 ANNUAL INSPECTION PHOTOGRAPH (ARROW DENOTES DIRECTION OF VIEW)

REV. NO.	DATE	DESCRIPTION



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**NEW CASTLE GENERATING STATION
WEST PITTSBURG, PENNSYLVANIA**

PHOTOGRAPH LOCATION MAP

DRAWN BY: SJL APPROVED BY: RDS PROJ. NO.: 1009174011 DATE: JANUARY 2018

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Attachment 2
Photo Log

Photograph No. 1

Date:

October 17, 2017

Direction:

North

Description:

Non-contact stormwater downchute. Clear of obstructions. Revetment is in good condition. Functioning as intended.



Photograph No. 2

Date:

October 17, 2017

Direction:

South

Description:

Non-contact stormwater downchute is clear of obstructions. Gabion energy dissipator is installed at the junction with the stormwater perimeter ditch.



Photograph No. 3

Date:

October 17, 2017

Direction:

North

Description:

Leachate cleanout pipe with non-contact stormwater downchute in background.



Photograph No. 4

Date:

October 17, 2017

Direction:

West

Description:

Looking along a terrace berm to the low point where a downchute starts.



Photograph No. 5

Date:

October 17, 2017

Direction:

Southeast

Description:

Stage 6 final cover. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.



Photograph No. 6

Date:

October 17, 2017

Direction:

North

Description:

Stage 6 final cover. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.



Photograph No. 7

Date:

October 17, 2017

Direction:

Northwest

Description:

Stage 4 intermediate cover. Vegetation is partially established. No stability concerns evident.



Photograph No. 8

Date:

October 17, 2017

Direction:

West

Description:

Stage 4 active area surrounded with intermediate cover.

A vertical leachate riser is shown within the active area. No stability concerns evident.



Photograph No. 9

Date:

October 17, 2017

Direction:

Northwest

Description:

Stage 4 intermediate cover. Vegetation is partially established. No stability concerns evident.



Photograph No. 10

Date:

October 17, 2017

Direction:

Southwest

Description:

Stage 4 intermediate cover. Vegetation is partially established. No stability concerns evident.



Photograph No. 11

Date:

October 17, 2017

Direction:

North

Description:

Standing on Stage 4 intermediate cover looking north toward Stage 5 final cover. Stage 5 final cover vegetation is healthy and well established.



Photograph No. 12

Date:

October 17, 2017

Direction:

East

Description:

Drainage swale at toe of Stage 4. Drainage swale is free of obstructions and well vegetated.



Photograph No. 13

Date:

October 17, 2017

Direction:

West

Description:

Non-contact stormwater downchute is free of obstructions and in good condition.



Photograph No. 14

Date:

October 17, 2017

Direction:

Northeast

Description:

Stage 5 final cover is in good condition.



Photograph No. 15

Date:

October 17, 2017

Direction:

South

Description:

Stage 4 final cover on sideslopes is in good condition with no evidence of erosion, sloughing, seeps, or stability issues. No animal burrows noted.



Photograph No. 16

Date:

October 17, 2017

Direction:

Southwest

Description:

Stage 4 final cover in good condition with no evidence of erosion, sloughing, seeps, or stability issues. No animal burrows noted.



Photograph No. 17

Date:

October 17, 2017

Direction:

Southeast

Description:

Stage 4 final cover on sideslopes is in good condition with no evidence of erosion, sloughing, seeps, or stability issues. No animal burrows noted.



Photograph No. 18

Date:

October 17, 2017

Direction:

West

Description:

Stormwater ditch at confluence with downchute. Ditch is in good condition, well lined, and does not have any noted obstructions.



Photograph No. 19

Date:

October 17, 2017

Direction:

North

Description:

Final cover on Stage 4 sideslopes is in good condition with no evidence of damage from erosion, animals, or sloughing or stability issues.



Photograph No. 20

Date:

October 17, 2017

Direction:

East

Description:

Stormwater ditch at corner of landfill. Ditch is in good condition, well lined with vegetation, and does not have any noted obstructions.



Photograph No. 21

Date:

October 17, 2017

Direction:

North

Description:

Storm water ditch at corner of landfill. Ditch is in good condition, well lined with vegetation, and does not have any noted obstructions.



Photograph No. 22

Date:

October 17, 2017

Direction:

Northeast

Description:

Non-contact stormwater downchute. Clear of obstructions. Revetment is in good condition. Functioning as intended.



Photograph No. 23

Date:

October 17, 2017

Direction:

Southwest

Description:

Groundwater monitoring wells. Concrete pads are intact. Wells are locked.



Photograph No. 24

Date:

October 17, 2017

Direction:

East

Description:

Final Cover on Stage 4 sideslopes is in good condition with no evidence of damage from erosion, animals, or sloughing or stability issues.



Project: New Castle Inspection
Photographer: Richard Southorn

Project No.: 1009194003

Photograph No. 25

Date:

October 17, 2017

Direction:

Northeast

Description:

Final Cover on Stage 4 sideslopes is in good condition with no evidence of damage from erosion, animals, or sloughing or stability issues.



Photograph No. 26

Date:

October 17, 2017

Direction:

East

Description:

Leachate pipe discharging into contact stormwater ditch which ultimately flows to Leachate Pond. Pipe is free draining. No staining evidence of overtopping of ditch. Ditch is clear of obstructions.



Photograph No. 27

Date:

October 17, 2017

Direction:

East

Description:

Final Cover on Stage 5 sideslopes is in good condition with no evidence of damage from erosion, animals, or sloughing or stability issues.



Photograph No. 28

Date:

October 17, 2017

Direction:

Southeast

Description:

Stormwater ditch.



Photograph No. 29

Date:

October 17, 2017

Direction:

West

Description:

Inlet to Leachate Pond.



Photograph No. 30

Date:

October 17, 2017

Direction:

Southeast

Description:

Landfill Overview. Landfill is well maintained with no visible issues requiring modification.



Photograph No. 31

Date:

October 17, 2017

Direction:

Southeast

Description:

Non-contact stormwater downchute. Clear of obstructions. Revetment is in good condition. Functioning as intended.

Stage 5 final cover is in good condition with no signs of stability. No animal burrows noted. Vegetation is healthy.



Photograph No. 32

Date:

October 17, 2017

Direction:

East

Description:

Stormwater swale is in good condition. Well maintained with healthy vegetation. No debris or obstructions.



Photograph No. 33

Date:

October 17, 2017

Direction:

South

Description:

Stage 5 final cover is in good condition with no signs of stability. No animal burrows noted. Vegetation is healthy.



Photograph No. 34

Date:

October 17, 2017

Direction:

South

Description:

Non-contact stormwater downchute. Clear of obstructions. Revetment is in good condition. Functioning as intended.



Photograph No. 35

Date:

October 17, 2017

Direction:

Southeast

Description:

Stormwater swale is in good condition. Well maintained with healthy vegetation. No debris or obstructions.



Photograph No. 36

Date:

October 17, 2017

Direction:

Southwest

Description:

Stage 5 final cover is in good condition with no signs of stability. No animal burrows noted. Vegetation is healthy.



Photograph No. 37

Date:

October 17, 2017

Direction:

South

Description:

Stage 6 final cover is in good condition with no signs of stability. No animal burrows noted. Vegetation is healthy.



Photograph No. 38

Date:

October 17, 2017

Direction:

Southwest

Description:

Stage 6 final cover is in good condition with no signs of stability. No animal burrows noted. Vegetation is healthy.



Photograph No. 39

Date:

October 17, 2017

Direction:

North

Description:

Stage 6 final cover is in good condition with no signs of stability. No animal burrows noted. Vegetation is healthy.

