

**From:** [Vojin Janjic](#)  
**To:** [Elizabeth Rorie](#)  
**Subject:** FW: 2016 Kingston Fossil plant Annual Dike inspection report for NPDES Permit No. TN0080870  
**Date:** Monday, February 20, 2017 10:16:11 PM  
**Attachments:** [image001.png](#)  
[image002.png](#)

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**Vojin Janjic** | Manager, Water-Based Systems  
Division of Water Resources  
William R. Snodgrass Tennessee Tower, 11<sup>th</sup> Floor  
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**From:** Dennison, Adele M [mailto:[amdennison@tn.gov](mailto:amdennison@tn.gov)]  
**Sent:** Thursday, February 16, 2017 12:31 PM  
**To:** Robert Alexander; Sarah Terpstra; Angela J. Hall; Vojin Janjic  
**Cc:** Patrick Mulligan; Natalie Harris; Quinn, James Roy III  
**Subject:** 2016 Kingston Fossil plant Annual Dike inspection report for NPDES Permit No. TN0080870

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This report is for the Peninsula Landfill as required under NPDES Permit TN0080870.

*Thanks*

**Adele Dennison**

**Kingston Fossil Plant - Environmental**

**Office: 865-717-2157**

**Cell: 865-755-9280**





Tennessee Valley Authority, 714 Swan Pond Road, Harriman, Tennessee 37748

February 14, 2017

Mr. Vojin Janjić, Manager  
Permits Section  
TDEC - Division Water Resources  
WR Snodgrass TN Tower  
312 Rosa Parks Ave, 11th Floor  
Nashville, Tennessee 37243

Dear Mr. Janjić:

TENNESSEE VALLEY AUTHORITY (TVA) - KINGSTON FOSSIL (KIF) PLANT - NPDES PERMIT NO. TN0080870 - FLUE GAS DESULFURIZATION (FGD) IMPOUNDMENT AND PRODUCTION ASH ANNUAL REPORT FOR THE PENINSULA LANDFILL

As required by Part III.B.2.(3) of the KIF FGD System NPDES Permit No. TN0080870, TVA is providing the enclosed report summarizing findings of all monitoring, inspections, and remediation measures pertaining to the structural integrity, design, construction, and operation and maintenance of all FGD impoundments. As previously discussed with the division, TVA performs annual dike inspections on a rolling 15 month frequency in order to assess the pertinent features across all seasons over a 5 year period.

If you have any questions or need additional information concerning this report, please call Adele Dennison at 865-717-2157.

*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.*

Sincerely,

A handwritten signature in black ink that reads "B. Doug Keeling". The signature is written in a cursive, flowing style.

B. Doug Keeling  
Plant Manager  
Kingston Fossil Plant

BDK/amd

Enclosures

Page 2

cc: Brad Love, BR 4A-C  
Mike Tritapoe, LP 5D-C  
Plant File  
EDMS

# **KINGSTON FOSSIL PLANT NPDES DIKE INSPECTION REPORT**

**PERMIT NUMBER TN0080870**

**Reporting Period October 1, 2015 - December 31, 2016**

## **Peninsula Disposal Area and FGD Stormwater Pond**

The Peninsula disposal area was constructed in 2008 and contains both gypsum (Phase IA) and gypsum and production ash (Phase IB).

As a byproduct of the flue gas desulfurization, approximately 257,000 tons of synthetic gypsum was produced in 2016 with approximately 42,000 tons marketed.

Approximately 101,400 tons of Conditioned Production Fly Ash was placed in Phase IB.

## **Peninsula Disposal Area FGD Stormwater Pond**

The Peninsula Disposal Area FGD Stormwater Pond is located on the Peninsula area east of the plant site. It was constructed in 2008. The pond has a flexible 60-mil HDPE liner overlaying a 24 inch thick granular drainage layer.

- **Gypsum/Fly Ash Disposal Area Handling and Operations**

In 2014, TVA applied for a major permit modification to dispose of ash along with gypsum in the Phase 1B Gypsum disposal landfill. The Permit application was approved on September 29, 2015.

TransAsh is contracted to haul and place material at the GDA landfill. TVA's Generation Construction Project and Services Field Superintendent is responsible for oversight of the contractor with additional inspections of the work area performed by Plant Operations and the On-site Environmental Scientists.

- **Gypsum/Fly Ash Disposal Area Dike Inspections**

Tim Hill, TDEC Solid Waste Inspector requested information regarding maintenance activities conducted on the outer perimeter of the Landfill. See Attachment A.

Daily Dike inspections are conducted by Coal yard Operations Personnel and are retained at the facility.

Quarterly Dike inspections are conducted by TVA's Generation Construction Projects and Services group and retained at the facility.

An Annual (15 month) Dike inspection was conducted on January 14, 2016. See Attachment B.

- **Peninsula Disposal Area FGD Stormwater Pond Handling and Operations**

The FGD Stormwater pond accepts Process water from the gypsum dewatering facility, leachate from the Landfill (Phase 1A and Phase 1B) and stormwater runoff. Based on a level indicator, the water in the pond is discharged to the Watts Bar Reservoir at NPDES Outfall 01A.

## Monitoring Activities at both the Peninsula Disposal Area and the FGD Stormwater Pond

- **Daily Inspections** are conducted by Kingston Coal Yard Operations Personnel. These include observations of dams, dikes and toe areas for erosions, cracks or bulges, subsidence, seepage, wet or soft soil, changes in geometry, the depth and elevation of the impounded water, sediment or slurry, freeboard, changes in vegetation such as overly lush, obstructive vegetation and trees, outlet controls, drains and any other changes which may indicate a potential compromise to impoundment integrity. Any obvious change from previous inspections is reported to the Field Supervisor and to Kingston Fossil Plant Site Environmental.

*Daily inspections are maintained at the site and are available for review*

- **Quarterly Inspections** are the responsibility of the Senior Program Manager Generation Construction Projects and Services. These include observations of dams, dikes and toe areas for erosions, cracks or bulges, subsidence, seepage, wet or soft soil, changes in geometry, the depth and elevation of the impounded water, sediment or slurry, freeboard, changes in vegetation such as overly lush, obstructive vegetation and trees, outlet controls, drains and any other changes which may indicate a potential compromise to impoundment integrity. Any obvious change from previous inspections is reported to the Kingston Fossil Plant Manager and Site Environmental.

*Quarterly inspections are maintained at the site and are available for review.*

- **Special Inspections**

Special Inspections are preformed by TVA's Generation Construction Projects and Services group

- Special Inspections - There were no new or unchanged conditions to report
- Seismic Event Inspections - None to report
- Design Rainfall Event (over 10 year 24-hour event) - None to report

- **Maintenance Activities**

- The Peninsula GDA Stormwater pond has a rock basin to capture any sediment carry-over from the Gypsum Dewatering clarifiers. This basin was vacuumed of sediment in the spring of 2016.
- Stormwater Pond Pump Flow Meter and Totalizer was inspected in the fall of 2016. The Flow meters were replaced and an independent verification of the flow meter output was performed using an ultrasonic flow device. A summary of the work performed was included in the December 2016 Discharge monitoring report..
- Eastern side of the Peninsula Disposal area, vehicle ruts caused by ATV traffic to the Groundwater Monitoring Wells was rocked to eliminate rutting and improve access

## **Seeps**

### **Inactive Seep 1**

As reported in the 2011 dike inspection report, five drainage trenches were installed on the southeast exterior side of the Stormwater Pond to maintain a low groundwater elevation near the toe of the dike. See Attachment C Seep Layout.

## **Attachment A**

On 4/01/15 the TVA team and Trans Ash contractors performed mitigation work on the depression areas in the woods along south side of GDA. TVA and TDEC teams were out on site 3/30/15 and 3/31/15 and inspected the depression areas. TVA received approval to proceed with the repairs. Upon starting repair work Trans Ash had two operators and a site supervisor on site to perform the work and a small excavator and a skid steer.

The first area was approximately 2x2x2 ft in size and Trans Ash excavated it out to approximately 3x5x4 ft. This depression was a rotted out tree stump. The bottom of the depression was probed and confirmed to have a solid bottom. Trans Ash started the backfill process of putting clay back in hole in 10 in lifts and compacting it with an excavator bucket to original grade.

The second depression was approximately 3x3x3 ft and was excavated to approx. 4x3x4.5 ft. This depression also appeared to be a stump hole. The bottom of the depression was probed and confirmed to have a solid bottom. Trans Ash preceded to backfill with clay in 8/10 in lifts and compacted with excavator bucket back to original grade .

The third area was the larger depression area, it was approximately 6x7x4 ft. While excavating this area, Trans Ash chased a rock down to approximately 11 ft deep and 8ft wide and 8ft long and found solid bottom where rock choked off. Trans Ash started their backfill procedure by placing approximately 5ft of riprap in 1ft lifts and compacted with excavator bucket. Then 3 ft of number 2 stone was then placed in approximately 10 in lifts and compacted with excavator and 2ft of crush and run stone was placed in 8/10 inch lifts and compacted with excavator. A layer of non-woven geo textile fabric was placed in a 10x10x10 ft area and clay was placed on top of the fabric in 8/10 in lifts and compacted with an excavator and brought to original grade.

There were three more depression areas found during the remediation. Each area was approximately 1x1x1 ft and once excavated Trans Ash it was determined that these areas were all rotted stumps and we probed all for solid sides and bottoms and repaired these by placing clay back into holes and compacting in 8/10 inch lifts and bringing to original grade.

All remediated areas were seeded and covered with straw. This completed the remediation work.

Travis McConkey

TVA - Civil Construction  
Civil Lead

























## **Attachment B**



July 7, 2016

**2016 Annual (Intermediate) Inspection of CCR Facilities  
Kingston Fossil (KIF) Plant  
Kingston, Roane County, Tennessee**

The 2016 Intermediate Inspection of Coal Combustion Residual (CCR) facilities at Tennessee Valley Authority's (TVA's) Kingston Fossil (KIF) Plant included review of the following structures:

- KRP Ash Landfill
- North Embayment Dam
- Peninsula Disposal Area
- Sluice Trench (K3)
- Stilling Pond (K1)

The inspection was performed on May 23, 2016, in accordance with the KIF Inspection plan with the last intermediate inspection conducted June 2015. The weather at the time of the inspection was fair, partly cloudy and approximately 85°.

The results of the field inspection (inspection forms, photo logs, and site layout maps) and instrumentation review are included within this report and the attached documents. The report and attachments are prepared in accordance with TVA's GCP&S-SPP-27.5, and DSG SPP 27.005.

**Data Review**

The following documents were reviewed prior to performing the inspection.

- 2016 Kingston Fossil Inspection Plan
- Kingston Fossil, FY2015 2nd Quarter Informal Inspection
- Kingston Fossil, FY2015 3rd Quarter Informal Inspection
- Kingston Fossil, FY2015 4th Quarter Informal Inspection
- Kingston Fossil, FY2016 1st Quarter Informal Inspection
- Intermediate (Annual) Inspection (June 9, 2015) Report, January 14, 2016
- Annual Instrumentation and Monitoring Program Final Report (Rev. 2), FY2015, Stantec and AECOM, February 19, 2016
- Monthly Instrumentation Reports (November 2015--May 2016) by Stantec
- iSite Central Instrumentation Readings (May 2015--May 2016)

The documents were reviewed for previously identified areas of interest, potential locations of structural weakness at each facility, instrumentation condition and readings, and documentation of any construction activities that occurred since the previous intermediate inspection.

### **General Conditions**

At the time of the inspection, the following was observed at the inspected facilities:

- The KRP Ash Landfill is a closed facility and does not receive CCR material.
- CCR material from the Ballfield Area was being removed, transported, and placed at the Peninsula Disposal Area. The operation was nearing completion. The Peninsula Disposal Area is under the CCR Rule.
- The Stilling Basin (K1) and North Embayment Dam are not under the CCR Rule but are active facilities with no maintenance and/or construction activities.
- Preparation for the construction of a proposed pond was in progress at the Sluice Trench (K3) area.

Additionally, a document review along with field observations indicate wet areas of interest have been mitigated or are in the process of being mitigated.

A general overview of site conditions is provided below.

- A good stand of grass is generally maintained on the slopes of the perimeter dikes and stacks of all the facilities.
- Based on a document review, and site observations, it appears there's adequate freeboard at the Stilling Basin (K1) and the Sluice Trench (K3).
- Operation and maintenance activities at the facilities have been performed since the previous informal and annual inspections, including the repairs noted on previous inspections.
- No global slope instability was observed during this inspection.
- Evidence of sinkholes or depressions was not observed.
- Outlet structures and drainage pipes generally in good condition.
- Photographs documenting site conditions at the time of the inspection are attached.

The inspection team did not observe any deficiencies that would be considered significant. Significant being defined by GCP&S-SPP 27.4.4, Section 3.2.7.

### **Areas of Interest - 2015 Intermediate Inspection (May 19, 2015)**

The 2015 intermediate inspection reported two areas of interest.

- Minor rutting at the toe of the dike on the southern side of the Peninsula Disposal Area. Rutting was considered minor. (TVA WO 117543496) .
- Eroded area at the toe of the eastern dike of the Dry Fly Ash Stack adjacent to the Stilling Pond. Erosion was considered minor. (TVA WO 117543513).

Areas of interest have been repaired.

#### **Areas of Interest - 2016 Intermediate Inspection (May 19, 2015)**

One area of interest has been noted and details provided in Attachments C and H. The outlet of the control structure located at the embankment of the North Embayment Dam is partially obstructed by displaced rock riprap.

#### **Instrumentation**

Instrumentation data was reviewed from May 2015 to May 2016. This data includes automated and manual pressure head readings obtained at the piezometers; and, deflection measurements in the slope inclinometers. Instrumentation data was collected from TVA's iSite Central; and, facility annual and monthly reports. Also, instrumentation maps have been included in Attachment A as well as instrumentation summary tables for each facility. Below is a summary of the instrumentation review at each facility. For additional details, refer to the monthly instrumentation summary reports.

- The KRP Ash Landfill and Stilling Basin are the only facilities that have instrumentation.
- No exceedence in piezometer threshold and/or action levels.
- Significant horizontal displacement readings (inclinometers) were not experienced. A significant displacement is considered to be greater than 0.2 inch.
- Piezometers and inclinometers in the KRP Ash Landfill have been automated.
- Instrumentation at the Stilling Basin is manually read. No readings have been recorded in the last year. Automation of these instruments will be implemented.

#### **CCR Rule Compliance**

Based on 40 CFR §257.83 and §257.84 from the published EPA CCR Rules, various metrics are required for each CCR impoundment and landfill facility for the annual (intermediate) inspection in addition to the visual assessment of the CCR units. A table of these metrics is presented in Attachment G.

Bryan Kyker, PE

Attachment A – Facility and Instrumentation Maps  
Attachment B – KRP Landfill  
Attachment C – North Embayment Dam  
Attachment D – Peninsula Disposal Area  
Attachment E – Sluice Trench (K3)  
Attachment F – Stilling Pond (K1)  
Attachment G – CCR Rule Metric Table  
Attachment H – Inspection Item List



## **Attachment A**

### **Project Maps**

- Facility Map
- Instrumentation Maps

KIF

Facility Map

North Embayment Dam

KRP Ash Landfill

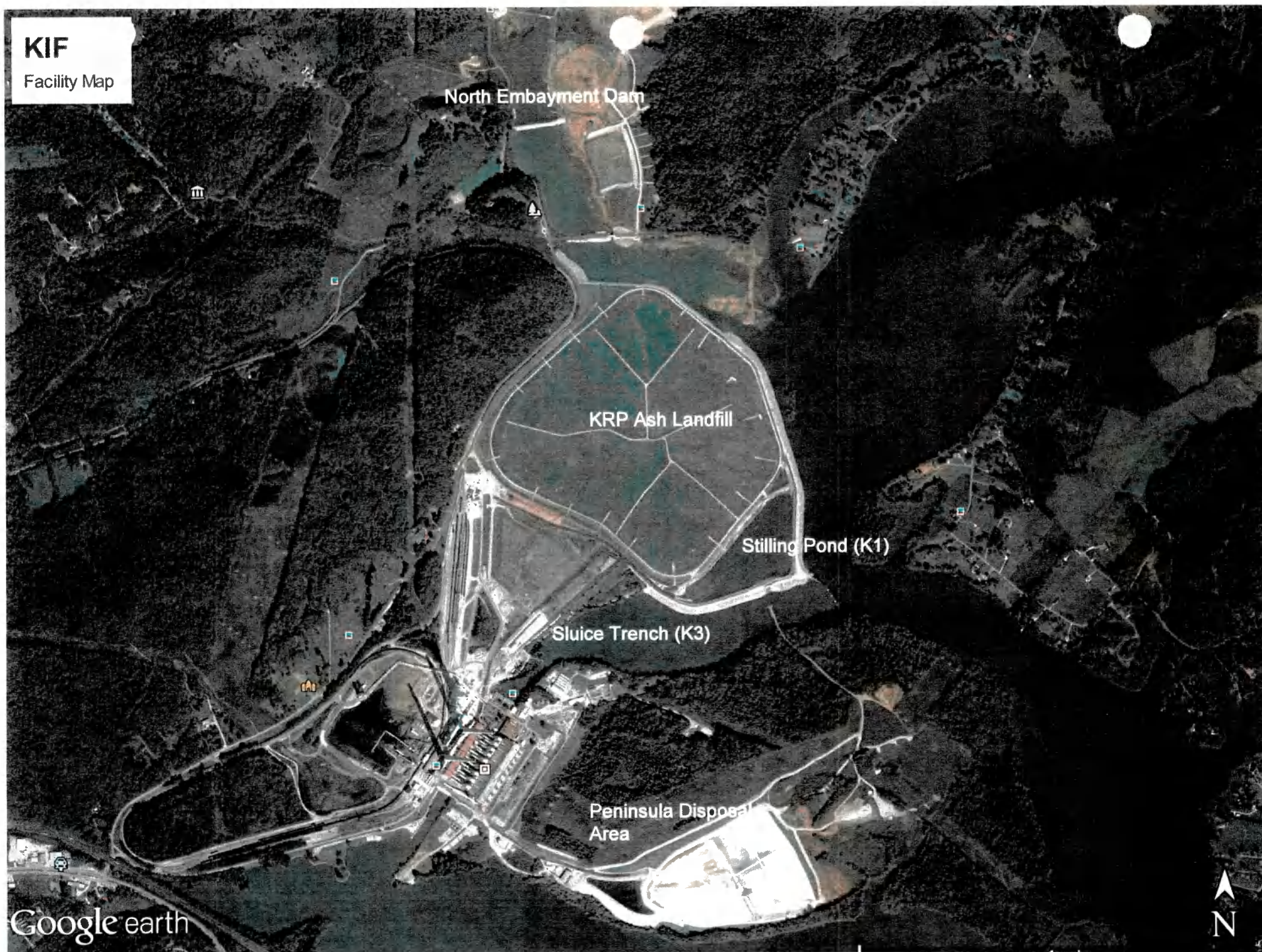
Stilling Pond (K1)

Sluice Trench (K3)

Peninsula Disposal  
Area

Google earth

N







## KINGSTON FOSSIL PLANT 2016 INTERMEDIATE INSPECTION

1. Site Name: **Kinston Fossil Plant** 2. Facility Name: **Peninsula Disposal Area** 3. Date: **05/23/2016**  
4. Operator Name: **Trans Ash** 5. Hazard Classification: **N/A**  
6. Inspector's Names: **Michael Hulslander, Bryan Kyker, Stanley Nixon, and Brett Wyatt**  
7. Weather Conditions / Temperature: **Fair - Partly Cloudy - Approximately 85°**

Check the appropriate box below. If not applicable, record "N/A". Provide comments when appropriate. Any other areas that should be investigated more closely should also be noted in the "Comments" section. Indicate the locations of any areas identified, and photograph and attach to the form. Previous observation forms should be reviewed and any NEW observations or degradation of previous conditions should be reported on this observation form.

	Yes	No		Yes	No
8. Pre-Job Safety Briefing Performed	X		14. <b>DIKE TOE AREAS</b>		
9. Activity / Construction on / at facility	X		A. Wet Areas of Interest <input type="radio"/> New <input type="radio"/> Existing		X
10. <b>DIKE CREST</b>			o Clear or Muddy		N/A
A. Settlement / Cracking		X	o Flow Increase / Decrease		N/A
B. Rutting		X	o Aquatic Vegetation Growing		N/A
C. Lateral Displacement		X	o Ash or Clay Deposits Below Seep Outlet		N/A
D. Erosion		X	B. Boils <input type="radio"/> New <input type="radio"/> Existing		X
11. <b>IMPOUNDMENT</b>			o Clear or Muddy		N/A
A. Minimum Freeboard Required		N/A	o Flow Increase / Decrease		N/A
B. Actual Minimum Freeboard		N/A	o Growing in Size		N/A
C. Pool Elevation Measurement		N/A	C. Sinkholes/Depressions <input type="radio"/> New <input type="radio"/> Existing		X
12. <b>DIKE INTERIOR/EXTERIOR SLOPES</b>			15. <b>WATER COLLECTION SYSTEM</b>		
A. Instabilities (Sloughs or Slides)		X	A. Estimated Flow Measurement		N/A
B. Erosion		X	B. Increased Flow		N/A
C. Sinkholes/Depressions <input type="radio"/> New <input type="radio"/> Existing		X	C. Emitting Clear or Dirty Water		N/A
D. Vegetation / Brush / Trees (excessive)		X	16. <b>SPILLWAY WEIRS &amp; OUTLETS</b>		
E. Animal Burrows <input type="radio"/> New <input type="radio"/> Existing		X	A. Decant Riser Misaligned		N/A
F. Wet Areas of Interest <input type="radio"/> New <input type="radio"/> Existing		X	B. Decant Pipe Joints Leaking/Separated		N/A
o Clear or Muddy		N/A	C. Headwall in Good Condition		N/A
o Increased Flow		N/A	D. Siphons/Emergency Spillway in Good Condition		N/A
o Ash or Clay Deposits Below Seep Outlet		N/A	E. Spillway Outlet in Good Condition		N/A
G. Seep around Drain Pipe (s)		X	17. <b>OPERATIONS &amp; MAINTENANCE</b>		
13. <b>DEFICIENCIES</b>			A. Routine O&M Performed	X	
A. Prior Deficiencies Checked		X	B. Changes in Operations		X
B. New Deficiencies Identified / Flagged		X	18. <b>INSTRUMENTATION</b>		
C. Immediate Actions Taken (Note Below)		N/A	A. Instrumentation readings reviewed		X
D. Photos of deficiencies attached		N/A	B. Instrumentation functioning properly		N/A
			C. Physical Damage to Instrumentation		X

19. Major adverse changes in these items could cause instability and should be investigated more closely as soon as possible for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, etc.) in the space below. General Inspection comments and observations should also be noted below.

9 - Ash placement in progress.

18 A, B & C - Instrumentation consists of groundwater wells. Instrumentation is not read/recorded for structural dam safety purposes.

21. I hereby attest the above is based on actual field observations made during the period indicated, by either myself or an appointed representative and are accurate,

Period Covered:

From: 2015 To: 2016

Signature:

*Bryan Kyker*

Date:

07/07/2016

## **Attachment C**







Figure No.  
**2**

**Kingston Fossil Plant Seepage Layout  
Area North of Fossil Plant**

Project Location  
Harrison  
Roane County, Tennessee

Prepared by WSW on 2016-09-21  
Technical Review by JW on 2016-09-21  
Independent Review by TR on 2016-09-21

0 500 1,000  
Feet  
1:6,000 (At original document size of 11x17)

**Legend**

● Mitigated Seep

**PRIVILEGED AND CONFIDENTIAL**



**Notes**

1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Kingston Fossil Plant Aerial Image courtesy of USGS © 2016 Microsoft Corporation
3. No TVA Identified Wetlands Within Map View.
4. Seep Table Coordinates Shown in NAD 1983 StatePlane Tennessee FIPS 4100

Seep Number	Latitude	Longitude
3	35° 54' 15"	-84° 30' 15"

