

**APPENDIX I –  
SEEP INVESTIGATION**

**APPENDIX I.1**  
**SEEP SUMMARY REPORT**



**John Sevier Fossil Plant  
Seep Summary Report**

TDEC Commissioner's Order:  
John Sevier Fossil Plant  
Rogersville, Tennessee

July 30, 2021

Prepared for:

Tennessee Valley Authority  
Chattanooga, Tennessee



Prepared by:

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# JOHN SEVIER FOSSIL PLANT SEEP SUMMARY REPORT

## Revision Record

<b>Revision</b>	<b>Description</b>	<b>Date</b>
0	Submittal to TDEC	August 21, 2020
1	Addresses September 4, 2020 TDEC Review Comments and Issued for TDEC Review	October 15, 2020
2	Addresses November 9, 2020 TDEC Review Comments and Issued for TDEC Review	July 30, 2021



## Sign-off Sheet

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# JOHN SEVIER FOSSIL PLANT SEEP SUMMARY REPORT

## Abbreviations

AOC	Area of Concern
CCP	Coal Combustion Products
CCR	Coal Combustion Residuals
DSWM	TDEC Division of Solid Waste Management
EIP	Environmental Investigation Plan
HDPE	High Density Polyethylene
JCC Plant	John Sevier Combined Cycle Plant
JSF Plant	John Sevier Fossil Plant
NPDES	National Pollutant Discharge Elimination System
SAP	Sampling and Analysis Plan
Stantec	Stantec Consulting Services Inc.
TDEC	Tennessee Department of Environment and Conservation
TDEC Order	Commissioner's Order No. OGC15-0177
TVA	Tennessee Valley Authority



# JOHN SEVIER FOSSIL PLANT SEEP SUMMARY REPORT

Introduction  
July 30, 2021

## 1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has prepared this Seep Summary Report on behalf of the Tennessee Valley Authority (TVA) to document seep-related observations and activities at TVA's John Sevier Fossil Plant (JSF Plant) located in Rogersville, Tennessee.

TVA prepared this report in support of fulfilling the requirements for the Tennessee Department of Environment and Conservation (TDEC) issued Commissioner's Order No. OGC15-0177 (TDEC Order) to TVA (TDEC 2015). The TDEC Order sets forth a "process for the investigation, assessment, and remediation of unacceptable risks" at TVA's coal ash disposal sites in Tennessee. Pursuant to the TDEC Order, TVA developed and TDEC approved an Environmental Investigation Plan (EIP) for the John Sevier Fossil Plant (JSF Plant) (Stantec 2018). As described in the EIP, there are currently no known active seeps at the JSF Plant as a result of remedial activities conducted by TVA beginning in 1998, as described herein. As such, no seep investigation was planned nor conducted as part of TDEC Order EIP activities. Instead, in response to TDEC's request, TVA has developed this JSF Plant Seep Summary Report, which provides a summary of historical documentation of seep-related observations, remediation/mitigation efforts, and ongoing closure and post-closure monitoring at the JSF Plant. Should active seeps be identified in the future, a Seep Investigation Sampling and Analysis Plan (SAP) will be developed and implemented.





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Objective and Scope  
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## 2.0 OBJECTIVE AND SCOPE

The objective of this JSF Plant Seep Summary Report is to summarize historical documentation, mitigation/remediation activities, and closure and post-closure monitoring activities associated with Coal Combustion Residuals (CCR) units at the JSF Plant where historical seeps and/or Areas of Concern (AOCs) have been documented over time. A list of reviewed documents are provided in Appendix A and are not specifically referenced herein. The CCR units and locations of historically documented seeps and AOCs are shown on Exhibit B.1 (Appendix B). The information summarized in this report is based on historical and recent documentation including: historical inspections, assessments, and plans; remediation and mitigation efforts; permit requirements; and closure/post-closure monitoring conducted by TVA for the following former CCR storage facilities at the JSF Plant:

- Dry Fly Ash Stack
- Ash Disposal Area J
- Bottom Ash Pond
- Highway 70 Borrow Area.

Each of these facilities have completed closure activities and are at various stages of their respective post-closure periods.

This report summarizes the seep-related information provided in the available documentation and demonstrates that the historical presence of seeps associated with the CCR units have been adequately mitigated/remediated such that no active seeps currently exist. Note that the terminology used for “seeps” and the CCR units has changed in the documentation over time; the terminology used in this report is taken from the original references with clarification provided, as needed.



# JOHN SEVIER FOSSIL PLANT SEEP SUMMARY REPORT

Summary of Seep-Related Documentation  
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## 3.0 SUMMARY OF SEEP-RELATED DOCUMENTATION

The following sections summarize information contained in historical documents for the JSF Plant that were available for review relevant to seep-related observations, historical seeps, and AOCs. Locations of historical seeps/AOCs identified by TVA are provided on Exhibit B.1 in Appendix B. Remediation/mitigation activities conducted in these areas are discussed in Section 4.0.

### 3.1 HISTORICAL INSPECTIONS

TVA conducted Annual Ash Pond Dike Inspections (also referred to as “Annual Ash Disposal Area Inspection,” “Annual Joint Inspection of Ash Disposal Areas,” “Annual Inspection of Ash Disposal Areas,” “Stability Inspection of Ash Disposal Areas,” and “Red Water Seep Inspection”) at the JSF Plant from 1967 to 2012 (see reviewed document list in Appendix A). These inspections focused on stability issues pertaining to JSF Plant operations, such as changes in the dikes since the last inspection; changes in pond operation since the last inspection; condition of spillways, skimmers and outlets; and recommendations and actions on previous recommendations from the last inspection. Although not a listed item on the report forms, some of the inspection reports noted, but did not differentiate between, “seeps”, “seepage”, “wet spots”, and “wet areas”.

In 2013, TVA conducted an “Annual Inspection of Coal Combustion Products (CCP) Disposal Facilities,” and annually from 2014 to 2017, conducted an “Intermediate Inspection of CCP Disposal Facilities”. These inspections were performed to evaluate the conditions of the disposal facilities, document changes since the last inspection, and to provide recommendations for additional improvements and maintenance.

A summary of the seep-related observations documented during these inspections are provided in the following sections.

#### 3.1.1 Inspection Reports

Seep-related information in available TVA annual inspection reports between 1979 and 2017 was reviewed and summarized where noted. Some annual reports specifically stated that there was no evidence of seepage; however, some reports did not specifically contain seep-related information and are therefore, not included herein. Locations of reported seep-related observations were correlated to existing areas when possible (see Exhibit B.1, Appendix B and Table C.1, Appendix C).

The historical seep-related observations documented during the annual inspections included:

- The 1979 and 1980 Annual Ash Disposal Area Inspection reports noted that “all dikes appear to be stable with no evidence of seepage”
- An 1980 memorandum regarding an Ash Disposal Pond Leak identified a “wet spot at the toe of the dike approximately 75 feet west of the point where the ash pond run-off pump discharge line starts up the dike” up to approximately 15 square yards in size. This area appears to have been



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Summary of Seep-Related Documentation  
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located along the north dike, adjacent to historical Area A of the Dry Fly Ash Stack and near later established historical seep A and AOC#1 (Exhibit B.1, Appendix B).

- The 1981 Interim Disposal Area Inspection report determined that the “wet spot” noted in the 1980 memorandum had reduced in size to approximately 10-15 feet wide and, there was no sign of slides or sloughing of the dike slope
- The 1982, 1983 and 1984 Annual Ash Disposal Areas Inspection reports stated that the dikes appeared to be stable with no evidence of seepage. In the 1983 report, a “soft wet area” was observed at the exterior slope of the southwest dike of Ash Disposal Area 2 (currently part of the Bottom Ash Pond), extending from the toe of the dike to the cut of the Southern Railroad line, but this area was dry during the 1984 inspection.
- The 1985 and 1986 Annual Joint Inspection of the Ash Disposal Areas reports noted that the area of the exterior slope of the southwest dike that was reported to be soft and wet in the 1983 annual inspection report was observed to be firm and dry
- The 1988 Annual Joint Inspection of Ash Disposal Areas report noted “a small area of seepage was observed at the toe of the waste disposal area along the north dike of the coal yard drainage basin.” This area appears to correlate with Areas D and H of the Dry Fly Ash Stack area shown in Exhibit B.1 (Appendix B).
- The 1995 Annual Fossil Engineering Inspection of Ash Disposal Areas report noted that “four abandoned pipes located near the northeast corner of this area [riverbank] and previously identified as draining (seepage) into the Holston River have been recently plugged” in the “original disposal area” and that “seepage is now discharging along the outside of the pipes and saturating an area of the riverbank”. This location appears to correlate with later established AOC#1 in the Dry Fly Ash Stack area (Exhibit B.1, Appendix B). Also, during this inspection, due to low water elevation, seepages were observed along the reservoir bank below the toe of the dikes near the spillway outfall.
- In the 1996 Dike Stability/Quarterly Red Water Seep Inspection report, “wet areas” were identified along Polly Branch south of the former Outfall 3 and 300 feet east of Polly Branch along a gravel walkway. These locations appear to correlate with the area immediately north of the Dry Fly Ash Stack (Exhibit B.1, Appendix B).
- The 1998 Annual Inspection of Waste Disposal Areas report noted that a seepage interception and collection system was under construction near the “wet spot” identified in the 1980 Ash Disposal Pond Leak memorandum near AOC#1 and adjacent to Area A of the Dry Fly Ash Stack (Exhibit B.1, Appendix B)
- The 1999 Annual Inspection of Waste Disposal Areas report noted that the seepage interception and collection system construction, near AOC#1 and adjacent to Area A of the Dry Fly Ash Stack, was completed. Additional information is provided in Section 4.0. Also, few minor seeps were noted below the toe of the north dike in Area C of the Dry Fly Ash Stack (Exhibit B.1, Appendix B).



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Summary of Seep-Related Documentation  
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- The 2000 Annual Inspection of Waste Disposal Areas report noted an additional seep at the toe of the dike in the Bottom Ash Pond (Exhibit B.1, Appendix B). Two minor seeps were noted below the toe of the north dike in Area C just west of the access road at the Dry Fly Ash Stack.
- The 2002 Stability Inspection of Ash Disposal Areas report noted that the seepage interception and collection system constructed in 1998-1999 was expanded. Also, the Stilling Pond was reported to have two partially blocked inlets, which caused seepage along the entire length of the pond.
- The 2003 inspection report noted that the two inlets to the Stilling Pond were still partially blocked and that seepage was still occurring along the entire length of the pond
- No references to seeps were noted in the 2004-2012 annual inspection reports
- The 2013 Annual Inspection of CCP Disposal Facilities report noted a “potential seep” at the toe of the southeast slope where the exterior slope of the Dry Fly Ash Stack transitions to the interior slope of the Sediment Pond East. Because this inspection was conducted following a precipitation event the previous night, it could not be confirmed that this area was an active seep.
- The 2014 Intermediate Inspection of CCP Disposal Facilities report noted that ground conditions were slightly damp around the northcentral section of the Bottom Ash Pond but there was no evidence of flowing water
- No reference to seeps were noted in the 2015, 2016 or 2017 annual inspection reports
- The TDEC Division of Solid Waste Management (DSWM) documented a wet area in the vicinity of AOC#1 in its post-inspection report of the Dry Fly Ash Stack dated October 17, 2018. TVA submitted a minor modification to DSWM on October 24, 2018 regarding repair of this wet area, and TDEC DSWM approved it on March 19, 2019.

Supplemental information regarding “wet spots” and “wet areas” noted above and historical seeps/AOC locations (first referenced in the 2010 Seepage Action Plan; see Section 3.3) is provided on Table C.1 in Appendix C and Exhibit B.1 in Appendix B.

### 3.1.2 Red-Water Seep Inspections

TVA conducted quarterly “Red-Water Seep Inspections” from March 2003 to December 2008. The results of the quarterly inspection reports were submitted yearly to TDEC’s Division of Water Quality as the JSF Plant’s “Annual Ash Pond Seep Inspection Report” as required under the plant’s NPDES permit. While active seeps were not documented in any of the quarterly inspections, intermittently stained areas were noted at the following locations:

- The Bottom Ash Pond divider dike (historical seep location Q shown on Exhibit B.1)
- Either one side or both sides of the main rail line near Active Ash Pond 2
- On the lower road near the Ash Stack River Dike



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Summary of Seep-Related Documentation  
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- West of the Stilling Pond (historical seep location G shown on Exhibit B.1)
- 100 feet south of the campground bridge and 30 feet south of the discharge pipes near the Ash Stack River Dike.

### 3.2 1987 RED WATER DISCHARGE ASSESSMENT

In 1987, TVA conducted a Red Water Discharge Assessment study to evaluate red water discharge from the JSF Plant. The “red-water seepages” were identified during a drought period when stages in the Holston River were unusually low. A later 1987 report titled, “Seepage Flux from JSF Plant Ash Disposal Area into Holston River” used water level and water quality field data collected during the Red Water Discharge Assessment and modeled seepage flux estimates to predict that a ground-water mound caused by the ash-sludging into the disposal unit could have caused excess groundwater seepage. The ash-sludging activities have ceased and the plant has been inactive since 2012.

### 3.3 2010 SEEPAGE ACTION PLAN

A Seepage Action Plan was prepared for the JSF Plant in 2010 to describe various seepage action levels and to provide short-term management measures should any action be required. The seepage action levels were based on potential risk associated with progressive erosion due to seepage and resulting breach of the embankment or impoundment.

Nine AOCs at the JSF Plant and their associated action levels were identified and numbered in the Plant’s seepage log, along with location coordinates, date of initial observation, approximate size, assigned seepage action level, description, and mitigation status. Seventeen historical seep locations, A through Q, and supplemental areas with seep conditions were also identified. The status of the historical seep/AOC locations and associated action levels were summarized in Table 1 of the 2010 Seepage Action Plan (provided herein as Table C.1, Appendix C and shown on Exhibit B.1, Appendix B). No historical seeps or AOCs have been observed near Ash Disposal Area J, nor for the Highway 70 Borrow Area.

The nine AOCs were classified as Action Level 1 (non-flowing) and were remediated and/or are inactive. As documented in the 2010 Seepage Action Plan, the nine AOCs (and co-located historical seeps) and their associated seepage action levels include:

- AOC#1 – located at the northeast section of the Dry Fly Ash Stack along the Holston River); Action Level 1 (Non-Flowing) and Inactive. AOC#1 is co-located with historical seep A
- AOC# 2 - located at the southwest section of the Dry Fly Ash Stack along the Holston River; Action Level 1 (Non-Flowing). AOC#2 is co-located with historical seep D
- AOC#3 - located at the southwest section of the Dry Fly Ash Stack along the Holston River; Action Level 1 (Non-Flowing). AOC#3 is co-located with historical seep E
- AOC#4 – located near the west section of the Dry Fly Ash Stack by the Stilling Pond); Action Level 1 (Non-Flowing) and Inactive. AOC#4 is co-located with historical seep F



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- AOC#5 – located near the west Section of the Dry Fly Ash Stack by the Stilling Pond; Action Level 1 (Non-Flowing) and Inactive. AOC#5 is co-located with historical seep G
- AOC#6 – located near the west Section of the Dry Fly Ash Stack by the Stilling Pond); Action Level 1 (Non-Flowing) and Inactive. AOC#6 is co-located with historical seep H
- AOC#7 – located near the northeast section of the Bottom Ash Pond; Action Level 1 (Non-Flowing) and Inactive. AOC#7 is co-located with historical seep L
- AOC#8 – located near the northcentral section of the Bottom Ash Pond); Action Level 1 (Non-Flowing) and Inactive. AOC#8 is co-located with historical seep M
- AOC#9 – located near the southwest section of the Bottom Ash Pond); Action Level 1 (Non-Flowing) and Inactive. AOC#9 is co-located with historical seep N.

### 3.4 2019 WET AREA INVESTIGATION

On September 2, 2019, a “wet area” was observed by TVA plant personnel at Ash Disposal Area J during a routine JSF Plant maintenance inspection. The wet area was specifically identified along the lower access road at the southern toe of Ash Disposal Area J, adjacent to the railroad (see Figure 1 below). Following weeks of monitoring the wet area, a strong correlation was found between the presence of standing water at this location and previous rainfall events. A precipitation event of 0.28 to 0.4 inches was recorded on August 28, 2019, five days before the initial observation on September 2, 2019.

**Figure 1. Aerial View of 2019 Wet Area**



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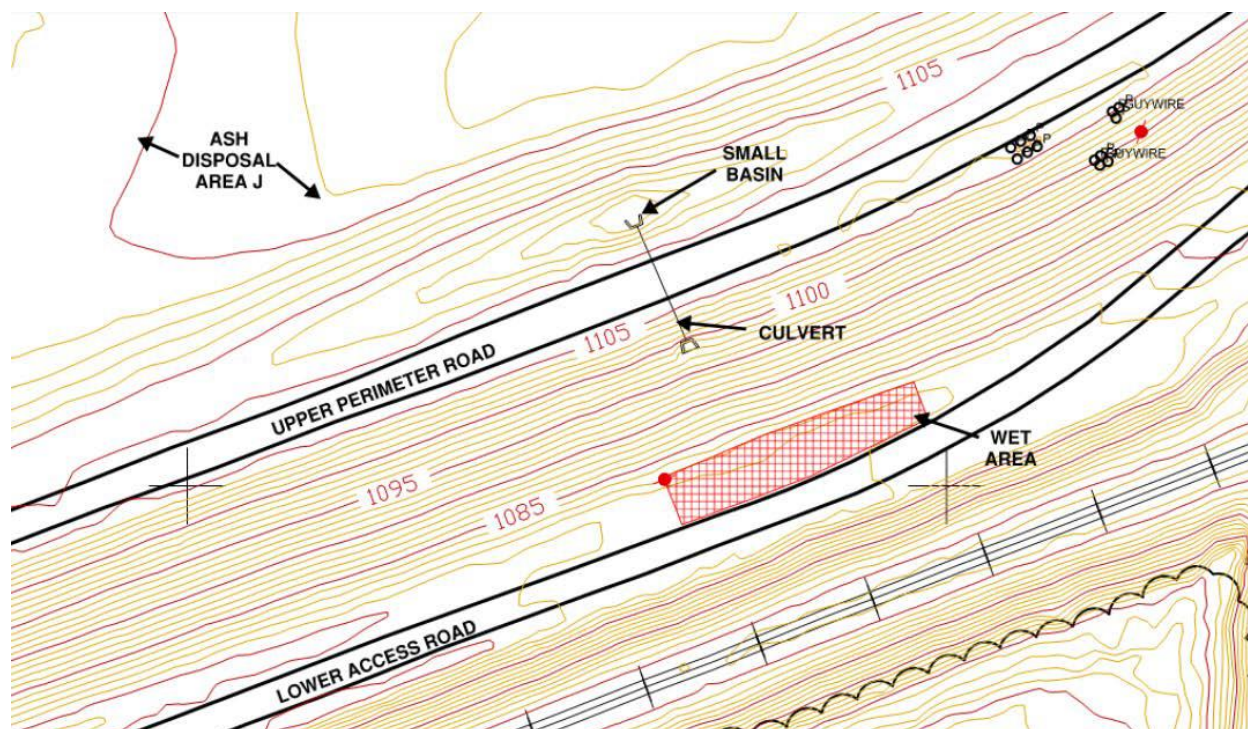
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On September 4, 2019, TVA and Stantec personnel observed standing water in the swale along the edge of the lower access road adjacent to the toe of Ash Disposal Area J. It was also observed that the standing water in the swale had accumulated in a rock-lined area of low relief along the toe of the slope that appeared to have obstructed positive drainage. The standing water was not observed to be turbid, flowing or discolored at the time of the site visit, and the wet area was isolated to the swale only.

The wet area was adjacent to a rock-lined flume located along the outslope that discharges flow from a culvert crossing under the upper perimeter road (see Figure 1 above). This culvert discharges water from a small stormwater basin located between the upper perimeter road and the top of Ash Disposal Area J. The small basin collects surface runoff from this portion of closed Ash Disposal Area J and appears to be contributing to the wet area.

The topographic information presented in Figure 2 below shows the grade in this area to be less than one percent, confirming the field observations noted above.

**Figure 2. Topography of Aerial View from Figure 1**



After the initial observation of the wet area, TVA continued to monitor the area and observe changes for approximately four weeks. Photographs of the area taken on the observation dates during wet and dry conditions are provided in Appendix D. After approximately eleven days, on September 12, 2019, the observed area was reported to be free of standing water and the swale appeared to be similar to other adjacent dry areas. The area continued to remain dry through the inspections of October 7 and 10, 2019.

On October 23, 2019, standing water was again observed in the same area; however, the observation was preceded by several rain events including the following:



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- 0.8 inch of rainfall on October 16
- 1.6 inches of rainfall on October 20
- 0.14 inch of rainfall on October 23.

Comparisons of photographs taken on October 23rd and the 25th show the wet area receding (Appendix D). The presence of standing water after rainfall events is consistent with the rainfall event before the initial observation on September 2, 2019.

Based on the observation reports and rainfall records, the accumulated water observed along the toe of Ash Disposal Area J appears to be from surface runoff during rainfall events originating from the rock-lined flume and drainage from the road crossing located directly east of the flume.

Currently, information and observations suggest that poor drainage along the toe of Ash Disposal Area J is the cause of the wet area, and it was not considered an Area of Interest for further evaluation for the seep investigation. After a rain event, the standing water in the swale appears, and then slowly recedes and disappears during subsequent dry weather (see Appendix D).

As part of standard maintenance, TVA will improve the site drainage in this area to facilitate drainage away from Ash Disposal Area J and prevent standing water. TVA will also evaluate lining the slope of the stack with riprap to facilitate the construction of a ditch and improve stability. A drainage improvement project is currently in progress to address the drainage issue in this area, and a "*General Maintenance Ash Management Plan*" (Barge, 2020) for Ash Disposal Area J has been developed along with the construction drawings to provide details on the positive stormwater drainage maintenance work. The Ash Disposal Area J drainage improvement project plans to address the area have been reviewed by TDEC. Documentation of the drainage improvement activities and results will be provided in the Environmental Assessment Report.





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Remediation/Mitigation Activities  
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### 4.0 REMEDIATION/MITIGATION ACTIVITIES

Remedial activities conducted by TVA at the JSF Plant included the construction of a seepage interception and collection system to provide remediation/mitigation at historical seep A/AOC#1 near the Dry Fly Ash Stack in 1998–1999. When completed, the system had an average flow rate of 12.6 gallons per minute. An 1,000-foot expansion of the system was constructed in 2001-2002 near Areas C and D of the Dry Fly Ash Stack. The system intercepts and collects seepage in the vicinity of the Ash Disposal Area to the Coal Yard Drainage Basin and eventually the Bottom Ash Pond. TVA subsequently completed a slope stabilization project in the area near historical seep P near the western end of the Dry Fly Ash Stack that involved grading the perimeter dike slopes and stabilizing the toe with riprap.

In 2011, TVA installed an additional seepage collection system at the Dry Fly Ash Stack to supplement the previous intercept and collection systems described above. These improvements provided remediation at AOCs #2 and #3 and historical seeps B, C, D, and E using a toe drain system, as described in Table C.1, Appendix C. The toe drain system was used to collect and pump seepage water to the Coal Yard Runoff Pond.

In 2013-2014, TVA repaired two “wet areas”, one at the west end of the Bottom Ash Pond near historical seep O, and one near the southeast corner of the Dry Fly Ash Stack near historical seep J.

On March 19, 2019, a minor permit modification was approved by TDEC to repair a wet area on the northeast side of Dry Fly Ash Stack in the vicinity of AOC#1. The repair involved the installation of a toe drain system to collect and direct any accumulating water for discharge through a permitted NPDES outfall. Construction on the approved toe drain extension project began on May 14, 2019 and was completed on May 30, 2019.

On May 11, 2021, TDEC approved a minor permit modification for the replacement of a portion of the existing toe drain system force main on the north side of the Dry Fly Ash Stack, as defined in TVA’s minor modification request dated March 19, 2021. Improvements include: installing two 3-inch and three 4-inch high-density polyethylene (HDPE) force mains along the upper bench of the Dry Fly Ash Stack; installing clean-outs on the HDPE force mains; replacing three existing transfer vaults with three new vaults; connecting the new force mains into the existing toe drain system; and demolishing and abandoning select existing force main system components. The scheduled completion date is September 30, 2021.

Remediation/mitigation at the other historical seep and AOC locations were not conducted because active seeps were not present over time (i.e., conditions were dry, or if wet or damp were non-flowing), as documented during routine inspections (see Section 3.1).

To date, historical seeps/AOCs at the JSF Plant have been remediated/mitigated, or site conditions are such that active seeps are not present.



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Closure and Post-Closure Monitoring  
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### 5.0 CLOSURE AND POST-CLOSURE MONITORING

The coal-fired JSF Plant became inactive in 2012 and was replaced by the John Sevier Combined Cycle (JCC) Plant. Documents describing closure and post-closure monitoring activities at the JSF Plant are summarized in the following sections.

#### 5.1 2013 OPERATIONS MANUAL

As detailed in the 2013 Operations Manual (Dry Fly Ash Stacking Facility), TVA will maintain the approved final contours and drainage system of the Dry Fly Ash Stacking Facility during the 30-year post-closure period such that erosion of the cover/cap is minimized, precipitation on the stack is controlled and directed off the stack, and ponding is eliminated. TVA has a quarterly inspection and regular maintenance schedule for post-closure care activities, which includes monitoring for intermittent seeps or soft spots, erosional effects, depressions, and standing water.

#### 5.2 2017 CLOSURE AND POST-CLOSURE PLAN

As detailed in the 2017 Closure and Post-Closure Plan (for the Bottom Ash Pond), TVA will maintain the integrity and effectiveness of the final cover system; make repairs as necessary to correct the effects of settlement, subsidence, erosion, and other events; and control run-on and run-off from eroding or otherwise damaging the final cover in accordance with accepted engineering practices for 30 years. Also, regularly scheduled inspections, developed specifically for the conditions at the JSF Plant, will be conducted on the final cover system and will include visual observations of the dike slopes, crest, and toe. Inspections will also monitor for erosion, pooling, sloughing, burrows, excessive plant growth and unwanted vegetation, wet areas, seeps, bare areas, and other visual structural issues.

TVA visually inspects the Toe Drain System, installed in 2011 for remediation of AOCs #2 and #3, twice daily. Pump alarms are attached to telemetry for monitoring.

#### 5.3 2020 NPDES PERMIT

A National Pollutant Discharge Elimination System (NPDES) Permit (Permit No. TN0005436) was issued by TDEC to TVA for the JCC Plant on April 1, 2020, with an effective date of June 1, 2020. This permit was a renewal to previous NPDES permits for the JSF/JCC Plant, the most recent dated September 30, 2015. Under this permit and associated Seep Action Plan (see Section 5.4), TVA is required to visually inspect former ash disposal areas and historical seeps/AOCs on a quarterly basis. If active seeps are identified during the quarterly inspections, the active seeps shall be inspected monthly, or more frequently if deemed necessary due to stability concerns, until an approved repair is completed.

On March 20, 2020, TDEC conducted a routine NPDES compliance inspection at the JSF Plant. The inspection determined that current conditions were in compliance with the NPDES permit. No seeps were noted in the report.



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Closure and Post-Closure Monitoring  
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### 5.4 2020 SEEP ACTION PLAN

In May 2020, an updated Seep Action Plan for the John Sevier Site was prepared, as required by the 2020 NPDES Permit (see Section 5.3). Revision 1 of the John Sevier Seep Action Plan was submitted to TDEC on July 27, 2020, incorporating TDEC Division of Water Resources comments. The plan includes Table 1 titled, "Seepage History Summary" (Table C.1; Appendix C) , and a site plan showing the location of historical seeps and AOCs (Exhibit B.1, Appendix B). The 2020 Seep Action Plan states that the Seepage History Summary table, originally included in the 2010 Seepage Action Plan, has not been updated since 2014 "because there haven't been any observations of new seeps or AOCs," and "it is TVA's understanding that the Table 1 remains up-to-date." The relevant CCR storage facilities ceased receiving CCR materials in 2014 and have already completed or initiated closure activities. As stated earlier, AOCs and historical seeps documented on Table 1 in the 2020 Seep Action Plan (Table C.1, Appendix C) have either been remediated or have been determined to be non-flowing and/or inactive based on routine inspections.



## JOHN SEVIER FOSSIL PLANT SEEP SUMMARY REPORT

Summary  
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### 6.0 SUMMARY

Stantec has completed a summary of seep-related documentation for the JSF Plant in Rogersville, Tennessee for four CCR storage facilities: Dry Fly Ash Stack, Ash Disposal Area J, Bottom Ash Pond, and Highway 70 Borrow Area. The available historical documentation included seep-related observations during routine inspections, assessments, and plans for the CCR units since 1979; remediation/mitigation efforts beginning in 1998; and ongoing closure and post-closure monitoring.

No historical seeps or AOCs have been observed near Ash Disposal Area J, nor for the Highway 70 Borrow Area. Nine AOCs (and their co-located historical seeps) and an additional eight historical seeps were originally identified at the JSF Plant in the 2010 Seepage Action Plan. Through remediation/mitigation efforts conducted by TVA since 1998 and/or non-flowing conditions observed over time during the routine inspections, there are currently no active seeps present at the JSF Plant.

A “*General Maintenance Ash Management Plan*” (Barge 2020) for Ash Disposal Area J has been developed along with the construction drawings for the positive stormwater drainage maintenance work, to be conducted as part of the drainage improvement project at Ash Disposal Area J.

Closure and post-closure monitoring for the presence of seep conditions will continue to be performed and documented at the JSF Plant in accordance with the 2020 NPDES permit and Seep Action Plan and closure and post-closure plans. Should active seeps be identified in the future, a Seep Investigation SAP will be developed and implemented.



**APPENDIX A**  
**REVIEWED DOCUMENT AND**  
**REFERENCE LIST**

## REVIEWED DOCUMENT AND REFERENCE LIST

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TVA. 2007c. *Quarterly Red Water Seep Inspection Check Sheet.* May 14, 2007.

TVA. 2007d. *Quarterly Red Water Seep Inspection Check Sheet.* August 17, 2007.



- TVA. 2007e. *Quarterly Red Water Seep Inspection Check Sheet*. November 13, 2007.
- TVA. 2008a. *Quarterly Red Water Seep Inspection Check Sheet*. March 10, 2008.
- TVA. 2008b. *John Sevier Fossil Plant (JSF) – Annual Stability Inspection of Waste Disposal Areas*. March 28, 2008.
- TVA. 2008c. *Quarterly Red Water Seep Inspection Check Sheet*. May 29, 2008.
- TVA. 2008d. *Quarterly Red Water Seep Inspection Check Sheet*. September 11, 2008.
- TVA. 2008e. *Quarterly Red Water Seep Inspection Check Sheet*. December 15, 2008.
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**APPENDIX B**  
**EXHIBIT**

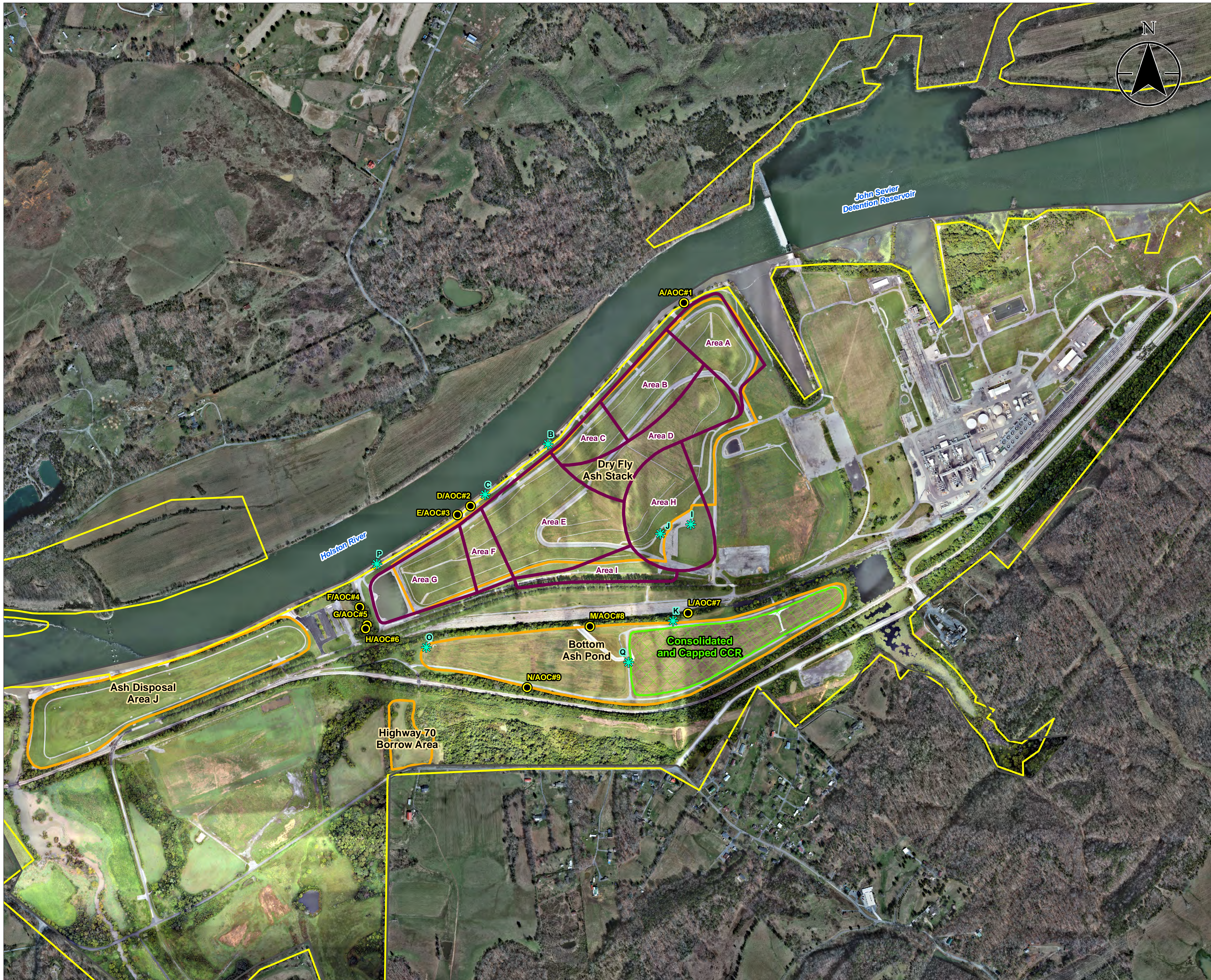
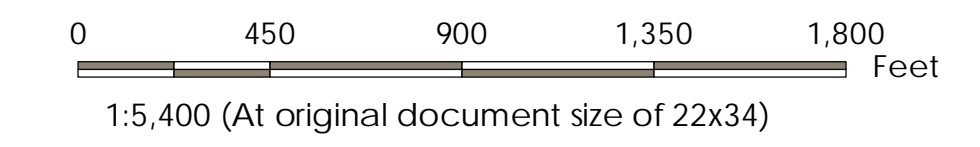


Exhibit No. **B.1**  
 Title **Areas of Concern and Historical Seep Locations**  
 Client/Project  
 Tennessee Valley Authority  
 John Sevier Fossil (JSF) Plant TDEC Order  
 Project Location  
 Rogersville, Tennessee  
 175568225  
 Prepared by DMB on 2020-07-23  
 Technical Review by RB on 2020-07-23



**Legend**

- Historical Seep/Area of Concern (AOC)#
- Historical Seep
- 2018 Imagery Boundary
- CCR Unit Area (Approximate)
- Consolidated & Capped CCR Area (Approximate)
- Limit of Historical Ash Disposal Ponds (Approximate)
- TVA Property Boundary

**Notes**

1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Imagery Provided by Tuck Mapping (2017-03-08) and TVA (2018-09-11)



**APPENDIX C**  
**HISTORICAL SEEP/AOC SUMMARY**

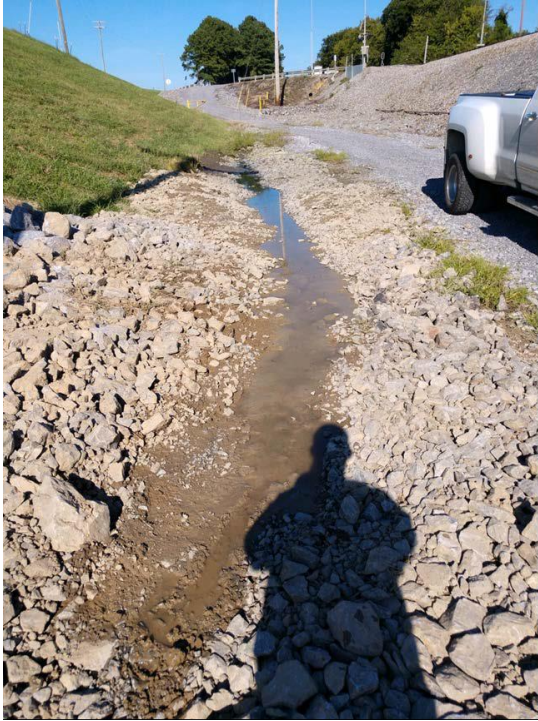

**Table C.1 Seepage History Summary**

Map ID	Seepage Action Plan AOC No.	CCR Unit	Description
A	1	Dry Fly Ash Stack	<p>This AOC was reported in TVA (1995). TVA continued to monitor this area as documented in subsequent annual inspection reports. TVA constructed a seepage interception and collection system shown in TVA Drawing Series 17W445 to intercept and collect seepage from this area (TVA 1999). This system pumped effluent to the Coal Yard Drainage Basin and eventually the Bottom Ash Pond. Subsequent annual inspection reports noted the system appeared to be functioning correctly and wet areas noted in previous inspection reports were not observed. TVA later expanded this system (TVA 2002). This AOC was classified as Action Level 1 (Non-Flowing) and inactive. During a TDEC DSWM site inspection on October 17, 2018, a wet area was observed on the northeast side of the Dry Fly Ash Stack in the vicinity of AOI#1. As approved by TDEC, between May 14 and 30, 2019, TVA installed a toe drain system to collect and direct any accumulating water in this area for discharge through a permitted NPDES outfall. On May 11, 2021, TDEC approved a minor permit modification for the replacement of a portion of the existing toe drain system force main on the north side of the Dry Fly Ash Stack. Improvements include: installing two 3-inch and three 4-inch HPDE force mains along the upper bench of the Dry Fly Ash Stack; installing clean-outs on the HDPE force mains; replacing three existing transfer vaults with three new vaults; connecting the new force mains into the existing toe drain system; and demolishing and abandoning select existing force main system components. The scheduled completion date is September 30, 2021.</p>
NA	NA	Dry Fly Ash Stack	<p>Wet areas were noted along Polly Branch south of the discharge pipes formerly identified as Outfall 003 in TVA (1996). The inspection report noted “there is no flow from these areas to Polly Branch.” A second area located “approximately 300 feet east of Polly Branch along the gravel walkway” was also reported in TVA (1996). These areas were not reported in subsequent inspection reports.</p>
B	NA	Dry Fly Ash Stack	<p>This seep was located around an abandoned concrete pipe as reported in TVA (2000). TVA continued to monitor this area as documented in subsequent annual inspection reports. The inspection reports did not indicate whether the seep was flowing. TVA constructed a toe drain system (shown in TVA Drawing Series 10W511) in this area in 2011. The toe drain system collected seepage and pumped it to the Coal Yard Runoff Pond.</p>
C	NA	Dry Fly Ash Stack	<p>These two seeps were reported in TVA (2000). TVA continued to monitor this area as documented in subsequent annual inspection reports. The inspection reports did not indicate if the seeps were flowing. TVA constructed a toe drain system (shown in TVA Drawing Series 10W511) in this area in 2011. The toe drain system collected seepage and pumped it to the Coal Yard Runoff Pond.</p>
P	NA	Dry Fly Ash Stack	<p>Seep reported in TVA (2002) along the length of the Stilling Pond. TVA completed a slope stabilization project in this area that involved grading the perimeter dike slopes and stabilizing the toe with riprap per recommendations documented in Parsons (1999). Plans and details of the project are shown in TVA Drawing Series 10W206.</p>



**Table C.1 Seepage History Summary**

<b>Map ID</b>	<b>Seepage Action Plan AOC No.</b>	<b>CCR Unit</b>	<b>Description</b>
D	2	Dry Fly Ash Stack	Seep observed by TVA in 2006. TVA constructed a toe drain system (shown in TVA Drawing Series 10W511) in 2011 to address this seep. The toe drain system collected seepage and pumped it to the Coal Yard Runoff Pond. This AOC is classified as Action Level 1 (Non-Flowing) and has been remediated by the toe drain system.
E	3	Dry Fly Ash Stack	Seep observed by TVA in 2009. TVA constructed a toe drain system (shown in TVA Drawing Series 10W511) in 2011 to address this seep. The toe drain system collected seepage and pumped it to the Coal Yard Runoff Pond. This AOC is classified as Action Level 1 (Non-Flowing) and has been remediated by the toe drain system.
F	4	Dry Fly Ash Stack	Seep observed by TVA in 2008. This AOC is classified as Action Level 1 (Non-Flowing) and inactive.
G	5	Dry Fly Ash Stack	Potential seep observed by TVA in 2002. Non-flowing seep/stain reported west of Stilling Pond in 2004-2006 during February inspections only. This AOC is classified as Action Level 1 (Non-Flowing) and inactive. Inspections conducted in 2007-2008 did not observe potential seep/staining.
H	6	Dry Fly Ash Stack	Seep observed by TVA in 2002. This AOC is classified as Action Level 1 (Non-Flowing) and inactive.
I	NA	Dry Fly Ash Stack	Potential seep observed during 2013 Annual Inspection. Not reported in subsequent annual inspection reports.
J	NA	Dry Fly Ash Stack	Repaired wet area discussed in TVA (2014).
K		Bottom Ash Pond	Two seeps in this area were reported in TVA (1996) TVA continued to monitor this area as documented in subsequent annual inspections. TVA (2004) noted the seepage water at this location was "analyzed and the results indicate that it does not originate from within the ash pond." Subsequent inspection reports noted seepage was not observed in this area during the inspections.
L	7	Bottom Ash Pond	Potential seep observed by TVA in 2009. This AOC is classified as Action Level 1 (Non-Flowing) and inactive.
M	8	Bottom Ash Pond	Seep observed by Stantec/TVA in July 2009 during maintenance and tree removal activities. This AOC is classified as Action Level 1 (Non-Flowing) and inactive.
N	9	Bottom Ash Pond	Potential seep observed by TVA prior to 2008. This AOC is classified as Action Level 1 (Non-Flowing) and inactive.
O	NA	Bottom Ash Pond	Repaired area discussed in TVA (2014).
Q	NA	Bottom Ash Pond	Small, non-flowing seeps/stains observed on divider dike periodically from 2003-2005. Inspections conducted from 2006-2008 did not observe seep/stain.

**APPENDIX D**  
**SITE PHOTOGRAPHS**


<b>Client:</b> Tennessee Valley Authority		<b>Project:</b> Seep Summary Report	
<b>Site Name:</b> John Sevier Fossil (JSF) Plant		<b>Site Location:</b> Rogersville, Tennessee	
<b>Photograph ID:</b> 1			
<b>Photo Location:</b> "2019 Wet Area", adjacent to Ash Disposal Area J			
<b>Direction:</b> Northeast			
<b>Survey Date:</b> 9/2/2019			
<b>Comments:</b> Standing water after rain event on 8/28/2019.			
<b>Photograph ID:</b> 2			
<b>Photo Location:</b> "2019 Wet Area", adjacent to Ash Disposal Area J			
<b>Direction:</b> Southwest			
<b>Survey Date:</b> 9/2/2019			
<b>Comments:</b> Standing water after rain event on 8/28/2019.			





<b>Client:</b>	Tennessee Valley Authority	<b>Project:</b>	Seep Summary Report
<b>Site Name:</b>	John Sevier Fossil (JSF) Plant	<b>Site Location:</b>	Rogersville, Tennessee
<b>Photograph ID:</b> 3			
<b>Photo Location:</b> "2019 Wet Area", adjacent to Ash Disposal Area J			
<b>Direction:</b> Southwest			
<b>Survey Date:</b> 9/4/2019			
<b>Comments:</b> Wet area taken two days after the initial observation.			
<b>Photograph ID:</b> 4			
<b>Photo Location:</b> "2019 Wet Area", adjacent to Ash Disposal Area J			
<b>Direction:</b> Southwest			
<b>Survey Date:</b> 9/12/2019			
<b>Comments:</b> Former wet area is dry, 11 days after the initial observation.			



<b>Client:</b>	<b>Tennessee Valley Authority</b>	<b>Project:</b>	<b>Seep Summary Report</b>
<b>Site Name:</b>	<b>John Sevier Fossil (JSF) Plant</b>	<b>Site Location:</b>	<b>Rogersville, Tennessee</b>



<p><b>Photograph ID:</b> 5</p>	
<p><b>Photo Location:</b> "2019 Wet Area", adjacent to Ash Disposal Area J</p>	
<p><b>Direction:</b> North/Northwest</p>	
<p><b>Survey Date:</b> 10/7/2019</p>	
<p><b>Comments:</b> Former wet area is dry, 33 days after the initial observation.</p>	

<p><b>Photograph ID:</b> 6</p>	
<p><b>Photo Location:</b> "2019 Wet Area", adjacent to Ash Disposal Area J</p>	
<p><b>Direction:</b> Southwest</p>	
<p><b>Survey Date:</b> 10/7/2019</p>	
<p><b>Comments:</b> Former wet area is dry, 33 days after the initial observation.</p>	

<b>Client:</b>	Tennessee Valley Authority	<b>Project:</b>	Seep Summary Report
<b>Site Name:</b>	John Sevier Fossil (JSF) Plant	<b>Site Location:</b>	Rogersville, Tennessee
<b>Photograph ID:</b> 7			
<b>Photo Location:</b>			
<b>Direction:</b>			
<b>Survey Date:</b>			
<b>Comments:</b>			
<b>Photograph ID:</b> 8			
<b>Photo Location:</b>			
<b>Direction:</b>			
<b>Survey Date:</b>			
<b>Comments:</b>			

<b>Client:</b>	Tennessee Valley Authority	<b>Project:</b>	Seep Summary Report
<b>Site Name:</b>	John Sevier Fossil (JSF) Plant	<b>Site Location:</b>	Rogersville, Tennessee
<b>Photograph ID:</b> 9			
<b>Photo Location:</b>			
<b>Direction:</b>			
<b>Survey Date:</b>			
<b>Comments:</b>			
<b>Photograph ID:</b> 10			
<b>Photo Location:</b>			
<b>Direction:</b>			
<b>Survey Date:</b>			
<b>Comments:</b>			

<b>Client:</b>	Tennessee Valley Authority	<b>Project:</b>	Seep Summary Report
<b>Site Name:</b>	John Sevier Fossil (JSF) Plant	<b>Site Location:</b>	Rogersville, Tennessee
<b>Photograph ID:</b> 11			
<b>Photo Location:</b>			
<b>Direction:</b>			
<b>Survey Date:</b>			
<b>Comments:</b>			
<p>Wet area receding two days after October 2019 rain events.</p>			
<b>Photograph ID:</b> 12			
<b>Photo Location:</b>			
<b>Direction:</b>			
<b>Survey Date:</b>			
<b>Comments:</b>			
<p>Wet area receding two days after October 2019 rain events.</p>			

<b>Client:</b>	Tennessee Valley Authority	<b>Project:</b>	Seep Summary Report
<b>Site Name:</b>	John Sevier Fossil (JSF) Plant	<b>Site Location:</b>	Rogersville, Tennessee
<b>Photograph ID:</b> 13			
<b>Photo Location:</b> "2019 Wet Area", adjacent to Ash Disposal Area J			
<b>Direction:</b> Southwest			
<b>Survey Date:</b> 10/25/2019			
<b>Comments:</b> Standing water after October 26, 27, 31 and November 1, 2019 rain events.			
<b>Photograph ID:</b> 14			
<b>Photo Location:</b> "2019 Wet Area", adjacent to Ash Disposal Area J			
<b>Direction:</b> South			
<b>Survey Date:</b> 11/6/2019			
<b>Comments:</b> Standing water after October 26, 27, 31 and November 1, 2019 rain events.			

<b>Client:</b>	<b>Tennessee Valley Authority</b>	<b>Project:</b>	<b>Seep Summary Report</b>
<b>Site Name:</b>	<b>John Sevier Fossil (JSF) Plant</b>	<b>Site Location:</b>	<b>Rogersville, Tennessee</b>

<p><b>Photograph ID:</b> 15</p>	
<p><b>Photo Location:</b> "2019 Wet Area", adjacent to Ash Disposal Area J</p>	
<p><b>Direction:</b> North</p>	
<p><b>Survey Date:</b> 11/6/2019</p>	
<p><b>Comments:</b> Standing water after October 26, 27, 31 and November 1, 2019 rain events.</p>	