APPENDIX F – BACKGROUND SOIL INVESTIGATION

APPENDIX F.1

BACKGROUND SOIL INVESTIGATION SAMPLING AND ANALYSIS REPORT

Johnsonville Fossil Plant
Background Soil Investigation
Sampling and Analysis Report

TDEC Commissioner's Order
Environmental Investigation Plan
Johnsonville Fossil Plant
New Johnsonville, Tennessee

August 24, 2020

Prepared for:

Tennessee Valley Authority
Chattanooga, Tennessee

Prepared by:
Stantec Consulting Services Inc.
Lexington, Kentucky

Revision Record

Revision	Description	Date
0	Submittal to TDEC	August 24, 2020

Sign-off Sheet

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LIST OF APPENDICES

Abbreviations

ASTM	American Society for Testing and Materials
BGS	Background Soil
CCR	Coal Combustion Residuals
CCR Parameters	Constituents listed in Appendix III and IV of 40 CFR 257 and five inorganic included in Appendix I of Tennessee Rule 0400-11-01-04
CEC	Civil & Environmental Engineering Consultants, Inc.
CFR	Code of Federal Regulations
COC	Chain-of-Custody
DPT	Direct Push Technology
EAR	Environmental Assessment Report
EIP	Environmental Investigation Plan
ENV	Environmental
EnvStds	Environmental Standards, Inc.
FSP	Field Sampling Personnel
ft bgs	feet below ground surface
GPS	Global Positioning System
HSA	Hollow Stem Auger
ID	Identification
IDW	Investigation derived waste
JOF Plant	Johnsonville Fossil Plant
PG	Professional Geologist
PLM	Polarized Light Microscopy
QAPP	Quality Assurance Project Plan
QC	Quality Control
RJ Lee	RJ Lee Group, Inc.
SAP	Sampling and Analysis Plan
SAR	Sampling and Analysis Report
SOP	Standard Operating Procedure
Stantec	Stantec Consulting Services Inc.
TDEC	Tennessee Department of Environment and Conservation
TDEC Order	Commissioner's Order No. OGC15-0177
TestAmerica	TestAmerica Laboratories, Inc.

TI	Technical Instruction
TVA	Tennessee Valley Authority

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has prepared this sampling and analysis report (SAR) on behalf of the Tennessee Valley Authority (TVA) to document activities related to a Background Soil (BGS) investigation at TVA's Johnsonville Fossil (JOF) Plant located in New Johnsonville, Tennessee as shown on Exhibit A.1. (Appendix A).

The purpose of the BGS investigation was to collect soil samples to evaluate the background soil conditions at the JOF Plant 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.

The purpose of this SAR is to document the work completed during the BGS investigation and to present the information and data collected during the execution of the Background Soil Sampling and Analysis Plan (SAP) (Stantec 2018a). This SAR is not intended to provide conclusions or evaluations of results. The scope of the BGS investigation represented herein was conducted pursuant to the SAP and is part of a larger environmental investigation at the JOF Plant. The evaluation of the results will consider other aspects of the environmental investigation, as well as the data collected under other State and/or coal combustion residuals (CCR) programs, and will be presented in the Environmental Assessment Report (EAR).

The BGS investigation activities were performed in general accordance with the following documents developed by TVA to support fulfilling the requirements of the TDEC Order at the JOF Plant:

- *Background Soil SAP* (Stantec 2018a)
- *Environmental Investigation Plan (EIP)* (Stantec 2018b)
- *Hydrogeological Investigation SAP* (Stantec 2018c)
- *Quality Assurance Project Plan (QAPP)* (Environmental Standards, Inc. 2018).

The BGS and hydrogeological investigations were implemented in accordance with TVA- and TDEC-approved Programmatic- and Project-specific changes. Minor variations in scope and procedures from those outlined in the Background Soil SAP and Hydrogeological Investigation SAP occurred during field activities due to field conditions and programmatic updates, and are referenced in Section 3.6.

The BGS sampling activities were completed May 22, 2019 through June 4, 2019 and on August 23, 2019. Additional BGS samples were collected June 20, 2019 through August 28, 2019 as part of the hydrogeological investigation during background groundwater monitoring well installations as described in the Hydrogeological Investigation SAP.

Laboratory analysis of constituents was performed by TestAmerica Laboratories, Inc (TestAmerica) in Pittsburgh, Pennsylvania and St. Louis, Missouri (radium samples only), and by RJ Lee Group, Inc. (RJ

Introduction

Lee) in Monroeville, Pennsylvania (percent ash). Additional quality assurance oversight on data acquisition protocols, sampling practices, and data validation or verification were performed by Environmental Standards, Inc. (EnvStds) under direct contract to TVA.

2.0 OBJECTIVE AND SCOPE

The primary objective of the BGS investigation conducted pursuant to the Background Soil SAP is to collect soil samples for characterization of the background soils within the vicinity of the JOF Plant in response to the TDEC Order. The approach for the investigation was to:

- Identify locations where naturally occurring, in-situ, native soils unaffected by CCR material are present
- Mobilize a track-mounted direct push technology (DPT) rig to staked boring locations approved by TDEC and considered suitable for the DPT rig to safely drill into the native underlying soils
- Advance the DPT rig and collect background soil samples for analyses
- Collect background soil samples from the well screen intervals of the three background monitoring wells using a hollow stem auger (HSA) drilling rig, as part of the hydrogeological investigation scope of work.

The scope of work for the BGS investigation consisted of the following tasks:

- Verifying and documenting proposed sampling locations using global positioning system (GPS) survey
- Collecting field measurements of soil pH
- Collecting soil samples for laboratory analysis of CCR-related constituents as described in the SAPs.

These activities were carried out concurrently with advancement of the soil borings. Drilling and background well installation and development activities were performed in accordance with the Hydrogeological Investigation SAP and reported in the JOF Plant Hydrogeological Investigation SAR.

3.0 FIELD ACTIVITIES

BGS investigation field activities were conducted between May 22, 2019 and August 23, 2019. Additionally, under the hydrogeological investigation scope of work, three background monitoring well borings were drilled between June 19, 2019 and August 27, 2019. Soil samples that were collected from the 12 background soil borings and three background monitoring well borings are included with the BGS investigation. Prior to initiating field activities, TVA conducted environmental reviews, obtained permits, and performed utility clearances as necessary to complete the field work.

Stantec performed soil sample collection activities based on guidance and specifications listed in TVA's Environmental (ENV) Technical Instructions (TIs), the SAPs, and the QAPP, except as noted in the Variations section of this report. As part of TVA's commitment to generate representative and reliable data, data validation or verification of laboratory analytical data was performed by EnvStds under direct contract with TVA. EnvStds also conducted audits of field activities and provided quality reviews of field documentation. In addition, on behalf of TDEC, Civil and Environmental Consultants, Inc. (CEC) collected split soil samples at two boring locations (JOF-BG03 and JOF-BG04). Additional details of the CEC sample collection are provided in Section 3.3.1.

During the BGS investigation, Stantec conducted the following field activities:

- Verified boring locations proposed in the SAP using the GPS
- Collected GPS measurements at the boring locations
- Collected soil samples from 12 BGS boring locations and three background monitoring well locations (hydrogeological investigation scope of work)
- Recorded field measurements of soil pH at the 15 sampled boring/well locations
- Collected quality control (QC) samples, including four matrix spike/matrix spike duplicates, two field duplicates, 13 field blanks, and three equipment blanks
- Conveyed collected samples via laboratory-provided courier service to TestAmerica and via Federal Express shipment to RJ Lee for analysis.

Details on each activity are presented in the sections below.

3.1 WORK LOCATIONS

The BGS investigation field activities were conducted at 12 locations near the JOF Plant under the BGS investigation scope of work and three locations near JOF Plant under the hydrogeological investigation scope of work. The BGS investigation boring locations are shown on Exhibit A.2 (Appendix A). A list of the BGS investigation borings and associated soil samples is included in Table B.1, and sample results are provided in Tables B.2 through B.4 (Appendix B).

3.1.1 Soil Horizons

Surficial soil samples were collected at depths ranging from 0.0 to 0.5 feet below ground surface (ft bgs) using a hand auger. Along with surficial samples, the Field Sampling Personnel (FSP) collected approximately two feet of soil from each five-foot soil run (one foot in both directions from the midpoint of the five-foot interval) for the total depth of the boring. In cases where recovery was less than five feet, the FSP collected the two-foot sample interval generally from either the mid-point of the recovered interval or from the entire recovered interval, if recovery was about 2.5 feet or less. Samples were collected from multiple soil depths to provide data for vertical characterization of background soils.

3.2 DOCUMENTATION

Stantec planned the BGS investigation activities per ENV-TI-05.08.01, *Planning Sampling Events* and maintained field documentation in general accordance with ENV-TI-05.80.03, *Field Record Keeping* and the QAPP. Field activities and data were primarily recorded on program-specific field forms. Health and safety forms were completed in accordance with TVA and Stantec health and safety requirements. Additional information regarding field documentation is provided below.

3.2.1 Field Forms

Stantec used program-specific field forms to record field observations and data for specific activities. Field forms used during the BGS investigation included:

- *Daily Field Activity Log*
- *Subsurface Log*
- *Soil pH Calibration and Inspection Log*
- *Soil pH Data Form*
- *Chain-of-Custody (COC).*

3.2.1.1 Daily Field Activity Log

Stantec FSP recorded daily field activities, observations and data on a *Daily Field Activity Log* to chronologically document the field program. Deviations from the SAPs or QAPP were also documented on the *Daily Field Activity Log*.

3.2.1.2 Subsurface Log

A Professional Geologist (PG) licensed in the State of Tennessee prepared a *Subsurface Log* for each boring. The log documented time, boring location, drilling personnel, tooling/equipment used, depth to water, sample number, sample recovery, Standard Penetration Test blow counts (not recorded when DPT rig was used), subsurface lithology and other relevant observations. Soil color was logged per the appropriate Munsell soil color chart (Munsell Color 2009). The *Subsurface Logs* are provided in Appendix C.

3.2.1.3 Soil pH Calibration and Inspection Log

Stantec FSP recorded daily pH meter calibrations on a *Soil pH Calibration and Inspection Log* for each day that soil pH measurements were taken. The log documented temperature, temperature verification, temperature-adjusted calibration values, post calibration pH values, and calibration solution details. Additional information on equipment calibration is provided in Section 3.2.2.

3.2.1.4 Soil pH Data Form

Stantec FSP prepared a *Soil pH Data Form* for each day that soil pH measurements were taken. The form documented the sample identification (ID), boring ID, the depth range, pH measurement date and time, and the field pH value.

3.2.1.5 Chain-of-Custody

Stantec FSP completed a *COC* documentation for each soil sample collected for laboratory analysis during the BGS investigation. The sample ID, sample location, sample depth (if applicable), type of sample, sampling date and time, analyses requested, and sample custody record were recorded on the *COCs*. The Field Team Leader reviewed the *COCs* for completeness, and the FSP conducted a QC check of samples in each cooler compared to sample IDs on the corresponding *COC* prior to submittal to the laboratory. *COCs* were completed in general accordance with *ENV-TI-05.80.02: Sample Labeling and Custody*.

3.2.2 Equipment Calibration

Field instruments used to collect, generate, or measure environmental data were calibrated each day prior to sampling as specified by the SAPs, QAPP, and Stantec Standard Operating Procedure (SOP) - REV 1 for measurement of soil pH using the ExTech ExStik 110 meter (Stantec 2018d). Temperature was recorded using a calibrated National Institute of Standards and Technology traceable thermometer. Additional details regarding equipment calibration were recorded on the *Soil pH Calibration and Inspection Logs*.

3.2.3 Photographs

Photographs of the soil cores from boring activities were taken during the BGS investigation. Photographic logs of subsurface soil cores from the BGS borings and the screened interval of the background well borings are provided in Attachments D.1 and D.2, respectively, in Appendix D.

3.3 SOIL BORINGS AND SAMPLING

3.3.1 Soil Borings

The BGS investigation borings were advanced by Geo Logic, Inc., under Stantec oversight, using a DPT rig equipped with a DT37 dual tube tooling system. The background monitoring wells, completed under the hydrogeological investigation, were advanced by Stantec using a HSA drilling rig with a two-inch spilt-spoon attached per American Society for Testing and Materials (ASTM) *D6151-08: Standard Practice for Using Hollow-Stem Augers for Geotechnical Exploration and Soil Sampling*.

A list of BGS investigation borings and associated soil samples is included in Table B.1 (Appendix B); the locations of the BGS investigation borings are shown on Exhibit A.2 (Appendix A). BGS investigation borings were advanced in the following chronological sequence:

- JOF-BG02 – On May 22, 2019, the DPT rig mobilized to location JOF-BG02. The DPT rig advanced one soil boring at this location. Refusal was encountered at 25 ft bgs. The boring was logged and sampled as JOF-BG02. As described in Section 3.6.2, the surficial sample (0 to 0.5 ft bgs) was collected on May 24, 2019, directly adjacent to the boring location.

- JOF-BG08 – On May 22, 2019, the DPT rig mobilized to location JOF-BG08. The DPT rig advanced one soil boring at this location. Refusal was encountered at 17 ft bgs. The boring was logged and sampled as JOF-BG08. As described in Section 3.6.2, the surficial sample (0 to 0.5 ft bgs) was collected on May 24, 2019, directly adjacent to the boring location.

- JOF-BG11 – On May 23, 2019, the DPT rig mobilized to location JOF-BG11. The DPT rig advanced one soil boring at this location. Refusal was encountered at 10 ft bgs. The boring was logged and sampled as JOF-BG11. As described in Section 3.6.2, the surficial sample (0 to 0.5 ft bgs) was collected on May 24, 2019, directly adjacent to the boring location.

- JOF-BG10 – On May 23, 2019, the DPT rig mobilized to location JOF-BG10. The DPT rig advanced one soil boring at this location. Refusal was encountered at 15 ft bgs. The boring was logged and sampled as JOF-BG10. As described in Section 3.6.2, the surficial sample (0 to 0.5 ft bgs) was collected on May 24, 2019, directly adjacent to the boring location.

- JOF-BG05 – On May 24, 2019, the DPT rig mobilized to location JOF-BG05. The DPT rig advanced one soil boring at this location. Refusal was encountered at 14.0 ft bgs. The boring was logged and sampled as JOF-BG05.

- JOF-BG04 – On May 29, 2019, the DPT rig mobilized to location JOF-BG04. The DPT rig advanced one soil boring at this location. Refusal was encountered at 29.8 ft bgs (first boring), and a second boring was drilled three feet east of the first boring to obtain sufficient sampling volume to split samples with CEC. The first boring, drilled to 29.8 ft bgs, was logged and sampled as JOF-BG04 for the BGS investigation.

  CEC collected split samples from 1.5 to 3.5 ft bgs and 6.5 to 8.5 ft bgs at JOF-BG04.

- JOF-BG03 – On May 29, 2019, the DPT rig mobilized to location JOF-BG03. The DPT rig advanced one soil boring at this location. Refusal was encountered at 24.7 ft bgs, and a second boring was drilled three feet east of the first boring to obtain sufficient sampling volume to split samples with CEC. The first boring, 24.7 ft bgs, was logged and sampled as JOF-BG03 for the BGS investigation.

  CEC collected split samples from 1.5 to 3.5 ft bgs at JOF-BG03.

- JOF-BG06 – On May 30, 2019, the DPT rig mobilized to location JOF-BG06. The DPT rig advanced one soil boring at this location. Refusal was encountered at 41.5 ft bgs. The boring was logged and sampled as JOF-BG06.

- JOF-BG01 – On June 3, 2019, the DPT rig mobilized to location JOF-BG01. The DPT rig advanced three soil borings at this location. Refusal was encountered at 4.5 ft bgs (first boring), at 4.7 ft bgs (second boring), and at 9.8 ft bgs (third boring). The deepest boring, drilled to 9.8 ft bgs, was logged and sampled as JOF-BG01.

- JOF-BG07 – On June 4, 2019, the DPT rig mobilized to location JOF-BG07. The DPT rig advanced one soil boring at this location. Refusal was encountered at 23.3 ft bgs. The boring was logged and sampled as JOF-BG07.

- JOF-BG12 – On June 4, 2019, the DPT rig mobilized to location JOF-BG12. The DPT rig advanced one soil boring at this location to a depth of 13.6 ft bgs. The boring was logged and sampled as JOF-BG12.

- JOF-109 – On June 18, 2019, the HSA rig mobilized to location JOF-109. However, during the initial attempt to level the HSA rig, it was deemed potentially unsafe and the boring was moved southeast within 25 feet of the original staked location. On June 19, 2019, the HSA rig advanced one soil boring at this location to a depth of 46.5 ft bgs. The boring was logged and sampled as JOF-109, and background monitoring well JOF-109 was installed at this boring location. Monitoring well installation activities are summarized in the Hydrogeological Investigation SAR.

- JOF-119 – On July 9, 2019, the HSA rig mobilized to location JOF-119. The HSA rig advanced one soil boring at this location to a depth of 45 ft bgs. The boring was logged and sampled as JOF-119, and background monitoring well JOF-119 was installed at this boring location. Monitoring well installation activities are summarized in the Hydrogeological Investigation SAR.

- JOF-BG09 – Due to access restrictions and as approved by TDEC, the JOF-BG09 boring location was relocated east of the original staked location. On August 23, 2019, the DPT rig mobilized to the revised location for boring JOF-BG09. The DPT rig advanced one soil boring at this location. Refusal was encountered at 8.8 ft bgs. The boring was logged and sampled as JOF-BG09.

- JOF-112 – On August 27, 2019, the HSA rig mobilized to location JOF-112. The HSA rig advanced one soil boring at this location to a depth of 30.9 ft bgs. The boring was logged and sampled as JOF-112, and background monitoring well JOF-112 was installed at this boring location. Monitoring well installation activities are summarized in the Hydrogeological Investigation SAR.

Following sample collection, as described in Section 3.3.2, the borings were backfilled using a 30 percent solids bentonite grout placed by the tremie method to within approximately six inches of the surface. The top six inches were restored to match the surrounding existing conditions.

3.3.2 Soil Sampling

During advancement of each boring, a Tennessee-licensed PG prepared field subsurface logs using a mobile data collection platform. Inputs include a description of subsurface lithology, sample recovery, color using the Munsell Soil Color Charts and other relevant parameters as required by the SAPs and TIs. As part of the logging process, soil cores were photographed by Stantec FSP with interval data presented on a white board. Analytical and duplicate samples were collected from the BGS investigation borings and documented in the *Daily Field Activity Log* and *COC* as shown on Table B.1 (Appendix B).

The sampling team typically collected approximately two-foot grab samples from the mid-point of each five-foot soil run based on recovery. The collected soil was placed in clean, resealable plastic bags and homogenized using gloved hands and when necessary, clean, unused, disposable, or decontaminated sampling tools. Decontamination of sampling equipment was conducted in accordance with TVA, ENV-TI-05.80.05, *Field Sampling Equipment Cleaning and Decontamination*. Once the sample was sufficiently homogenized, an aliquot of the homogenized sample and deionized water was used to create a soil paste for measurement of the soil pH with the ExTech ExStik 110 pH meter according to Stantec SOP – REV 1 (Stantec 2018d). The measurements were recorded on the *Soil pH Data Form* within 15 minutes after creating the soil paste.

Afterwards, the soil sample was placed in an appropriate laboratory-supplied sample jar. Soil samples were collected in accordance with ENV-TI-05.80.50, *Soil and Sediment Sampling* and ENV-TI-05.80.04, *Field Sampling Quality Control*. Sample containers were labeled and handled in accordance with ENV-TI-05.80.02, *Sample Labeling and Custody*. FSP secured caps on each bottle and attached a custody seal across the cap before placing the sample container in a cooler with ice (within 15 minutes of sample collection) for transport to the laboratory.

The samples were analyzed for CCR-related constituents listed in Appendices III and IV of Title 40 of the Code of Federal Regulations (CFR) Part 257 (40 CFR 257). In addition, five inorganic constituents listed in Appendix I of Tennessee Rule 0400-11-01-.04 and not included in the 40 CFR 257 Appendices III and IV were analyzed to maintain continuity with the TDEC environmental programs. These additional TDEC Appendix I constituents included copper, nickel, silver, vanadium, and zinc. The combined federal CCR Appendices III and IV constituents and TDEC Appendix I inorganic constituents are hereafter referred to as “CCR Parameters.” In addition, surficial soil samples from each BGS investigation boring location were analyzed for the presence of ash (percent ash) by polarized light microscopy (PLM).

3.4 INVESTIGATION DERIVED WASTE

Investigation derived waste (IDW) generated during the BGS investigation included:

- Used calibration solutions
- Soil cuttings
- Decontamination fluids
- Personal protective equipment
- General trash.

Soil cuttings and decontamination fluids produced during the BGS investigation were dispersed to the ground surface as authorized by TVA JOF Plant personnel and in accordance with ENV-TI-05.80.05, *Field Sampling Equipment Cleaning and Decontamination* and the Background Soil SAP.

IDW was handled in accordance with JOF Plant-specific waste management plan, and local, state, and federal regulations. Transportation and disposal of IDW was coordinated with TVA JOF Plant personnel.

3.5 SAMPLE SHIPMENT

Samples were packed and transported or shipped under *COC* procedures as required by ENV-TI-05.80.06, *Handling and Shipping of Samples* and ENV-TI-05.80.02, *Sample Labeling and Custody*. The soil samples were shipped to TestAmerica in St. Louis, Missouri (radium analysis only) and delivered via courier to TestAmerica in Nashville, Tennessee and then subsequently shipped to TestAmerica in Pittsburgh, Pennsylvania (all other analyses). The samples to be analyzed for percent ash by PLM were shipped separately to RJ Lee located in Monroeville, Pennsylvania. TestAmerica submitted sample receipt forms to EnvStds to document the condition in which the samples were received.

3.6 VARIATIONS

The proposed scope and procedures for the BGS investigation were outlined in the SAPs, QAPP, and applicable TVA TIs and ASTM standards as detailed in the sections above. Variations in scope or procedures discussed with TDEC and/or TVA, changes based on field conditions, or additional sampling performed to complete the scope of work in the SAP are described in the following sections. As discussed below, these variation do not impact the overall usability and representativeness of the data provided in this SAR for the BGS investigation at the JOF Plant.

3.6.1 Variations in Scope

Variations in scope from the SAP are provided below.

- BGS boring JOF-BG09 was relocated because of access restrictions as approved by TDEC.

- The surficial sample collected at boring JOF-BG09 was submitted to the laboratory for PLM (percent ash) analysis only because the CCR Parameter analysis was inadvertently omitted; however, the overall dataset for the CCR Parameters meets the completeness goals defined in the QAPP.

3.6.2 Variations in Procedures

Variations in procedures occurring in the field are provided below.

- The soil pH was not measured before placing the soil samples into the laboratory sample containers at borings JOF-BG02 and JOF-BG08 on May 22, 2019 as specified in the SAPs. This occurred because the field pH meter calibration solutions from the vendor arrived later than scheduled. The field pH for soils at JOF-BG02 and JOF-BG08 were measured a day later on May 23, 2019. Also, the soil samples collected from these borings were submitted to the laboratory for pH testing.
- Surficial soil samples (0 to 0.5 ft bgs) for borings JOF-BG02, JOF-BG08, JOF-BG10, and JOF-BG11 were not initially collected for CCR Parameter analysis on the days the borings were drilled, so the surficial samples collected for percent ash were discarded. These surficial samples were recollected and sampled according to the Background Soil SAP on May 24, 2019.
- Field pH reading was not recorded from the JOF-BS-BG04-0.0/0.5-20190529 sample on May 29, 2019; however, pH was measured in the sample sent to the laboratory and in the field from a location immediately adjacent to the original sample on May 31, 2019.
- The frequency of field QC sample collection did not meet the specific QAPP and SAP requirements. The results of the collected field QC samples were evaluated as part of the data validation/verification process performed by EnvStds.

4.0 SUMMARY

The data presented in this report are from the BGS investigation at the JOF Plant. The BGS investigation included collecting soil analytical samples to assess CCR Parameters and percent ash. A total of 67 samples, including two duplicate samples, were collected from the 12 BGS borings (JOF-BG01 through JOF-BG12) and three background well borings (JOF-109, JOF-112, and JOF-119) and analyzed for CCR Parameters. Surficial soil samples from each BGS investigation boring location were analyzed for the presence of ash (percent ash) by PLM. Soil samples were also tested for pH in the field.

A list of samples collected, along with duplicates, is presented in Table B.1. Soil analytical data are presented in Tables B.2 and B.3, and the field soil pH data are summarized in Table B.4. Analytical data were reported by TestAmerica and RJ Lee and validated by EnvStds.

Stantec has completed the BGS investigation at the JOF Plant in New Johnsonville, Tennessee, in accordance with the Background Soil and Hydrogeological Investigation SAPs as documented herein. The data collected during the BGS investigation are usable for reporting and evaluation in the EAR and meet the objectives of the TDEC Order EIP. The complete dataset from this investigation will be evaluated along with data collected under other TDEC Order SAPs, as well as data collected under other State and CCR Programs. This evaluation will be provided in the EAR.

5.0 REFERENCES

American Standard Test Method *D6151-08: Standard Practice for Using Hollow-Stem Augers for Geotechnical Exploration and Soil Sampling*.

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TVA. ENV-TI-05.80.02, *Sample Labeling and Custody.*

TVA. ENV-TI-05.80.03, *Field Record Keeping.*

TVA. ENV-TI-05.80.04, *Field Sampling Quality Control.*

TVA. ENV-TI-05.80.05, *Field Sampling Equipment Cleaning and Decontamination.*

TVA. ENV-TI-05.80.06, *Handling and Shipping of Samples.*

TVA. ENV-TI-05.80.50, *Soil and Sediment Sampling.*

APPENDIX A - EXHIBITS

Exhibit No.

A.1

Title

Site Location Map

Client/Project

Tennessee Valley Authority
Johnsonville Fossil Plant

Project Location

New Johnsonville, Tennessee

175568286
Prepared by DMB on 2019-12-03
Technical Review by RN on 2019-12-03

0 1,100 2,200 3,300 4,400 Feet

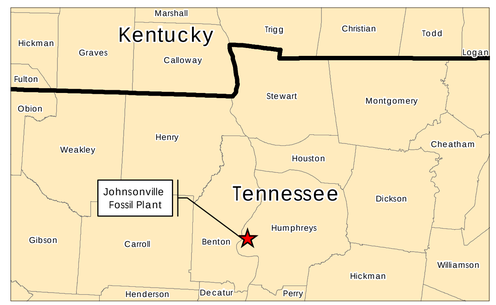
1:13,200 (At original document size of 22x34)

Legend

- CCR Unit Boundary (Approximate)
- Coal Yard

Notes

1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Topographic Basemap Provided by ESRI Basemaps (US Topo Maps)



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TVA

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Exhibit No.

A.2

Title

Background Soil Boring Location Map

Client/Project

Tennessee Valley Authority
Johnsonville Fossil Plant

Project Location

New Johnsonville, Tennessee

175568286

Prepared by DMB on 2019-12-03
Technical Review by RN on 2019-12-03

0 1,300 2,600 3,900 5,200 Feet

1:15,600 (At original document size of 22x34)

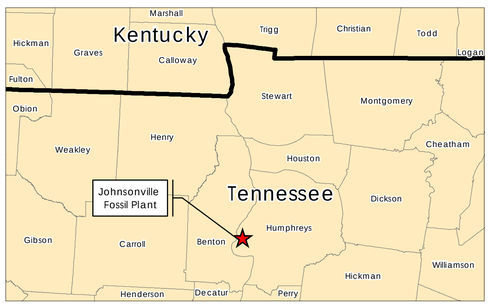
Legend

- Background Soil Boring — BGS Id
- Background Monitoring Well — Well Name / Boring Name
- CCR Unit Boundary (Approximate)
- Coal Yard

N

Notes

1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Imagery Provided by TVA (2017) & ESRI Basemaps
3. Each inset outline color correlates with the same color extent shown in the main figure.



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APPENDIX B - TABLES

TABLE B.1 – Summary of Background Soil Samples
Johnsonville Fossil Plant
May 2019 – August 2019

			Analysis Type						
Location ID	**Sample ID**	**Sample Type**	% Ash	Total Metals	Total Mercury	Anions	pH (laboratory)	pH (field)	Radium-226, Radium-228, Radium-226+228
JOF-109	JOF-BS-JOF109-31.5/34.5-20190620	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-JOF109-36.0/39.0-20190620	Normal Environmental Sample		x	x	x	x	x	x
JOF-112	JOF-BS-112-19.5/24.0-20190828	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-DUP01-20190828	Field Duplicate Sample		x	x	x	x		x
	JOF-BS-112-24.0/28.9-20190828	Normal Environmental Sample		x	x	x	x	x	x
JOF-119	JOF-BS-JOF119-34.5/37.5-20190710	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-JOF119-39.0/42.0-20190710	Normal Environmental Sample		x	x	x	x	x	x
JOF-BG01	JOF-BS-BG01-0.0/0.5-20190603	Normal Environmental Sample	x	x	x	x	x	x	x
	JOF-BS-BG01-1.5/3.5-20190603	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG01-6.5/8.5-20190603	Normal Environmental Sample		x	x	x	x	x	x
JOF-BG02	JOF-BS-BG02-0.0/0.5-20190524	Normal Environmental Sample	x	x	x	x	x	x	x
	JOF-BS-BG02-0.0/2.2-20190522	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG02-6.5/8.5-20190522	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG02-11.5/13.5-20190522	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG02-16.5/18.5-20190522	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG02-21.5/23.5-20190522	Normal Environmental Sample		x	x	x	x	x	x
JOF-BG03	JOF-BS-BG03-0.0/0.5-20190529	Normal Environmental Sample	x	x	x	x	x	x	x
	JOF-BS-BG03-1.5/3.5-20190529	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG03-6.5/8.5-20190529	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG03-11.5/13.5-20190529	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG03-16.5/18.5-20190529	Normal Environmental Sample		x	x	x	x	x	x
JOF-BG04	JOF-BS-BG04-0.0/0.5-20190529	Normal Environmental Sample	x	x	x	x	x		x
	JOF-BS-DUP01-20190529	Field Duplicate Sample	x	x	x	x	x		x
	JOF-BS-BG04-0.0/0.5-20190531	Normal Environmental Sample						x	
	JOF-BS-BG04-1.5/3.5-20190529	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG04-6.5/8.5-20190529	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG04-11.5/13.5-20190529	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG04-16.5/18.5-20190529	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG04-21.5/23.5-20190529	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG04-25.0/28.5-20190529	Normal Environmental Sample		x	x	x	x	x	x
JOF-BG05	JOF-BS-BG05-0.0/0.5-20190524	Normal Environmental Sample	x	x	x	x	x	x	x
	JOF-BS-BG05-1.5/3.5-20190524	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG05-6.5/8.5-20190524	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG05-11.5/13.5-20190524	Normal Environmental Sample		x	x	x	x	x	x
JOF-BG06	JOF-BS-BG06-0.0/0.5-20190530	Normal Environmental Sample	x	x	x	x	x	x	x
	JOF-BS-BG06-1.5/3.5-20190530	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG06-6.5/8.5-20190530	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG06-11.5/13.5-20190530	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG06-16.5/18.5-20190530	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG06-21.5/23.5-20190530	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG06-26.5/28.5-20190530	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG06-31.5/33.5-20190531	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG06-36.5/38.5-20190531	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG06-40.0/41.5-20190531	Normal Environmental Sample		x	x	x	x	x	x
JOF-BG07	JOF-BS-BG07-0.0/0.5-20190604	Normal Environmental Sample	x	x	x	x	x	x	x
	JOF-BS-BG07-1.5/3.5-20190604	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG07-6.5/8.5-20190604	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG07-11.5/13.5-20190604	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG07-16.5/18.5-20190604	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG07-21.5/23.3-20190604	Normal Environmental Sample		x	x	x	x	x	x

See notes on last page.

TABLE B.1 – Summary of Background Soil Samples
Johnsonville Fossil Plant
May 2019 – August 2019

			Analysis Type						
Location ID	**Sample ID**	**Sample Type**	% Ash	Total Metals	Total Mercury	Anions	pH (laboratory)	pH (field)	Radium-226, Radium-228, Radium-226+228
JOF-BG08	JOF-BS-BG08-0.0/0.5-20190524	Normal Environmental Sample	x	x	x	x	x	x	x
	JOF-BS-BG08-1.5/3.5-20190522	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG08-6.5/8.5-20190522	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG08-11.5/13.5-20190522	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG08-15.0/17.0-20190522	Normal Environmental Sample		x	x	x	x	x	x
JOF-BG09	JOF-BS-BG09-0.0/0.5-20190823	Normal Environmental Sample	x					x	
	JOF-BS-BG09-1.5/3.5-20190823	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG09-5.9/7.9-20190823	Normal Environmental Sample		x	x	x	x	x	x
JOF-BG10	JOF-BS-BG10-0.0/0.5-20190524	Normal Environmental Sample	x	x	x	x	x	x	x
	JOF-BS-BG10-1.5/3.5-20190523	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG10-6.5/8.5-20190523	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG10-11.5/13.5-20190523	Normal Environmental Sample		x	x	x	x	x	x
JOF-BG11	JOF-BS-BG11-0.0/0.5-20190524	Normal Environmental Sample	x	x	x	x	x	x	x
	JOF-BS-BG11-1.5/3.5-20190523	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG11-6.5/8.5-20190523	Normal Environmental Sample		x	x	x	x	x	x
JOF-BG12	JOF-BS-BG12-0.0/0.5-20190604	Normal Environmental Sample	x	x	x	x	x	x	x
	JOF-BS-BG12-1.5/3.5-20190604	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG12-6.5/8.5-20190604	Normal Environmental Sample		x	x	x	x	x	x
	JOF-BS-BG12-11.5/13.5-20190604	Normal Environmental Sample		x	x	x	x	x	x

Notes

% Ash	PLM
Total Metals	SW-846 6020A
Total Mercury	SW-846 7471B
Anions	SW-846 9056A
pH (laboratory)	SW-846 9045D
Radium-226, Radium-228, Radium-226+228	EPA 901.1
ID	identification

1. Field and laboratory quality control sample results except for field duplicates are not included in report tables but were used for data validation.
2. Boring JOF-109, JOF-112, and JOF-119 under hydrogeological investigation scope of work; sample collected within well screen interval.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-109		JOF-112			JOF-119		JOF-BG01	
Sample Date		20-Jun-19	20-Jun-19	28-Aug-19	28-Aug-19	28-Aug-19	10-Jul-19	10-Jul-19	3-Jun-19	3-Jun-19
Sample ID		JOF-BS-JOF109-31.5/34.5-20190620	JOF-BS-JOF109-36.0/39.0-20190620	JOF-BS-112-19.5/24.0-20190828	JOF-BS-DUP01-20190828	JOF-BS-112-24.0/28.9-20190828	JOF-BS-JOF119-34.5/37.5-20190710	JOF-BS-JOF119-39.0/42.0-20190710	JOF-BS-BG01-0.0/0.5-20190603	JOF-BS-BG01-0.0/0.5-20190603
Sample Depth		31.5 - 34.5 ft	36 - 39 ft	19.5 - 24 ft	19.5 - 24 ft	24 - 28.9 ft	34.5 - 37.5 ft	39 - 42 ft	0 - 0.5 ft	0 - 0.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Validated
PLM										
% ASH	%	-	-	-	-	-	-	-	3	-
Total Metals										
Antimony	mg/kg	0.0954 J	<0.0775	0.115 J	0.239	0.149 J	0.101 J	0.129 J	-	0.197 J
Arsenic	mg/kg	1.69	1.82	2.64	1.96	2.40	6.95	6.14	-	3.33
Barium	mg/kg	109	69.5	205	230	105	29.7	46.9	-	39.0
Beryllium	mg/kg	6.06	4.76	2.36	2.24	3.12	0.507	0.401	-	0.356
Boron	mg/kg	3.67 J	3.48 J	<1.58	1.83 J	9.59 J	<1.49	<1.63	-	1.57 J
Cadmium	mg/kg	0.0962 J	0.0900 J	0.215	0.173	1.71	0.124	0.0896 J	-	0.0361 J
Calcium	mg/kg	4,690	3,480	1,200	1,570 J	56,300	349	599	-	466
Chromium	mg/kg	7.91	4.52	5.03 J	7.52 J	16.6	9.73	12.3	-	12.7
Cobalt	mg/kg	1.61	3.49	14.9	13.1	7.75	5.68	6.90	-	3.40
Copper	mg/kg	10.3	6.29	10.8	9.59 J	12.6 J	3.15	4.40	-	5.93
Lead	mg/kg	9.99	15.3	3.48	4.19	4.79	3.61	4.43	-	8.12
Lithium	mg/kg	0.602	1.02	1.17	1.67	5.62	0.861	2.90	-	4.41
Mercury	mg/kg	<0.0174	<0.0170	0.0208 J	<0.0155	0.0252 J	<0.0167	<0.0160	-	0.0299 J
Molybdenum	mg/kg	1.44	0.675	1.37	1.64	2.58	1.36	1.01	-	0.716
Nickel	mg/kg	17.2	27.6	11.5	11.6 J	15.9 J	8.17	8.79	-	4.96
Selenium	mg/kg	0.707	0.416 J	0.601	0.541 J	0.762	0.169 J	0.439 J	-	0.764
Silver	mg/kg	<0.0308	<0.0338	<0.0317	<0.0312	<0.0331	<0.0299	<0.0326	-	0.0396 J
Thallium	mg/kg	0.0326 J	0.0339 J	0.167	0.310	0.228	0.0661 J	0.115 U*	-	0.289
Vanadium	mg/kg	5.33	4.39	4.44	3.92 J	11.1 J	10.5	14.8	-	15.6
Zinc	mg/kg	65.4	92.6	36.4	31.1 J	73.1 J	19.9	26.1	-	56.8
Anions										
Chloride	mg/kg	6.20 J	<4.70	5.00 J	4.54 J	7.11 J	<4.32	<4.50	-	<4.33
Fluoride	mg/kg	0.968 J	2.27 J	8.80 J	7.35 J	13.1 J	2.04	4.02	-	0.758 UR
Sulfate	mg/kg	20.6	18.5	18.0	12.3	38.6	11.3	18.9	-	9.03 J
General Chemistry										
pH (lab)	SU	6.9	7.3	8.0	8.0	8.0	6.8	7.0	-	5.6

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG01		JOF-BG02						JOF-BG03
Sample Date		3-Jun-19	3-Jun-19	24-May-19	22-May-19	22-May-19	22-May-19	22-May-19	22-May-19	29-May-19
Sample ID		JOF-BS-BG01-1.5/3.5-20190603	JOF-BS-BG01-6.5/8.5-20190603	JOF-BS-BG02-0.0/0.5-20190524	JOF-BS-BG02-0.0/2.2-20190522	JOF-BS-BG02-6.5/8.5-20190522	JOF-BS-BG02-11.5/13.5-20190522	JOF-BS-BG02-16.5/18.5-20190522	JOF-BS-BG02-21.5/23.5-20190522	JOF-BS-BG03-0.0/0.5-20190529
Sample Depth		1.5 - 3.5 ft	6.5 - 8.5 ft	0 - 0.5 ft	0 - 2.2 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft	0 - 0.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Validated	Validated	Final-Verified	Validated	Validated	Validated	Validated	Validated	Final-Verified
PLM										
% ASH	%	-	-	1	-	-	-	-	-	2
Total Metals										
Antimony	mg/kg	0.189 J	<0.0891	0.411	0.233 J	0.189 J	0.187 J	0.155 J	0.135 J	-
Arsenic	mg/kg	2.66	0.348	8.28	5.51 J	3.50 J	3.75 J	3.86 J	3.18 J	-
Barium	mg/kg	87.8	17.1	79.8	52.4 J	35.7 J	62.5 J	38.9 J	31.3 J	-
Beryllium	mg/kg	0.622	0.670	0.501	0.197	0.191	0.253	0.183	0.164	-
Boron	mg/kg	2.31 J	4.93 J	2.11 J	1.57 UJ	1.64 UJ	1.74 UJ	1.68 UJ	1.75 UJ	-
Cadmium	mg/kg	0.0513 J	0.0485 J	0.0655 J	0.0356 J	<0.0207	<0.0220	0.0312 J	<0.0220	-
Calcium	mg/kg	1,650	650	1,270	964	101	110	126	155	-
Chromium	mg/kg	20.5	20.9	14.5	14.5	11.3	9.19	11.1	14.6	-
Cobalt	mg/kg	3.28	0.461	5.18	4.96	1.44	2.13	8.28	6.55	-
Copper	mg/kg	9.34	7.38	8.56	5.78	7.15	7.42	5.25	4.51	-
Lead	mg/kg	5.30	2.07	16.4	11.0	6.50	8.05	4.70	3.59	-
Lithium	mg/kg	4.45	1.16	8.85	5.16	4.16	3.68	3.12	2.97 U*	-
Mercury	mg/kg	0.0424	<0.0208	0.0780 J	0.0587	0.0229 J	0.0353 J	0.0213 J	0.0266 J	-
Molybdenum	mg/kg	0.622	<0.234	2.03	1.12 J	0.960 J	1.00 J	1.06 J	1.39 J	-
Nickel	mg/kg	8.72	9.10	7.45	5.52 J	4.41 J	5.06 J	5.45 J	4.84 J	-
Selenium	mg/kg	0.873	0.694 J	1.42	0.912	0.867	1.76	0.808	0.560 J	-
Silver	mg/kg	0.0674 J	0.0618 J	<0.0362	0.0343 J	<0.0328	<0.0349	<0.0335	<0.0350	-
Thallium	mg/kg	0.205	0.107 J	0.366	0.209	0.152	0.156	0.122 J	0.111 J	-
Vanadium	mg/kg	17.8	10.6	27.2	29.1 J	23.9 J	18.9 J	14.6 J	12.9 J	-
Zinc	mg/kg	36.9	103	29.3	15.8	14.7	18.2	17.0	14.0	-
Anions										
Chloride	mg/kg	5.61 J	11.5 J	5.89 J	<4.57	8.14 J	8.03 J	5.04 J	5.41 J	-
Fluoride	mg/kg	1.58 J	2.77 J	0.875 UJ	0.800 UR	0.828 UR	0.825 UR	0.803 UR	0.879 UR	-
Sulfate	mg/kg	46.3	63.8	72.7	105	34.8	31.3	59.6	66.1	-
General Chemistry										
pH (lab)	SU	7.2	7.6	5.5 J	5.3	5.1	5.2	4.9	5.3	-

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG03					JOF-BG04			
Sample Date		29-May-19	29-May-19	29-May-19	29-May-19	29-May-19	29-May-19	29-May-19	29-May-19	29-May-19
Sample ID		JOF-BS-BG03-0.0/0.5-20190529	JOF-BS-BG03-1.5/3.5-20190529	JOF-BS-BG03-6.5/8.5-20190529	JOF-BS-BG03-11.5/13.5-20190529	JOF-BS-BG03-16.5/18.5-20190529	JOF-BS-BG04-0.0/0.5-20190529	JOF-BS-DUP01-20190529	JOF-BS-BG04-0.0/0.5-20190529	JOF-BS-DUP01-20190529
Sample Depth		0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample	Field Duplicate Sample
Level of Review		Validated	Validated	Validated	Validated	Validated	Final-Verified	Final-Verified	Validated	Validated
	Units									
PLM										
% ASH	%	-	-	-	-	-	<1	<1	-	-
Total Metals										
Antimony	mg/kg	0.297	0.423	0.218 J	0.398	0.387	-	-	0.296	0.330
Arsenic	mg/kg	5.57	11.3	5.03	11.5	9.71	-	-	6.44	7.00
Barium	mg/kg	101	89.2	31.1	49.5	47.7	-	-	62.7 J	91.1 J
Beryllium	mg/kg	0.636	0.666	0.335	0.755	0.885	-	-	0.509	0.586
Boron	mg/kg	<1.66	1.76 J	<1.68	<1.71	<1.87	-	-	<1.49	<1.49
Cadmium	mg/kg	0.107 J	0.0476 J	<0.0212	0.0522 J	0.125 J	-	-	0.0592 J	0.0758 J
Calcium	mg/kg	621	311	213	312	382	-	-	1,030	1,180
Chromium	mg/kg	12.9	18.1	13.6	31.6	27.1	-	-	20.5	23.9
Cobalt	mg/kg	7.15	13.9	3.73	5.34	12.7	-	-	7.15 J	11.7 J
Copper	mg/kg	7.58	9.18	3.95	7.79	9.61	-	-	6.67	7.86
Lead	mg/kg	15.1	31.6	9.42	10.5	9.46	-	-	9.23	10.1
Lithium	mg/kg	5.56	6.35	5.00	5.90	5.15	-	-	4.99	5.69
Mercury	mg/kg	0.0424	0.0594	0.0316 J	0.0449	0.122	-	-	0.0480	0.0396
Molybdenum	mg/kg	1.28	1.90	0.925	1.90	1.84	-	-	1.44	1.75
Nickel	mg/kg	7.89 J	7.59	3.37 J	6.75 J	12.9 J	-	-	6.99 J	7.95 J
Selenium	mg/kg	1.48	1.29	0.502 J	0.658	0.465 J	-	-	0.865	1.02
Silver	mg/kg	<0.0331	0.0437 J	<0.0337	<0.0341	<0.0374	-	-	<0.0297	<0.0298
Thallium	mg/kg	0.224	0.326	0.164	0.185	0.208	-	-	0.197	0.272
Vanadium	mg/kg	21.3	38.7	25.1	44.1	29.0	-	-	26.9	29.2
Zinc	mg/kg	25.8	18.8	10.8	22.3	39.5	-	-	29.0	38.4
Anions										
Chloride	mg/kg	<4.58	<4.67	5.74 J	<4.56	5.15 J	-	-	<4.24	<4.29
Fluoride	mg/kg	0.802 UJ	0.819 UJ	0.856 UJ	0.799 UJ	0.896 UJ	-	-	0.743 UJ	0.752 UJ
Sulfate	mg/kg	19.0	74.4	89.9	75.4	48.9	-	-	22.9	26.1
General Chemistry										
pH (lab)	SU	5.3	5.0	4.8	5.1	5.8	-	-	6.1	6.0

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG04						JOF-BG05		
Sample Date		29-May-19	29-May-19	29-May-19	29-May-19	29-May-19	29-May-19	24-May-19	24-May-19	24-May-19
Sample ID		JOF-BS-BG04-1.5/3.5-20190529	JOF-BS-BG04-6.5/8.5-20190529	JOF-BS-BG04-11.5/13.5-20190529	JOF-BS-BG04-16.5/18.5-20190529	JOF-BS-BG04-21.5/23.5-20190529	JOF-BS-BG04-25.0/28.5-20190529	JOF-BS-BG05-0.0/0.5-20190524	JOF-BS-BG05-1.5/3.5-20190524	JOF-BS-BG05-6.5/8.5-20190524
Sample Depth		1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft	25 - 28.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Validated	Validated	Validated	Validated	Validated	Validated	Final-Verified	Final-Verified	Final-Verified
	Units									
PLM										
% ASH	%	-	-	-	-	-	-	2	-	-
Total Metals										
Antimony	mg/kg	0.325	0.284	0.290	0.178 J	0.167 J	0.139 J	0.264	0.272	0.172 J
Arsenic	mg/kg	6.85	6.76	3.10	2.83	3.45	3.14	4.95	7.39	3.66
Barium	mg/kg	47.7	43.1	21.5	41.4	203	99.7	51.3	105	176
Beryllium	mg/kg	0.312	0.286	0.400	0.302	0.706	0.735	0.437	0.547	0.510
Boron	mg/kg	<1.70	<1.66	<1.55	<1.61	<1.67	<1.65	1.85 J	1.85 J	<1.59
Cadmium	mg/kg	<0.0214	<0.0210	0.0247 J	<0.0203	<0.0210	0.0399 J	0.0399 J	<0.0217	<0.0200
Calcium	mg/kg	324	225	431	591	376	270	292	204	466
Chromium	mg/kg	15.0	16.5	12.0	15.3	12.7	11.7	12.7	16.7	14.2
Cobalt	mg/kg	3.65	2.19	2.12	1.94	2.37	3.20	7.35	5.90	6.92
Copper	mg/kg	6.35	4.14	3.93	3.74	5.46	5.33	3.71	9.96	4.81
Lead	mg/kg	11.0	9.54	6.64	12.1	8.75	5.59	13.4	13.2	10.0
Lithium	mg/kg	8.52	6.25	2.39	3.29	3.52	3.63	6.18	9.25	6.54
Mercury	mg/kg	0.0574	0.0371 J	0.0234 J	0.0228 J	<0.0134	0.0335 J	0.0453 J	0.0267 J	0.0268 J
Molybdenum	mg/kg	1.26	1.16	1.95	1.09	1.13	0.803	1.20	1.16	0.645
Nickel	mg/kg	6.32 J	3.98 J	6.51 J	2.62 J	4.39 J	5.95 J	5.74	10.6	8.32
Selenium	mg/kg	0.861	0.769	0.441 J	0.738	2.13	1.14	1.11	1.57	1.32
Silver	mg/kg	<0.0340	<0.0333	<0.0309	<0.0323	<0.0334	<0.0330	0.0321 J	<0.0345	0.0331 J
Thallium	mg/kg	0.228	0.212	0.0987 J	0.142	0.208	0.133	0.320	0.315	0.192
Vanadium	mg/kg	30.9	33.5	16.4	24.6	14.4	13.9	19.9	26.5	21.6
Zinc	mg/kg	19.1	11.6	11.1	9.44	14.9	19.5	20.8	43.3	21.1
Anions										
Chloride	mg/kg	5.15 J	5.18 J	4.52 J	<4.62	<4.75	<4.95	6.61 J	12.5 J	28.2
Fluoride	mg/kg	0.816 UJ	0.785 UJ	2.13 J	1.26 J	0.832 UJ	0.867 UJ	0.805 UJ	0.891 UJ	2.44 J
Sulfate	mg/kg	50.2	25.9	26.6	25.7	44.3	47.7	29.2	51.0	51.3
General Chemistry										
pH (lab)	SU	5.2	5.5	6.6	6.4	5.5	5.5	5.1 J	5.4 J	5.6 J

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG05	JOF-BG06							
Sample Date		24-May-19	30-May-19	30-May-19	30-May-19	30-May-19	30-May-19	30-May-19	30-May-19	31-May-19
Sample ID		JOF-BS-BG05-11.5/13.5-20190524	JOF-BS-BG06-0.0/0.5-20190530	JOF-BS-BG06-1.5/3.5-20190530	JOF-BS-BG06-6.5/8.5-20190530	JOF-BS-BG06-11.5/13.5-20190530	JOF-BS-BG06-16.5/18.5-20190530	JOF-BS-BG06-21.5/23.5-20190530	JOF-BS-BG06-26.5/28.5-20190530	JOF-BS-BG06-31.5/33.5-20190531
Sample Depth		11.5 - 13.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft	26.5 - 28.5 ft	31.5 - 33.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
	Units									
PLM										
% ASH	%	-	1	-	-	-	-	-	-	-
Total Metals										
Antimony	mg/kg	0.227 J	0.217 J	0.266 J	0.114 J	0.123 J	0.127 J	0.0768 UJ	0.0704 UJ	0.124 J
Arsenic	mg/kg	5.13	4.91	5.36	2.55	3.44	3.31	0.769	0.390	2.81
Barium	mg/kg	22.8	51.9	75.6	68.8	77.2	48.6	11.1	26.3	70.7
Beryllium	mg/kg	0.140	0.395	0.735	0.452	0.336	0.345	0.108 J	0.220	0.586
Boron	mg/kg	<1.69	<1.57	<1.76	<1.54	<1.70	<1.61	<1.67	<1.53	<1.76
Cadmium	mg/kg	<0.0213	0.0263 J	0.0270 J	<0.0194	<0.0214	<0.0203	<0.0211	<0.0193	<0.0222
Calcium	mg/kg	842	158	138	282	783	789	453	631	704
Chromium	mg/kg	13.5	12.1	15.8	9.70	12.1	9.96	5.58	9.50	13.4
Cobalt	mg/kg	0.737	2.84	3.61	4.85	2.26	1.13	0.377	0.844	1.52
Copper	mg/kg	2.33	5.87	8.97	3.65	4.59	2.86	1.79	4.13	5.32
Lead	mg/kg	6.78	8.33	10.8	7.08	10.0	6.13	4.20	4.47	7.20
Lithium	mg/kg	5.16	5.18	6.79	4.92	4.08	4.08	1.60	2.45	3.36
Mercury	mg/kg	0.0868 J	0.0578	0.0549	0.0190 J	<0.0182	0.0351 J	<0.0177	<0.0168	0.0201 J
Molybdenum	mg/kg	1.02	0.830	1.05	0.526 J	0.631	0.606	0.252 J	<0.185	1.64
Nickel	mg/kg	2.07	5.42	6.92	5.70	4.61	2.68	1.15	2.08	4.04
Selenium	mg/kg	0.649	1.03	1.39	1.20	0.827	0.854	0.431 J	0.497 J	1.17
Silver	mg/kg	0.0372 J	<0.0315	0.0497 J	0.0429 J	<0.0340	0.0399 J	0.0550 J	<0.0306	0.0418 J
Thallium	mg/kg	0.176	0.213	0.246	0.179	0.190	0.172	0.129	0.167	0.188
Vanadium	mg/kg	30.9	21.2 J	25.7 J	17.9 J	23.3 J	20.5 J	7.96 J	6.72 J	16.3 J
Zinc	mg/kg	5.56	17.3	19.2	15.2	10.6	6.14	3.19	7.96	16.5
Anions										
Chloride	mg/kg	11.9 J	4.76 J	<4.93	9.60 J	13.2	13.2	48.3	53.8	31.3
Fluoride	mg/kg	0.849 UJ	0.799 UR	0.864 UR	1.46 J	1.60 J	1.07 J	0.822 UR	0.799 UR	1.06 J
Sulfate	mg/kg	74.7	25.2 J	31.1 J	19.7 J	52.1 J	109 J	89.7 J	19.6 J	56.7 J
General Chemistry										
pH (lab)	SU	6.6 J	5.2	5.5	6.0	6.7	6.0	5.3	5.2	5.9

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG06		JOF-BG07						JOF-BG08
Sample Date		31-May-19	31-May-19	4-Jun-19	4-Jun-19	4-Jun-19	4-Jun-19	4-Jun-19	4-Jun-19	24-May-19
Sample ID		JOF-BS-BG06-36.5/38.5-20190531	JOF-BS-BG06-40.0/41.5-20190531	JOF-BS-BG07-0.0/0.5-20190604	JOF-BS-BG07-1.5/3.5-20190604	JOF-BS-BG07-6.5/8.5-20190604	JOF-BS-BG07-11.5/13.5-20190604	JOF-BS-BG07-16.5/18.5-20190604	JOF-BS-BG07-21.5/23.3-20190604	JOF-BS-BG08-0.0/0.5-20190524
Sample Depth		36.5 - 38.5 ft	40 - 41.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.3 ft	0 - 0.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
PLM										
% ASH	%	-	-	<1	-	-	-	-	-	<1
Total Metals										
Antimony	mg/kg	0.153 J	0.190 J	0.268	0.205 J	0.191 J	0.421	0.146 J	0.328	0.351
Arsenic	mg/kg	2.29	2.03	5.82	5.28	4.03	9.02	4.28	6.54	8.46
Barium	mg/kg	87.9	126	61.6	66.4	71.5	52.1	26.6	21.3	58.7
Beryllium	mg/kg	0.690	0.799	0.655	0.429	0.506	0.288	0.201	0.225	0.388
Boron	mg/kg	<1.84	<1.74	<1.65	1.91 J	<1.55	<1.60	<1.55	<1.59	<1.71
Cadmium	mg/kg	<0.0232	0.0353 J	0.0471 J	<0.0208	<0.0196	<0.0201	<0.0196	<0.0200	0.0311 J
Calcium	mg/kg	487	637	284	179	429	659	656	619	1,250
Chromium	mg/kg	9.21	9.00	15.5	17.0	13.7	25.5	13.7	22.9	18.1
Cobalt	mg/kg	2.07	3.76	10.2	3.64	2.65	2.43	1.88	1.55	4.33
Copper	mg/kg	5.18	6.88	4.57	8.72	4.05	5.55	3.25	3.72	9.83
Lead	mg/kg	9.59	11.5	14.7	10.5	8.63	13.3	7.60	9.47	14.4
Lithium	mg/kg	4.79	5.13	5.08	9.79	7.31	6.41	3.95	3.78	9.09
Mercury	mg/kg	0.0186 J	0.0271 J	0.0324	0.0578	<0.0176	0.0562	0.0421	0.0394 J	0.0855 J
Molybdenum	mg/kg	0.709	0.849	0.933	0.948	0.838	1.80	0.860	1.39	1.34
Nickel	mg/kg	5.29	7.94	6.12	8.37	5.27	4.53	2.45	3.26	8.37
Selenium	mg/kg	1.21	1.77	1.05	0.997	0.773	0.884	0.529 J	0.789	1.25
Silver	mg/kg	0.118 J	<0.0349	<0.0331	<0.0331	<0.0311	0.0345 J	0.0717 J	0.0952 J	<0.0342
Thallium	mg/kg	0.395	0.363	0.229	0.246	0.225	0.235	0.148	0.340	0.228
Vanadium	mg/kg	13.3 J	14.4 J	22.7	27.6	24.3	47.3	25.3	37.6	30.4
Zinc	mg/kg	18.0	27.0	18.4	25.1	14.3	17.2	9.91	14.5	35.0
Anions										
Chloride	mg/kg	34.7	15.0	<4.51	5.50 J	17.7	12.6	38.7	74.5	5.33 J
Fluoride	mg/kg	0.878 UR	0.868 UR	0.791 UR	0.831 UR	2.21 J	0.838 J	0.798 UR	0.789 UR	0.797 UJ
Sulfate	mg/kg	22.8 J	12.0 J	11.3 J	35.9	15.8	80.5	35.2	32.6	45.5
General Chemistry										
pH (lab)	SU	5.4	5.4	5.2	5.3	5.6	6.4	4.0	5.9	5.6 J

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG08				JOF-BG09			JOF-BG10	
Sample Date		22-May-19	22-May-19	22-May-19	22-May-19	23-Aug-19	23-Aug-19	23-Aug-19	24-May-19	23-May-19
Sample ID		JOF-BS-BG08-1.5/3.5-20190522	JOF-BS-BG08-6.5/8.5-20190522	JOF-BS-BG08-11.5/13.5-20190522	JOF-BS-BG08-15.0/17.0-20190522	JOF-BS-BG09-0.0/0.5-20190823	JOF-BS-BG09-1.5/3.5-20190823	JOF-BS-BG09-5.9/7.9-20190823	JOF-BS-BG10-0.0/0.5-20190524	JOF-BS-BG10-1.5/3.5-20190523
Sample Depth		1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	15 - 17 ft	0 - 0.5 ft	1.5 - 3.5 ft	5.9 - 7.9 ft	0 - 0.5 ft	1.5 - 3.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Validated	Validated	Validated	Validated	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Validated
PLM										
% ASH	%	-	-	-	-	1	-	-	1	-
Total Metals										
Antimony	mg/kg	0.289 J	0.297 J	0.164 J	0.229 J	-	0.104 J	0.249	0.373	1.55 J
Arsenic	mg/kg	5.87 J	6.58 J	4.37 J	7.70 J	-	2.79	4.77	6.05	24.2 J
Barium	mg/kg	51.6 J	55.4 J	18.7 J	33.0 J	-	48.4	35.8	197	35.0 J
Beryllium	mg/kg	0.226	0.249	0.112 J	0.259	-	0.511	0.458	1.39	0.215
Boron	mg/kg	1.68 UJ	1.68 UJ	1.66 UJ	1.57 UJ	-	<1.53	<1.57	<1.67	1.65 UJ
Cadmium	mg/kg	<0.0211	<0.0212	0.0213 J	0.0618 J	-	<0.0193	<0.0197	0.139	0.0528 J
Calcium	mg/kg	317	705	667	421	-	467	365	9,740	467
Chromium	mg/kg	16.6	20.6	13.8	34.0	-	8.96	15.5	20.1	13.4
Cobalt	mg/kg	2.82	2.47	1.16	6.40	-	0.878	1.09	9.10	4.38
Copper	mg/kg	7.19	8.04	4.96	6.70	-	1.83	3.87	11.6	15.2
Lead	mg/kg	11.0	12.7	3.71	4.01	-	5.70	11.0	15.9	10.7
Lithium	mg/kg	6.34	7.03	4.06	3.59	-	2.83	4.62	4.24	4.51
Mercury	mg/kg	0.0237 J	0.0924	0.0210 J	0.0375	-	0.0199 J	0.0304 J	0.0433 J	0.101
Molybdenum	mg/kg	1.14 J	1.42 J	0.949 J	1.93 J	-	0.472 J	0.879	2.14	39.4 J
Nickel	mg/kg	5.72 J	5.17 J	3.42 J	8.71 J	-	1.84	3.21	15.7	5.61 J
Selenium	mg/kg	1.23	0.889	0.544 J	0.596	-	0.575	0.568 J	2.81	1.05
Silver	mg/kg	<0.0335	<0.0337	0.0395 J	0.0491 J	-	0.0667 J	0.0368 J	<0.0334	0.0504 J
Thallium	mg/kg	0.221	0.256	0.112 J	0.123	-	0.0991 J	0.124	0.526	0.485
Vanadium	mg/kg	31.4 J	41.7 J	20.8 J	24.8 J	-	12.4	25.0	21.8	46.5 J
Zinc	mg/kg	20.4	16.3	10.9	28.8	-	5.55	7.37	31.7	14.1
Anions										
Chloride	mg/kg	14.1	23.9	28.2	18.7	-	<4.40	5.49 J	<4.62	<4.69
Fluoride	mg/kg	0.791 UR	0.829 UR	0.834 J	1.14 J	-	0.796 J	0.802 UJ	5.62 J	0.821 UR
Sulfate	mg/kg	22.5	37.3	23.8	23.6	-	24.9	21.7	8.74 J	52.6
General Chemistry										
pH (lab)	SU	3.7	6.6	7.1	6.9	-	6.8	6.0	7.9 J	5.7

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG10		JOF-BG11			JOF-BG12			
Sample Date		23-May-19	23-May-19	24-May-19	23-May-19	23-May-19	4-Jun-19	4-Jun-19	4-Jun-19	4-Jun-19
Sample ID		JOF-BS-BG10-6.5/8.5-20190523	JOF-BS-BG10-11.5/13.5-20190523	JOF-BS-BG11-0.0/0.5-20190524	JOF-BS-BG11-1.5/3.5-20190523	JOF-BS-BG11-6.5/8.5-20190523	JOF-BS-BG12-0.0/0.5-20190604	JOF-BS-BG12-1.5/3.5-20190604	JOF-BS-BG12-6.5/8.5-20190604	JOF-BS-BG12-11.5/13.5-20190604
Sample Depth		6.5 - 8.5 ft	11.5 - 13.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Validated	Validated	Final-Verified	Validated	Validated	Final-Verified	Final-Verified	Final-Verified	Final-Verified
	Units									
PLM										
% ASH	%	-	-	<1	-	-	1	-	-	-
Total Metals										
Antimony	mg/kg	4.92 J	4.74 J	0.303	0.189 J	0.130 J	0.355	0.184 J	0.251 J	0.193 J
Arsenic	mg/kg	62.8 J	66.0 J	4.97	4.08 J	2.77 J	5.81	8.17	5.53	7.97
Barium	mg/kg	61.4 J	83.0 J	93.5	31.5 J	32.1 J	171	239	37.0	101
Beryllium	mg/kg	0.181	0.195	0.679	0.160	0.226	0.601	0.842	1.03	0.895
Boron	mg/kg	3.12 J	2.58 J	<1.60	1.56 UJ	1.51 UJ	<1.53	<1.54	<1.72	<1.54
Cadmium	mg/kg	0.108 J	0.145	0.0828 J	0.0207 J	<0.0190	0.122	0.144	0.0958 J	0.0983 J
Calcium	mg/kg	195	215	1,580	216	294	425	339	199	279
Chromium	mg/kg	15.5	11.6	13.1	9.90	4.97	13.5	17.3	38.1	27.3
Cobalt	mg/kg	0.514	1.67	7.89	3.10	2.00	25.2	84.1	10.5	39.5
Copper	mg/kg	72.5	61.5	6.40	9.09	4.38	6.72	6.96	6.19	9.06
Lead	mg/kg	33.1	36.2	12.6	6.05	3.27	14.7	4.53	3.84	4.22
Lithium	mg/kg	3.47	2.85	5.07	4.17	3.00	6.18	1.88	0.928	1.86
Mercury	mg/kg	0.175	0.235	0.0458 J	0.0620	0.0226 J	0.0393	0.0215 J	<0.0141	0.0194 J
Molybdenum	mg/kg	182 J	175 J	0.727	0.704 J	0.640 J	1.20	2.03	1.46	3.13
Nickel	mg/kg	2.02 J	15.0 J	10.1	5.41 J	3.55 J	7.59	8.42	11.1	10.5
Selenium	mg/kg	3.51	3.57	1.41	0.519 J	0.674	0.894	0.497 J	0.539 J	0.554 J
Silver	mg/kg	0.0847 J	0.170	0.0320 J	<0.0313	<0.0302	0.0317 J	0.0324 J	<0.0345	<0.0308
Thallium	mg/kg	3.75	6.55	0.191	0.101 J	0.0854 J	0.697	0.459	0.125 J	0.218
Vanadium	mg/kg	90.3 J	81.9 J	20.2	17.0 J	9.19 J	23.0	17.1	24.3	20.7
Zinc	mg/kg	6.71	6.92	21.2	15.2	8.56	25.0	25.8	35.5	36.1
Anions										
Chloride	mg/kg	6.95 J	5.98 J	<4.70	<4.58	<4.36	<4.12	<4.43	<4.87	<4.41
Fluoride	mg/kg	0.994 J	0.830 UR	3.88 J	0.802 UR	0.764 UR	0.723 UR	0.777 UR	0.854 UR	0.773 UR
Sulfate	mg/kg	146	169	12.0 J	32.5	23.4	12.9	14.2	10.8 J	15.1
General Chemistry										
pH (lab)	SU	3.8	4.0	7.2 J	5.4	5.5	5.3	6.6	6.9	6.8

Notes:

<0.03	analyte was not detected at a concentration greater than the Method Detection Limit
-	parameter not analyzed / not available
%	percent
ft	feet below ground surface
ID	identification
J	quantitation is approximate due to limitations identified during data validation
mg/kg	milligrams per kilogram
PLM	Polarized Light Microscopy - analysis for % ash
SU	Standard Unit
U*	this result should be considered “not detected” because it was detected in an associated field or laboratory blank at a similar level
UJ	this compound was not detected, but the reporting or detection limit should be considered estimated due to a bias identified during data validation
UR	unreliable reporting or detection limit; compound may or may not be present in sample.

1. Level of review is defined in the Quality Assurance Project Plan.
2. Non-detect (ND) results reported by RJ Lee Group for percent (%) ash expressed as <1 in table.
3. The 0-0.5 foot sample was collected using a hand auger when accessible during the drilling operations at that boring location; it may or may not have been the first sample obtained and thus could have a different sample date.
4. Level of review for % ash samples is Final-Verified.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-109		JOF-112			JOF-119		JOF-BG01	
Sample Date		20-Jun-19	20-Jun-19	28-Aug-19	28-Aug-19	28-Aug-19	10-Jul-19	10-Jul-19	3-Jun-19	3-Jun-19
Sample ID		JOF-BS-JOF109-31.5/34.5-20190620	JOF-BS-JOF109-36.0/39.0-20190620	JOF-BS-112-19.5/24.0-20190828	JOF-BS-DUP01-20190828 JOF-BS-112-19.5/24.0-20190828	JOF-BS-112-24.0/28.9-20190828	JOF-BS-JOF119-34.5/37.5-20190710	JOF-BS-JOF119-39.0/42.0-20190710	JOF-BS-BG01-0.0/0.5-20190603	JOF-BS-BG01-1.5/3.5-20190603
Sample Depth		31.5 - 34.5 ft	36 - 39 ft	19.5 - 24 ft	19.5 - 24 ft	24 - 28.9 ft	34.5 - 37.5 ft	39 - 42 ft	0 - 0.5 ft	1.5 - 3.5 ft
Sample Type	Units	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Validated	Field Duplicate Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Validated	Normal Environmental Sample Validated
Radiological Parameters										
Radium-226	pCi/g	2.89 +/-(0.444)	1.19 +/-(0.252)	2.45 +/-(0.336)	2.70 +/-(0.386)	3.59 +/-(0.523)	0.416 +/-(0.124)	0.363 +/-(0.101)	1.03 +/-(0.252)	0.760 +/-(0.210)
Radium-228	pCi/g	0.458 +/-(0.304)	0.230 +/-(0.161)	0.0485 +/-(0.284)U	0.183 +/-(0.260)U	0.167 +/-(0.294)U	0.380 +/-(0.147)	0.428 +/-(0.122)	0.956 +/-(0.286)	1.09 +/-(0.248)
Radium-226+228	pCi/g	3.35 +/-(0.538)	1.42 +/-(0.299)	2.50 +/-(0.440)J	2.88 +/-(0.465)J	3.76 +/-(0.600)J	0.796 +/-(0.192)	0.791 +/-(0.158)	1.99 +/-(0.381)	1.85 +/-(0.325)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG01	JOF-BG02						JOF-BG03	
Sample Date		3-Jun-19	24-May-19	22-May-19	22-May-19	22-May-19	22-May-19	22-May-19	29-May-19	29-May-19
Sample ID		JOF-BS-BG01-6.5/8.5-20190603	JOF-BS-BG02-0.0/0.5-20190524	JOF-BS-BG02-0.0/2.2-20190522	JOF-BS-BG02-6.5/8.5-20190522	JOF-BS-BG02-11.5/13.5-20190522	JOF-BS-BG02-16.5/18.5-20190522	JOF-BS-BG02-21.5/23.5-20190522	JOF-BS-BG03-0.0/0.5-20190529	JOF-BS-BG03-1.5/3.5-20190529
Sample Depth		6.5 - 8.5 ft	0 - 0.5 ft	0 - 2.2 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft	0 - 0.5 ft	1.5 - 3.5 ft
Sample Type	Units	Normal Environmental Sample Validated	Normal Environmental Sample Final-Verified	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated
Radiological Parameters										
Radium-226	pCi/g	1.39 +/-(0.373)	1.38 +/-(0.364)	1.62 +/-(0.365)J	1.22 +/-(0.279)J	1.08 +/-(0.250)J	0.733 +/-(0.184)J	0.545 +/-(0.142)J	1.03 +/-(0.271)	1.06 +/-(0.277)
Radium-228	pCi/g	0.357 +/-(0.468)U	1.24 +/-(0.389)	1.64 +/-(0.334)	1.22 +/-(0.361)	1.06 +/-(0.359)	0.636 +/-(0.181)	0.498 +/-(0.139)	1.04 +/-(0.318)	1.36 +/-(0.325)
Radium-226+228	pCi/g	1.75 +/-(0.598)J	2.62 +/-(0.533)	3.26 +/-(0.495)J	2.44 +/-(0.456)J	2.14 +/-(0.437)J	1.37 +/-(0.258)J	1.04 +/-(0.199)J	2.07 +/-(0.418)	2.42 +/-(0.427)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG03			JOF-BG04					
Sample Date		29-May-19	29-May-19	29-May-19	29-May-19	29-May-19	29-May-19	29-May-19	29-May-19	29-May-19
Sample ID		JOF-BS-BG03-6.5/8.5-20190529	JOF-BS-BG03-11.5/13.5-20190529	JOF-BS-BG03-16.5/18.5-20190529	JOF-BS-BG04-0.0/0.5-20190529	JOF-BS-DUP01-20190529 JOF-BS-BG04-0.0/0.5-20190529	JOF-BS-BG04-1.5/3.5-20190529	JOF-BS-BG04-6.5/8.5-20190529	JOF-BS-BG04-11.5/13.5-20190529	JOF-BS-BG04-16.5/18.5-20190529
Sample Depth		6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	0 - 0.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft
Sample Type	Units	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Field Duplicate Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated
Radiological Parameters										
Radium-226	pCi/g	0.722 +/-(0.233)	0.923 +/-(0.236)	0.659 +/-(0.149)	0.858 +/-(0.218)	0.864 +/-(0.254)	0.872 +/-(0.230)	1.16 +/-(0.292)	0.999 +/-(0.219)	0.988 +/-(0.198)
Radium-228	pCi/g	1.05 +/-(0.306)	0.452 +/-(0.257)	0.591 +/-(0.181)	0.652 +/-(0.253)J	1.10 +/-(0.329)J	0.962 +/-(0.265)	1.36 +/-(0.368)	0.943 +/-(0.381)	1.55 +/-(0.325)
Radium-226+228	pCi/g	1.77 +/-(0.385)	1.38 +/-(0.349)	1.25 +/-(0.234)	1.51 +/-(0.334)J	1.96 +/-(0.416)J	1.83 +/-(0.351)	2.52 +/-(0.470)	1.94 +/-(0.439)	2.54 +/-(0.381)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG04		JOF-BG05				JOF-BG06		
Sample Date		29-May-19	29-May-19	24-May-19	24-May-19	24-May-19	24-May-19	30-May-19	30-May-19	30-May-19
Sample ID		JOF-BS-BG04-21.5/23.5-20190529	JOF-BS-BG04-25.0/28.5-20190529	JOF-BS-BG05-0.0/0.5-20190524	JOF-BS-BG05-1.5/3.5-20190524	JOF-BS-BG05-6.5/8.5-20190524	JOF-BS-BG05-11.5/13.5-20190524	JOF-BS-BG06-0.0/0.5-20190530	JOF-BS-BG06-1.5/3.5-20190530	JOF-BS-BG06-6.5/8.5-20190530
Sample Depth		21.5 - 23.5 ft	25 - 28.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft
Sample Type	Units	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified
Radiological Parameters										
Radium-226	pCi/g	1.26 +/-(0.269)	0.640 +/-(0.172)	1.23 +/-(0.361)	1.19 +/-(0.245)	1.73 +/-(0.366)	1.03 +/-(0.247)	1.25 +/-(0.273)	1.72 +/-(0.407)	1.06 +/-(0.265)
Radium-228	pCi/g	0.813 +/-(0.282)	0.273 +/-(0.143)U	1.33 +/-(0.568)	1.39 +/-(0.325)	1.62 +/-(0.470)	1.15 +/-(0.306)	1.32 +/-(0.312)	1.88 +/-(0.466)	1.19 +/-(0.293)
Radium-226+228	pCi/g	2.07 +/-(0.390)	0.913 +/-(0.224)J	2.56 +/-(0.673)	2.58 +/-(0.407)	3.35 +/-(0.596)	2.18 +/-(0.393)	2.57 +/-(0.415)	3.60 +/-(0.619)	2.25 +/-(0.395)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG06							JOF-BG07	
Sample Date		30-May-19	30-May-19	30-May-19	30-May-19	31-May-19	31-May-19	31-May-19	4-Jun-19	4-Jun-19
Sample ID		JOF-BS-BG06-11.5/13.5-20190530	JOF-BS-BG06-16.5/18.5-20190530	JOF-BS-BG06-21.5/23.5-20190530	JOF-BS-BG06-26.5/28.5-20190530	JOF-BS-BG06-31.5/33.5-20190531	JOF-BS-BG06-36.5/38.5-20190531	JOF-BS-BG06-40.0/41.5-20190531	JOF-BS-BG07-0.0/0.5-20190604	JOF-BS-BG07-1.5/3.5-20190604
Sample Depth		11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft	26.5 - 28.5 ft	31.5 - 33.5 ft	36.5 - 38.5 ft	40 - 41.5 ft	0 - 0.5 ft	1.5 - 3.5 ft
Sample Type	Units	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified
Radiological Parameters										
Radium-226	pCi/g	0.933 +/-(0.197)	0.840 +/-(0.238)	1.22 +/-(0.327)	1.21 +/-(0.250)	0.991 +/-(0.277)	1.25 +/-(0.289)	1.41 +/-(0.326)	1.13 +/-(0.266)	1.67 +/-(0.415)
Radium-228	pCi/g	1.19 +/-(0.216)	1.11 +/-(0.378)	0.356 +/-(0.207)	1.20 +/-(0.321)	1.07 +/-(0.338)	1.23 +/-(0.417)	1.04 +/-(0.361)	1.14 +/-(0.341)	1.67 +/-(0.459)
Radium-226+228	pCi/g	2.12 +/-(0.292)	1.95 +/-(0.447)	1.58 +/-(0.387)	2.41 +/-(0.407)	2.06 +/-(0.437)	2.48 +/-(0.507)	2.45 +/-(0.486)	2.27 +/-(0.432)	3.34 +/-(0.619)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG07				JOF-BG08				
Sample Date		4-Jun-19	4-Jun-19	4-Jun-19	4-Jun-19	24-May-19	22-May-19	22-May-19	22-May-19	22-May-19
Sample ID		JOF-BS-BG07-6.5/8.5-20190604	JOF-BS-BG07-11.5/13.5-20190604	JOF-BS-BG07-16.5/18.5-20190604	JOF-BS-BG07-21.5/23.3-20190604	JOF-BS-BG08-0.0/0.5-20190524	JOF-BS-BG08-1.5/3.5-20190522	JOF-BS-BG08-6.5/8.5-20190522	JOF-BS-BG08-11.5/13.5-20190522	JOF-BS-BG08-15.0/17.0-20190522
Sample Depth		6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.3 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	15 - 17 ft
Sample Type	Units	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated
Radiological Parameters										
Radium-226	pCi/g	1.34 +/-(0.415)	1.35 +/-(0.322)	1.19 +/-(0.232)	1.02 +/-(0.294)	1.19 +/-(0.307)	1.14 +/-(0.268)J	1.06 +/-(0.274)J	0.818 +/-(0.229)J	0.828 +/-(0.212)J
Radium-228	pCi/g	0.602 +/-(0.394)	1.78 +/-(0.375)	1.24 +/-(0.303)	1.36 +/-(0.329)	1.77 +/-(0.383)	1.36 +/-(0.508)	1.52 +/-(0.421)	1.02 +/-(0.258)	0.552 +/-(0.348)
Radium-226+228	pCi/g	1.94 +/-(0.572)	3.13 +/-(0.494)	2.43 +/-(0.382)	2.38 +/-(0.441)	2.96 +/-(0.491)	2.50 +/-(0.574)J	2.58 +/-(0.502)J	1.84 +/-(0.345)J	1.38 +/-(0.407)J

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG09		JOF-BG10				JOF-BG11		
Sample Date		23-Aug-19	23-Aug-19	24-May-19	23-May-19	23-May-19	23-May-19	24-May-19	23-May-19	23-May-19
Sample ID		JOF-BS-BG09-1.5/3.5-20190823	JOF-BS-BG09-5.9/7.9-20190823	JOF-BS-BG10-0.0/0.5-20190524	JOF-BS-BG10-1.5/3.5-20190523	JOF-BS-BG10-6.5/8.5-20190523	JOF-BS-BG10-11.5/13.5-20190523	JOF-BS-BG11-0.0/0.5-20190524	JOF-BS-BG11-1.5/3.5-20190523	JOF-BS-BG11-6.5/8.5-20190523
Sample Depth		1.5 - 3.5 ft	5.9 - 7.9 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft
Sample Type	Units	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Validated	Normal Environmental Sample Final-Verified	Normal Environmental Sample Validated	Normal Environmental Sample Validated
Radiological Parameters										
Radium-226	pCi/g	0.981 +/-(0.253)	1.16 +/-(0.327)	1.99 +/-(0.452)	4.07 +/-(0.660)J	18.3 +/-(2.23)J	18.1 +/-(2.15)J	1.07 +/-(0.298)	0.578 +/-(0.146)J	0.763 +/-(0.204)J
Radium-228	pCi/g	0.923 +/-(0.338)	1.74 +/-(0.391)	1.42 +/-(0.472)	1.22 +/-(0.505)	3.04 +/-(0.828)	1.85 +/-(0.814)	0.780 +/-(0.529)	0.689 +/-(0.227)	0.261 +/-(0.246)U
Radium-226+228	pCi/g	1.90 +/-(0.422)	2.90 +/-(0.510)	3.41 +/-(0.654)	5.29 +/-(0.831)J	21.3 +/-(2.38)J	20.0 +/-(2.30)J	1.85 +/-(0.607)	1.27 +/-(0.270)J	1.02 +/-(0.320)J

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location		JOF-BG12			
Sample Date		4-Jun-19	4-Jun-19	4-Jun-19	4-Jun-19
Sample ID		JOF-BS-BG12-0.0/0.5-20190604	JOF-BS-BG12-1.5/3.5-20190604	JOF-BS-BG12-6.5/8.5-20190604	JOF-BS-BG12-11.5/13.5-20190604
Sample Depth		0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft
Sample Type	Units	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified	Normal Environmental Sample Final-Verified
Radiological Parameters					
Radium-226	pCi/g	1.04 +/-(0.225)	0.570 +/-(0.177)	0.516 +/-(0.114)	0.538 +/-(0.164)
Radium-228	pCi/g	1.33 +/-(0.315)	0.236 +/-(0.187)	0.349 +/-(0.142)	0.153 +/-(0.273)U
Radium-226+228	pCi/g	2.37 +/-(0.387)	0.806 +/-(0.257)	0.865 +/-(0.182)	0.691 +/-(0.318)J

Notes:

ft	feet below ground surface
ID	identification
J	quantitation is approximate due to limitations identified during data validation
pCi/g	picoCurie per gram
U	not detected

1. Level of review is defined in the Quality Assurance Project Plan.
2. The 0-0.5 foot sample was collected using a hand auger when accessible during the drilling operations at that boring location; it may or may not have been the first sample obtained and thus could have a different sample date.

TABLE B.4 - Soil Field pH Results
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location	Sample ID	Sample Date	Sample Depth	pH (field)
				SU
JOF-109	JOF-BS-JOF109-31.5/34.5-20190620	20-Jun-19	31.5 - 34.5 ft	6.06
	JOF-BS-JOF109-36.0/39.0-20190620	20-Jun-19	36 - 39 ft	6.66
JOF-112	JOF-BS-112-19.5/24.0-20190828	28-Aug-19	19.5 - 24 ft	7.28
	JOF-BS-112-24.0/28.9-20190828	28-Aug-19	24 - 28.9 ft	7.52
JOF-119	JOF-BS-JOF119-34.5/37.5-20190710	10-Jul-19	34.5 - 37.5 ft	6.45
	JOF-BS-JOF119-39.0/42.0-20190710	10-Jul-19	39 - 42 ft	6.57
JOF-BG01	JOF-BS-BG01-0.0/0.5-20190603	3-Jun-19	0 - 0.5 ft	5.01
	JOF-BS-BG01-1.5/3.5-20190603	3-Jun-19	1.5 - 3.5 ft	4.84
	JOF-BS-BG01-6.5/8.5-20190603	3-Jun-19	6.5 - 8.5 ft	7.03
JOF-BG02	JOF-BS-BG02-0.0/0.5-20190524	24-May-19	0 - 0.5 ft	5.06
	JOF-BS-BG02-0.0/2.2-20190522	22-May-19	0 - 2.2 ft	4.86
	JOF-BS-BG02-6.5/8.5-20190522	22-May-19	6.5 - 8.5 ft	4.17
	JOF-BS-BG02-11.5/13.5-20190522	22-May-19	11.5 - 13.5 ft	4.21
	JOF-BS-BG02-16.5/18.5-20190522	22-May-19	16.5 - 18.5 ft	4.41
	JOF-BS-BG02-21.5/23.5-20190522	22-May-19	21.5 - 23.5 ft	4.72
JOF-BG03	JOF-BS-BG03-0.0/0.5-20190529	29-May-19	0 - 0.5 ft	8.21
	JOF-BS-BG03-1.5/3.5-20190529	29-May-19	1.5 - 3.5 ft	5.57
	JOF-BS-BG03-6.5/8.5-20190529	29-May-19	6.5 - 8.5 ft	5.33
	JOF-BS-BG03-11.5/13.5-20190529	29-May-19	11.5 - 13.5 ft	5.63
	JOF-BS-BG03-16.5/18.5-20190529	29-May-19	16.5 - 18.5 ft	4.89
JOF-BG04	JOF-BS-BG04-0.0/0.5-20190531	31-May-19	0 - 0.5 ft	5.88
	JOF-BS-BG04-1.5/3.5-20190529	29-May-19	1.5 - 3.5 ft	5.21
	JOF-BS-BG04-6.5/8.5-20190529	29-May-19	6.5 - 8.5 ft	5.24
	JOF-BS-BG04-11.5/13.5-20190529	29-May-19	11.5 - 13.5 ft	5.94
	JOF-BS-BG04-16.5/18.5-20190529	29-May-19	16.5 - 18.5 ft	5.33
	JOF-BS-BG04-21.5/23.5-20190529	29-May-19	21.5 - 23.5 ft	7.91
	JOF-BS-BG04-25.0/28.5-20190529	29-May-19	25 - 28.5 ft	6.91
JOF-BG05	JOF-BS-BG05-0.0/0.5-20190524	24-May-19	0 - 0.5 ft	4.68
	JOF-BS-BG05-1.5/3.5-20190524	24-May-19	1.5 - 3.5 ft	4.22
	JOF-BS-BG05-6.5/8.5-20190524	24-May-19	6.5 - 8.5 ft	5.16
	JOF-BS-BG05-11.5/13.5-20190524	24-May-19	11.5 - 13.5 ft	5.41
JOF-BG06	JOF-BS-BG06-0.0/0.5-20190530	30-May-19	0 - 0.5 ft	4.62
	JOF-BS-BG06-1.5/3.5-20190530	30-May-19	1.5 - 3.5 ft	4.46
	JOF-BS-BG06-6.5/8.5-20190530	30-May-19	6.5 - 8.5 ft	5.18
	JOF-BS-BG06-11.5/13.5-20190530	30-May-19	11.5 - 13.5 ft	5.87
	JOF-BS-BG06-16.5/18.5-20190530	30-May-19	16.5 - 18.5 ft	5.33
	JOF-BS-BG06-21.5/23.5-20190530	30-May-19	21.5 - 23.5 ft	4.59
	JOF-BS-BG06-26.5/28.5-20190530	30-May-19	26.5 - 28.5 ft	4.75
	JOF-BS-BG06-31.5/33.5-20190531	31-May-19	31.5 - 33.5 ft	4.99
	JOF-BS-BG06-36.5/38.5-20190531	31-May-19	36.5 - 38.5 ft	5.27
	JOF-BS-BG06-40.0/41.5-20190531	31-May-19	40 - 41.5 ft	5.81
JOF-BG07	JOF-BS-BG07-0.0/0.5-20190604	4-Jun-19	0 - 0.5 ft	4.50
	JOF-BS-BG07-1.5/3.5-20190604	4-Jun-19	1.5 - 3.5 ft	4.82
	JOF-BS-BG07-6.5/8.5-20190604	4-Jun-19	6.5 - 8.5 ft	5.35
	JOF-BS-BG07-11.5/13.5-20190604	4-Jun-19	11.5 - 13.5 ft	5.16
	JOF-BS-BG07-16.5/18.5-20190604	4-Jun-19	16.5 - 18.5 ft	5.29
	JOF-BS-BG07-21.5/23.3-20190604	4-Jun-19	21.5 - 23.3 ft	5.11

See notes on last page.

TABLE B.4 - Soil Field pH Results
Johnsonville Fossil Plant
May 2019 - August 2019

Sample Location	Sample ID	Sample Date	Sample Depth	pH (field)
				SU
JOF-BG08	JOF-BS-BG08-0.0/0.5-20190524	24-May-19	0 - 0.5 ft	5.51
	JOF-BS-BG08-1.5/3.5-20190522	22-May-19	1.5 - 3.5 ft	5.11
	JOF-BS-BG08-6.5/8.5-20190522	22-May-19	6.5 - 8.5 ft	5.58
	JOF-BS-BG08-11.5/13.5-20190522	22-May-19	11.5 - 13.5 ft	6.50
	JOF-BS-BG08-15.0/17.0-20190522	22-May-19	15 - 17 ft	6.28
JOF-BG09	JOF-BS-BG09-0.0/0.5-20190823	23-Aug-19	0 - 0.5 ft	6.24
	JOF-BS-BG09-1.5/3.5-20190823	23-Aug-19	1.5 - 3.5 ft	4.60
	JOF-BS-BG09-5.9/7.9-20190823	23-Aug-19	5.9 - 7.9 ft	5.55
JOF-BG10	JOF-BS-BG10-0.0/0.5-20190524	24-May-19	0 - 0.5 ft	7.32
	JOF-BS-BG10-1.5/3.5-20190523	23-May-19	1.5 - 3.5 ft	4.83
	JOF-BS-BG10-6.5/8.5-20190523	23-May-19	6.5 - 8.5 ft	3.44
	JOF-BS-BG10-11.5/13.5-20190523	23-May-19	11.5 - 13.5 ft	3.37
JOF-BG11	JOF-BS-BG11-0.0/0.5-20190524	24-May-19	0 - 0.5 ft	6.45
	JOF-BS-BG11-1.5/3.5-20190523	23-May-19	1.5 - 3.5 ft	4.56
	JOF-BS-BG11-6.5/8.5-20190523	23-May-19	6.5 - 8.5 ft	4.86
JOF-BG12	JOF-BS-BG12-0.0/0.5-20190604	4-Jun-19	0 - 0.5 ft	4.97
	JOF-BS-BG12-1.5/3.5-20190604	4-Jun-19	1.5 - 3.5 ft	6.26
	JOF-BS-BG12-6.5/8.5-20190604	4-Jun-19	6.5 - 8.5 ft	6.51
	JOF-BS-BG12-11.5/13.5-20190604	4-Jun-19	11.5 - 13.5 ft	6.46

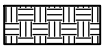
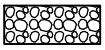
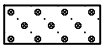
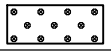
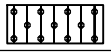
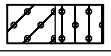
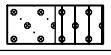
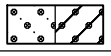
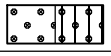
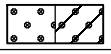
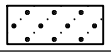
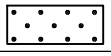
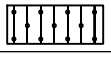
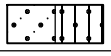
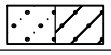
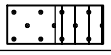
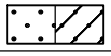
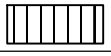
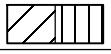
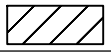
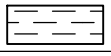
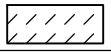
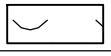
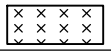
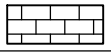
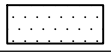
Notes:

ft	feet below ground surface
ID	identification
SU	Standard Unit

APPENDIX C - SUBSURFACE LOGS

Subsurface Boring Legend

Lithology Graphics

Symbol	Lithology
	Fill
	Top Soil
	Gravel
	Well Graded Gravel (GW)
	Poorly Graded Gravel (GP)
	Silty Gravel (GM)
	Silty, Clayey Gravel (GC-GM)
	Clayey Gravel (GC)
	Well Graded Gravel with Silt (GW-GM)
	Well Graded Gravel with Clay (GW-GC)
	Poorly Graded Gravel with Silt (GP-GM)
	Poorly Graded Gravel with Clay (GP-GC)
	Well Graded Sand (SW)
	Poorly Graded Sand (SP)
	Silty Sand (SM)
	Silty, Clayey Sand (SC-SM)
	Clayey Sand (SC)
	Well Graded Sand with Silt (SW-SM)
	Well Graded Sand with Clay (SW-SC)
	Poorly Graded Sand with Silt (SP-SM)
	Poorly Graded Sand with Clay (SP-SC)
	Silt (ML)
	Silty Clay (CL-ML)
	Lean Clay (CL)
	Organic Silt (OL)
	Elastic Silt (MH)
	Fat Clay (CH)
	Organic Clay (OH)
	Shale
	Siltstone
	Coal
	Limestone
	Sandstone

Lithology Graphics are based on TVA drafting standards.

Other Graphics

Symbol	Description
	Denotes environmental analytical sample interval
	Denotes SS sample interval
	Denotes ST sample interval
	Denotes DP sample interval
	Denotes RS sample interval
	Denotes RC sample interval
	First water level reading
	Second water level reading

Common Abbreviations

Abbreviation	Definition
DP	Direct Push
HA	Hand Auger
HSA	Hollow Stem Auger
N/A	Not Applicable
NR	Not Recorded
RC	Rock Core
RQD	Rock Quality Designation
RS	Rotary Sonic
SS	Split Spoon
ST	Shelby Tube
WH	Weight of Hammer
WR	Weight of Rod

General Notes

The boring logs include sample numbering used during drilling. For assigned Environmental Analytical Sample ID numbers, see relevant Environmental Chain-of- Custody forms from the drilling date range listed on each log.

For pH readings and additional field data, see applicable field documentation (e.g., Soil pH Data Form) from the drilling date range listed on each log.

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-109**
Client	Tennessee Valley Authority	Boring Location	605,123.62 N; 1,413,243.55 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	382.8 ft
Project Name	JOF TDEC Order	Date Started	6/19/19
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water	N/A
Inspector	C. Burton	Logger	C. Burton
Drilling Contractor	Stantec Consulting Services Inc.	Drill Rig Type and ID	CME 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-1/4" HSA, 2" SS w/o liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	8-1/4" HSA overdrill of boring	Overdrill Depth	41.0 ft
Sampler Hammer Type	Automatic	Weight	140 lb
Drop	30"	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	K. Carey	Approved By	L. Tucker

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	382.8		Top of Hole						
0.1	382.7		Topsoil						
			SILTY LEAN CLAY WITH SAND, CL, 2.5Y 8/3 (pale brown) to 2.5Y 8/2 (pale brown), non to low plasticity, medium firm, moist, [FILL]		SS01G	0.0 - 1.5	0.0 - 1.5	0.9	5-7-7
1.5	381.3		SILTY LEAN CLAY WITH GRAVEL, CL, 10YR 4/2 (dark grayish brown) to 10YR 5/2 (grayish brown), low plasticity, firm, [FILL]		SS02G	1.5 - 3.0	1.5 - 3.0	0.1	6-7-7
					SS03G	3.0 - 4.5	3.0 - 4.5	0.5	3-2-2
4.5	378.3		CLAYEY SILT, CL-ML, 7.5YR 4/2 (brown), low plasticity, very soft to very hard, moist, [FILL]		SS04G	4.5 - 6.0	4.5 - 6.0	0.3	1-WH-WH
					SS05G	6.0 - 7.5	6.0 - 7.5	0.3	WH-WH-1
7.7	375.1				SS06aG	7.5 - 7.7	7.5 - 9.0	0.9	1-4-12
					SS06bG	7.7 - 9.0			
9.0	373.8		SILTY LEAN CLAY WITH GRAVEL, CL, 7.5YR 5/6 (strong brown) to 10YR 5/1 (gray), non-plastic, hard, moist						
			POORLY GRADED GRAVEL WITH CLAY, GC, 10YR 5/8 (yellowish brown) to 10YR 7/1 (light gray), non-plastic, very dense		SS07G	9.0 - 10.2	9.0 - 10.2	1.0	21-40-50/2"
					SS08G	10.5 - 11.2	10.5 - 11.2	0.7	46-50/2"
					SS09G	12.0 - 13.1	12.0 - 13.1	0.7	29-21-50/1"
					SS10G	13.5 - 14.4	13.5 - 14.4	0.9	40-50/5"
					SS11G	15.0 - 15.4	15.0 - 15.4	0.4	50/5"
					SS12G	16.5 - 16.9	16.5 - 16.9	0.4	50/5"

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC SUBSURF DT 20190530.GDT 8/27/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **JOF-109**
Client: Tennessee Valley Authority
Boring Location: 605,123.62 N; 1,413,243.55 E NAD27 Plant Local
Project Number: 175568286
Surface Elevation: 382.8 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
18			POORLY GRADED GRAVEL WITH CLAY, GC, 10YR 5/8 (yellowish brown) to 10YR 7/1 (light gray), non-plastic, very dense *(Continued)*		SS13G	18.0 - 19.5	18.0 - 19.5	1.3	40-47-48
19									
20					SS14G	19.5 - 21.0	19.5 - 21.0	1.3	41-31-30
21									
22					SS15G	21.0 - 22.5	21.0 - 22.5	0.6	42-32-34
23					SS16G	22.5 - 24.0	22.5 - 24.0	0.6	14-29-49
24									
25					SS17G	24.0 - 25.2	24.0 - 25.2	0.8	48-42-50/2"
26					SS18G	25.5 - 27.0	25.5 - 27.0	1.5	47-43-25
27	27.0	355.8							
28			POORLY GRADED GRAVEL WITH CLAY WITH SAND, GP-GC, 10YR 5/6 (yellowish brown) to 10YR 8/1 (white), very dense, moist		SS19G	27.0 - 28.5	27.0 - 28.5	1.4	18-17-19
29					SS20G	28.5 - 30.0	28.5 - 30.0	0.7	17-17-13
30									
31					SS21G	30.0 - 31.5	30.0 - 31.5	1.1	14-23-35
32				31.5/34.5-20190620	SS22E	31.5 - 33.0	31.5 - 33.0	0.8	12-12-20
33									
34					SS23E	33.0 - 34.5	33.0 - 34.5	0.9	16-44-38
35					SS24G	34.5 - 36.0	34.5 - 36.0	1.1	14-16-30
36				36.0/39.0-20190620					
37					SS25E	36.0 - 37.5	36.0 - 37.5	1.0	25-16-10
38					SS26E	37.5 - 39.0	37.5 - 39.0	0.4	30-24-16
39									
40					SS27G	39.0 - 40.5	39.0 - 40.5	1.3	14-17-20
41	41.1	341.7			SS28aG	40.5 - 41.1	40.5 - 42.0	1.1	15-14-7
42					SS28bG	41.1 - 42.0			

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC SUBSURF DT 20190530.GDT 8/27/20

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **JOF-109**
Client Tennessee Valley Authority
Boring Location 605,123.62 N; 1,413,243.55 E NAD27 Plant Local
Project Number 175568286
Surface Elevation 382.8 ft
Elevation Datum NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
43			SANDY LEAN CLAY WITH GRAVEL, CL, 10YR 4/6 (dark yellowish brown) to 10YR 6/3 (pale brown), low to medium plasticity, very soft to very hard, moist *(Continued)*		SS29G	42.0 - 43.5	42.0 - 43.5	0.9	22-13-17
44	44.0	338.8			SS30aG	43.5 - 44.0	43.5 - 45.0	1.0	13-9-11
45			FAT CLAY, CH, 10R 5/3 (weak red), medium to high plasticity, very hard, moist, iron oxide staining, Color 5G 5/2 metallic appearance on 10R 5/3		SS30bG	44.0 - 45.0			
46	46.5	336.3			SS31G	45.0 - 46.5	45.0 - 46.5	1.3	9-11-15

No Refusal /
Bottom of Hole at 46.5 Ft.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

TVA EIP BORING LOG 175568286_JOF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190530.GDT 8/27/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-112**
Client	Tennessee Valley Authority	Boring Location	604,376.52 N; 1,412,991.02 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	389.8 ft — Elevation Datum NGVD29
Project Name	JOF TDEC Order	Date Started	8/27/19 — Completed 8/27/19
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water	N/A — Date/Time N/A
Inspector	S. Stanley — Logger S. Stanley	Depth to Water	N/A — Date/Time N/A
Drilling Contractor	Stantec Consulting Services Inc.	Drill Rig Type and ID	CME 1050, #952
Overburden Drilling and Sampling Tools (Type and Size)	4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	8-1/4" HSA overdrill of boring	Overdrill Depth	30.9 ft
Sampler Hammer Type	Automatic — Weight 140 lb — Drop 30"	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Snider	Approved By	L. Tucker

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	389.8		Top of Hole						
0.5	389.3		Crushed stone						
			SANDY LEAN CLAY LITTLE GRAVEL, CL, 7.5YR 5/8 (strong brown), low to medium plasticity, very hard, dry, [FILL]		SS01G	0.0 - 1.5	0.0 - 1.5	1.2	28-14-9
			Rock in SS02 from 1.5' to 3.0'		SS02G	1.5 - 3.0	1.5 - 3.0	0.4	8-7-6
4.0	385.8				SS03G	3.0 - 4.5	3.0 - 4.5	1.0	7-3-4
4.5	385.3		SANDY LEAN CLAY LITTLE GRAVEL, CL, 7.5YR 5/2 (brown), low to medium plasticity, firm, moist						
			SANDY LEAN CLAY LITTLE GRAVEL, CL, 7.5YR 5/8 (strong brown), low to medium plasticity, firm, moist		SS04G	4.5 - 6.0	4.5 - 6.0	1.2	4-2-3
7.2	382.6				SS05G	6.0 - 7.5	6.0 - 7.5	1.2	3-3-2
7.5	382.3		CLAYEY SILT TRACE SAND, CL-ML, 7.5YR 4/6 (strong brown), low to medium plasticity, firm, moist		SS06G	7.5 - 9.0	7.5 - 9.0	1.4	WH-1-WH
9.2	380.6		SANDY LEAN CLAY LITTLE GRAVEL, CL, 2.5YR 4/6 (red), low to medium plasticity, very soft, moist						
			SANDY LEAN CLAY LITTLE GRAVEL, CL, 2.5YR 4/6 (red), low plasticity, very soft, wet		SS07G	9.0 - 10.5	9.0 - 10.5	1.0	WH-WH-WH
					SS08G	10.5 - 12.0	10.5 - 12.0	1.2	WH-WH-2
12.5	377.3				SS09aG	12.0 - 12.5	12.0 - 13.5	1.5	10-19-35
			POORLY GRADED GRAVEL WITH SILT, GP, 7.5YR 4/6 (strong brown), non-plastic, very hard, wet, limestone rock fragments		SS09bG	12.5 - 13.5			
					SS10G	13.5 - 15.0	13.5 - 15.0	1.5	18-26-42
					SS11G	15.0 - 16.5	15.0 - 16.5	1.5	11-20-20
					SS12G	16.5 - 18.0	16.5 - 18.0	1.3	12-14-14

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC SUBSURF DT 20190530.GDT 2/20/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **JOF-112**
Client: Tennessee Valley Authority
Boring Location: 604,376.52 N; 1,412,991.02 E NAD27 Plant Local
Project Number: 175568286
Surface Elevation: 389.8 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			POORLY GRADED GRAVEL WITH SILT, GP, 7.5YR 4/6 (strong brown), non-plastic, very hard, wet, limestone rock fragments *(Continued)*		SS13G	18.0 - 19.5	1.0	9-5-8
19								
20					SS14E	19.5 - 21.0	1.3	10-10-15
21								
22					SS15E	21.0 - 22.5	1.1	16-14-11
23					SS16E	22.5 - 24.0	1.5	9-7-5
24								
25					SS17E	24.0 - 25.5	0.9	12-16-43
26					SS18E	25.5 - 26.9	1.4	27-37-50/5"
26.9	362.9							
27	27.0 362.8 27.3 362.5		Auger without sampling		SS19E	27.0 - 27.3	0.3	50/4"
28			POORLY GRADED GRAVEL WITH SILT, GP, 7.5YR 4/6 (strong brown), non-plastic, very hard, wet, limestone rock fragments					
28.5	361.3				SS20E	28.5 - 28.9	0.4	50/5"
28.9	360.9		Auger without sampling					
29								
30			POORLY GRADED GRAVEL WITH SILT, GP, 7.5YR 4/3 (brown), non-plastic, very hard, wet, limestone rock fragments		SS21G	30.0 - 30.9	0.9	40-50/5"
30.0	359.8		Auger without sampling					
30.9	358.9		POORLY GRADED GRAVEL WITH SILT, GP, 7.5YR 4/3 (brown), non-plastic, very hard, wet, limestone rock fragments					

Refusal /
Bottom of Hole at 30.9 Ft.

19.5/24.0-20190828
24.0/28.9-20190828

Permanent monitoring well JOF-112 installed in this boring following over-drilling. See JOF-112 monitoring well installation log for details.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190530.GDT 2/20/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-119**
Client	Tennessee Valley Authority	Boring Location	598,645.87 N; 1,410,031.49 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	363.4 ft
Project Name	JOF TDEC Order	Date Started	7/9/19
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water	3.7 ft
Inspector	C. Burton	Logger	C. Burton
Drilling Contractor	Stantec Consulting Services Inc.	Drill Rig Type and ID	CME 55T#1, #709
Overburden Drilling and Sampling Tools (Type and Size)	4-1/4" HSA, 2" SS w/o liners, 3" Shelby Tubes		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	8-1/4" HSA overdrill of boring	Overdrill Depth	45.0 ft
Sampler Hammer Type	Automatic	Weight	140 lb
Drop	30"	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	J. Snider	Approved By	L. Tucker
Elevation Datum	NGVD29	Completed	7/10/19
Date/Time	7/10/19 15:38	Date/Time	N/A

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	363.4		Top of Hole						
0			Crushed stone mixed with clay, [FILL]		SS01G	0.0 - 1.5	0.0 - 1.5	0.3	2-1-2
1									
2					SS02G	1.5 - 3.0	1.5 - 3.0	0.5	3-3-3
3.0	360.4								
3			FAT CLAY, CH, 10YR 4/3 (brown) with 10YR 6/1 (gray), high plasticity, firm, iron oxide staining		SS03G	3.0 - 4.5	3.0 - 4.5	1.3	2-2-5
4									
5					SS04G	4.5 - 6.0	4.5 - 6.0	0.8	4-6-6
6									
7					SS05G	6.0 - 7.5	6.0 - 7.5	1.1	3-2-4
7.5	355.9								
8			SILTY FAT CLAY, CH, 10YR 5/4 (yellowish brown), medium to high plasticity, very soft to very hard		SS06G	7.5 - 9.0	7.5 - 9.0	1.4	2-2-2
9.0	354.4								
9			SILTY FAT CLAY, CH, 10YR 5/3 (brown) to 2.5Y 6/3 (light yellowish brown), high plasticity, very soft		SS07G	9.0 - 10.5	9.0 - 10.5	1.3	1-1-1
10									
11					SS08G	10.5 - 12.0	10.5 - 12.0	1.5	3-5-7
12									
13					SS09G	12.0 - 13.5	12.0 - 13.5	1.5	3-3-5
14									
15					SS10G	13.5 - 15.0	13.5 - 15.0	1.5	3-4-7
16									
17					SS11G	15.0 - 16.5	15.0 - 16.5	1.5	4-4-5
18									
					SS12G	16.5 - 18.0	16.5 - 18.0	1.3	2-3-6

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC SUBSURF DT 20190530.GDT 2/20/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **JOF-119**
Client: Tennessee Valley Authority
Boring Location: 598,645.87 N; 1,410,031.49 E NAD27 Plant Local
Project Number: 175568286
Surface Elevation: 363.4 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
19.5	343.9		SILTY FAT CLAY, CH, 10YR 5/3 (brown) to 2.5Y 6/3 (light yellowish brown), high plasticity, very soft *(Continued)*		SS13G	18.0 - 19.5	18.0 - 19.5	1.5	5-6-10
			FAT CLAY, CH, 7.5YR 4/6 (strong brown) with 10YR 6/1 (gray), high plasticity		SS14G	19.5 - 21.0	19.5 - 21.0	1.3	7-8-10
					SS15G	21.0 - 22.5	21.0 - 22.5	1.5	7-7-9
					SS16G	22.5 - 24.0	22.5 - 24.0	1.5	4-5-4
25.5	337.9				SS17G	24.0 - 25.5	24.0 - 25.5	1.5	5-4-6
			SILTY FAT CLAY, CH, 10YR 4/1 (dark gray) with 7.5YR 5/6 (strong brown), high plasticity		SS18G	25.5 - 27.0	25.5 - 27.0	1.5	4-2-3
					SS19G	27.0 - 28.5	27.0 - 28.5	1.5	2-2-2
					SS20G	28.5 - 30.0	28.5 - 30.0	1.5	WH-WH-2
31.3	332.1				SS21aG	30.0 - 31.3	30.0 - 31.5	1.5	1-1-8
					SS21bG	31.3 - 31.5			
			POORLY GRADED GRAVEL, GP, 7.5YR 4/6 (strong brown) to 7.5YR 5/4 (brown), fine to coarse, very dense, poorly graded		SS22G	31.5 - 33.0	31.5 - 33.0	1.5	9-15-31
					SS23G	33.0 - 34.5	33.0 - 34.5	1.0	10-14-21
				34.5/37.5-20190710	SS24E	34.5 - 36.0	34.5 - 36.0	1.4	18-23-26
					SS25E	36.0 - 37.5	36.0 - 37.5	1.3	13-19-31
					SS26G	37.5 - 39.0	37.5 - 39.0	1.5	15-12-15
				39.0/42.0-20190710	SS27E	39.0 - 40.5	39.0 - 40.5	1.5	9-10-12
					SS28E	40.5 - 42.0	40.5 - 42.0	1.3	11-18-19

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC SUBSURF DT 20190530.GDT 2/20/20

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **JOF-119**
Client Tennessee Valley Authority
Boring Location 598,645.87 N; 1,410,031.49 E NAD27 Plant Local
Project Number 175568286
Surface Elevation 363.4 ft
Elevation Datum NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
43			POORLY GRADED GRAVEL, GP, 7.5YR 4/6 (strong brown) to 7.5YR 5/4 (brown), fine to coarse, very dense, poorly graded *(Continued)*		SS29G	42.0 - 43.5	42.0 - 43.5	1.5	14-11-15
44					SS30G	43.5 - 45.0	43.5 - 45.0	1.5	9-13-18
45	45.0	318.4	No Refusal / Bottom of Hole at 45.0 Ft.						

Permanent monitoring well JOF-119 installed in this boring following over-drilling. See JOF-119 monitoring well installation log for details.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

TVA EIP BORING LOG 175568286_JOF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190530.GDT 2/20/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-BG01**
Client	Tennessee Valley Authority	Boring Location	612,015.70 N; 1,422,736.85 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	402.7 ft
Project Name	JOF TDEC Order	Elevation Datum	NGVD29
Project Location	New Johnsonville, Humphreys Co., TN	Date Started	6/3/19
Inspector	D. Mihalek	Completed	6/3/19
Logger	D. Mihalek	Depth to Water / Date/Time	N/A / N/A
Drilling Contractor	Geo Logic (Subcontractor)	Depth to Water / Date/Time	N/A / N/A
Drill Rig Type and ID	GEOPROBE 6610		
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	2" Direct Push Liner		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	N/A	Weight / Drop / Efficiency	N/A / N/A / N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	K. Carey	Approved By	P. Dunne

Lithology Depth Ft[3]	Elevation	Graphic	Description	Overburden: / Rock Core:	Sample[1,2]	Depth Ft[3] / Run Ft	Rec. Ft / Rec. %	Blows/PSI
0.0	402.7		Top of Hole					
0			SILTY SAND, SM, 10YR 8/4 (very pale brown), fine to coarse, very loose, dry, sandstone pebbles throughout		HA[4] 1.5/3.5-20190603 HA01	0.0 - 0.5	0.5	
1								
2								
3					DP01	0.5 - 5.0	4.5	N/A
4.0	398.7							
4.5	398.2		SILTY LEAN CLAY, CL, 2.5Y 8/4 (pale brown), medium plasticity, soft, moist, sandstone pebbles throughout					
5								
6			FAT CLAY WITH GRAVEL, CH, 10YR 7/6 (yellow), medium to coarse, high plasticity, soft, moist					
7					6.5/8.5-20190603 DP02	5.0 - 9.8	4.8	N/A
8								
9								
9.3	393.4							
9.8	392.9		Sandstone, pale brown, very fine grained, hard, laminated, moist, flow banded, quartz					
			Bedrock Refusal / Bottom of Hole at 9.8 Ft.					
			Top of Rock = 9.3 Ft. Top of Rock Elevation = 393.4 Ft.					

0.5 - 5.0

5.0 - 9.8

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190603) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-BG02**
Client	Tennessee Valley Authority	Boring Location	604,594.94 N; 1,414,992.06 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	396.4 ft
Project Name	JOF TDEC Order	Date Started	5/22/19
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water	17.0 ft
Inspector	D. Mihalek	Logger	D. Mihalek
Drilling Contractor	Geo Logic (Subcontractor)	Drill Rig Type and ID	GEOPROBE 6610
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	2" Direct Push Liner		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	N/A	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	K. Carey	Approved By	P. Dunne

Depth Ft[3]	Elevation	Graphic	Description	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
				Overburden:			
				Rock Core:	RQD %	Rec. Ft	Rec. %
0.0	396.4		Top of Hole				
1.5	394.9		SILT, ML, 10YR 5/6 (yellowish brown), low plasticity, medium stiff, moist	HA[4] 0.0/2.2-20190522	HA01 0.0 - 0.5	0.5	
5.0	391.4		FAT CLAY, CH, 10YR 4/1 (dark gray), medium to high plasticity, soft, moist		DP01 0.0 - 5.0	2.2	N/A
10.0	386.4		SILTY LEAN CLAY, CL, 10YR 5/6 (yellowish brown), very fine, low plasticity, medium stiff, moist	6.5/8.5-20190522	DP02 5.0 - 10.0	5.0	N/A
15.0	381.4		SANDY SILT, ML, 7.5YR 5/8 (strong brown), non-plastic, soft, moist	11.5/13.5-20190522	DP03 10.0 - 15.0	5.0	N/A
			SILTY SAND, SM, 10YR 5/6 (yellowish brown), fine to medium, loose, wet, Groundwater encountered at 17 ft.	16.5/18.5-20190522	DP04 15.0 - 20.0	5.0	N/A

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC SUBSURF DT 20190530.GDT 1/8/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **JOF-BG02**
Client: Tennessee Valley Authority
Boring Location: 604,594.94 N; 1,414,992.06 E NAD27 Plant Local
Project Number: 175568286
Surface Elevation: 396.4 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18								
19			SILTY SAND, SM, 10YR 5/6 (yellowish brown), fine to medium, loose, wet, Groundwater encountered at 17 ft. *(Continued)*					
20.0	376.4							
20			POORLY GRADED GRAVEL, GP, 10YR 5/6 (yellowish brown), medium to coarse, loose, wet, poorly graded, Chert fragments					
21								
22				21.5/23.5-20190522	DP05	20.0 - 25.0	5.0	N/A
23								
24.0	372.4							
24			Sandstone, dark brown, very fine grained, hard, wet, quartz, Sandstone bedrock. Refusal encountered at 25 ft.					
25.0	371.4							
25			Bedrock Refusal / Bottom of Hole at 25.0 Ft.					

Top of Rock = 24.0 Ft.
Top of Rock Elevation = 372.4 Ft.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190524) sampled using hand auger

TVA EIP BORING LOG 175568286_JOF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190530.GDT 1/8/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-BG03**
Client	Tennessee Valley Authority	Boring Location	601,538.80 N; 1,415,655.31 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	392.0 ft
Project Name	JOF TDEC Order	Date Started / Completed	5/29/19 / 5/29/19
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water / Date/Time	23.0 ft / 5/29/19
Inspector / Logger	D. Mihalek / D. Mihalek	Depth to Water / Date/Time	N/A / N/A
Drilling Contractor	Geo Logic (Subcontractor)	Drill Rig Type and ID	GEOPROBE 6610
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	2" Direct Push Liner		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	N/A	Weight / Drop / Efficiency	N/A / N/A / N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	K. Carey	Approved By	P. Dunne

Lithology Depth Ft[3]	Elevation	Graphic	Description	Overburden: / Rock Core:	Sample[1,2] / RQD %	Depth Ft[3] / Run Ft	Rec. Ft / Rec. %	Blows/PSI
0.0	392.0		Top of Hole					
0			SILT, ML, 7.5YR 4/4 (brown), non-plastic, soft, dry		HA[4] HA01	0.0 - 0.5	0.5	
2.5	389.5				1.5/3.5-20190529 DP01	0.5 - 5.0	4.3	N/A
			SILTY LEAN CLAY, CL, 10YR 5/6 (yellowish brown), medium plasticity, medium stiff, moist					
7.0	385.0				6.5/8.5-20190529 DP02	5.0 - 10.0	5.0	N/A
			FAT CLAY, CH, 10YR 4/6 (dark yellowish brown), medium to high plasticity, soft, moist					
13.0	379.0				11.5/13.5-20190529 DP03	10.0 - 15.0	5.0	N/A
			SILTY GRAVEL, GM, 7.5YR 5/4 (brown), very fine to medium, loose, moist, Chert and sandstone fragments throughout.					
17.0	375.0				16.5/18.5-20190529 DP04	15.0 - 20.0	4.8	N/A

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC_SUBSURF DT 20190530.GDT 8/27/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **JOF-BG03**
Client: Tennessee Valley Authority
Boring Location: 601,538.80 N; 1,415,655.31 E NAD27 Plant Local
Project Number: 175568286
Surface Elevation: 392.0 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			WELL GRADED GRAVEL WITH SILT, GW, 7.5YR 5/6 (strong brown), medium to coarse, loose, wet, Angular chert sandstone fragments throughout. *(Continued)*					
19								
20								
21								
22					DP05	20.0 - 24.7	NR	N/A
23 ▽								
24	24.0	368.0						
	24.7	367.3	Sandstone, light brown to light pink, hard, wet, quartz, Groundwater encountered at 23 ft.					

Bedrock Refusal /
Bottom of Hole at 24.7 Ft.

Top of Rock = 24.0 Ft.
Top of Rock Elevation = 368.0 Ft.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190529) sampled using hand auger

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC SUBSURF DT 20190530.GDT 8/27/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-BG04**
Client	Tennessee Valley Authority	Boring Location	600,915.90 N; 1,416,080.08 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	405.6 ft
		Elevation Datum	NGVD29
Project Name	JOF TDEC Order	Date Started	5/29/19
		Completed	5/29/19
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water	27.0 ft
		Date/Time	5/29/19 12:53
Inspector	D. Mihalek	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Geo Logic (Subcontractor)	Drill Rig Type and ID	GEOPROBE 6610
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	2" Direct Push Liner		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	N/A	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	K. Carey	Approved By	P. Dunne

Lithology Depth Ft[3]	Elevation	Graphic	Description	Overburden: / Rock Core:	Sample[1,2] / RQD %	Depth Ft[3] / Run Ft	Rec. Ft / Rec. Ft	Blows/PSI / Rec. %
0.0	405.6		Top of Hole					
0.5	405.1		SILT WITH GRAVEL, ML, 7.5YR 4/6 (strong brown), non-plastic, soft, dry, [FILL]		HA[4] HA01	0.0 - 0.5	0.5	
2.0	403.6		GRAVELLY SILT, ML, 7.5YR 4/6 (strong brown), non-plastic, soft, dry, [FILL]					
5.0	400.6		LEAN CLAY, CL, 7.5YR 4/6 (strong brown), low to medium plasticity, medium stiff, moist		1.5/3.5-20190529 DP01	0.0 - 5.0	NR	N/A
9.0	396.6		LEAN CLAY SOME GRAVEL, CL, 10YR 5/6 (yellowish brown), medium plasticity, stiff, moist		6.5/8.5-20190529 DP02	5.0 - 10.0	5.0	N/A
11.5	394.1		FAT CLAY, CH, 10YR 5/6 (yellowish brown), medium plasticity, soft, moist					
16.5	389.1		LEAN CLAY LITTLE SAND, CL, 2.5Y 7/2 (light gray), medium plasticity, stiff, moist		11.5/13.5-20190529 DP03	10.0 - 15.0	NR	N/A
			LEAN CLAY, CL, 7.5YR 4/6 (strong brown), medium plasticity, stiff, moist, Angular sandstone fragments observed throughout.		16.5/18.5-20190529 DP04	15.0 - 20.0	5.0	N/A

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **JOF-BG04**
Client: Tennessee Valley Authority
Boring Location: 600,915.90 N; 1,416,080.08 E NAD27 Plant Local
Project Number: 175568286
Surface Elevation: 405.6 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			LEAN CLAY, CL, 7.5YR 4/6 (strong brown), medium plasticity, stiff, moist, Angular sandstone fragments observed throughout. *(Continued)*					
19								
20								
21								
22								
23	23.0	382.6		21.5/23.5-20190529	DP05	20.0 - 25.0	5.0	N/A
24			SANDY LEAN CLAY SOME GRAVEL, CL, 10YR 5/8 (yellowish brown), medium plasticity, soft, moist, Groundwater encountered at 27 ft.					
25								
26				25.0/28.5-20190529				
27 ▽					DP06	25.0 - 29.8	NR	N/A
28	28.5	377.1						
29	29.8	375.8	Sandstone, very light brown to pale gray, fine grained, hard, wet, quartz grains throughout					

Bedrock Refusal /
Bottom of Hole at 29.8 Ft.

Top of Rock = 28.5 Ft.
Top of Rock Elevation = 377.1 Ft.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190529) sampled using hand auger

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC SUBSURF DT 20190530.GDT 1/8/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-BG05**
Client	Tennessee Valley Authority	Boring Location	600,036.57 N; 1,417,116.93 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	421.0 ft
Project Name	JOF TDEC Order	Date Started / Completed	5/24/19 / 5/24/19
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water / Date/Time	N/A / N/A
Inspector / Logger	D. Mihalek / D. Mihalek	Depth to Water / Date/Time	N/A / N/A
Drilling Contractor	Geo Logic (Subcontractor)	Drill Rig Type and ID	GEOPROBE 6610
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	2" Direct Push Liner		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	N/A	Weight / Drop / Efficiency	N/A / N/A / N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	K. Carey	Approved By	P. Dunne

Lithology Depth Ft[3]	Elevation	Graphic	Description	Overburden: / Rock Core:	Sample[1,2] / RQD %	Depth Ft[3] / Run Ft	Rec. Ft / Rec. %	Blows/PSI
0.0	421.0		Top of Hole					
0.5	420.5		Topsoil		HA[4] HA01	0.0 - 0.5	0.5	
			SILT, ML, 10YR 5/3 (brown), non-plastic, soft, moist		1.5/3.5-20190524 DP01	0.0 - 5.0	NR	N/A
7.5	413.5				6.5/8.5-20190524 DP02	5.0 - 10.0	5.0	N/A
			SILTY GRAVEL WITH SAND, GM, 10YR 5/6 (yellowish brown), very fine to coarse, very loose, dry, well graded, Angular chert fragments included.					
13.5	407.5				11.5/13.5-20190524 DP03	10.0 - 14.0	4.0	N/A
14.0	407.0		Sandstone, light orange, fine, hard, dry, chert present					

Bedrock Refusal /
Bottom of Hole at 14.0 Ft.

Top of Rock = 13.5 Ft.
Top of Rock Elevation = 407.5 Ft.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190524) sampled using hand auger

TVA EIP BORING LOG 175568286_JOF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190530.GDT 1/8/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-BG06**
Client	Tennessee Valley Authority	Boring Location	599,714.21 N; 1,417,299.68 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	418.7 ft
Elevation Datum	NGVD29		
Project Name	JOF TDEC Order	Date Started	5/30/19
Completed	5/31/19		
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water	32.0 ft
Date/Time	5/31/19 10:55		
Inspector	D. Mihalek	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Geo Logic (Subcontractor)	Drill Rig Type and ID	GEOPROBE 6610
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	2" Direct Push Liner		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	N/A	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	K. Carey	Approved By	P. Dunne

Lithology Depth Ft[3]	Elevation	Graphic	Description	Overburden: / Rock Core:	Sample[1,2]	Depth Ft[3] / Run Ft	Rec. Ft / Rec. %	Blows/PSI
0.0	418.7		Top of Hole					
0.5	418.2		ORGANIC SILT, OL, 10YR 5/6 (yellowish brown), moist		HA[4] HA01	0.0 - 0.5	0.5	
1.5	417.2		SILT, ML, 10YR 5/6 (yellowish brown), non-plastic, stiff, dry		1.5/3.5-20190530 DP01	0.0 - 5.0	5.0	N/A
			SILTY LEAN CLAY, CL, 10YR 5/6 (yellowish brown), low plasticity, medium stiff, moist		6.5/8.5-20190530 DP02	5.0 - 10.0	5.0	N/A
9.0	409.7		FAT CLAY, CH, 10YR 5/4 (yellowish brown), medium to high plasticity, stiff, moist		11.5/13.5-20190530 DP03	10.0 - 15.0	5.0	N/A

TVA EIP BORING LOG 175568286_JOF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190530.GDT 1/8/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **JOF-BG06**
Client: Tennessee Valley Authority
Boring Location: 599,714.21 N; 1,417,299.68 E NAD27 Plant Local
Project Number: 175568286
Surface Elevation: 418.7 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
			FAT CLAY, CH, 10YR 5/4 (yellowish brown), medium to high plasticity, stiff, moist *(Continued)*		DP04	15.0 - 20.0	5.0	N/A
			Color change to 10YR 6/3 (pale brown), high plasticity at 20.0'		DP05	20.0 - 25.0	5.0	N/A
25.0	393.7		SILTY LEAN CLAY, CL, 7.5YR 8/2 (pinkish white), low to medium plasticity, soft, moist		DP06	25.0 - 30.0	4.9	N/A
30.0	388.7		FAT CLAY, CH, 10YR 8/4 (very pale brown), high plasticity, soft, wet, Groundwater encountered at 32 ft.		DP07	30.0 - 35.0	4.6	N/A
					DP08	35.0 - 40.0	3.2	N/A

16.5/18.5-20190530
21.5/23.5-20190530
26.5/28.5-20190530
31.5/33.5-20190531
36.5/38.5-20190531

15.0 - 20.0
20.0 - 25.0
25.0 - 30.0
30.0 - 35.0
35.0 - 40.0

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC SUBSURF DT 20190530.GDT 1/8/20

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **JOF-BG06**
Client Tennessee Valley Authority
Boring Location 599,714.21 N; 1,417,299.68 E NAD27 Plant Local
Project Number 175568286
Surface Elevation 418.7 ft
Elevation Datum NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
40								
41.0	377.7			40.0/41.5-20190531	DP09	40.0 - 41.5	1.5	N/A
41						40.0 - 41.5		
41.5	377.2		Sandstone, brown, quartz grains throughout					

Bedrock Refusal /
Bottom of Hole at 41.5 Ft.

Top of Rock = 41.0 Ft.
Top of Rock Elevation = 377.7 Ft.

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G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190530) sampled using hand auger

TVA EIP BORING LOG 175568286_JOF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190530.GDT 1/8/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-BG07**
Client	Tennessee Valley Authority	Boring Location	599,183.13 N; 1,417,833.45 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	424.1 ft
Elevation Datum	NGVD29		
Project Name	JOF TDEC Order	Date Started	6/4/19
Completed	6/4/19		
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water	N/A
Date/Time	N/A		
Inspector	D. Mihalek	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Geo Logic (Subcontractor)	Drill Rig Type and ID	GEOPROBE 6610
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	2" Direct Push Liner		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	N/A	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	K. Carey	Approved By	P. Dunne

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	424.1		Top of Hole						
0.5	423.6		SILT, ML, 7.5YR 5/4 (brown), non-plastic, very soft, dry		HA01	0.0 - 0.5		0.5	
			SILTY LEAN CLAY, CL, 10YR 5/6 (yellowish brown), non to low plasticity, medium stiff, moist		DP01	0.0 - 5.0	0.0 - 5.0	4.4	N/A
5.0	419.1		CLAYEY SILT, ML, 10YR 5/6 (yellowish brown), non-plastic, stiff, moist		DP02	5.0 - 10.0	5.0 - 10.0	5.0	N/A
			Sandstone fragments present from 9.0' to 10.0'						
11.5	412.6		LEAN CLAY, CL, 5YR 4/6 (yellowish red), medium plasticity, very stiff, moist		DP03	10.0 - 15.0	10.0 - 15.0	4.2	N/A
15.0	409.1		FAT CLAY, CH, 5YR 5/8 (yellowish red), medium to high plasticity, medium stiff, moist		DP04	15.0 - 20.0	15.0 - 20.0	5.0	N/A

HA[4] 1.5/3.5-20190604 6.5/8.5-20190604 11.5/13.5-20190604 16.5/18.5-20190604

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC SUBSURF DT 20190530.GDT 1/8/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **JOF-BG07**
Client: Tennessee Valley Authority
Boring Location: 599,183.13 N; 1,417,833.45 E NAD27 Plant Local
Project Number: 175568286
Surface Elevation: 424.1 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			FAT CLAY, CH, 5YR 5/8 (yellowish red), medium to high plasticity, medium stiff, moist *(Continued)*					
19								
20								
21								
22				21.5/23 3-20190604	DP05	20.0 - 23.3	3.3	N/A
23	401.1							
23.0								
23.3	400.8		Sandstone, dark brown, fine grained, hard, laminated, moist, quartz grains throughout					

Bedrock Refusal /
Bottom of Hole at 23.3 Ft.

Top of Rock = 23.0 Ft.
Top of Rock Elevation = 401.1 Ft.

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G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190604) sampled using hand auger

TVA EIP BORING LOG 175568286_JOF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190530.GDT 1/8/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-BG08**
Client	Tennessee Valley Authority	Boring Location	598,957.44 N; 1,412,733.58 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	396.3 ft
Project Name	JOF TDEC Order	Elevation Datum	NGVD29
Project Location	New Johnsonville, Humphreys Co., TN	Date Started	5/22/19
Inspector	D. Mihalek	Completed	5/22/19
Logger	D. Mihalek	Depth to Water	N/A
Drilling Contractor	Geo Logic (Subcontractor)	Date/Time	N/A
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners	Depth to Water	N/A
Rock Drilling and Sampling Tools (Type and Size)	2" Direct Push Liner	Date/Time	N/A
Overdrill Tooling (Type and Size)	N/A	Drill Rig Type and ID	GEOPROBE 6610
Sampler Hammer Type	N/A	Overdrill Depth	N/A
Borehole Azimuth	N/A	Weight	N/A
Reviewed By	K. Carey	Drop	N/A
		Efficiency	N/A
		Borehole Inclination (from Vertical)	N/A
		Approved By	P. Dunne

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	396.3		Top of Hole						
			SILT, ML, 5YR 5/6 (yellowish red), non-plastic, very stiff, dry		HA01	0.0 - 0.5		0.5	
					DP01	0.0 - 5.0	0.0 - 5.0	5.0	N/A
5.0	391.3								
			LEAN CLAY, CL, 5YR 5/4 (reddish brown), non to low plasticity, very stiff, moist		DP02	5.0 - 10.0	5.0 - 10.0	5.0	N/A
8.5	387.8								
			CLAYEY SILT, ML, 5YR 4/4 (reddish brown), low plasticity, stiff, moist		DP03	10.0 - 15.0	10.0 - 15.0	5.0	N/A
12.5	383.8								
			CLAYEY SAND, SC, 7.5YR 5/4 (brown), fine to medium, medium dense, moist, Fine chert fragments at 13 to 15 ft						
15.0	381.3								
			POORLY GRADED GRAVEL WITH SILT, GP, 7.5YR 5/4 (brown), very fine to coarse, loose, moist						

HA[4] 1.5/3.5-20190522

6.5/8.5-20190522

11.5/13.5-20190522

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC SUBSURF DT 20190530.GDT 1/8/20

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **JOF-BG08**
Client Tennessee Valley Authority
Boring Location 598,957.44 N; 1,412,733.58 E NAD27 Plant Local
Project Number 175568286
Surface Elevation 396.3 ft
Elevation Datum NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
16									
16.5	379.8			15.0/17.0-20190522	DP04	15.0 - 17.0	15.0 - 17.0	NR	N/A
17.0	379.3		Limestone, light gray, moist, Refusal encountered at 17 ft.						
17									

Bedrock Refusal /
Bottom of Hole at 17.0 Ft.

Top of Rock = 16.5 Ft.
Top of Rock Elevation = 379.8 Ft.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190524) sampled using hand auger

TVA EIP BORING LOG 175568286_JOF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190530.GDT 1/8/20

SUBSURFACE LOG (DRAFT)

Client Borehole ID	N/A	Stantec Boring No.	**JOF-BG09**
Client	Tennessee Valley Authority	Boring Location	594,079.91 N; 1,416,560.06 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	408.9 ft
Elevation Datum	NGVD29		
Project Name	JOF TDEC Order	Date Started	8/23/19
Completed	8/23/19		
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water	N/A
Date/Time	N/A		
Inspector	C. Burton	Logger	C. Burton
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Geo Logic (Subcontractor)	Drill Rig Type and ID	Geoprobe 6610DT
Overburden Drilling and Sampling Tools (Type and Size)	Macro Core 2.0" OD with 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	N/A	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	K. Carey	Approved By	P. Dunne

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	408.9		Top of Hole						
0.4	408.5		Topsoil		HA[4] HA01	0.0 - 0.5		0.5	
			SILTY FAT CLAY, CH, 7.5YR 4/4 (brown) with 7.5YR 7/1 (light gray), high plasticity, hard, moist, iron oxide staining, disturbed material, [FILL]						
2.5	406.4		SILTY FAT CLAY, CH, 7.5YR 4/6 (strong brown) to 10YR 7/1 (light gray), high plasticity, hard, moist		1.5/3.5-20190823 DP01	0.0 - 5.0	0.0 - 5.0	5.0	N/A
					5.9/7.9-20190823 DP02	5.0 - 8.8	5.0 - 8.8	3.8	N/A
8.8	400.1		Bedrock Refusal / Bottom of Hole at 8.8 Ft.						

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190823) sampled using hand auger

TVA EIP BORING LOG 175568286_JOF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190530.GDT 1/23/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-BG10**
Client	Tennessee Valley Authority	Boring Location	596,765.95 N; 1,415,886.62 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	374.6 ft
Project Name	JOF TDEC Order	Date Started / Completed	5/23/19 / 5/23/19
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water / Date/Time	N/A / N/A
Inspector / Logger	K. Carey / M. Reynolds	Depth to Water / Date/Time	N/A / N/A
Drilling Contractor	Geo Logic (Subcontractor)	Drill Rig Type and ID	GEOPROBE 6610
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	2" Direct Push Liner		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type / Weight / Drop / Efficiency	N/A / N/A / N/A / N/A		
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	K. Carey	Approved By	P. Dunne

Lithology Depth Ft[3]	Elevation	Graphic	Description	Overburden: / Rock Core:	Sample[1,2] / RQD %	Depth Ft[3] / Run Ft	Rec. Ft / Rec. Ft	Blows/PSI / Rec. %
0.0	374.6		Top of Hole					
0			CLAYEY SILT, ML, 7.5YR 4/6 (strong brown), non to low plasticity, medium stiff, moist		HA[4] HA01	0.0 - 0.5	0.5	
1								
2					1.5/3.5-20190523 DP01	0.0 - 5.0	4.6	N/A
3								
4								
5.0	369.6		LEAN CLAY, CL, 7.5YR 3/2 (dark brown), low to medium plasticity, medium stiff, moist					
5								
6								
7					6.5/8.5-20190523 DP02	5.0 - 10.0	4.6	N/A
8								
9								
10			Very stiff, dry at 10.0'					
11								
12					11.5/13.5-20190523 DP03	10.0 - 15.0	4.5	N/A
13								
14								
14.5	360.1							
15.0	359.6		Shale, dark black brown, very fine grained, moderately hard, thin bedded, Refusal at 15 ft.					

Bedrock Refusal /
Bottom of Hole at 15.0 Ft.

Top of Rock = 14.5 Ft.
Top of Rock Elevation = 360.1 Ft.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190524) sampled using hand auger

TVA EIP BORING LOG_175568286_JOF_TDEC_ORDER.GPJ_TDEC SUBSURF DT 20190530.GDT 1/8/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-BG11**
Client	Tennessee Valley Authority	Boring Location	596,594.13 N; 1,414,502.93 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	369.9 ft
Project Name	JOF TDEC Order	Date Started	5/23/19
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water	N/A
Inspector	D. Mihalek	Logger	D. Mihalek
Drilling Contractor	Geo Logic (Subcontractor)	Drill Rig Type and ID	GEOPROBE 6610
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	2" Direct Push Liner		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	N/A	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	K. Carey	Approved By	P. Dunne

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	369.9		Top of Hole						
			SILT, ML, 7.5YR 3/4 (dark brown), non-plastic to low plasticity, soft to stiff, moist, no staining		HA01	0.0 - 0.5		0.5	
					DP01	0.0 - 5.0	0.0 - 5.0	NR	N/A
6.0	363.9								
			SILTY GRAVEL, GM, 7.5YR 5/8 (strong brown), very fine to coarse, very loose, dry, with chert fragments		DP02	5.0 - 10.0	5.0 - 10.0	NR	N/A
9.0	360.9								
10.0	359.9		Sandstone, light gray, very coarse grained, dry, quartz grains throughout						

HA[4] 1.5/3.5-20190523

6.5/8.5-20190523

Bedrock Refusal /
Bottom of Hole at 10.0 Ft.

Top of Rock = 9.0 Ft.
Top of Rock Elevation = 360.9 Ft.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190524) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**JOF-BG12**
Client	Tennessee Valley Authority	Boring Location	594,931.66 N; 1,416,266.42 E NAD27 Plant Local
Project Number	175568286	Surface Elevation	398.7 ft
Project Name	JOF TDEC Order	Date Started / Completed	6/4/19 / 6/4/19
Project Location	New Johnsonville, Humphreys Co., TN	Depth to Water / Date/Time	N/A / N/A
Inspector / Logger	D. Mihalek / D. Mihalek	Depth to Water / Date/Time	N/A / N/A
Drilling Contractor	Geo Logic (Subcontractor)	Drill Rig Type and ID	GEOPROBE 6610
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System with 60" PVC Liners		
Rock Drilling and Sampling Tools (Type and Size)	2" Direct Push Liner		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	N/A	Weight / Drop / Efficiency	N/A / N/A / N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	K. Carey	Approved By	P. Dunne

Lithology Depth Ft[3]	Elevation	Graphic	Description	Overburden: / Rock Core:	Sample[1,2] / RQD %	Depth Ft[3] / Run Ft	Rec. Ft / Rec. Ft	Blows/PSI / Rec. %
0.0	398.7		Top of Hole					
0.5	398.2		SILT, ML, 7.5YR 6/6 (reddish yellow), non-plastic, very soft, dry		HA[4]	HA01 0.0 - 0.5	0.5	
			SILTY GRAVEL, GM, 7.5YR 4/6 (strong brown), fine to coarse, loose, dry		1.5/3.5-20190604	DP01 0.5 - 5.0	3.5	N/A
					6.5/8.5-20190604	DP02 5.0 - 10.0	2.6	N/A
9.0	389.7		SILTY SAND, SM, 7.5YR 5/8 (strong brown), fine to coarse, very loose, moist		11.5/13.5-20190604	DP03 10.0 - 13.6	2.6	N/A
13.5	385.2							
13.6	385.1		Limestone, white, very fine grained, hard, moist, calcareous					
			No Refusal / Bottom of Hole at 13.6 Ft.					
			Top of Rock = 13.5 Ft. Top of Rock Elevation = 385.2 Ft.					

0.5 - 5.0 | 5.0 - 10.0 | 10.0 - 13.6

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190604) sampled using hand auger

TVA EIP BORING LOG 175568286_JOF_TDEC_ORDER.GPJ TDEC SUBSURF DT 20190530.GDT 8/27/20

APPENDIX D – PHOTOGRAPHIC LOGS

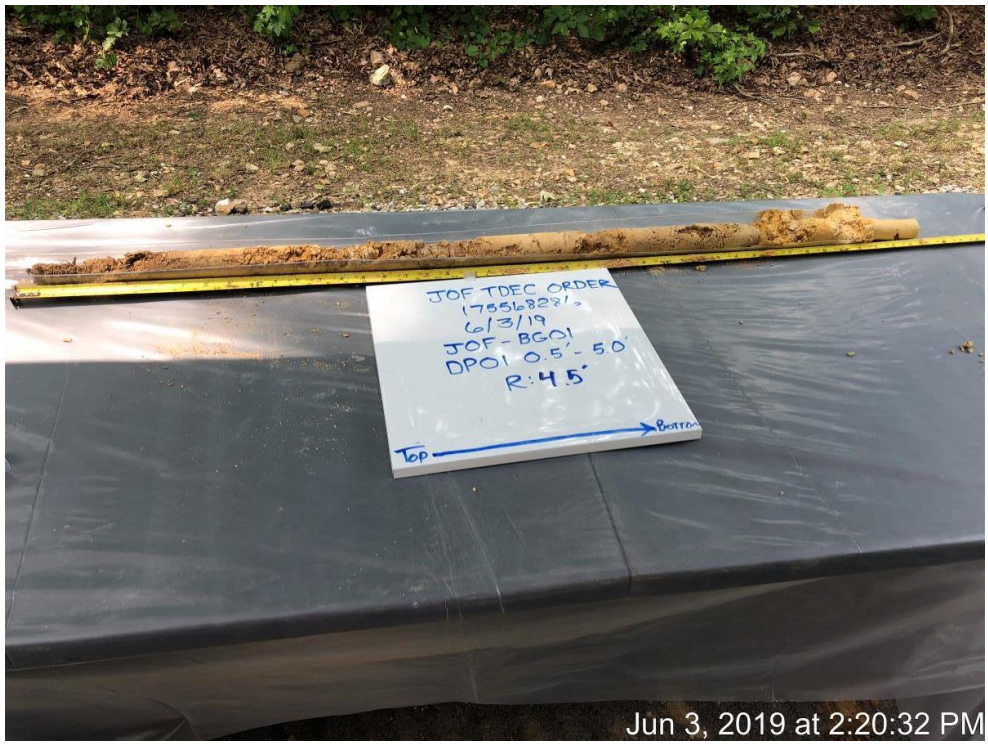
ATTACHMENT D.1

Photographic Logs of Soil Cores

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 1 **Photo Location:** JOF-BG01 **Photo Date:** 6/3/2019 **Comments:** Photo of first boring location interval (0.0-4.5 feet) unavailable. Boring refusal at 4.5 feet.	No Photo Applicable
Photograph ID: 2 **Photo Location:** JOF-BG01 **Photo Date:** 6/3/2019 **Comments:** Photo of second boring location interval (0.0-4.7 feet) unavailable. Offset 7 feet to the southwest of the first boring. Boring refusal at 4.7 feet.	No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 3 **Photo Location:** JOF-BG01 **Photo Date:** 6/3/2019 **Comments:** Third boring location interval (0.0-5.0 feet). Offset 25 feet to the west of the second boring.	
Photograph ID: 4 **Photo Location:** JOF-BG01 **Photo Date:** 6/3/2019 **Comments:** Third boring location interval (5.0-9.8 feet). Bottom depth shown on white board should be 9.8'.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 5 **Photo Location:** JOF-BG02 **Photo Date:** 5/22/2019 **Comments:** Interval (0.0-5.0 feet).	
Photograph ID: 6 **Photo Location:** JOF-BG02 **Photo Date:** 5/22/2019 **Comments:** Interval (5.0-10.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 7 **Photo Location:** JOF-BG02 **Photo Date:** 5/22/2019 **Comments:** Interval (10.0-15.0 feet). The boring ID on the white board should be JOF-BG02.	
Photograph ID: 8 **Photo Location:** JOF-BG02 **Photo Date:** 5/22/2019 **Comments:** Interval (15.0-20.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 9 **Photo Location:** JOF-BG02 **Photo Date:** 5/22/2019 **Comments:** Interval (20.0-25.0 feet). Depth shown on white board should be 20.0-25.0'.	
Photograph ID: 10 **Photo Location:** JOF-BG03 **Photo Date:** 5/29/2019 **Comments:** Interval (0.5-5.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 11 **Photo Location:** JOF-BG03 **Photo Date:** 5/29/2019 **Comments:** Interval (5.0-10.0 feet).	
Photograph ID: 12 **Photo Location:** JOF-BG03 **Photo Date:** 5/29/2019 **Comments:** Photo of interval (10.0-15.0 feet) unavailable.	No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 13 **Photo Location:** JOF-BG03 **Photo Date:** 5/29/2019 **Comments:** Interval (15.0-20.0 feet).	
Photograph ID: 14 **Photo Location:** JOF-BG03 **Photo Date:** 5/29/2019 **Comments:** Photo of interval (20.0-24.7 feet) no recovery, photo unavailable.	No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 15 **Photo Location:** JOF-BG04 **Photo Date:** 5/29/2019 **Comments:** Photo of interval (0.5-5.0 feet) unavailable.	No Photo Applicable
Photograph ID: 16 **Photo Location:** JOF-BG04 **Photo Date:** 5/29/2019 **Comments:** Interval (5.0-10.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 17 **Photo Location:** JOF-BG04 **Photo Date:** 5/29/2019 **Comments:** Photo of interval (10.0-15.0 feet) unavailable.	No Photo Applicable
Photograph ID: 18 **Photo Location:** JOF-BG04 **Photo Date:** 5/29/2019 **Comments:** Interval (15.0-20.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 19 **Photo Location:** JOF-BG04 **Photo Date:** 5/29/2019 **Comments:** Interval (20.0-25.0 feet). The boring ID on the white board should be JOF-BG04.	
Photograph ID: 20 **Photo Location:** JOF-BG04 **Photo Date:** 5/29/2019 **Comments:** Photo of interval (25.0-29.8 feet) unavailable.	No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 21 **Photo Location:** JOF-BG05 **Photo Date:** 5/24/2019 **Comments:** Photo of interval (0.5-5.0 feet) unavailable.	No Photo Applicable
Photograph ID: 22 **Photo Location:** JOF-BG05 **Photo Date:** 5/24/2019 **Comments:** Interval (5.0-10.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 23 **Photo Location:** JOF-BG05 **Photo Date:** 5/24/2019 **Comments:** Interval (10.0-14.0 feet).	
Photograph ID: 24 **Photo Location:** JOF-BG06 **Photo Date:** 5/30/2019 **Comments:** Photo of interval (0.0-5.0 feet) unavailable.	No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 25 **Photo Location:** JOF-BG06 **Photo Date:** 5/30/2019 **Comments:** Photo of interval (5.0-10.0 feet) unavailable.	No Photo Applicable
Photograph ID: 26 **Photo Location:** JOF-BG06 **Photo Date:** 5/30/2019 **Comments:** Photo of interval (10.0-15.0 feet) unavailable.	No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 27 **Photo Location:** JOF-BG06 **Photo Date:** 5/30/2019 **Comments:** Photo of interval (15.0-20.0 feet) unavailable.	No Photo Applicable
Photograph ID: 28 **Photo Location:** JOF-BG06 **Photo Date:** 5/30/2019 **Comments:** Photo of interval (20.0-25.0 feet) unavailable.	No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 29 **Photo Location:** JOF-BG06 **Photo Date:** 5/30/2019 **Comments:** Interval (25.0-30.0 feet).	
Photograph ID: 30 **Photo Location:** JOF-BG06 **Photo Date:** 5/31/2019 **Comments:** Interval (30.0-35.0 feet).	

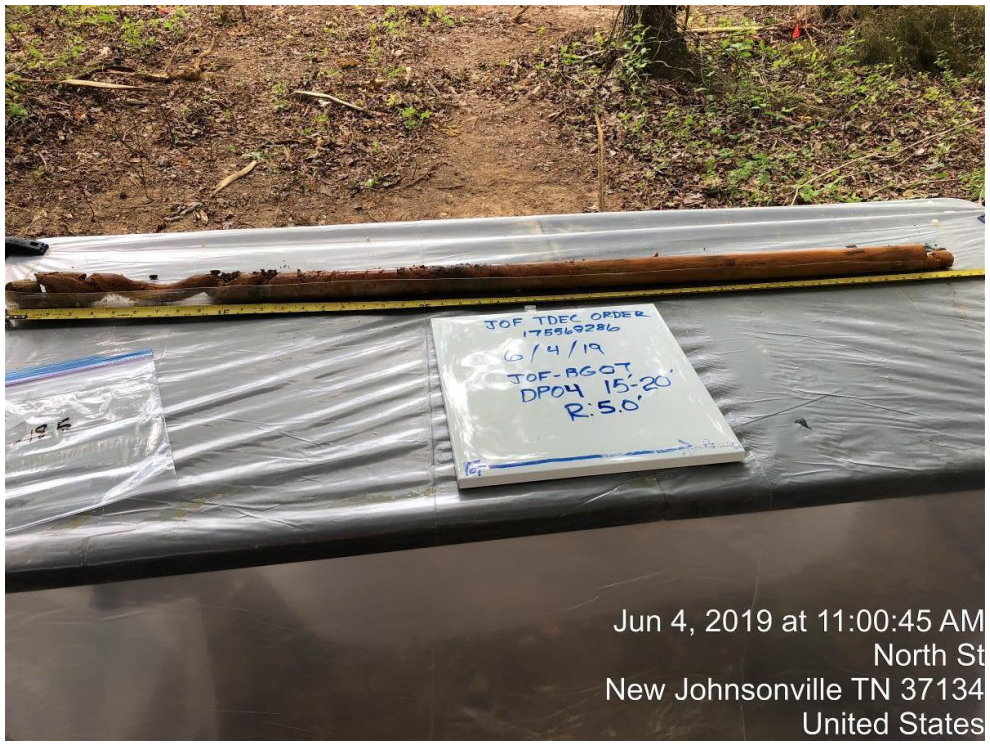
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 31 **Photo Location:** JOF-BG06 **Photo Date:** 5/31/2019 **Comments:** Interval (35.0-40.0 feet).	
Photograph ID: 32 **Photo Location:** JOF-BG06 **Photo Date:** **Comments:** Photo of interval (40.0-41.5 feet) unavailable.	No Photo Applicable

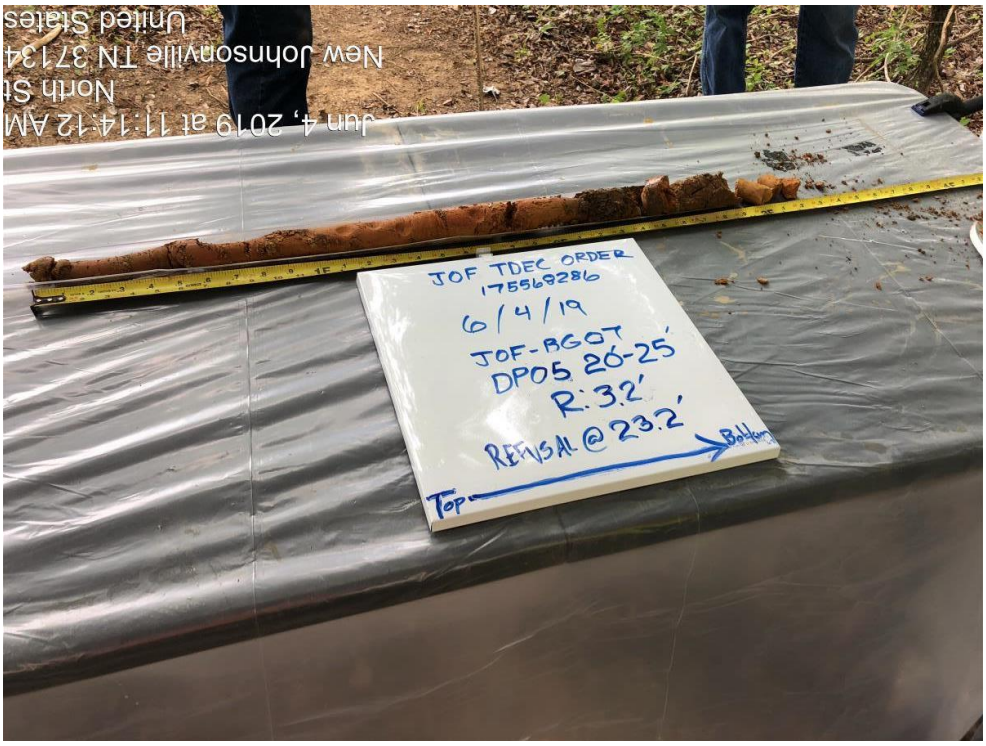
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 33 **Photo Location:** JOF-BG07 **Photo Date:** 6/4/2019 **Comments:** Interval (0.5-5.0 feet).	
Photograph ID: 34 **Photo Location:** JOF-BG07 **Photo Date:** 6/4/2019 **Comments:** Interval (5.0-10.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 35 **Photo Location:** JOF-BG07 **Photo Date:** 6/4/2019 **Comments:** Interval (10.0-15.0 feet).	
Photograph ID: 36 **Photo Location:** JOF-BG07 **Photo Date:** 6/4/2019 **Comments:** Interval (15.0-20.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 37 **Photo Location:** JOF-BG07 **Photo Date:** 6/4/2019 **Comments:** Interval (20.0-23.3 feet). Recovery and refusal depth shown on white board should be 3.3' and 23.3', respectively.	
Photograph ID: 38 **Photo Location:** JOF-BG08 **Photo Date:** 5/22/2019 **Comments:** Interval (0.0-5.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 39 **Photo Location:** JOF-BG08 **Photo Date:** 5/22/2019 **Comments:** Interval (5.0-10.0 feet).	
Photograph ID: 40 **Photo Location:** JOF-BG08 **Photo Date:** 5/22/2019 **Comments:** Interval (10.0-15.0 feet).	

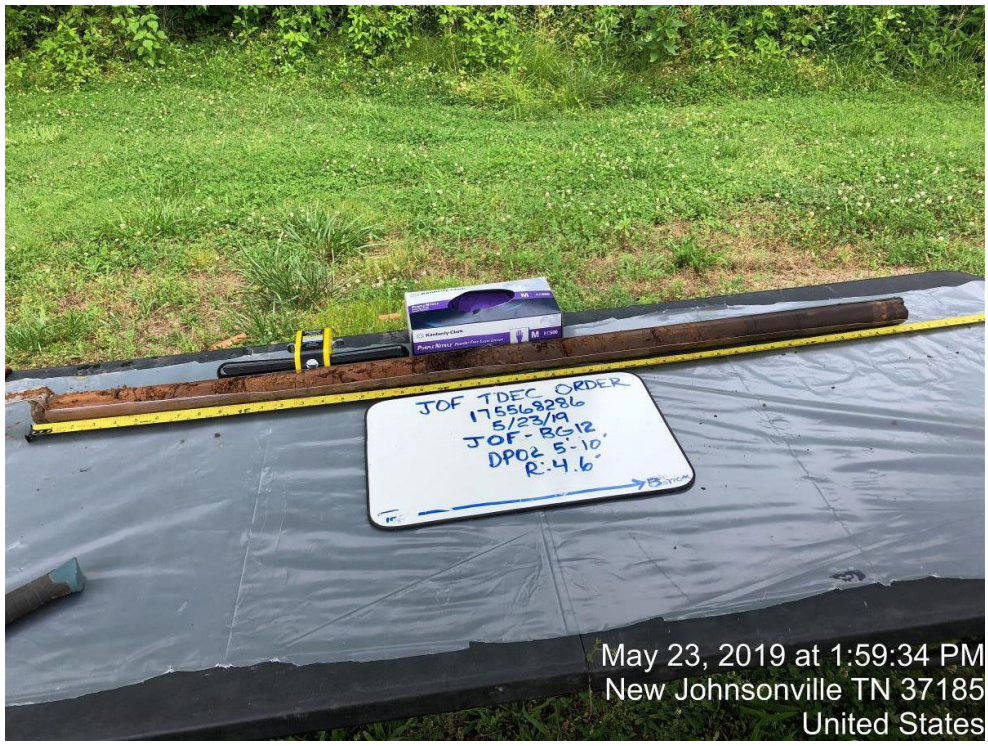
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 41 **Photo Location:** JOF-BG08 **Photo Date:** 5/22/2019 **Comments:** Photo of interval (15.0-17.0 feet) unavailable.	No Photo Applicable
Photograph ID: 42 **Photo Location:** JOF-BG09 **Photo Date:** 8/23/2019 **Comments:** Interval (0.0-5.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 43 **Photo Location:** JOF-BG09 **Photo Date:** 8/23/2019 **Comments:** Interval (5.0-8.8 feet).	
Photograph ID: 44 **Photo Location:** JOF-BG10 **Photo Date:** 5/23/2019 **Comments:** Interval (0.0-5.0 feet). The boring ID and depth interval shown on the white board should be JOF-BG10 and 0.0-5.0 feet, respectively.	

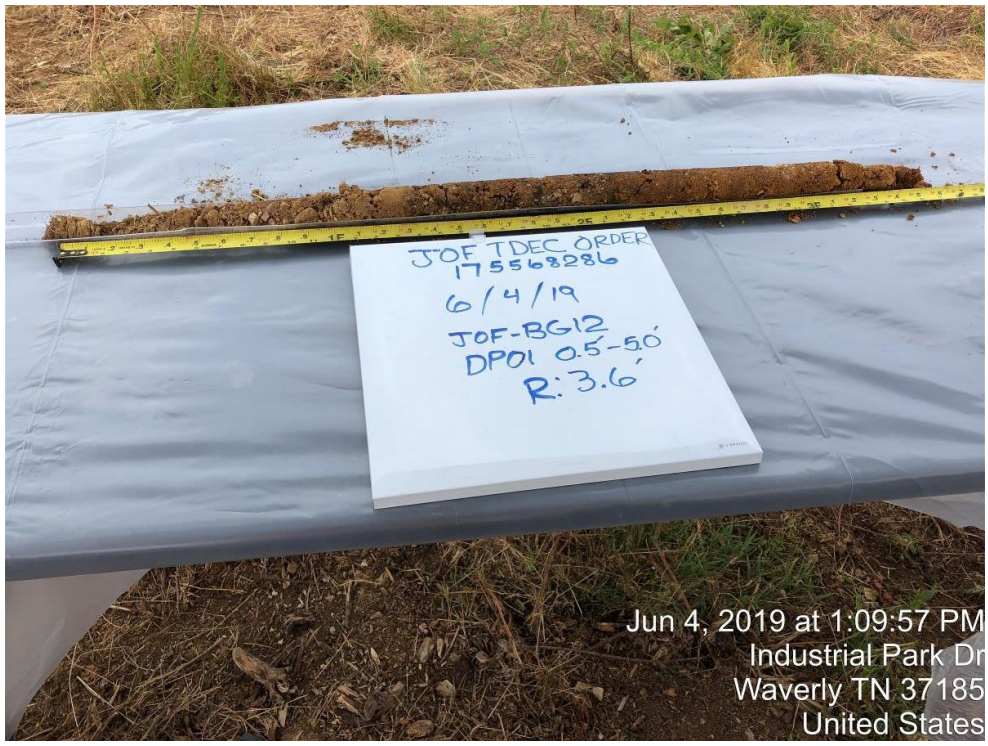
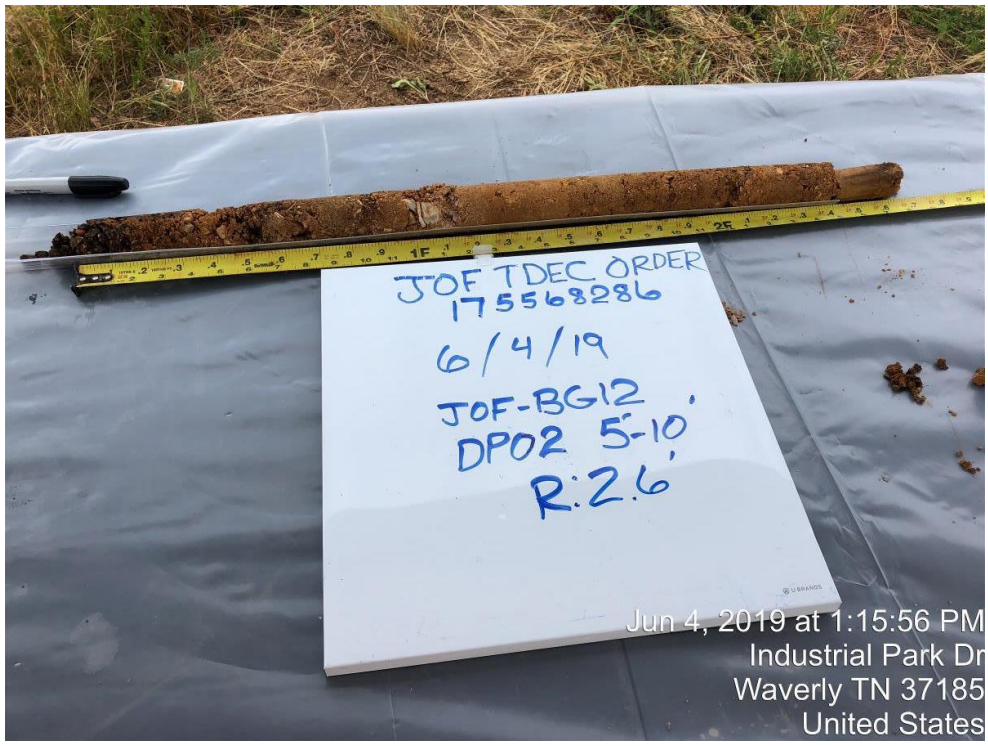
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 45 **Photo Location:** JOF-BG10 **Photo Date:** 5/23/2019 **Comments:** Interval (5.0-10.0 feet). The boring ID shown on the white board should be JOF-BG10.	
Photograph ID: 46 **Photo Location:** JOF-BG10 **Photo Date:** 5/23/2019 **Comments:** Interval (10.0-15.0 feet). The boring ID shown on the white board should be JOF-BG10.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 47 **Photo Location:** JOF-BG11 **Photo Date:** 5/23/2019 **Comments:** Photo of interval (0.0-5.0 feet) unavailable.	No Photo Applicable
Photograph ID: 48 **Photo Location:** JOF-BG11 **Photo Date:** 5/23/2019 **Comments:** Photo of interval (5.0-10.0 feet) unavailable.	No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 49 **Photo Location:** JOF-BG12 **Photo Date:** 6/4/2019 **Comments:** Interval (0.5-5.0 feet). The recovery shown on the white board should be 3.5 feet.	
Photograph ID: 50 **Photo Location:** JOF-BG12 **Photo Date:** 6/4/2019 **Comments:** Interval (5.0-10.0 feet).	

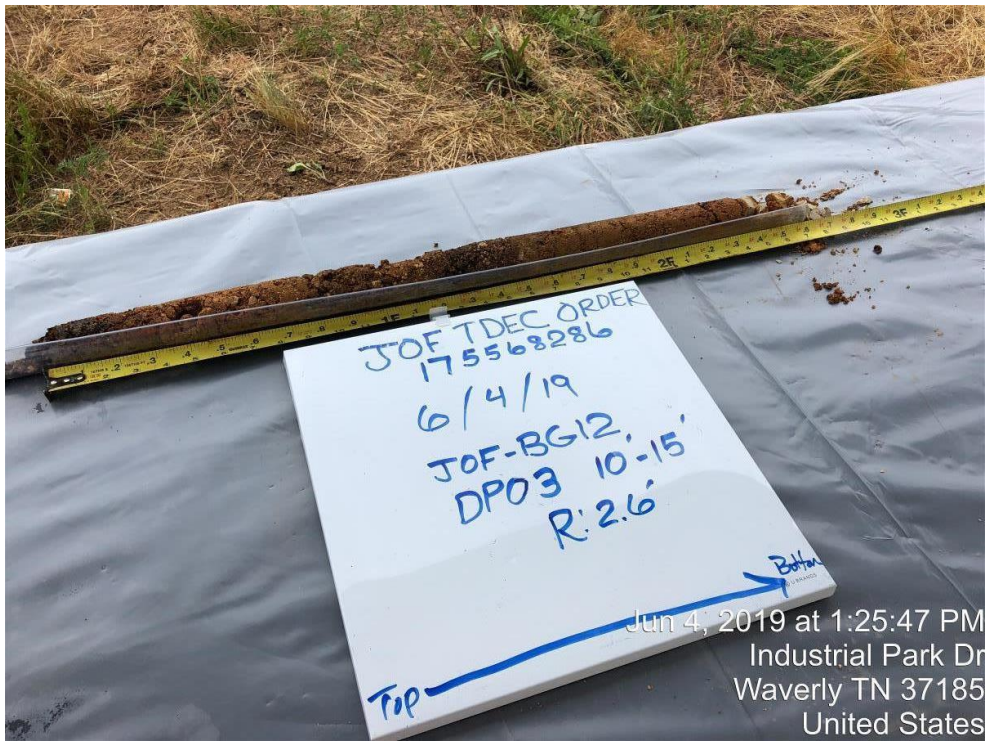
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 51

Photo Location:
JOF-BG12

Photo Date:
6/4/2019

Comments:
Interval (10.0-13.5 feet). The depth interval shown on the white board should be 10.0-13.5 feet.



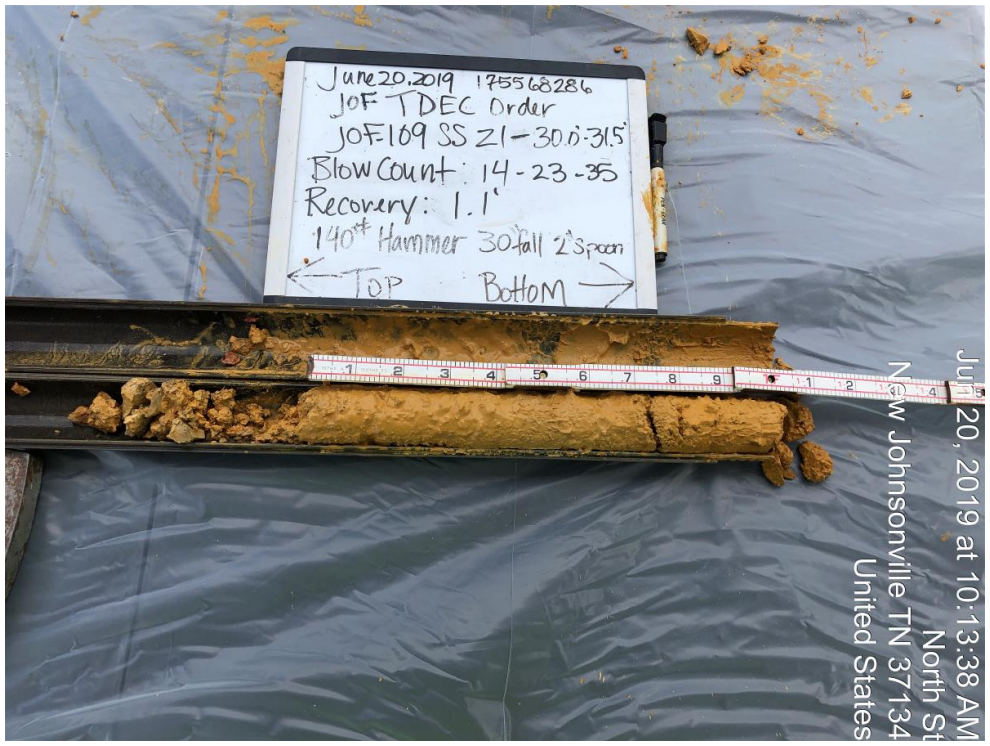
ATTACHMENT D.2

Photographic Logs of Soil Cores – Background Wells

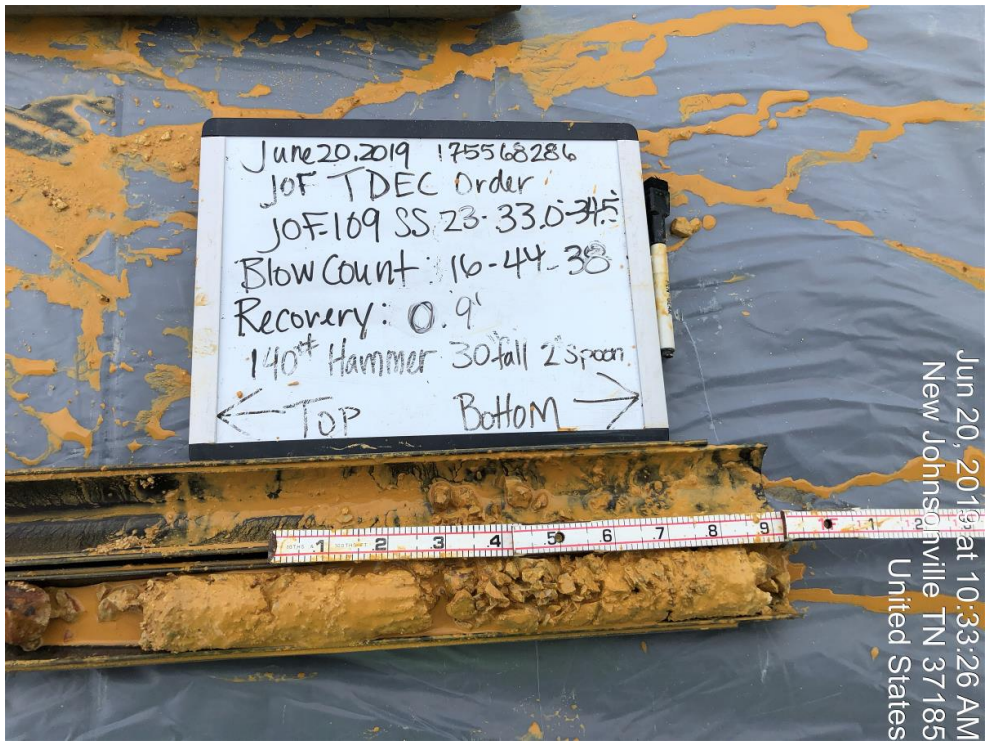
Stantec

Photographic Log

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 1 **Photo Location:** JOF-109 **Photo Date:** 6/20/2019 **Comments:** Interval (30.0-31.5 feet).	
Photograph ID: 2 **Photo Location:** JOF-109 **Photo Date:** 6/20/2019 **Comments:** Interval (31.5-33.0 feet).	

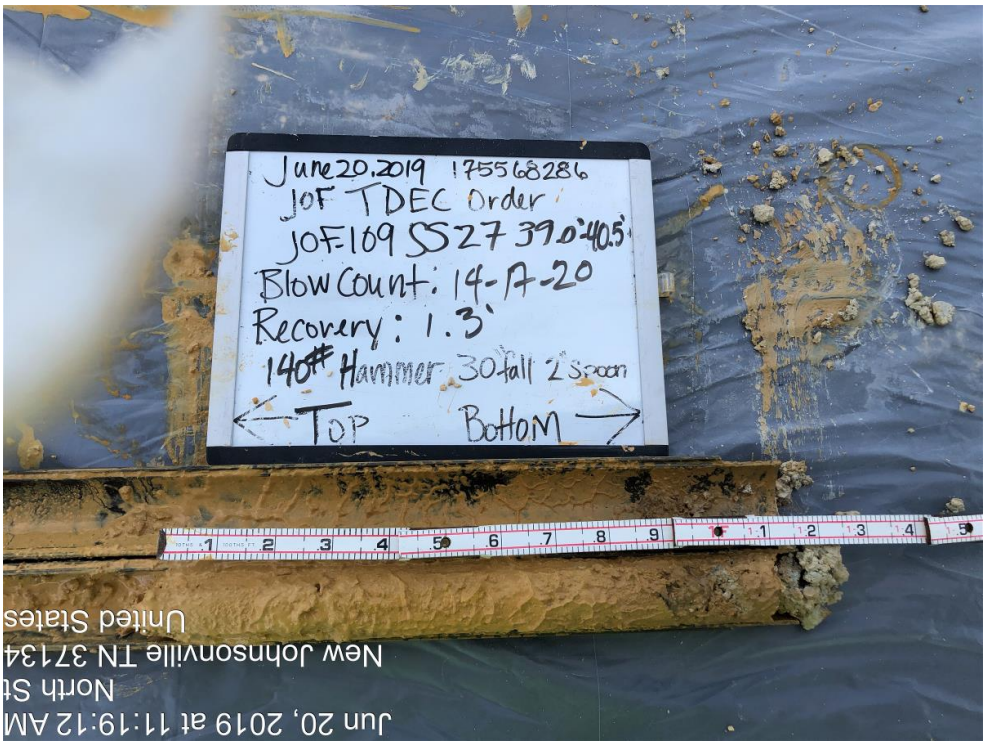
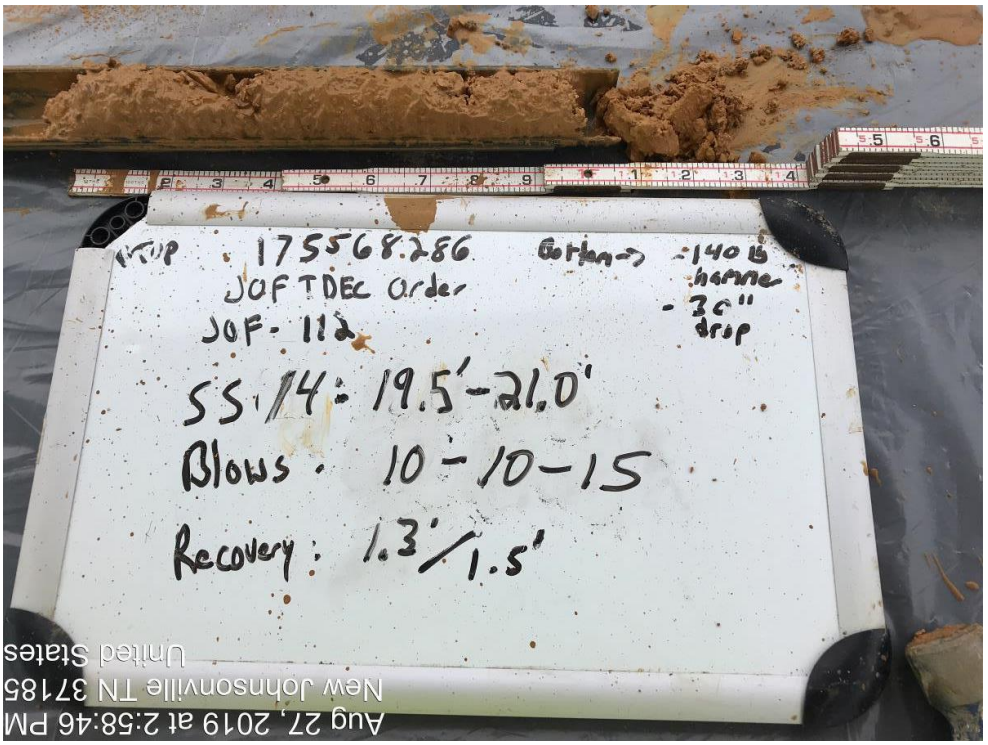
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 3 **Photo Location:** JOF-109 **Photo Date:** 6/20/2019 **Comments:** Interval (33.0-34.5 feet).	
Photograph ID: 4 **Photo Location:** JOF-109 **Photo Date:** 6/20/2019 **Comments:** Interval (34.5-36.0 feet).	

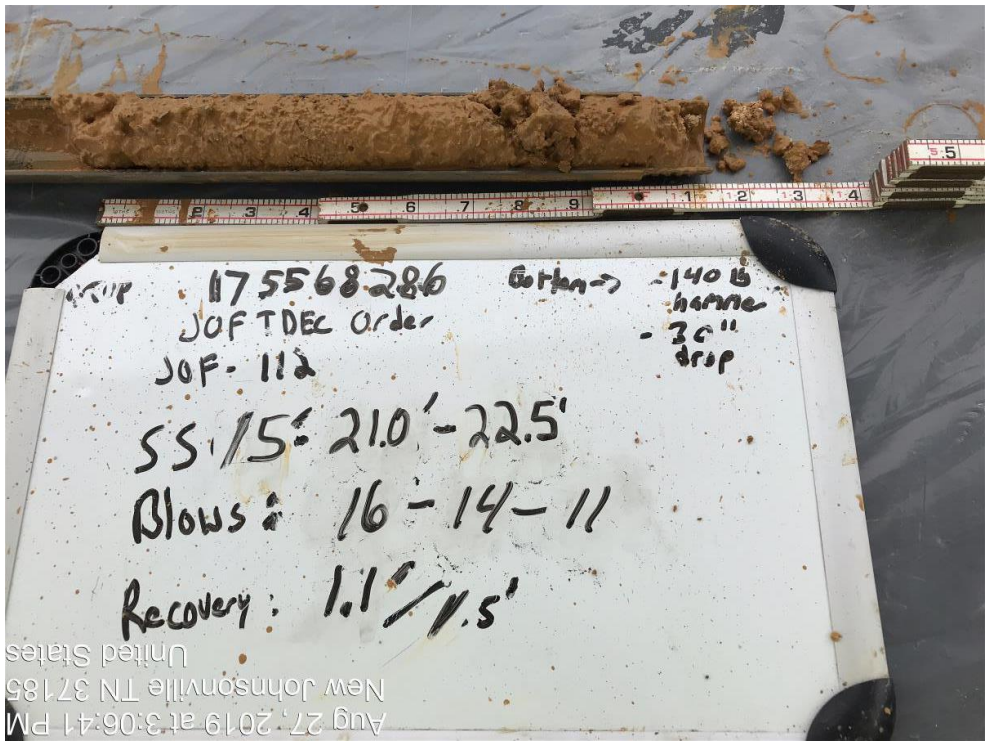
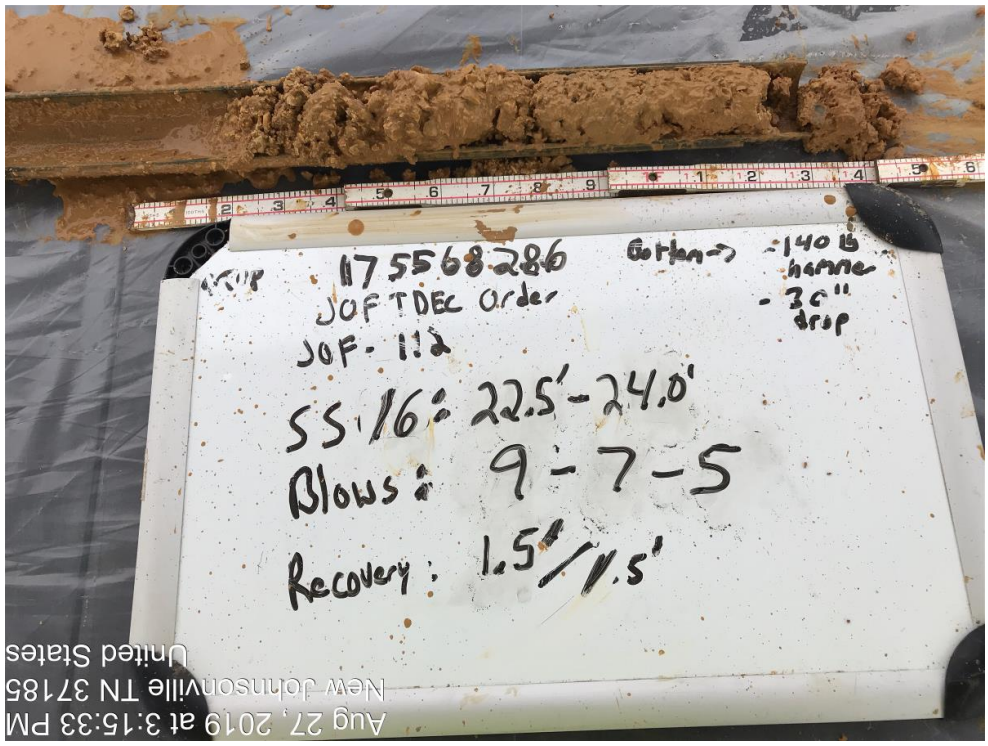
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 5 **Photo Location:** JOF-109 **Photo Date:** 6/20/2019 **Comments:** Interval (36.0-37.5 feet).	
Photograph ID: 6 **Photo Location:** JOF-109 **Photo Date:** 6/20/2019 **Comments:** Interval (37.5-39.0 feet).	

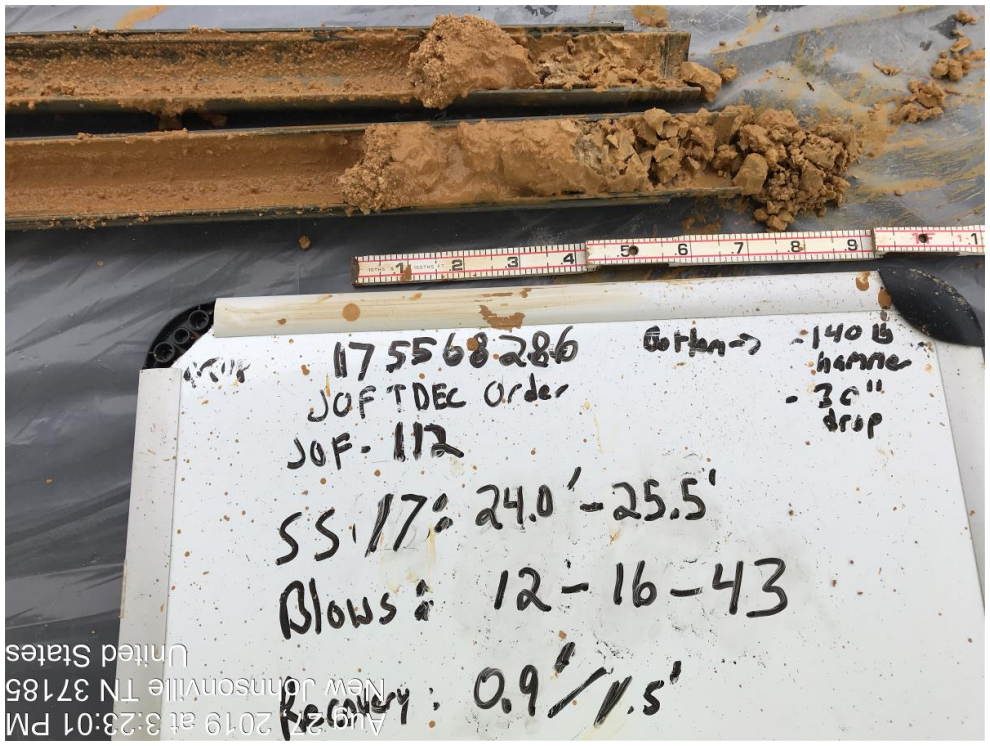
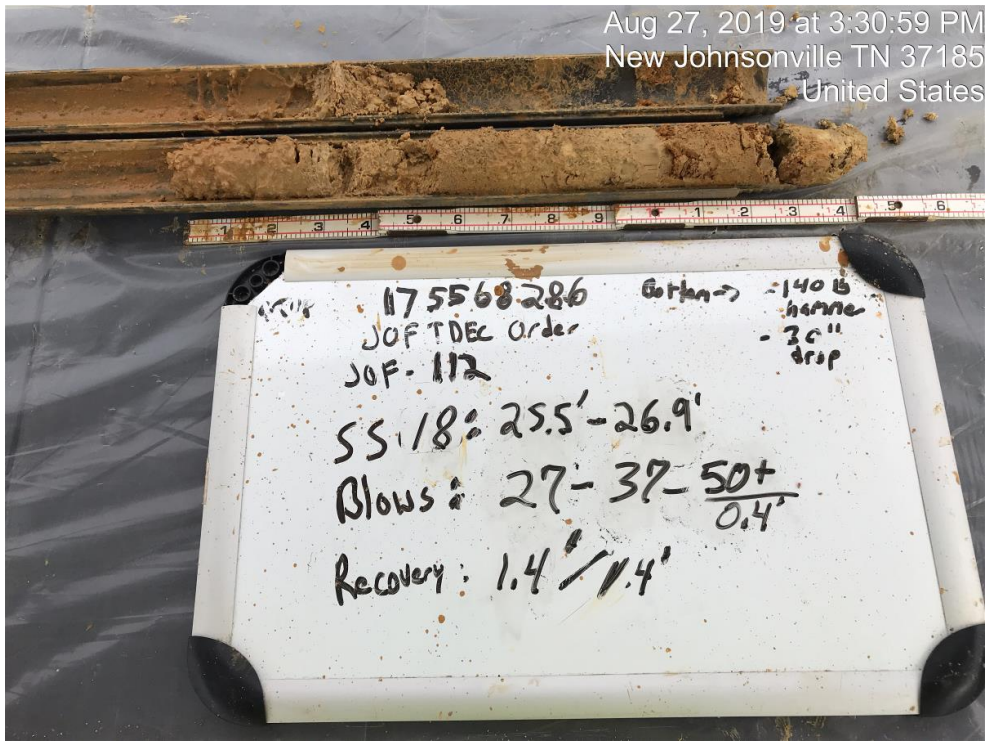
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 7 **Photo Location:** JOF-109 **Photo Date:** 6/20/2019 **Comments:** Interval (39.0-40.5 feet).	
Photograph ID: 8 **Photo Location:** JOF-112 **Photo Date:** 8/27/2019 **Comments:** Interval (19.5-21.0 feet).	

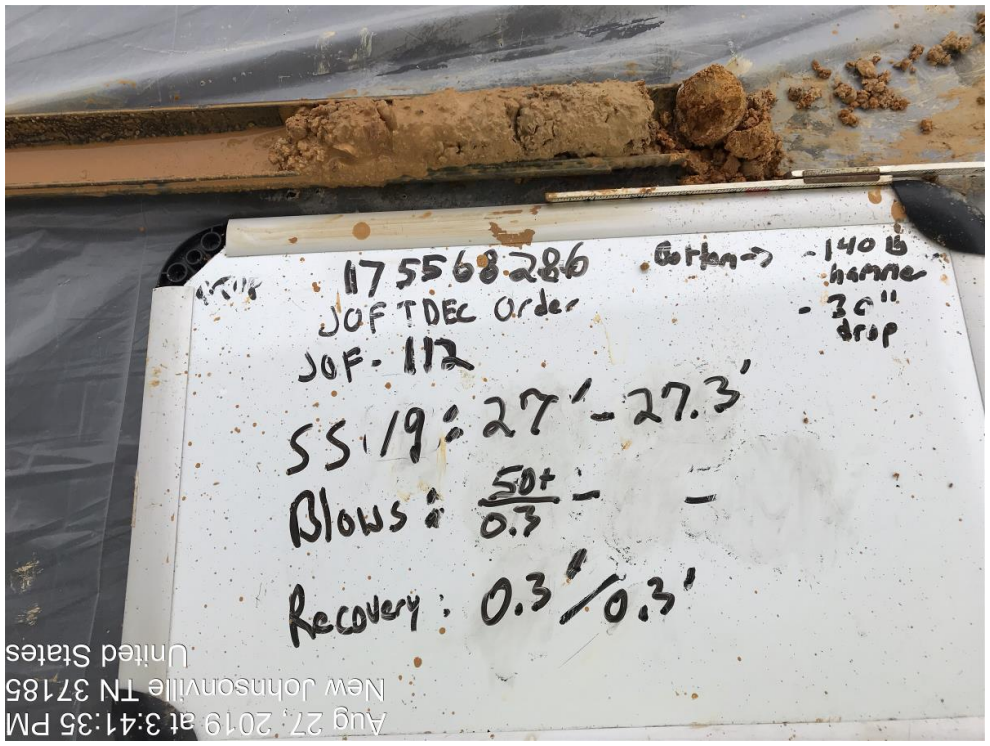
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

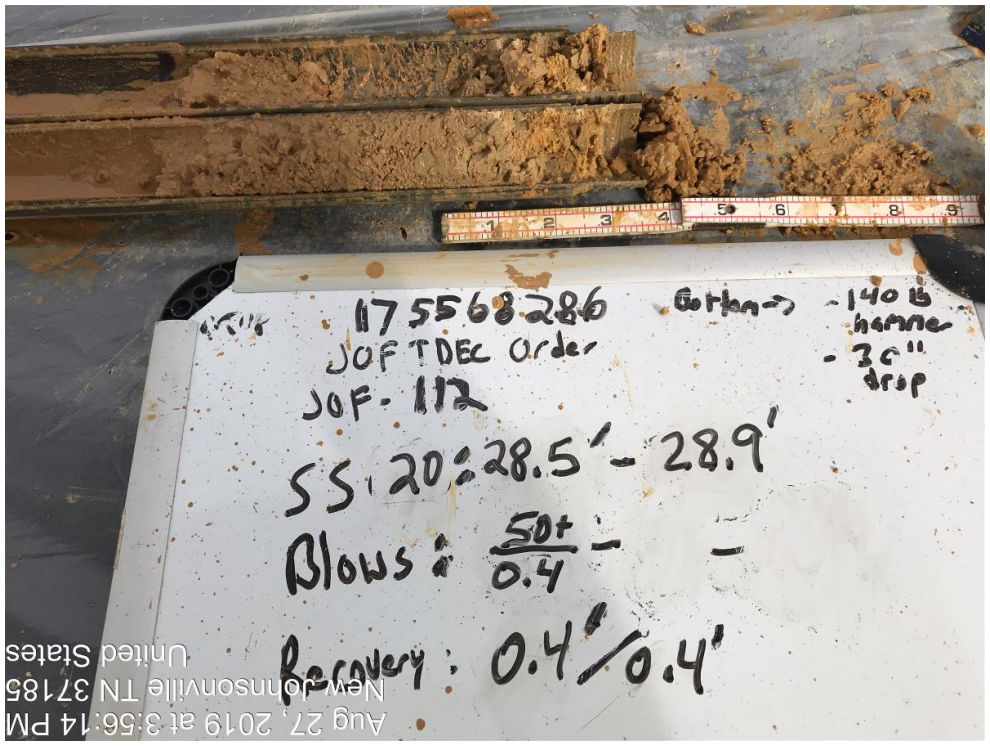
Photograph ID: 9 **Photo Location:** JOF-112 **Photo Date:** 8/27/2019 **Comments:** Interval (21.0-22.5 feet).	
Photograph ID: 10 **Photo Location:** JOF-112 **Photo Date:** 8/27/2019 **Comments:** Interval (22.5-24.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 11 **Photo Location:** JOF-112 **Photo Date:** 8/27/2019 **Comments:** Interval (24.0-25.5 feet).	
Photograph ID: 12 **Photo Location:** JOF-112 **Photo Date:** 8/27/2019 **Comments:** Interval (25.5-26.9 feet). Refusal at 26.9 feet.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 13	
Photo Location: JOF-112	
Photo Date: 8/27/2019	
Comments: Interval (27.0-28.5 feet). Refusal at 27.3 feet.	

Photograph ID: 14	
Photo Location: JOF-112	
Photo Date: 8/27/2019	
Comments: Interval (28.5-30.0 feet). Refusal at 28.9 feet.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 15

Photo Location:
JOF-119

Photo Date:
7/9/2019

Comments:
Interval (34.5-36.0 feet).

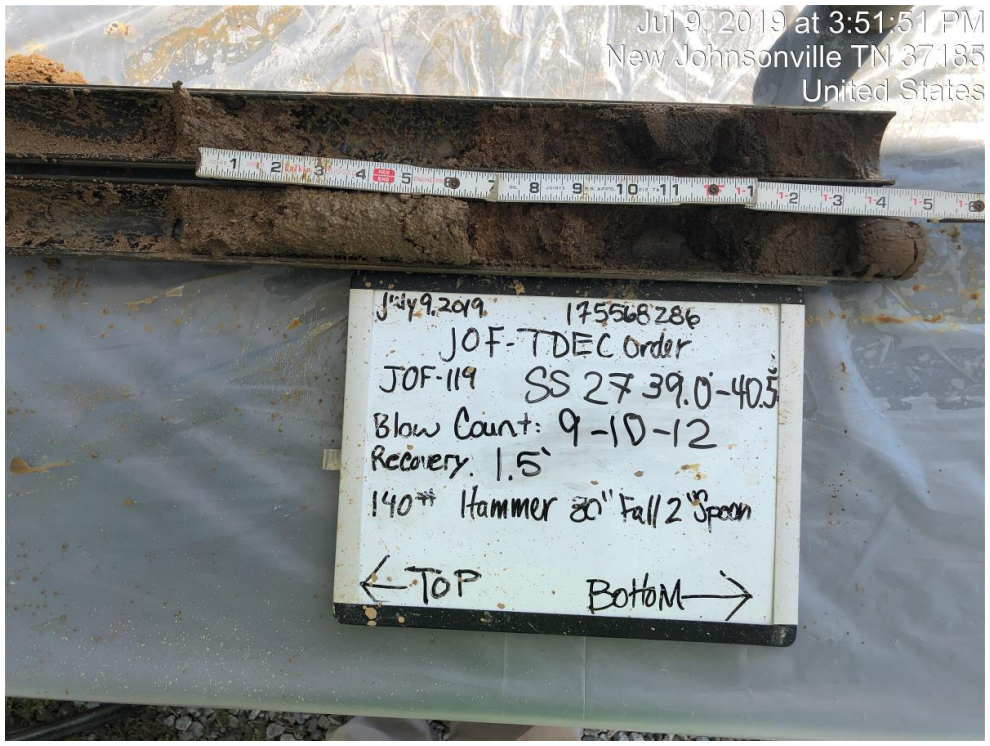
Photograph ID: 16

Photo Location:
JOF-119

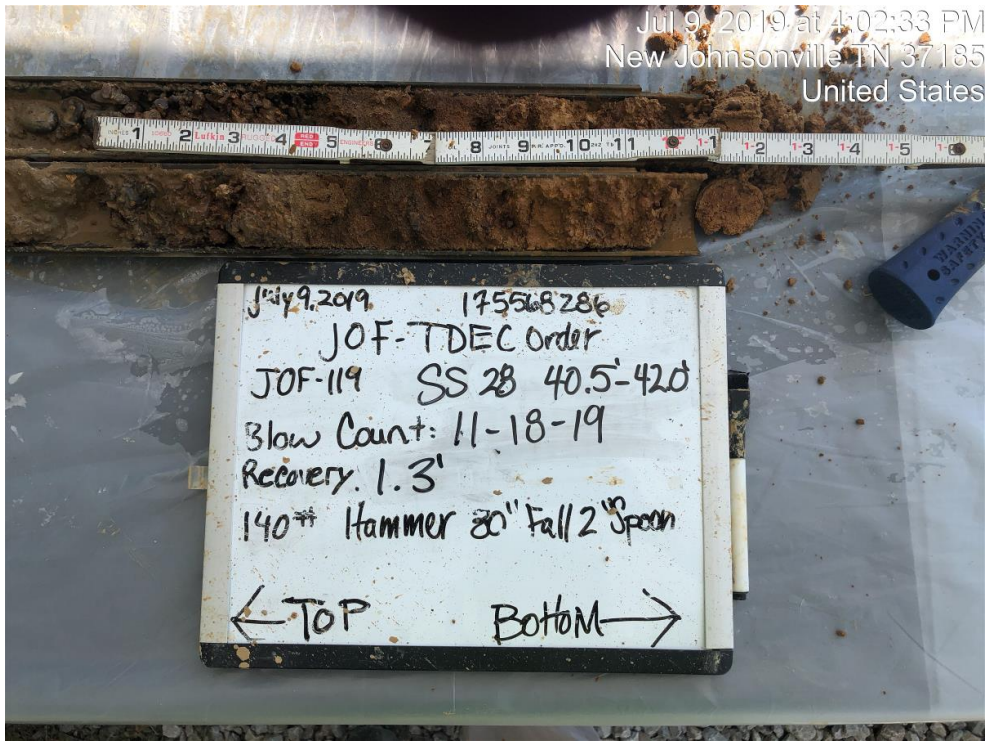
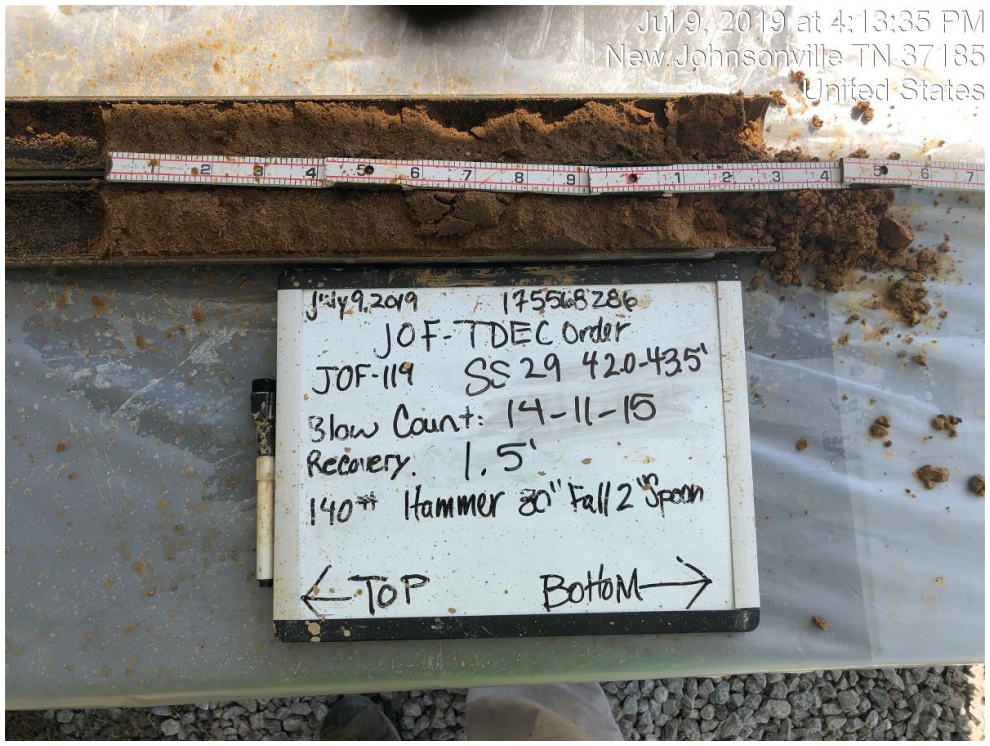
Photo Date:
7/9/2019

Comments:
Interval (36.0-37.5 feet).

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 17 **Photo Location:** JOF-119 **Photo Date:** 7/9/2019 **Comments:** Interval (37.5-39.0 feet).	
Photograph ID: 18 **Photo Location:** JOF-119 **Photo Date:** 7/9/2019 **Comments:** Interval (39.0-40.5 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 19 **Photo Location:** JOF-119 **Photo Date:** 7/9/2019 **Comments:** Interval (40.5-42.0 feet).	
Photograph ID: 20 **Photo Location:** JOF-119 **Photo Date:** 7/9/2019 **Comments:** Interval (42.0-43.5 feet).	

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Photographic Log

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Johnsonville Fossil (JOF) Plant**	**Site Location:**	**New Johnsonville, Tennessee**

Photograph ID: 21

Photo Location:
JOF-119

Photo Date:
7/9/2019

Comments:
Interval (43.5-45.0 feet).