WATTS BAR FOSSIL PLANT

Tennessee Valley Authority
welcomes you to the

Environmental Investigation Plan
Watts Bar Fossil Plant

COMMUNITY INFORMATION SESSION

WATTS BAR FOSSIL PLANT

EVENT GUIDE

This event is to provide information about the Environmental Investigation Plan (EIP) for the decommissioned Watts Bar Fossil Plant. We welcome your feedback and comments on the EIP.

The following acronyms appear frequently on the boards:

- Environmental Investigation Plan (EIP)
- Environmental Assessment Report (EAR)
- Coal Combustion Residuals (CCR)
- Tennessee Valley Authority (TVA)
- Tennessee Department of Environment and Conservation (TDEC)
- Sampling and Analysis Plan (SAP)
- Environmental Protection Agency (EPA)

The information boards are color-coded according to the technical focus area they cover in the EIP. For instance, if they contain general information regarding the EIP process, the information board will be color-coded in blue.

General Information

Below are the main areas of technical focus in the EIP, divided by study area. More information on the activities within each area has been provided at the stations around the room.

The evaluation of existing site data serves as the foundation to support the additional studies planned for each focus area.

Geotechnical	Civil/Mapping Activities	Hydrogeologic	Environmental
• Exploratory Drilling	• Coal Combustion Residuals Material Quantity	• Hydrogeologic Investigation	• Benthic Investigation
• Slope Stability		• Groundwater Investigation	• Surface Stream Investigation
		• Water Use Survey	• Fish Tissue Investigation
		• Background Soil Investigation	• Seepage Investigation
			• CCR Material Characteristics

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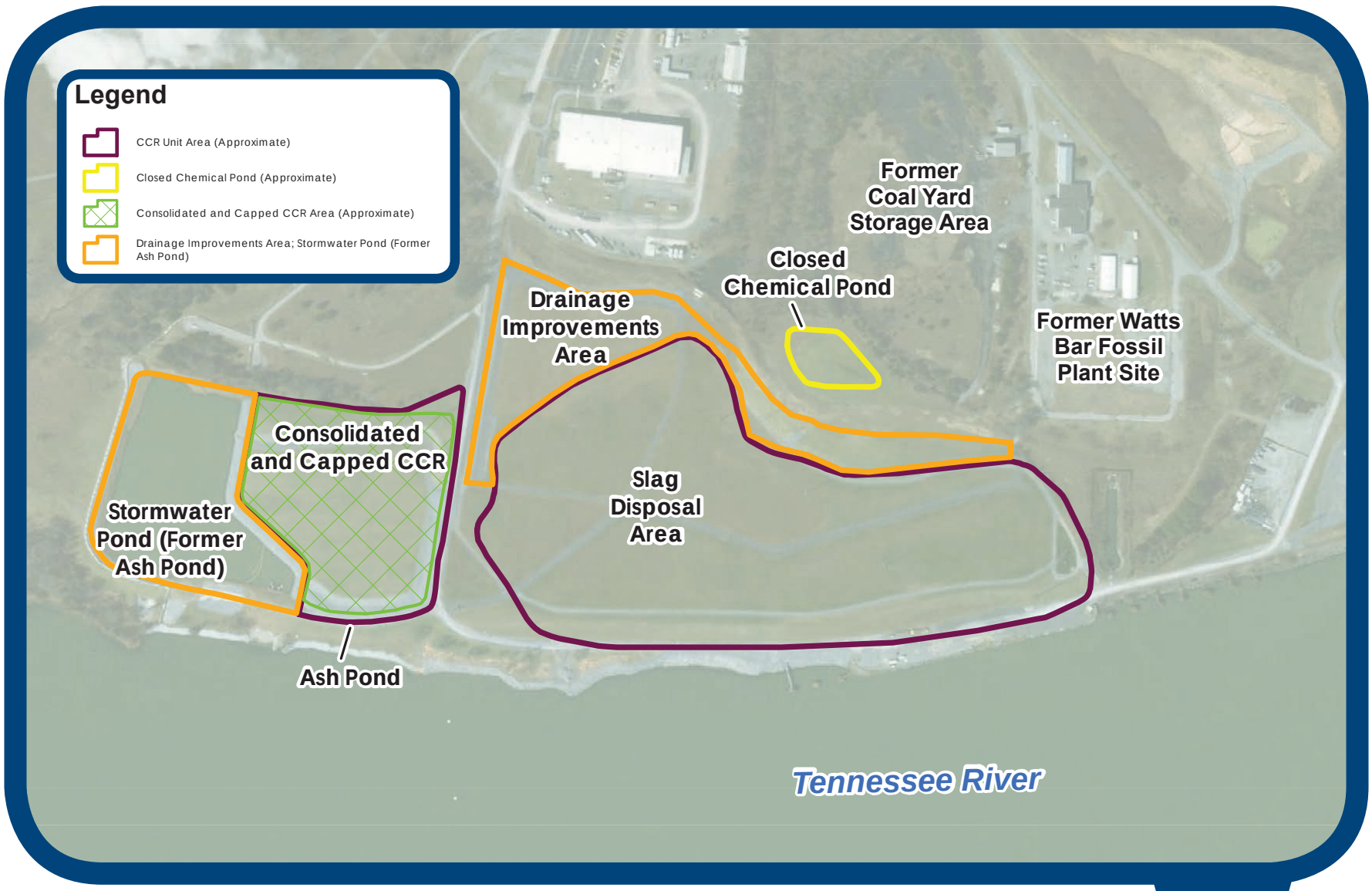
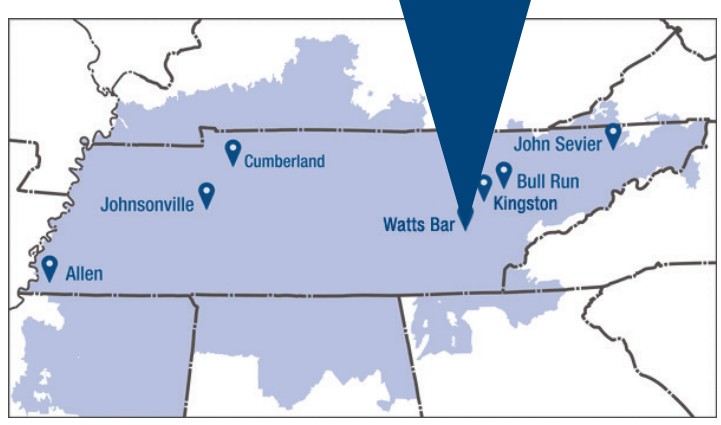


Facility Overview

1942 Watts Bar Fossil Plant construction completed as first coal plant built by TVA

4 Coal-fired units

267 Megawatt facility → Enough to power **152,000** homes



1957 Fossil plant shutdown

1970 Fossil plant restarted

1982 Fossil plant shutdown again

2009 Slag Disposal Area and Chemical Pond Area closed

2011 Fossil plant demolished

2015 Slag Disposal Area drainage improvement project completed
Ash Pond closed

TDEC Order CCR Units:

- Slag Disposal Area (Closed)
- Ash Pond (Closed)

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COAL COMBUSTION RESIDUALS COMPLIANCE ORDER

What is the TDEC Order and why was it put in place?

On August 6, 2015, the Tennessee Department of Environment and Conservation (TDEC) issued Commissioner's Order No. OGC15-0177 to the Tennessee Valley Authority (TVA) for Coal Combustion Residuals (CCR) Compliance pursuant to the provisions of Tennessee's solid waste management and disposal laws.

This order establishes a transparent, comprehensive process to investigate, assess, and remedy any unacceptable risks resulting from the management and disposal of CCR at TVA coal-fired power plants within the state:

Plant	Comment Period
Cumberland	April 12 to May 25
John Sevier	July 25 to September 7
Kingston	August 15 to September 28
Watts Bar	September 5 to October 19
Bull Run	September 19 to November 2
Johnsonville	September 26 to November 9
Allen	October 15 to November 28

What are coal combustion residuals?

Coal combustion residuals, commonly known as coal ash, are created when power plants burn coal to produce electricity.

These residuals include fly ash, bottom ash/ slag, and gypsum, and are collected separately from different areas of the facility.

Fly ash originates from the flue gas electrostatic precipitators, bottom ash from the boilers, and gypsum from the sulfur dioxide scrubbers.

What is the EIP?

What it is and why we do it

TDEC has requested certain information about Watts Bar's CCR management.

What TVA has already done

TVA has ongoing programs and monitoring that can help answer TDEC's questions.

Proposed EIP Activities

The Environmental Investigation Plan (EIP) lays out the proposed investigation TVA will conduct to provide additional information that TDEC has requested.

Did you know…

Watts Bar Fossil Plant once held the distinction of being the only location in the United States to generate electricity using hydroelectric, fossil and nuclear technology.

Watts Bar provided urgently needed power during the World War II effort to produce aluminum for airplanes and support the Manhattan Project at the Oak Ridge Laboratories.

Bottom Ash/Slag

Gypsum

Fly Ash

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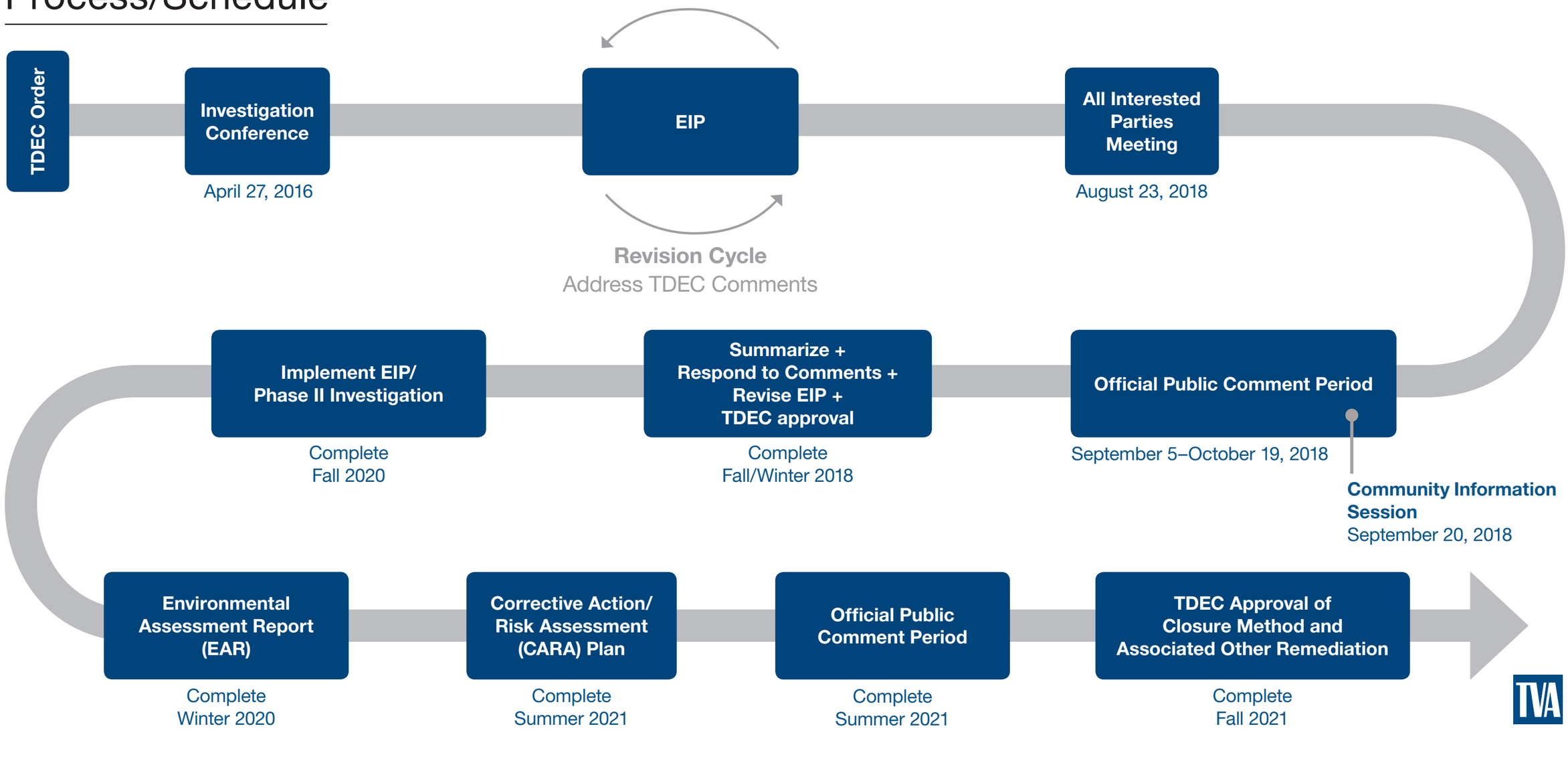
ENVIRONMENTAL INVESTIGATION PLAN

Process/Schedule



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ACTIVITIES MATRIX

FOCUS AREA	EXISTING INFORMATION	PROPOSED EIP ACTIVITIES
Exploratory Drilling	• Performed as required for specific projects • Over 20 existing borings and over 10 water level instruments	• Geotechnical drilling and soil sampling • Install water level instruments • Laboratory Testing
Slope Stability	• Routine visual monitoring and instrumentation monitoring • Existing analyses (available for some units) meet industry standards • Existing drilling and laboratory data support new analyses	• New analyses (for some units) for normal and earthquake conditions • Compare existing models to new data • If needed, update models and reanalyze • Compare slope stability results to acceptance criteria
Coal Combustion Residuals (CCR) Material Quantity	• As built/record drawings • Aerial surveys performed for specific projects • Drilled borings history beginning in 1942	• Review existing surveys, drawing, and borings • Develop 3-dimensional models of CCR units • Update 3-dimensional models with new boring data and water levels • Confirm CCR volumes
Hydrogeologic Investigation	• Monitoring well network in place for National Pollutant Discharge Elimination System 6 new wells	• Install 2 background wells • Install 4 downgradient wells
Groundwater Investigation	• Groundwater monitored from 1988 to 2000 • Ongoing groundwater sampling at Ash Pond conducted in accordance with TDEC requirements and semi-annual reports submitted to TDEC since 2014	• Bimonthly groundwater sampling for 1 year (6 events)
Water Use Survey	• Previous survey conducted in 2008	• Update previous studies by reviewing State database and water supply information for Spring City
Background Soil Investigation	• Background soil data previously collected during the 2015 installation of background monitoring well WBF-100	• Test additional background sampling locations for CCR Parameters • Visually inspect accessible rock and residuum outcrops in the vicinity of the plant in an attempt to determine if naturally occurring sources of metallic ore minerals are present in the area • Review existing data for comparative analysis

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ACTIVITIES MATRIX

FOCUS AREA	EXISTING INFORMATION	PROPOSED EIP ACTIVITIES
Benthic Investigation (sediment, benthic macroinvertebrate and mayfly sampling)	• Benthic invertebrate community sampling using Reservoir Benthic Index (RBI) methodology completed from 1994 to 2017	• Collect sediment, benthic macroinvertebrate, and mayfly samples • Analyze sediment samples for CCR constituents and percentage of ash • Analyze benthic macroinvertebrate samples for community composition • Analyze mayfly samples for CCR metals constituents • Report on analytical assessment
Surface Stream Investigation	• Water quality samples were collected at 4 locations near WBF in 1996 and 1997 • Limited water quality data was collected from 3 transects upstream and downstream of WBF in October 2015	• Collect water samples • Analyze samples for CCR Parameters • Conduct comparative analysis against upstream samples and existing surface data • Report on analytical assessment
Fish Tissue Investigation	• Aquatic monitoring programs, including fish surveys, at the Plant since early 1970s • Fish Community Surveys using Reservoir Fish Assemblage Index (RFAI) methodology • No previous fish tissue studies conducted at site	• Capture target fish species at sampling locations • Remove and transport fish tissue samples to laboratory • Analyze tissue samples for CCR constituents • Comparative analysis against upstream samples • Report on analytical assessment
Seepage Investigation	• Weekly site inspections per NPDES permit • Annual reports submitted to TDEC	• Conduct seepage investigation to identify active seeps • Collect soil and water samples at identified seeps • Analyze samples for CCR constituents • Comparative analysis against background soils • Report on analytical assessment
CCR Material Characteristics	• No existing leaching information available for CCR material	• Collect CCR material samples from borings in units • Collect pore water samples from temporary wells in units • Analyze samples for CCR constituents • Report on analytical assessment

WATTS BAR FOSSIL PLANT

HISTORIC TIMELINE

1939
Construction of Watts Bar Hydroelectric Dam begins

1940
Chickamauga Dam completed

1942
Watts Bar Fossil Plant construction completed as first coal plant built by TVA

Designed and constructed by TVA as part of an emergency plan to provide power to the defense industry.

Demand was increasing from various companies that supported the emerging war effort, in particular from the aluminum industry—which was involved in the production of everything from helmets and identification tags to gas masks and airplanes—and from the Valley's Oak Ridge National Laboratory, for its nuclear work.

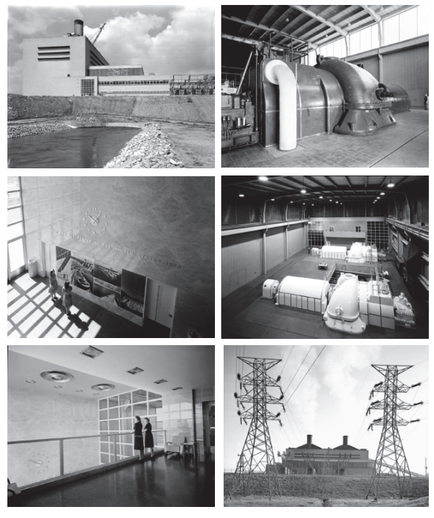
1947

1957
Fossil plant shutdown

The Watts Bar Fossil Plant played a major role in the production of electricity for industries supplying the U.S. military during World War II.

It was the first coal-fired steam plant planned, designed and constructed by TVA.

It represented the first step in the expansion of TVA's fossil fuel power program for both military and civilian uses, which transformed the region after the war.



1970
Fossil plant restarted

1982
Because of its relatively high cost of power production, fossil plant placed in shutdown mode and was used as a training facility

1992
Use as a training facility stops

2009
Slag Disposal Area and Chemical Pond Area closed

2011
Fossil plant demolished +90% of building materials are sold to recycling facilities or reused in some form

2015
Slag Disposal Area drainage improvement project completed

Ash Pond closed

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COAL COMBUSTION RESIDUALS MATERIAL QUANTITY

What it is and why we do it

Recent surveys of the site tracked the location and quantity of coal combustion residuals (CCR) to aid overall site management.

What TVA has already done

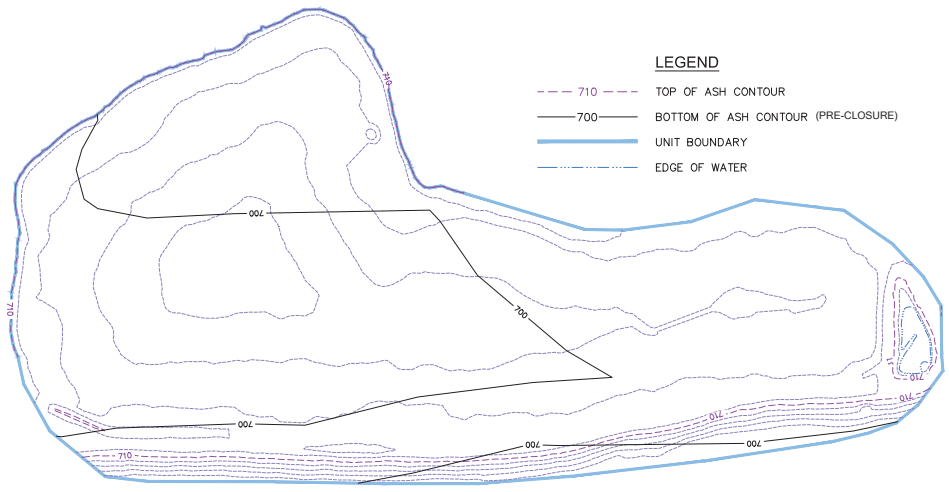
- Pre-development topographic maps
- Aerial surveys
- As-built/record drawings
- Drilled Borings

Before construction began, the facility had been extensively mapped within pre-development topographic maps and construction drawings.

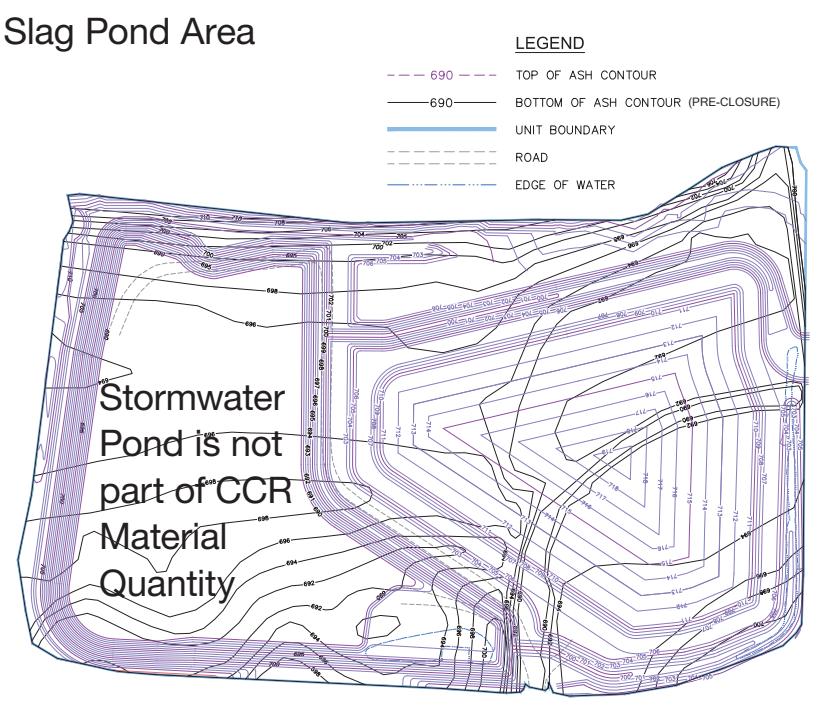
Site mapping and aerial photographs were updated when significant changes where made to the layout of the site.

Record drawings of the former Ash Pond and Slag Disposal Area closure projects provide final grades of CCR units.

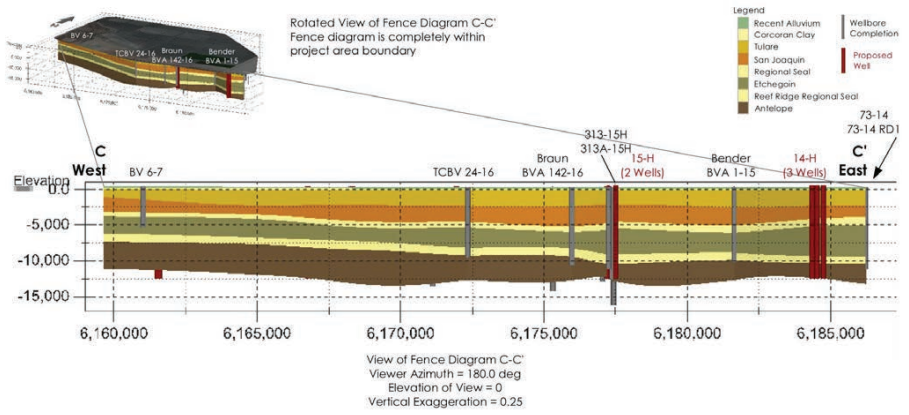
Borings were drilled for various CCR unit closure projects.



Closed Slag Pond Area



Closed Ash Pond



Example of a 3-dimensional model developed and used to calculate volumes

Proposed EIP Activities

- Review existing surveys, drawing, and borings.
- Develop 3-dimensional models of CCR units
- Update 3-dimensional models with new boring data and water levels
- Confirm CCR volumes

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BENTHIC INVESTIGATION–BIOLOGICAL STUDIES

What it is and why we do it

The Tennessee River is evaluated to compare the health of aquatic wildlife upstream and downstream of the plant.

These evaluations have two parts:

- Testing selected benthic macroinvertebrates to see if CCR constituents are in their tissues
- Counting the types and numbers of different benthic macroinvertebrates in the river adjacent to site

What are benthic macroinvertebrates?

Aquatic organisms that live in and on the sediment substrate.

Why do we study them?

They are an important part of the local food chain, and are good indicators of changes in the environment.

Examples of benthic macroinvertebrates

Nymphs are immature mayflies found in the sediment.

What TVA has already done

- Benthic invertebrate community sampling using Reservoir Benthic Index (RBI) scores completed upstream and downstream of the Plant from 1994 to 2017
- RBI scores at all downstream locations have been higher than RBI scores at the upstream location for all historical sampling periods
- RBI scores at the nearest downstream sampling location deemed “Excellent” in the most recent sampling conducted in autumn 2013, 2015, and 2017

Proposed EIP Activities

- Collect benthic macroinvertebrate samples
- Analyze benthic macroinvertebrate samples for community composition
- Analyze benthic macroinvertebrate samples for CCR metals constituents
- Report the analytical results in the Environmental Assessment Report (EAR)

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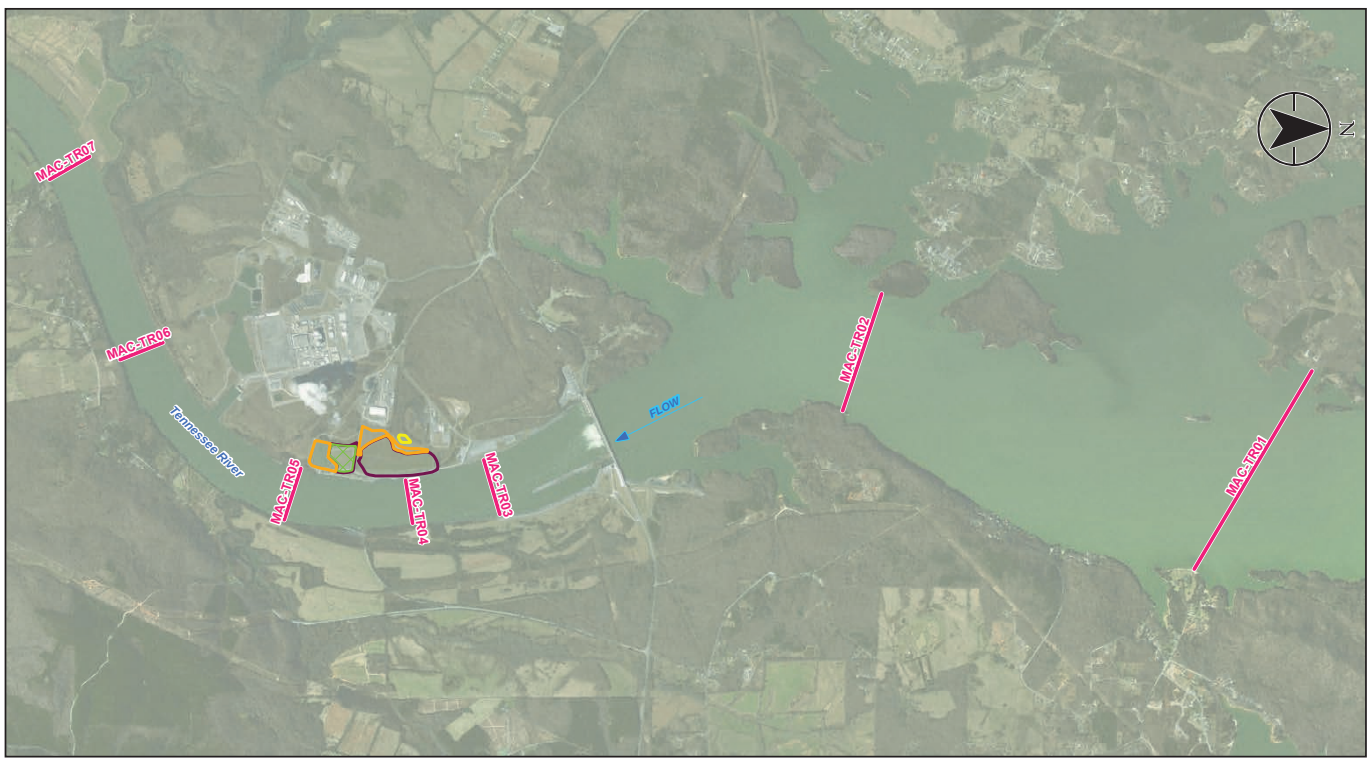
BENTHIC INVESTIGATION–BIOLOGICAL STUDIES

Where will the sampling be done?

Benthic macroinvertebrates community sampling



Legend

- Benthic Transect
- CCR Unit Area (Approximate)
- Closed Chemical Pond (Approximate)
- Consolidated and Capped CCR Area (Approximate)
- Drainage Improvements Area; Stormwater Pond (Former Ash Pond)

Mayfly (or other representative species) sampling

Legend

- Mayfly Sample Location
- CCR Unit Area (Approximate)
- Closed Chemical Pond (Approximate)
- Consolidated and Capped CCR Area (Approximate)
- Drainage Improvements Area; Stormwater Pond (Former Ash Pond)

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BENTHIC INVESTIGATION–SEDIMENT STUDIES

What it is and why we do it

Sediment samples are taken from the river bottom to determine whether CCR material and/or constituents have migrated from the site to Tennessee River.

What TVA has already done

- No historical sediment sampling has been conducted

Sediment sample locations

Legend

- Sediment Transect
- CCR Unit Area (Approximate)
- Closed Chemical Pond (Approximate)
- Consolidated and Capped CCR Area (Approximate)
- Drainage Improvements Area; Stormwater Pond (Former Ash Pond)

Proposed EIP Activities

- Collect sediment samples
- Analyze sediment samples for CCR constituents and percentage of ash
- Report the analytical results in the Environmental Assessment Report (EAR)

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SURFACE STREAM INVESTIGATION

What it is and why we do it

Surface stream sampling is performed both upstream and downstream to determine if CCR materials and/or constituents have migrated from the site to adjacent water bodies.

What TVA has already done

- Water quality samples were collected in the summers of 1996 and 1997 from 4 locations near WBF and analyzed for several constituents.
- Additional sampling was conducted in September 1996 and 1997 from 4 locations in the vicinity of WBF and analyzed for metals.
- Data collected from the above 2 studies concluded that the range of the Watts Bar Fossil Plan operational data points fall well within range of pre-operational data.
- Limited water quality data was collected along 3 transects in conjunction with biological monitoring conducted upstream and downstream of the plant in October 2015.

Surface water sample locations

Legend

- Stream Sample Transect
- CCR Unit Area (Approximate)
- Closed Chemical Pond (Approximate)
- Consolidated and Capped CCR Area (Approximate)
- Drainage Improvements Area; Stormwater Pond (Former Ash Pond)

Proposed EIP Activities

- Collect water samples
- Analyze samples for CCR Parameters
- Conduct comparative analysis against upstream samples and existing surface water data
- Report the analytical results in the Environmental Assessment Report (EAR)

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FISH TISSUE INVESTIGATION

What it is and why we do it

Fish are captured using electrofishing and gill netting, and tissue samples are taken.

These tissues samples are used to test the levels of CCR constituents in fish.

What TVA has already done

Fish surveys have been performed at the plant since the early 1970s:

- These included Fish Community Surveys and fish impingement and entrainment studies
- Results from these studies and surveys indicated no adverse impact to fish communities
- No samples were analyzed to assess impacts from CCR parameters

Fish sampling locations

Legend

- Fish Sample Location
- CCR Unit Area (Approximate)
- Closed Chemical Pond (Approximate)
- Consolidated and Capped CCR Area (Approximate)
- Drainage Improvements Area; Stormwater Pond (Former Ash Pond)

Electroshock fishing

Proposed EIP Activities

- Capture target fish species at sampling locations
- Remove and transport fish tissue samples to laboratory
- Analyze tissue samples for CCR constituents
- Comparative analysis against upstream samples
- Report the analytical results in the Environmental Assessment Report (EAR)

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SEEPAGE INVESTIGATION

What it is and why we do it

Dikes on the property are checked frequently to identify active seeps.

The soils and water at active seep areas are tested for CCR constituent levels.

What TVA has already done

- Annual and weekly dike inspections conducted per National Pollutant Discharge Elimination System permit
- Annual dike inspection report submitted to TDEC
- Historical seep summary provided in the EIP
- Seep mitigation project completed in 2015

Historic seep locations

Legend

- Historic Seep
- Watts Bar Nuclear Facility Boundary
- CCR Unit Area (Approximate)
- Closed Chemical Pond (Approximate)
- Consolidated and Capped CCR Area (Approximate)
- Drainage Improvements Area; Stormwater Pond (Former Ash Pond)

Proposed EIP Activities

- Conduct seepage investigation to identify active seeps
- Collect soil and water samples at identified seeps
- Analyze samples for CCR constituents
- Comparative analysis against background soils
- Report the analytical results in the Environmental Assessment Report (EAR)

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COAL COMBUSTION RESIDUALS MATERIAL CHARACTERISTICS

What it is and why we do it

The different CCR materials on site are tested for levels and types of chemical constituents. This helps us understand whether they leach from (or leave) the ash and enter the water in the CCR units.

What TVA has already done

- Ash sampling data from "Closure and Post Closure Plan, Slag Processing and Pond Area," TVA, April 2007

Proposed wells

Legend

- Proposed Boring with Temporary Well
  (Saturation Level in CCR, Pore Water Sampling, Geotechnical Data)
  (Screened Interval)
- Watts Bar Nuclear Facility Boundary
- CCR Unit Area (Approximate)
- Closed Chemical Pond (Approximate)
- Consolidated and Capped CCR Area (Approximate)
- Drainage Improvements Area; Stormwater Pond (Former Ash Pond)

Proposed EIP Activities

- Collect CCR material samples from borings in units
- Collect pore water samples from temporary wells in units
- Analyze samples for CCR constituents
- Report the analytical results in the Environmental Assessment Report (EAR)

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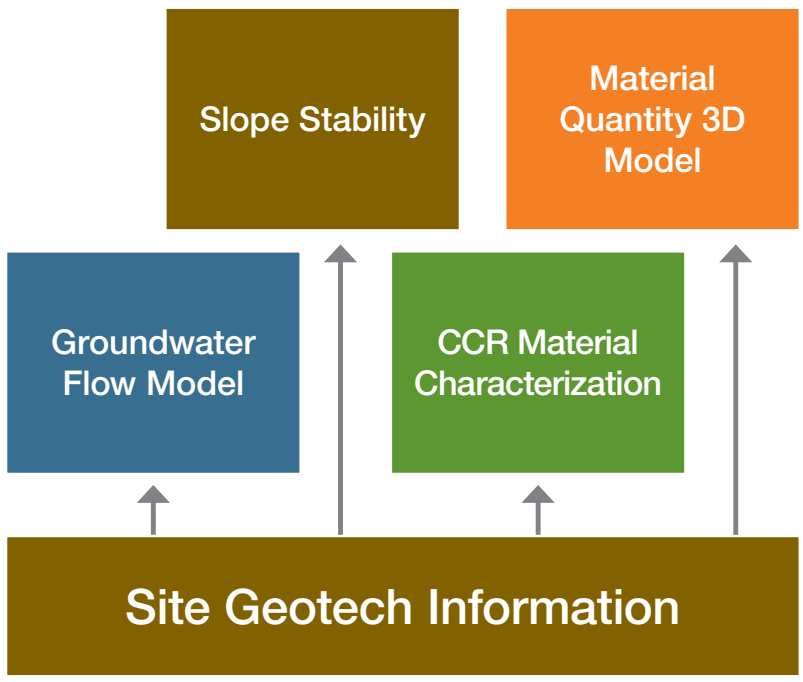
EXPLORATORY DRILLING (1 of 2)

What it is and why we do it

Exploratory drilling helps us better understand what is in and under each CCR unit.

It tells us:

- What is there: material types (CCR, soil, rock) and properties (strength, permeability, etc.)
- Where it is (material locations)
- Where the water level(s) are (material saturation)



What TVA has already done

The EIP includes an evaluation of existing geotechnical data. This includes a review of design and construction records, inspection records, field data (including 20+ borings and 10+ water level instruments), laboratory data, and engineering analyses.

Each piece of information has been evaluated to confirm that it was collected and analyzed properly in the past. This existing data is very valuable to understand the CCR unit conditions.

What are borings

Drilled holes from which to take samples of CCR, soil, and rock

The drilling inspector will prepare boring logs to describe the recovered samples.

Proposed EIP Activities

- Additional borings within the interior of the CCR units
- Install temporary wells in CCR material
- Targeted borings in specific areas along unit borders
- Shallow bedrock characterization
- Laboratory testing
- Share data with hydrogeological, environmental, and civil/mapping discipline teams

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EXPLORATORY DRILLING (2 of 2)

Where will the drilling be done?

Ash Pond

2 Borings

2 Borings with Temporary Wells and No Rock Coring

Legend

- Proposed Cone Penetration Test
- Proposed Boring with Piezometer Vibrating Wire
- Proposed Boring
- Proposed Boring with Temporary Well *(Saturation Level in CCR, Pore Water Sampling, Geotechnical Data) (Screened Interval)*
- Existing Boring
- Historical Stream Alignment (Approximate)
- Watts Bar Nuclear Facility Boundary
- CCR Unit Area (Approximate)
- Closed Chemical Pond (Approximate)
- Consolidated and Capped CCR Area (Approximate)
- Drainage Improvements Area; Stormwater Pond (Former Ash Pond)

Drainage Improvement Area*

10 Cone Penetration Tests

Chemical Pond**

1 Cone Penetration Test

Slag Disposal Area

11 Borings

- **3** Borings with Temporary Wells and No Rock Coring
- **4** Borings with Vibrating Wire Piezometers and Rock Coring
- **4** Borings with Rock Coring

33 Cone Penetration Tests

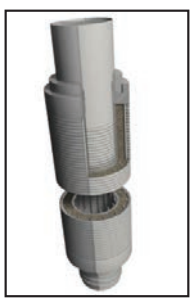
* The Drainage Improvement Area is not a CCR unit, but drilling is planned to determine if the Drainage Improvement Area contains CCR material.

** The Chemical Pond is not a CCR unit, but drilling is planned to confirm that the Chemical Pond does not contain CCR backfill.

What are Water Level Instruments/ Piezometers?

Sensors that measure water pressures in CCR, soil, rock

Example of a vibrating wire piezometer



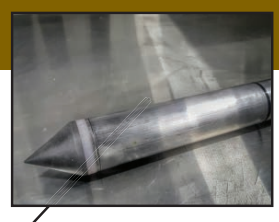
Slotted well screen

Surface protection for top of well

Slotted PVC pipe that allows water to enter at a selected depth in the boring

What are Cone Penetration Tests?

- Measure resistance to pushing cone
- Relate results to estimated engineering soil properties
- Quick, cost effective



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SLOPE STABILITY (1 of 2)

What it is and why we do it

These analyses tell us if the slopes of the CCR units are stable.

Multiple locations around each CCR unit are checked for stability.

Normal (long-term) conditions and earthquake conditions are evaluated.

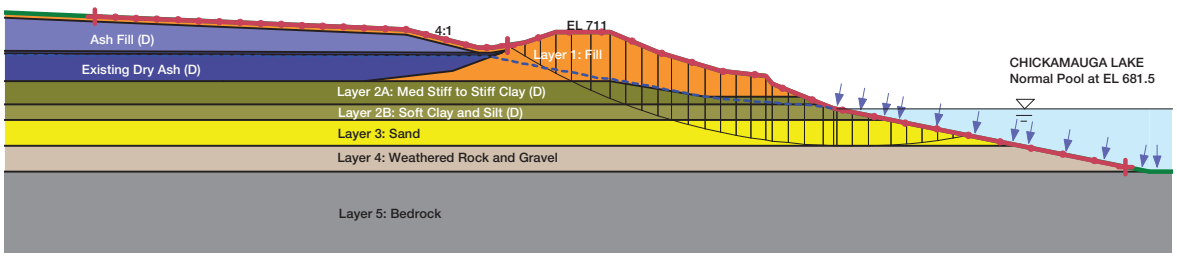
What TVA has already done

Slope stability has been analyzed many times over the years, for various conditions and at multiple units.

The existing analyses were reviewed as part of the evaluation of existing geotechnical data.

Each analysis was reviewed for adequate documentation, appropriate methods, and representative conditions.

Example of existing slope stability analysis



Inputs: Surface and subsurface geometry/zones, engineering properties, water levels/pressures, external loads

Outputs: Factor of safety against sliding

Existing and proposed analyses satisfy EIP requirements

CCR Unit	Normal	Earthquake
Ash Pond	E/P	E/P
Slag Disposal Area	P	P

E = Existing analysis **P** = Proposed analysis

Proposed EIP Activities

- Compare existing models to new data from the Exploratory Drilling Sampling and Analysis Plan
  - If models are representative, no changes
  - If not, update models and reanalyze
- New analyses (for some units) for normal and earthquake conditions
- Compare slope stability results to acceptance criteria

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SLOPE STABILITY (2 of 2)

What it is and why we do it

Slope stability is influenced by water levels and pressures (among other factors).

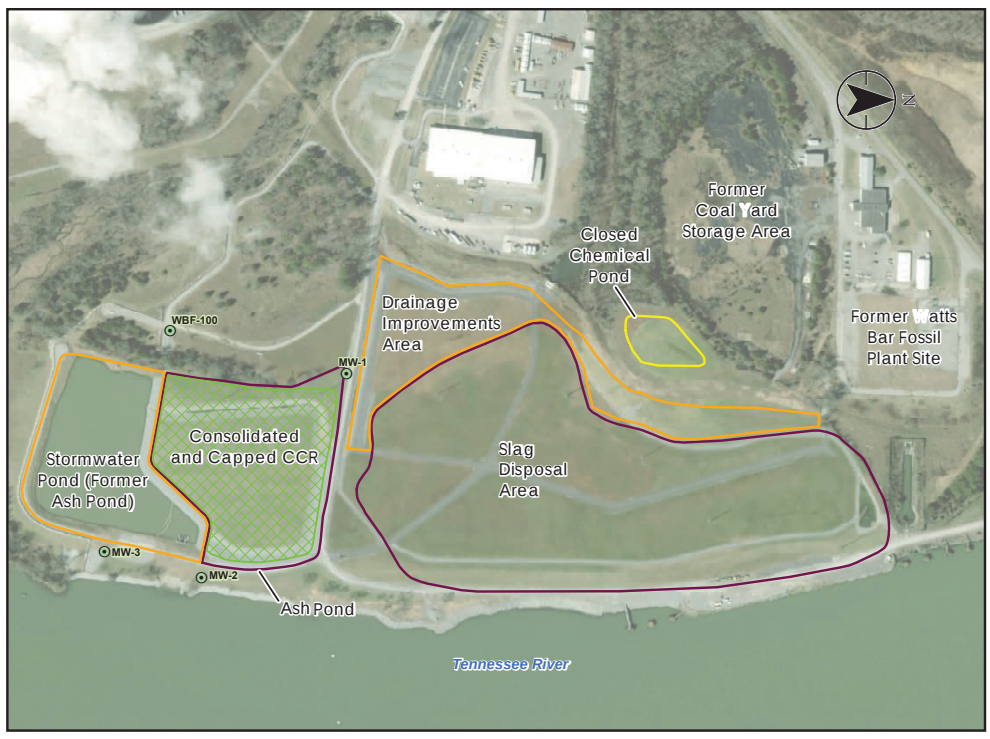
Monitoring water levels also supports the hydrogeologic investigation and the CCR material quantity estimate (saturated vs. unsaturated material).

What TVA has already done

TVA has multiple types of water level instruments on site, as well as a number of monitoring wells, to track water levels in many areas. These instruments have been installed over many years, for various purposes. Four water level instruments are currently installed.

A Groundwater Monitoring Program was instituted as part of the Ash Pond Closure and Post-Closure Plan. Quarterly sampling activities include manual water level readings.

Existing instrumentation



Legend

- Piezometer pen Standpipe (Screened Interval)
- CCR Unit Area (Approximate)
- Closed Chemical Pond (Approximate)
- Consolidated and Capped CCR Area (Approximate)
- Drainage Improvements Area; Stormwater Pond (Former Ash Pond)

Water level instrumentation

- New instruments are added
  - due to Exploratory Drilling Sampling and Analysis Plan
  - due to Hydrogeological Investigation Sampling and Analysis Plan (monitoring wells)

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CLOSURE AND CAP

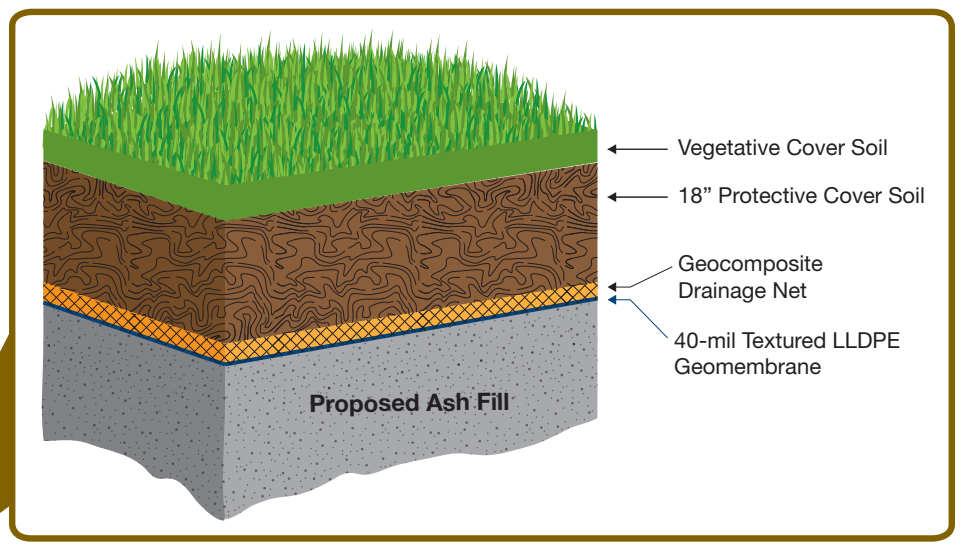
What it is and why we do it

CCR Units are closed and capped with a liner system to promote surface runoff and reduce infiltration.

The following CCR units have been capped and closed:

- Slag Disposal Area
- Ash Pond

Ash Pond closure cap liner system



Making the Ash Pond closure cap


Dry ash material with dry kiln


Fill and compact ash


Complete final ash grading


Install flexible membrane liner


Install geocomposite drainage layer over flexible membrane liner


Place protective cover soil


Top with final sod cover and riprapped ditch

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HYDROGEOLOGIC INVESTIGATION

What it is and why we do it

Hydrogeologic investigations help us better understand how groundwater moves in a particular area, as well as its interaction with the surrounding soils and rocks.

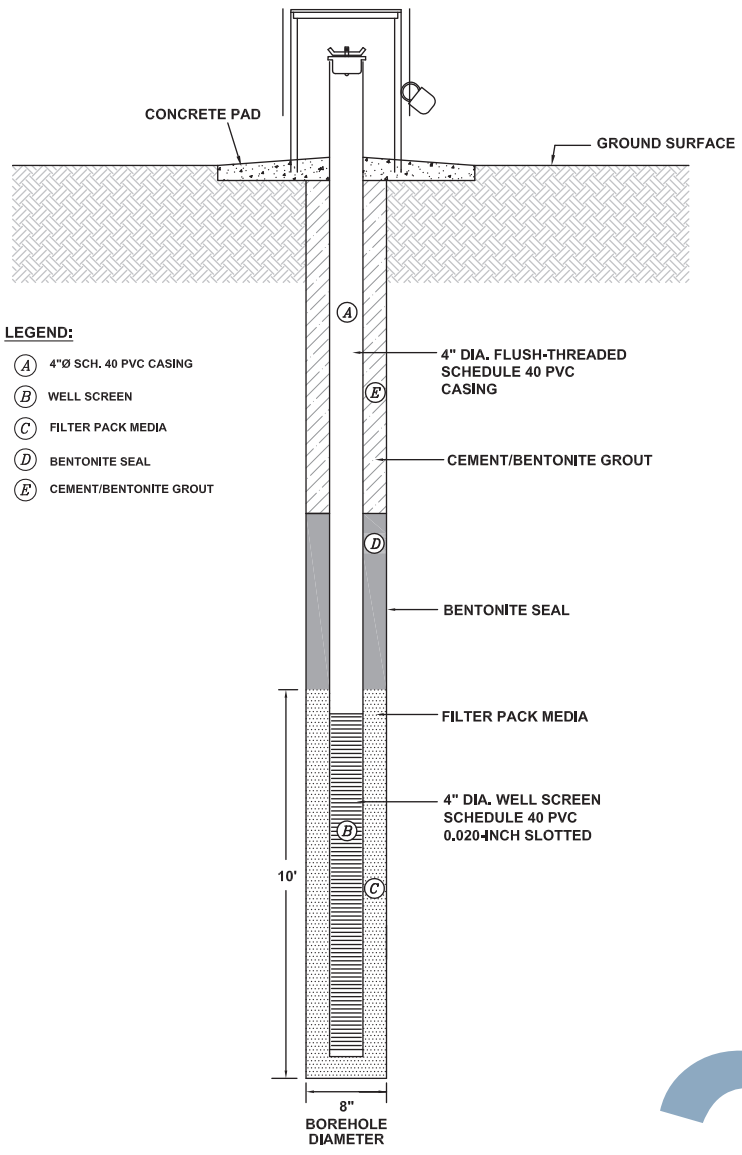
These investigations consist of installing groundwater monitoring wells to collect information about groundwater.

Background (i.e., unaffected by the Watts Bar site) and downgradient wells are used to study water quality changes.

What TVA has already done

Hydrogeological investigations have been conducted at the Watts Bar site to monitor groundwater quality and flow direction in the area of the Ash Pond. Additional investigation is needed at the Slag Disposal Area.

Groundwater monitoring well



What is a groundwater monitoring well?
A well specially designed and installed to obtain representative groundwater quality samples and hydrogeologic information.

Proposed EIP Activities

- Additional monitoring wells will be installed to supplement current groundwater monitoring well network to further investigate groundwater quality and flow direction:
  - 2 background monitoring wells
  - 4 downgradient monitoring wells
- Report the analytical results in the Environmental Assessment Report (EAR)

WATTS BAR FOSSIL PLANT

GROUNDWATER INVESTIGATION

What it is and why we do it

Groundwater samples are collected frequently to test for a number of quality measures. By testing groundwater regularly, TVA can track compliance with regulatory permits and requirements.

What TVA has already done

Groundwater was monitored at the Watts Bar site from 1988 to 2000. Since 2014, ongoing groundwater sampling at the Ash Pond has been conducted in accordance with TDEC requirements, and reports are submitted to TDEC semi-annually.

Proposed groundwater well locations

Proposed EIP Activities

- Bimonthly groundwater monitoring for 1 year (6 events)
  - Sample 6 new wells
  - Collect groundwater samples from background and downgradient locations
  - Conduct an investigation to understand the movement of groundwater
  - Investigate how the CCR units affect groundwater movement and quality

WATTS BAR FOSSIL PLANT

WATER USE SURVEY

What it is and why we do it

A water use survey is a search for private water supplies (e.g. wells, springs) located within a ½-mile radius of the Watts Bar Plant. It is used to evaluate the quality of groundwater used in these private wells.

What TVA has already done

A water use survey was conducted in 2008. No well locations were identified within a 1/2-mile radius of the Watts Bar site. The purpose of the water use survey was to understand local groundwater quality and measure if CCR are influencing the local groundwater supply.

Water supply wells

Legend

- CCR Unit Area 1/2 mile radius
- TVA Property
- CCR Unit Area (Approximate)
- Closed Chemical Pond (Approximate)
- Consolidated and Capped CCR Area (Approximate)
- Drainage Improvements Area; Stormwater Pond (Former Ash Pond)

Proposed EIP Activities

- Review existing information on private water wells and springs
  - Update previous studies by reviewing state database and water supply information for Spring City and Rhea County
  - Confirm that no new water supplies are currently in use
  - Report the analytical results in the Environmental Assessment Report (EAR)

WATTS BAR FOSSIL PLANT

BACKGROUND SOIL INVESTIGATION

What it is and why we do it

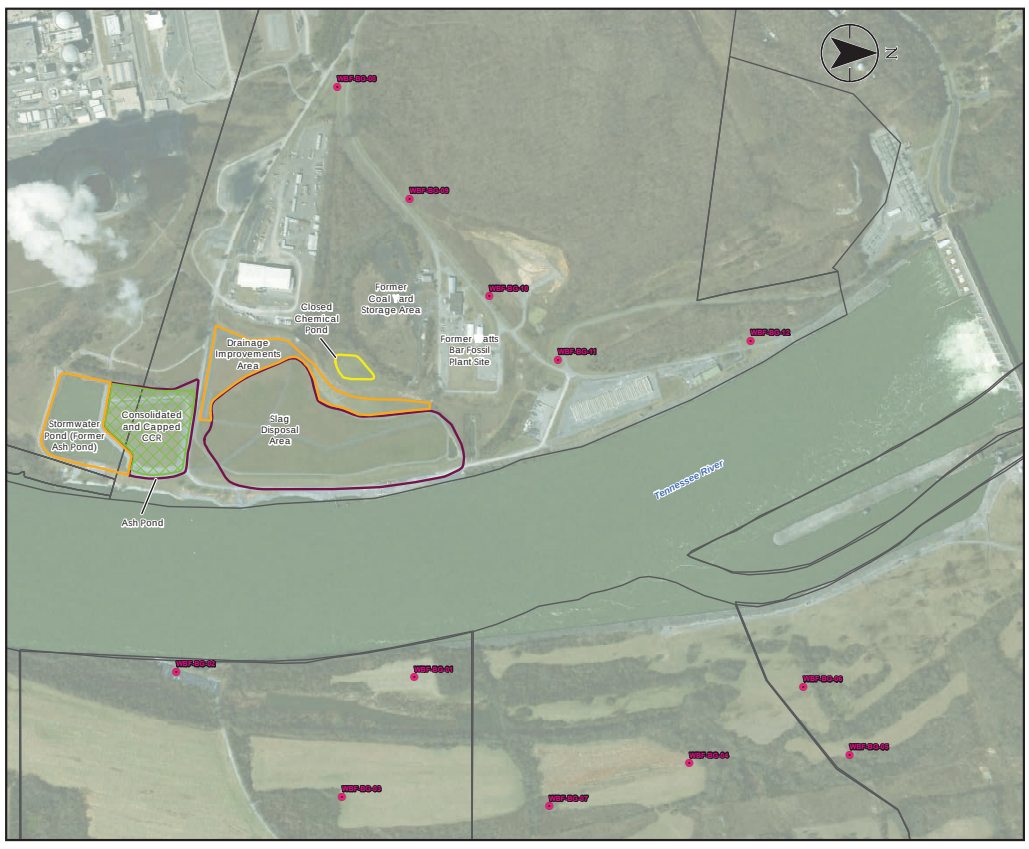
The constituents found in CCR are also found in nature. This investigation would detect CCR constituent levels in background soils.

These levels can be compared to other soils to determine if they are higher than natural levels and used to determine if CCR constituents are naturally occurring in native soils.

What TVA has already done

Background soil samples were collected during the installation of a background monitoring well. This data will be reviewed for inclusion with the set of data gathered during implementation of the Investigation.

Proposed soil sampling locations



Legend

- Proposed Background Soil Sample Location
- CCR Unit Area (Approximate)
- Closed Chemical Pond (Approximate)
- Consolidated and Capped CCR Area (Approximate)
- Drainage Improvements Area; Stormwater Pond (Former Ash Pond)
- TVA Property

Proposed EIP Activities

- Test additional background sampling locations for CCR Parameters
- Visually inspect accessible rock and residuum outcrops in the vicinity of the plant in an attempt to determine if naturally occurring sources of metallic ore minerals are present in the area
- Report the analytical results in the Environmental Assessment Report (EAR)

Tennessee Department of Environment & Conservation
TVA Environmental Investigation Plan
Watts Bar Fossil Plant

OGC15-0177 (Commissioner's Order) August 6, 2015

Order Has Two Purposes

1. Establish transparent and comprehensive process for the Investigation, assessment, and remediation of unacceptable risks, resulting from the management and disposal of coal combustion residuals (CCR) at the TVA's coal-fired power plants in Tennessee.
2. Coordination of Implementation of the federal CCR rule to insure compliance with Tennessee laws and regulations that govern the management and disposal of CCR.

TN Department of Environment & Conservation

Environmental Investigation Plan (EIP)

- The Order requires TVA to develop an EIP for each site that, when implemented, shall provide the information necessary to "*fully identify the extent of soil, surface water, and ground water contamination by CCR*"
- EIP development is an iterative process requiring review and input from TDEC
- TVA will address any comments TDEC may have, submitting additional revisions, and repeating the process until TDEC approves the EIP and schedule
- TDEC approved EIP will be presented at the AIP and issued for public comment

TN Department of Environment & Conservation

Source: TDEC All Interested Parties Meeting – August 23, 2018

Tennessee Department of Environment & Conservation
TVA Environmental Investigation Plan
Watts Bar Fossil Plant

Objectives of the EIP

- Define background conditions:
  - soil
  - surface water, sediment, and aquatic life
  - groundwater
  - pre-construction site conditions (topography, hydrology)
- Determine how each unit was constructed and modified during lifetime
- Develop a thorough understanding of the geology at the site
- Define groundwater flow and chemistry at the site
- Delineate potential impacts to groundwater, soil, surface water, sediment, and aquatic life

TN Department of Environment & Conservation

Objectives of the EIP

- Characterize CCR material
  - quantity
  - chemistry
  - physical characteristics (geotechnical)
  - saturation levels
  - existing and modeled for potential closure scenarios
- Data generated will be used to develop a final Environmental Assessment Report (EAR) and ultimately, an appropriate selection of remedy for each site

TN Department of Environment & Conservation

Source: TDEC All Interested Parties Meeting – August 23, 2018

Tennessee Department of Environment & Conservation
TVA Environmental Investigation Plan
Watts Bar Fossil Plant

Sampling and Analysis Plans (SAPs)

- TVA has worked with TDEC to develop and execute SAPs to develop new data where needed
- The SAPs provide detailed plans for conducting those studies to obtain new data and will describe how it will be used to respond to specific information requests
- The SAPs are structured as independent documents that guide the work of the SAP execution teams
- Included as Appendices to the EIP

TN Department of Environment & Conservation

TVA WBF SAPs

- Background Soil SAP
- Exploratory Drilling SAP
- Material Quantity SAP
- CCR Material Characteristics SAP
- Hydrogeological Investigation SAP
- Groundwater Investigation SAP
- Stability SAP
- Seep SAP
- Benthic SAP
- Surface Stream SAP
- Fish Tissue SAP

TN Department of Environment & Conservation

Source: TDEC All Interested Parties Meeting – August 23, 2018

Tennessee Department of Environment & Conservation
TVA Environmental Investigation Plan
Watts Bar Fossil Plant

CCR Parameters

40 CFR Part 257 Appendix III Constituents	40 CFR Part 257 Appendix IV Constituents
Boron	Antimony
Calcium	Arsenic
Chloride	Barium
Fluoride	Beryllium
pH	Cadmium
Sulfate	Chromium
Total Dissolved Solids – Not Applicable	Cobalt
	Fluoride
	Lead
	Lithium
	Mercury
	Molybdenum
	Selenium
	Thallium
	Radium 226 and 228 Combined

TN Department of Environment & Conservation

CCR Parameters

TN Rule 0400-11-01-.04, Appendix 1 Inorganic Constituents
Copper
Nickel
Silver
Vanadium
Zinc

TN Department of Environment & Conservation

Additional Data Included in the EIP

- Appendix B – Regulatory Correspondence
- Appendix E – Exhibits
- Appendix I – Groundwater Well Construction Details
- Appendix J – Groundwater Monitoring Data
- Appendix M – Drawings
- Appendix O – Evaluation of Existing Geotechnical Data
- Appendix R – Historic Seep Summary
- Appendix V – Public Comments

TN Department of Environment & Conservation

Source: TDEC All Interested Parties Meeting – August 23, 2018