
SEMI-ANNUAL REMEDY SELECTION AND DESIGN PROGRESS REPORT

PLANT WATSON FORMER CCR UNIT MISSISSIPPI POWER COMPANY

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Project Number: FR3795A

September 30, 2021

Semi-Annual Remedy Selection and Design Progress Report

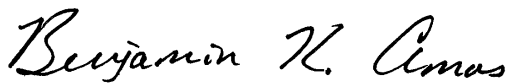
Plant Watson Former CCR Unit Mississippi Power Company

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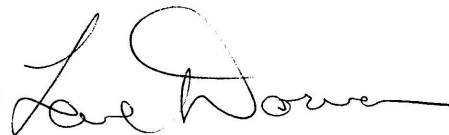
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ACRONYMS AND ABBREVIATIONS

ACM	assessment of corrective measures
ASD	alternate source demonstration
CCR	coal combustion residuals
CFR	Code of Federal Regulations
cm/sec	centimeters per second
EPA	Environmental Protection Agency
GWPS	groundwater protection standards
HPT	hydraulic performance testing
LLDPE	linear low-density polyethylene
MDEQ	Mississippi Department of Environmental Quality
MNA	monitored natural attenuation
NPDES	National Pollutant Discharge Elimination System
PRB	permeable reactive barrier
SSL	statistically significant level

1. INTRODUCTION

In accordance with the U.S. Environmental Protection Agency's (EPA's) Coal Combustion Residuals (CCR) Rule, 40 Code of Federal Regulations (CFR) § 257.97(a), this *Semi-Annual Remedy Selection and Design Progress Report* was prepared to provide a semi-annual progress update on the remedy selection process for the former CCR unit at Mississippi Power Company (Mississippi Power) Plant Watson in Gulfport, Mississippi (Site). The location of the former CCR unit is shown in **Figure 1**.

In August 2020, Mississippi Power completed an *Assessment of Corrective Measures (ACM)* to address the occurrence of arsenic, lithium, molybdenum, and combined radium 226 and 228 in Unit 3¹ groundwater at statistically significant levels (SSLs) (Geosyntec, 2020a). In December 2020, Mississippi Power completed a *Radium Alternate Source Demonstration* showing that naturally occurring sources of combined radium 226 and 228 result in the radium SSLs downgradient of the former CCR unit (Geosyntec, 2020b). In March 2021, Mississippi Power completed their first *Semi-Annual Remedy Selection and Design Progress Report* (March Progress Report; Geosyntec, 2021) detailing remedy selection activities during the period of August 2020 through February 2021. The ACM and March Progress Report were placed in the operating record and posted to the Site's CCR Rule Compliance Data and Information website.

Pursuant to 40 C.F.R. § 257.97, Mississippi Power is continuing to evaluate potential groundwater remedies presented in the ACM to identify a plan to implement a remedy, or combination of remedies, as soon as feasible. As discussed in the ACM, the following groundwater remedies are potentially viable at the Site:

- In-situ injections;
- Pump-and-treat (hydraulic containment and dewatering);
- Monitored natural attenuation (MNA);
- Permeable reactive barrier (PRB);
- Phytoremediation; and
- Subsurface vertical barrier walls.

Groundwater monitoring activities completed from July 2020 through June 2021 were included in the *2021 Annual Groundwater Monitoring and Corrective Action Report* (Annual Report; Southern Company Services, 2021) in accordance with 40 C.F.R. § 257.90(e). The Annual Report was placed in the operating record by August 1, 2021.

¹ Four distinct geologic units have been encountered near the former CCR unit. Unit 1 is comprised of dike fill material and is underlain by Unit 2, a sandy clay aquitard. Material in the former CCR unit is at the same elevation as Unit 1 and above Unit 2. Unit 3, below Unit 2, is the uppermost aquifer beneath the former CCR unit and consists primarily of sand. The CCR monitoring well network is screened in Unit 3. Finally, Unit 4 (the deepest unit) acts as a clay aquitard underlying Unit 3.

The following sections describe: (i) former CCR unit closure and source control; (ii) summary of work completed since the March Progress Report; and (iii) the anticipated schedule for currently planned activities.

2. FORMER CCR UNIT CLOSURE AND SOURCE CONTROL

Mississippi Power completed closure of the former CCR unit in 2018 via closure in place and capping. During closure, the former CCR unit was dewatered sufficiently to remove free liquids. The CCR material remaining in the former CCR unit was graded and a final cover system installed. The final cover system consists of a ClosureTurf cover system by WatershedGeo that utilizes an impermeable 50-mil linear low-density polyethylene (LLDPE) geomembrane overlain by an engineered synthetic turf. The final cover system was designed to limit infiltration of precipitation by providing sufficient grades and slopes to promote precipitation runoff to discharge points along the intake and discharge canals along the perimeter of the former CCR unit.

The closure of the former CCR unit in the manner described above provides a source control measure that reduces the potential for migration of CCR constituents to groundwater.

3. SUMMARY OF WORK COMPLETED

Since completion of the semi-annual remedy selection progress report submitted on March 31, 2021, further remedy selection-related activities have been performed as described below.

3.1 Semi-Annual Groundwater Monitoring

Semi-annual assessment monitoring of the certified CCR groundwater monitoring network has continued at the Site in accordance with 40 C.F.R. § 257.95. Groundwater samples were analyzed for Appendix III and Appendix IV constituents. Groundwater monitoring data and associated statistical analyses are documented in the *Annual Groundwater Monitoring and Corrective Action Reports*, due by August 1 of each year.

3.2 SSL Nature and Extent Assessment

Assessment of the nature and extent of SSLs, which was initiated prior to ACM completion in August 2020, has continued. The activities completed since March 2021 include sampling and data analysis associated with background monitoring wells, CCR monitoring wells, surface water sampling locations (horizontal delineation), and deep groundwater monitoring wells (vertical delineation). Surface water concentrations were below applicable groundwater protection standards (GWPSs), indicating the SSLs of arsenic, lithium, and molybdenum observed in Unit 3 groundwater are spatially limited to the area immediately surrounding the former CCR unit.

Similarly, data from deep groundwater monitoring wells were below GWPSs, except at APMW-4D and APMW-10D. Data collection and evaluation are ongoing at each deep well, and planning was initiated to further investigate the observed concentrations at APMW-4D and APMW-10D via unique isotopic signatures.

3.3 Groundwater Flow Modeling

A groundwater flow model was previously constructed for the Site. Data from hydraulic performance testing (HPT) and other 2019 and 2020 characterization efforts were used to update the model calibration. Subsequently, the flow model was used to evaluate the number of groundwater extraction wells and associated spacing for the groundwater extraction system proposed as a temporary corrective measure to enhance source control within the footprint of the former CCR unit.

3.4 Temporary Remedy

In a letter to the Mississippi Department of Environmental Quality (MDEQ) dated December 14, 2020 (Mississippi Power, 2020), Mississippi Power proposed installing a groundwater extraction system at the former CCR unit as a temporary remedy. The temporary remedy design has been advanced in the last 6 months and currently includes four groundwater extraction wells (TW-3 through TW-6), with TW-7 as a contingent location if needed. Groundwater will be extracted from Unit 3 below the footprint of the former CCR unit and within the existing slurry wall. Extracted groundwater will undergo bag filtration treatment prior to discharge to the Site leachate pond.

The goals of the temporary remedy extraction system are to:

- Begin affirmative groundwater corrective action while a long-term remedy strategy is developed.
- Reduce head in the uppermost aquifer (Unit 3) within the slurry wall footprint.
- Establish an inward flow gradient, thereby minimizing outward flow potential from the former CCR unit.
- Provide further data and information regarding hydraulic connectivity and interrelationship of water-bearing units at the Site.

In a letter dated January 29, 2021, MDEQ concurred with the conceptual approach. Groundwater extraction well permits were received from MDEQ on July 12, 2021 and MDEQ approval for temporary discharge during well installation, development, and testing was provided on August 24, 2021.

Temporary remedy inputs to the sedimentation pond will be included in the National Pollutant Discharge Elimination System (NPDES) permit renewal for the Site. The temporary remedy will not be operated until the NPDES permit for the Site has been updated to include the temporary remedy inputs to the sedimentation pond.

4. PLANNED ACTIVITIES AND ANTICIPATED SCHEDULE

The following activities are planned to support the remedy selection process over the next 6 to 12 months:

- Semi-annual groundwater assessment monitoring, including sampling of horizontal and vertical delineation locations, is planned for October 2021.
- Assess vertical delineation by evaluating groundwater chemistry signatures in surface water, porewater, and Unit 3 and Unit 4 groundwater. The purpose of this study is to investigate the potential source of elevated levels of select constituents in deeper groundwater.
- Finalize the scope and initiate the study to evaluate natural attenuation mechanisms in Unit 3. The attenuation study, which is anticipated to take 4 to 6 months to complete, will evaluate the EPA-recommended tiered analysis approach to develop multiple lines of evidence for confirming the appropriate application of natural attenuation as a component of a remedial strategy. The attenuation study is anticipated to include:
 - Aquifer matrix, groundwater, and surface water sampling;
 - Laboratory testing, which will likely include:
 - chemical and mineralogic characterization; and/or
 - batch sorption/desorption testing; and
 - Data evaluation and documentation of the attenuation mechanisms.
- Continue assessment of other corrective measures identified in the ACM, including evaluating if additional field data collection, laboratory studies, and/or field pilot tests are needed to support remedy selection.
- Install and test groundwater extraction wells for the temporary groundwater remedy.
- Design and construct the temporary groundwater remedy.

As appropriate, data obtained during these activities will be included in the *Annual Groundwater Monitoring and Corrective Action Report* due August 1, 2022.

Final selection of an appropriate remedy will occur as soon as feasible in accordance with the CCR Rule. Until remedy selection is complete, semi-annual remedy selection and design progress reports will continue to be prepared. The next semi-annual progress report will be completed by March 31, 2022.

5. REFERENCES

- Geosyntec, 2020a. Assessment of Corrective Measures. Former CCR Unit. Mississippi Power Company. Plant Watson. August 2020.
- Geosyntec, 2020b. Radium Alternate Source Demonstration. Former CCR Unit. Mississippi Power Company. Plant Watson. August 2020.
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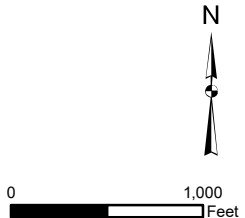
FIGURE



Legend

- Former CCR Unit Boundary
- RaceTrac Gas Station Property Boundary
- Plant Watson Property Boundary

Notes:
1. Property boundary georeferenced from Southern Company Services, 2020. Groundwater Monitoring Report. Mississippi Power Company. Plant Watson Ash Pond. 21 February.
2. CCR - Coal Combustion Residuals
3. Aerial Source: Google Earth Imagery 3/18/2019



Plant Watson Location Map

Plant Watson
Gulfport, Mississippi

Geosyntec
consultants

Pensacola, FL

June 2021

Figure

1