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SEMI-ANNUAL REMEDY SELECTION AND DESIGN PROGRESS REPORT

PLANT WATSON FORMER CCR UNIT MISSISSIPPI POWER COMPANY

Prepared for

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Project Number: FR3795A

September 30, 2022

Semi-Annual Remedy Selection and Design Progress Report

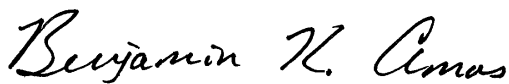
Plant Watson Former CCR Unit Mississippi Power Company

Prepared for

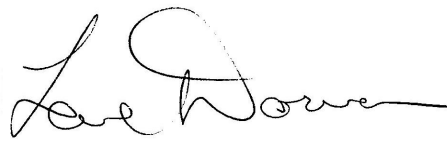
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ACRONYMS AND ABBREVIATIONS

ACM	assessment of corrective measures
CCR	coal combustion residuals
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
GWPS	groundwater protection standards
IFC	issued for construction
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 2021 and 2022, Mississippi Power completed *Semi-Annual Remedy Selection and Design Progress Reports* (Geosyntec, 2021a; Geosyntec, 2021b; Geosyntec, 2022) detailing remedy selection activities during the period of August 2020 through February 2022. The ACM and progress reports 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, or combination of remedies, presented in the ACM to implement a remedy 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 2021 through June 2022 were included in the *2022 Annual Groundwater Monitoring and Corrective Action Report* (Annual Report;

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.

Southern Company Services, 2022) in accordance with 40 C.F.R. § 257.90(e). The Annual Report was placed in the operating record by August 1, 2022.

The following sections describe: (i) former CCR unit closure and source control; (ii) summary of work completed since the March 2022 progress report (Geosyntec, 2022); 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 minimizes infiltration and reduces the potential for migration of CCR constituents.

3. SUMMARY OF WORK COMPLETED

Since completion of the *Semi-Annual Remedy Selection and Design Progress Report*, submitted on March 31, 2022, 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 February 2022 include groundwater and surface water sampling (March 2022) 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 (GWPS), 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. Therefore, horizontal delineation is completed.

Groundwater data collection and evaluation are ongoing at each deep well. In addition, an investigation using isotopic signatures was completed to evaluate groundwater constituent concentrations in deeper groundwater bearing zones. Based on the results of the isotopic data evaluation, an addendum to the *Comprehensive Groundwater Investigation Report* (Geosyntec, 2020c) is being developed for certain CCR constituents observed in deep groundwater in select locations. This document will serve to complete vertical delineation for SSLs at the Site.

3.3 Monitored Natural Attenuation (MNA) Evaluation

The attenuation study outlined in the March 2022 *Semi-Annual Remedy Selection and Design Progress Reports* (Geosyntec, 2022) was completed. The results of the evaluation generally indicated attenuation of SSL constituents in compliance wells as evidenced by decreasing temporal trends. Exceptions were the two monitoring wells on the east side of the former CCR unit (APMW-5 and APMW-6R). Based on these findings, MNA demonstration efforts focused on the monitoring wells characterized by decreasing temporal trends that are estimated to achieve GWPSs in an acceptable timeframe. For locations without decreasing temporal trends, concentrations will be monitored over the course of operation of the temporary remedy system (see Section 3.4) and the Site will utilize an adaptive management approach based on observed monitoring and performance data.

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 was completed and will extract groundwater 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 pursuant to the 2020 correspondence are to:

- Begin 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.

Temporary remedy discharge to the Site leachate pond were included in the approved National Pollutant Discharge Elimination System (NPDES) permit renewal for the Site.

As part of the temporary remedy system, four groundwater extraction wells (TW-4, TW-5, TW-6, and TW-7) were installed in November and December 2021 in the footprint of the former CCR unit as shown on **Figure 2**. TW-4 through TW-6 are incorporated into the temporary remedy system along with existing groundwater extraction well TW-3. TW-7 is available as a contingent extraction well to be incorporated into the system, if needed. The extraction wells were developed following installation and capacity tests were completed to evaluate potential groundwater extraction rates. The temporary remedy design drawings were stamped by a professional engineer licensed in Mississippi and issued for construction (IFC) on February 16, 2022. An overview of the temporary remedy system layout is provided in **Figure 2**.

Construction of the temporary remedy system commenced in May 2022 following a bidding and contractor selection process. The original schedule estimate indicated construction completion and system startup in September 2022. However, due to manufacturing and procurement delays associated with supply chain disruption throughout multiple sectors of the economy, the current estimated completion of construction and system startup is October 2022.

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 2022.
- Complete the vertical delineation addendum to the *Comprehensive Groundwater Investigation Report* (Geosyntec, 2020c).
- Continue assessment of 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.
- Complete construction and commission the temporary groundwater remedy.
- Develop a groundwater monitoring plan to assess the performance of the temporary groundwater remedy.

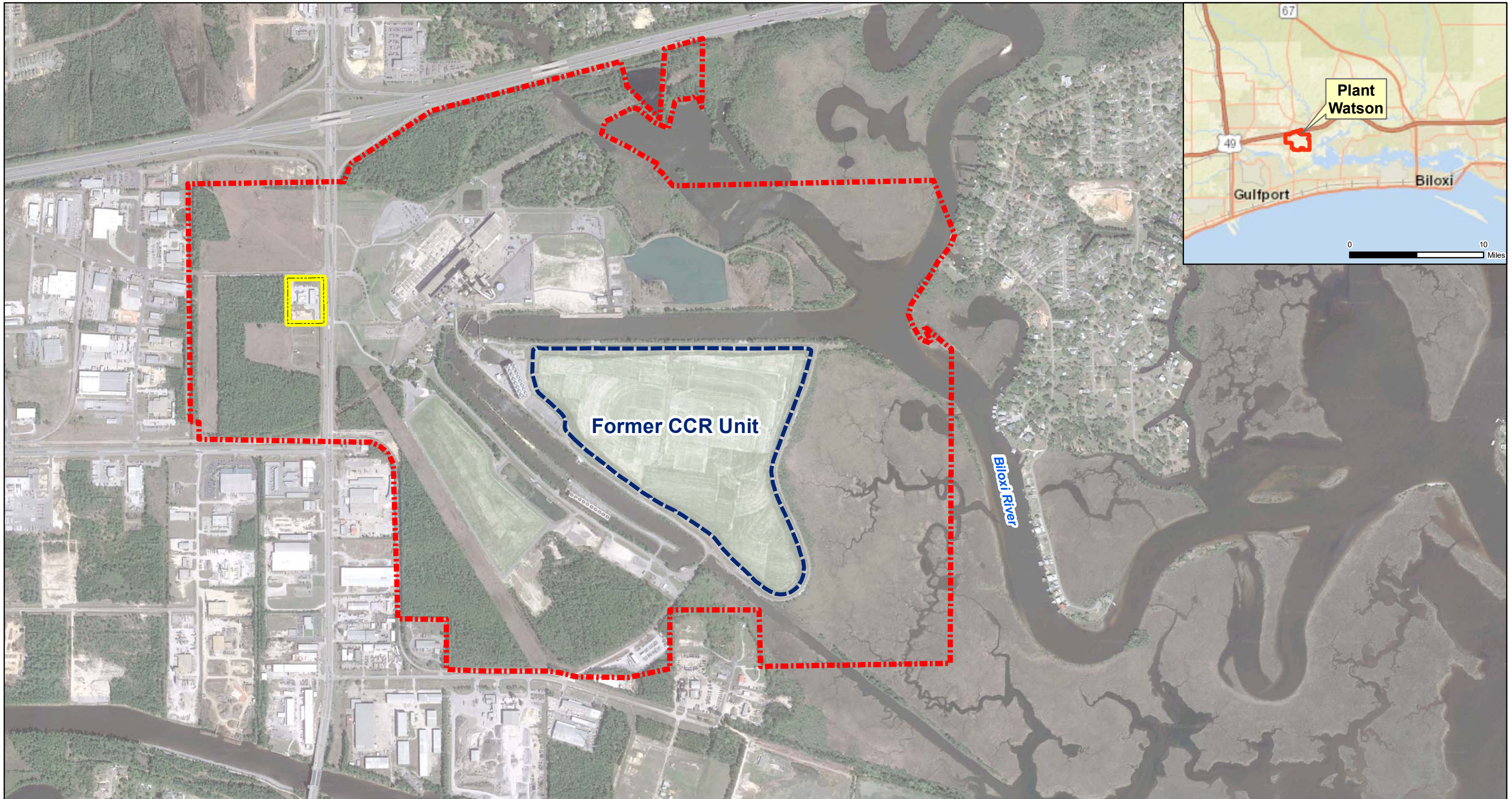
As appropriate, data obtained during these activities will be included in the *Annual Groundwater Monitoring and Corrective Action Report* due August 1, 2023.

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, 2023.

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.
- Geosyntec 2020c. Comprehensive Groundwater Investigation Report. Former CCR Unit. Mississippi Power Company. Plant Watson. December 2020.
- Geosyntec, 2021a. Semi-Annual Remedy Selection and Design Progress Report. Plant Watson Former CCR Unit. Mississippi Power Company. March 31, 2021.
- Geosyntec, 2021b. Semi-Annual Remedy Selection and Design Progress Report. Plant Watson Former CCR Unit. Mississippi Power Company. September 30, 2021.
- Geosyntec, 2022. Semi-Annual Remedy Selection and Design Progress Report. Plant Watson Former CCR Unit. Mississippi Power Company. March 31, 2022.
- Mississippi Power, 2020. Mississippi Power – Plant Watson. Agreed Order No 7010-19. Temporary Remedy. December 2020.
- Southern Company Services, 2022. 2022 Annual Groundwater Monitoring and Corrective Action Report. Mississippi Power Company. Plant Watson Former CCR Unit. August 1, 2022.

FIGURES



- 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

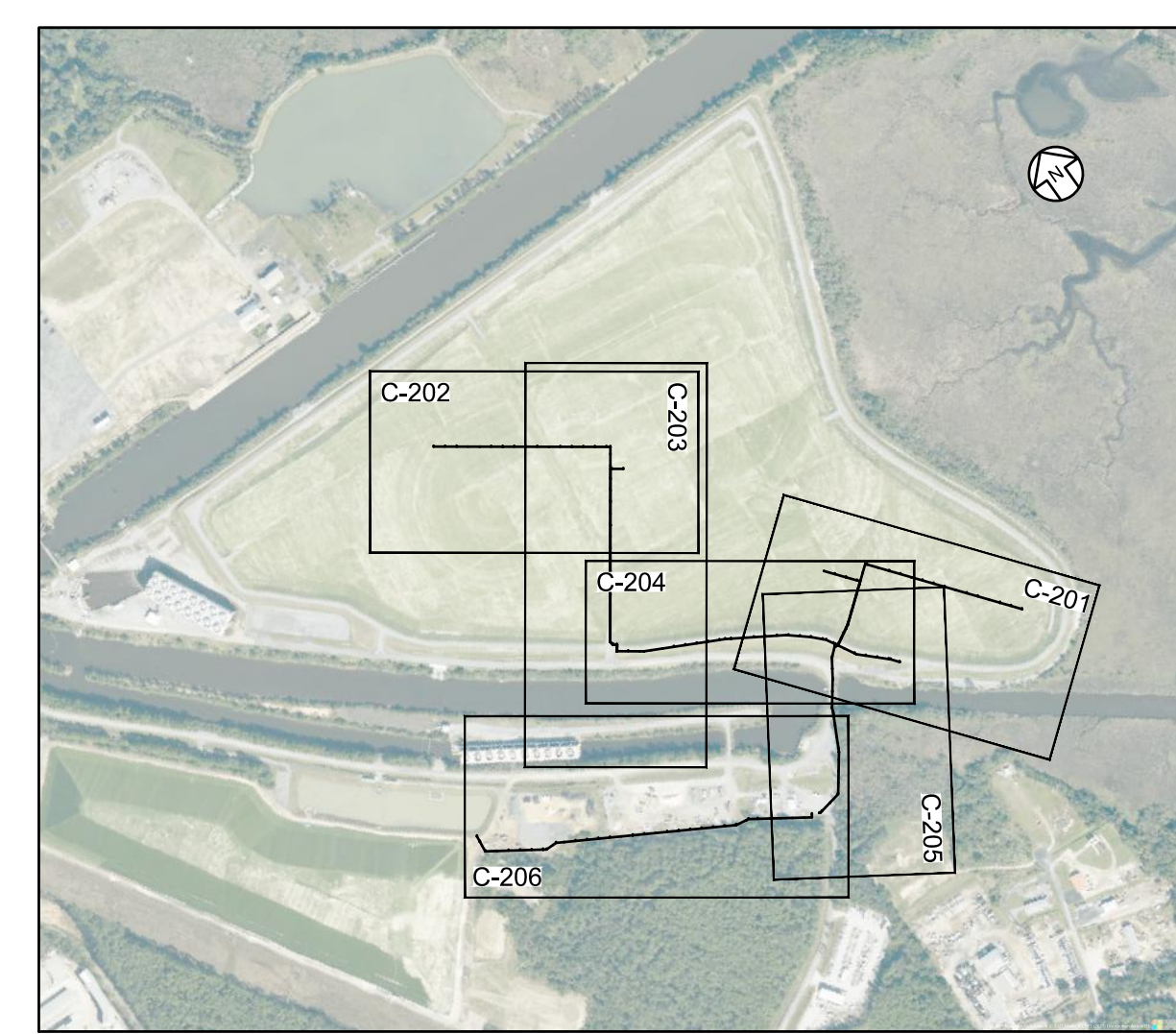
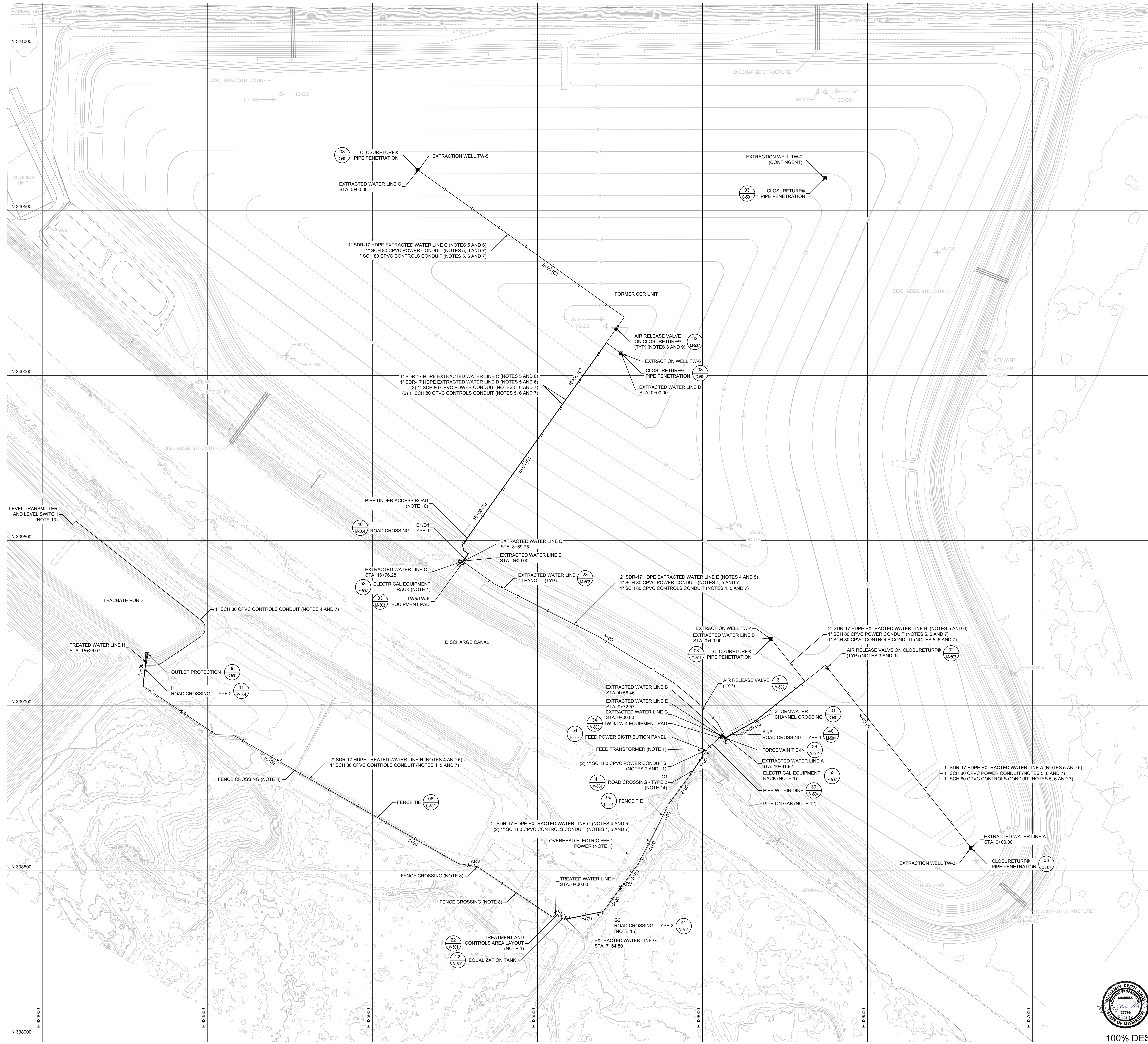
Geosyntec
 consultants

Pensacola, FL

September 2022

Figure

1



- NOTES:**
- MISSISSIPPI POWER SHALL SUPPLY POWER BETWEEN THE TRANSFORMER AND FEED POWER DISTRIBUTION PANEL. CONTRACTOR SHALL PICK UP ELECTRICAL INSTALLATION FROM THIS POINT.
 - PIPE BENDS ARE NOT DIRECTLY CALLED OUT. CONTRACTOR SHALL INSTALL BENDS AS NECESSARY TO MEET THE PROPOSED ALIGNMENT. ALL PIPE BENDS SHALL BE LONG SWEEP AND OF THE SAME PIPE TYPE AND CLASS AS THE MAIN LINES.
 - AIR RELEASE VALVES SHALL BE INSTALLED ALONG THE EXTRACTED AND TREATED WATER LINES AT LOCAL HIGH POINTS. CONTRACTOR SHALL VERIFY HIGH POINTS ALONG THE VERTICAL PIPELINE ALIGNMENT IN THE FIELD PRIOR TO FINALIZING AIR RELEASE VALVE LOCATIONS. ALL AIR RELEASE VALVE LOCATIONS SHALL BE CONFIRMED WITH THE OWNER'S ENGINEER BEFORE INSTALLATION.
 - OUTSIDE CLOSURETURF®: CONTRACTOR SHALL SECURE WATER LINES AND CONDUIT TO HALF CONCRETE BIN BLOCKS INSTALLED AT 25 FOOT INTERVALS AND PLACE THE LINES AS CLOSE AS POSSIBLE TO THE EXISTING DIKE ROAD. HALF CONCRETE BIN BLOCKS SHALL NOT BE INSTALLED ON THE CLOSURETURF® NOR ALONG PIPING ATTACHED TO EXISTING FENCE. CONTRACTOR MAY PROPOSE ALTERNATIVE CONCRETE BLOCK FOR REVIEW AND APPROVAL BY THE OWNER'S ENGINEER. PIPE SUPPORTS FOR CLEANOUTS AND AIR RELEASE VALVES SHALL BE IN ACCORDANCE WITH DETAILS 28 AND 31 ON DRAWING M-502.
 - CONDUITS SHALL BE FASTENED TO EXTRACTED WATER LINES WITH BLACK HEAVY DUTY CABLE TIES AT 10 FOOT INTERVALS AS SHOWN ON DETAIL 49 ON SHEET E-502.
 - WITHIN THE CLOSURETURF®: CONDUITS AND WATER LINES SHALL BE SUPPORTED USING CUSH-A-BLOCK RUBBER PIPE SUPPORTS OR SANDBAGS. IN AREAS INDICATED WITH BRACKETS, CONDUITS AND WATER LINES SHALL BE SUPPORTED BY CUSH-A-BLOCK RUBBER PIPE SUPPORTS AT 3 FOOT INTERVALS. IN AREAS OUTSIDE THE BRACKETS, THE CONDUIT AND WATER LINES SHALL BE LAID DIRECTLY ON THE CLOSURETURF®. SANDBAGS SHALL BE PLACED DIRECTLY ON TOP OF THE LINES AT 10 FOOT INTERVALS. ALONG THE ENTIRE ALIGNMENT, BLACK HEAVY DUTY CABLE TIES SHALL CONNECT THE THREE LINES AT 10-FOOT INTERVALS AS SHOWN ON DETAIL 49 ON SHEET E-502. THE CABLE TIE CONNECTIONS SHOULD BE OFFSET FROM THE PIPE SUPPORTS AND SANDBAGS. SEE PLAN AND PROFILE DRAWINGS FOR LOCATIONS.
 - CPVC PIPES, VALVES, AND FITTINGS EXPOSED TO DIRECT SUNLIGHT SHALL BE COATED WITH UV PROTECTIVE PAINT OR SHALL BE MANUFACTURED WITH UV INHIBITORS AND RATED FOR PROLONGED UV EXPOSURE.
 - CONTRACTOR IS RESPONSIBLE FOR FIELD-FIT PLACEMENT OF TREATED WATER LINE AND CONTROLS CONDUIT BELOW EXISTING FENCE AT FENCE CROSSING LOCATIONS.
 - CONTRACTOR SHALL INSTALL CLEAR POLYETHYLENE TUBING FROM AIR RELEASE VALVE SPOUT ALONG EXTRACTED WATER LINE ALIGNMENT TO DRAIN INTO EXTRACTION WELL NOTED ON FOLLOWING DRAWINGS. FASTEN POLYETHYLENE TUBING TO EXTRACTED WATER LINE USING BLACK HEAVY DUTY CABLE TIES.
 - THE EXTRACTED WATER LINES (2) AND CONDUITS (4) FROM TW-5 AND TW-6 SHALL BE BURIED WITHIN THE GAB (APPROX. 1 FT FROM EDGE) OF THE ACCESS ROAD ONTO THE CLOSURETURF® COVER FOR THE PIPES SHALL NOT EXTEND BEYOND THE FIRST 45 DEGREE LONG SWEEP ELBOW. ADDITIONAL GRAVEL SHALL BE ADDED TO THE END OF THE ACCESS ROAD ON THE CLOSURETURF® AND RAMPED TO ALLOW VEHICLE TRAFFIC TO ACCESS CLOSURETURF® IN EITHER DIRECTION AND NOT TRAVERSE DIRECTLY OVER THE EXTRACTED WATER LINES AND CONDUITS.
 - POWER CONDUITS SHALL DAYLIGHT AT THE BASE OF THE DIKE INTO THE GAB SURROUNDING THE FEED POWER DISTRIBUTION RACK AND RUN INTO THE FEED POWER DISTRIBUTION PANEL.
 - EXTRACTED WATER LINE G AND CONTROLS CONDUITS SHALL DAYLIGHT IN THE SAME LOCATION AS THE POWER CONDUIT. A 6" LAYER OF GAB, AS SHOWN ON DRAWING C-502, SHALL BE INSTALLED BENEATH EXTRACTED WATER LINE G AND THE CONTROLS CONDUITS FROM THE POINT OF DAYLIGHTING TO G1 ROAD CROSSING-TYPE 2.
 - CONTRACTOR SHALL INSTALL THE LEVEL TRANSMITTER AND LEVEL SWITCH ON OR NEAR THE OUTFALL STRUCTURE IN ACCORDANCE WITH CONSTRUCTION MANAGER APPROVAL.
 - CONTRACTOR SHALL DAYLIGHT WATER LINE AND CONTROLS CONDUIT ADJACENT TO THE FENCE LINE AND RECONSTRUCT THE GRAVEL BERM FOR ADDED PROTECTION OF THE LINES FROM VEHICLE TRAFFIC.
 - CONTRACTOR SHALL INSTALL A HALF CONCRETE BIN BLOCK ON EITHER END OF THE ROAD CROSSING TO INDICATE WHERE PIPING GOES UNDERGROUND AND WHERE IT DAYLIGHTS NEAR THE TREATMENT PAD.

REV	DATE	DESCRIPTION	DRN	APP
0	02/16/22	100% DESIGN DRAWINGS - ISSUED FOR CONSTRUCTION	VSA	BKA

SITE DEVELOPMENT PLAN
TEMPORARY REMEDY DESIGN
PLANT WATSON
MISSISSIPPI POWER COMPANY
GULFPORT, MISSISSIPPI

Geosyntec
consultants

MISSISSIPPI COA
No. 1441 EXP. 12/31/2021
28149 CANTON DRIVE, SUITE E
DAPHNE, ALABAMA 36622

PROJ. NO. FR7947 DWG. FR7947.01C102 SHEET C-102
SCALE 1" = 100' FIGURE 2
DATE 02.02.22

100% DESIGN
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