CONSTRUCTION QUALITY ASSURANCE PLAN

PLANT WANSLEY ASH POND 1 (AP-1) CLOSURE

HEARD AND CARROLL COUNTIES, GEORGIA

FOR

Georgia Power

REVISION 1

NOVEMBER 2025

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GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Approved

Solid Waste Management Program

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LIST OF ACRONYMS

AP-1	Ash Pond 1
ASTM	American Society for Testing and Materials
CCR	Coal Combustion Residuals
CQA	Construction Quality Assurance
CQC	Construction Quality Control
CRE	Constant Rate of Extension
GA EPD	Georgia Environmental Protection Division
GPC	Georgia Power Company
GSI	Geosynthetic Institute
GAI-LAP	Geosynthetic Accreditation Institute-Laboratory Accreditation Program
MQC	Manufacturer Quality Control
QA	Quality Assurance
QC	Quality Control

1. INTRODUCTION

1.1 OVERVIEW

This Construction Quality Assurance (CQA) Plan describes the quality assurance (QA) and quality control (QC) activities that will be undertaken during closure construction of Ash Pond 1 (AP-1) at Georgia Power Company's (GPC) Plant Wansley in Heard and Carroll Counties, Georgia. The purpose of this document is to define the scope, procedures, and acceptance criteria necessary to perform QA tasks such that the construction elements of AP-1 closure (hereafter referred to as "the Project") comply with the design as shown or indicated in the Permit Drawings.

1.2 PROJECT DESCRIPTION

AP-1 will be closed using a Closure by Removal approach, whereby the coal combustion residuals (CCR) will be either dredged and/or excavated from AP-1 and transported to designated facilities, including: the Georgia Environmental Protection Division (GA EPD) approved onsite CCR landfill for disposal (landfill modification, placement, and closure under a separate permit application), other solid waste facility approved to accept CCR, or other offsite locations where materials removed from AP-1 are diverted for beneficial use (BU). The Project will include the general activities described below:

- Site preparation, including but not limited to, clearing trees, grading, constructing access roadways and laydown construction areas, constructing non-contact water diversion channels and ponds, and installing erosion and sediment controls;
- Installation, testing, start-up, and operation of a water treatment plant (WTP) to support construction dewatering activities;
- Bulk Removal, including CQA in accordance with this CQA Plan, by either: (i) bulk removal of CCR via dredging or similar method, followed by removal of free water within AP-1; or (ii) removal of free water within AP-1 followed by bulk removal of CCR via conventional excavation;
- CCR material transport via piping from dredge, piping from dredge to paste thickening plant, conveyor, or haul truck to designated facilities;
- Final removal of CCR, including CQA in accordance with this CQA Plan, via conventual excavation and transportation by conveyor or haul truck to designated facilities, to its bottom in AP-1 as defined by the visual interface between CCR and underlying native soils with the complete drawdown of the free pool within AP-1;
- Removal, including CQA in accordance with the CQA Plan, via conventional excavation and transportation by conveyor or haul truck to designated facilities, of a minimum six inches of additional soils after reaching the CCR/native soil interface;

- Certification of CCR Removal;
- Temporary stabilization of bottom of excavation surface through approved methods in Manual for Erosion and Sediment Control in Georgia to prevent erosion;
- Placement of seepage and stability berm plus riprap on the Separator Dike;
- Breaching of non-contact water diversion channels and ponds; and
- Refill of former AP-1 via natural processes for potential plant uses.

Note that many of the activities described above will be conducted in a phased and overlapping manner.

1.3 CQA PLAN SCOPE

CQA services will be provided by a consulting engineering firm, reporting to the Owner, specializing in the inspection and testing of soils and geosynthetics. The scope of this CQA Plan includes:

- defining the qualifications and responsibilities of the CQA Consultant;
- establishing testing protocols for the evaluation of the closure components;
- establishing procedures for construction documentation; and
- establishing procedures for providing final documentation verifying that the construction project conforms to the Permit Drawings.

2. CQA PLAN DEFINITIONS AND CQA/CQC APPROACH

2.1 CONSTRUCTION QUALITY ASSURANCE AND CONSTRUCTION QUALITY CONTROL

In the context of this document, construction quality assurance and manufacturer quality control/construction quality control are defined as follows:

- Construction Quality Assurance (CQA) - A planned and systematic pattern of actions taken by an organization that operates separately from the Contractor and the Owner (i.e., independent party) to verify that construction materials and/or services achieve compliance with technical, contractual, and regulatory requirements. This generally involves observation, review of test results submitted by others, and conducting independent testing to verify conformity of the various components of the Project with the requirements of the Permit Drawings.
- Manufacturer Quality Control/Construction Quality Control (MQC/CQC) – A planned system of actions taken by the Manufacturers, Contractors, and Installers to

monitor, check, and control the quality of their own work (verify that they are supplying materials and providing the workmanship as required by the Permit Drawings). The CQC services may be performed "in-house" by the Manufacturers, Contractors and Installers or they may be subcontracted to an outside organization hired by these entities.

2.2 CONFORMANCE TESTING AND PERFORMANCE TESTING

In the context of this document, conformance testing and performance testing are defined as follows:

- Conformance Testing – Testing performed to evaluate whether a construction material (e.g., soil, aggregate, geosynthetic, or other materials) to be used on the Project possesses properties and characteristics that are in conformance with the specified parameters. By definition, conformance testing is conducted before a material is installed.

- Performance Testing – Testing performed on a completed work product to evaluate whether the construction material (e.g., soil, aggregate, or other materials) as-constructed/installed possesses properties and characteristics that are in conformance with the specified performance parameters and work product acceptance criteria. Performance testing is conducted during or after material is installed.

3. PERSONNEL

3.1 CQA CONSULTANT

3.1.1 Definition

The CQA Consultant is the party, retained by the Owner, but not affiliated with the Owner or Contractor, responsible for observing and documenting CQC activities, reviewing CQC submittals prepared by the Contractor/Manufacturer related to the Project, and performing CQA activities as described in this CQA Plan. The qualifications and responsibilities of the CQA Consultant are described below. Resumes and qualifications, including experience with projects of similar type, size and complexity, will be provided to the Owner for their review and approval.

3.1.2 Qualifications

The CQA Consultant will:

- have specialized experience in the design of geo-environmental infrastructure involving earthwork, waste materials management, piping

installations, project-site water management, revegetation, final cover system design, and CQA of these components;

- possess the equipment, personnel, and licenses necessary to conduct the monitoring required by this CQA Plan and the Permit Drawings;

- be experienced in the review of Contractor CQC submittals for conformance with the Project requirements and in the resolution of non-conformances; and

- be experienced in the preparation and/or review of CQA documentation including CQA plans, field documentation, field testing procedures, laboratory testing procedures, technical specifications, technical drawings, and CQA certification reports.

The CQA Consultant organization will be led by the CQA Certifying Engineer, who will be a Professional Engineer registered to practice in the State of Georgia. The CQA Consultant and the CQA Certifying Engineer shall come from the same company. The CQA Site Manager will be the on-site representative of the CQA Consultant and will have experience in construction activities required for the Project.

3.1.3 Responsibilities

The CQA Consultant will be responsible for:

- reviewing the Permit Drawings prior to the start of the construction;

- monitoring the compliance of construction materials and manufactured products delivered to the site with the CQC submittals and conformance requirements and/or shop drawings previously reviewed and approved by the Design Engineer;

- coordinating CQA conformance sampling and testing and reviewing test results;

- monitoring that the Contractor's construction methods and workmanship are performed in accordance with the Permit Drawings;

- performing on-site field and/or laboratory QA testing;

- maintaining calibration certificates of CQC and CQA field-testing equipment in the CQA Consultant's on-site project file;

- reviewing field and laboratory CQC test results in a timely manner so as not to impede or delay construction activities; and

- promptly notifying the Owner or Owner's Representative of any nonconformances of the Contractor's work with any requirements of the Project, including those requirements related to the prompt delivery of CQC results to the CQA consultant.

The CQA Consultant will be comprised of a Certifying Engineer, a Site Manager, and CQA Field Technicians. The specific duties of the individual CQA personnel are discussed in the following subsections.

3.1.3.1 CQA Certifying Engineer

The CQA Certifying Engineer:

- reviews the Permit Drawings;
- attends scheduled, meetings related to Project construction quality activities;
- makes site visits to verify conformance with this CQA Plan and the Permit Drawings;
- administers the CQA program (i.e., assigns and manages all on-site CQA personnel, reviews all field reports, provides engineering review of all CQA-related activities);
- provides quality control of CQA documentation;
- reviews and documents changes to the design during construction; and
- prepares and seals the final CQA Certification Report.

3.1.3.2 CQA Site Manager

The CQA Site Manager:

- serves as the on-site representative of the CQA Consultant;
- familiarizes all CQA field technicians with the site and the CQA requirements;
- coordinates with the Contractor on a daily basis and manages the daily activities of the CQA field technicians accordingly;
- attends regularly scheduled CQA-related meetings on-site;

- reviews the ongoing preparation of the construction record drawings;
- reviews test results, certifications, and documentation provided by the Contractor and makes appropriate recommendations;
- reviews the CQA field technicians' daily notes and logs;
- prepares a daily report for the project;
- oversees the collection and shipping of laboratory test samples;
- reviews the results of field and laboratory testing and makes appropriate recommendations;
- reports any unresolved deviations from the CQA Plan to the Construction Manager and CQA Certifying Engineer;
- assists with the preparation of the final CQA Certification Report; and
- performs duties of CQA field technician, as needed.

3.1.3.3 CQA Field Technicians

CQA field technicians:

- monitor material stockpiles for any deterioration of materials;
- monitor surface water drainage in the areas of soil and geosynthetic material stockpiles;
- monitor and test earthwork placement and compaction operations, as well as other tests as needed;
- monitor the unloading, storage, and on-site handling of the geosynthetics;
- monitor geosynthetic material deployment and installation operations;
- monitor geosynthetic repair operations;
- assist with the collection and shipping of laboratory test samples;
- document any on-site activities that could result in damage to the soils of the construction and report them as soon as practical to the CQA Site Manager;

- prepare notes and logs; and
- report problems to the CQA Site Manager.

3.2 CQA GEOSYNTHETICS LABORATORY

3.2.1 Definition

The CQA Geosynthetics Testing Laboratory is a party of the CQA Consultant and will be responsible for conducting tests on samples of geosynthetic materials used in the construction in accordance with standards referenced in this CQA Plan and the Permit Drawings. The testing results generated by the CQA Geosynthetics Laboratory will be used by the CQA Consultant to verify compliance of the geosynthetic materials with this CQA Plan and the Permit Drawings.

3.2.2 Qualifications

The CQA Geosynthetics Laboratory will be currently accredited by the Geosynthetic Institute (GSI) under their Geosynthetic Accreditation Institute-Laboratory Accreditation Program (GAI-LAP), be approved by the Certifying CQA Engineer and the Owner and have experience in testing geosynthetics to be used for the Project. The CQA Geosynthetics Laboratory will be familiar with ASTM and other applicable geosynthetic test standards. The CQA Geosynthetics Laboratory will be capable of providing destructive test results for geomembrane field seams within 24 hours of receipt of samples and will maintain that capability throughout the duration of geosynthetic material installation.

Prior to construction, the CQA Geosynthetics Laboratory will be required to submit their qualifications and QA/QC procedures to the CQA Consultant and the Owner for review and comment.

3.3 CQC PERSONNEL

3.3.1 Definition

The Contractor is responsible for supplying materials and providing the workmanship as required by the Permit Drawings. Construction documents for the Project may include required CQC activities for certain components of the Project, and/or may give the Contractor the option to develop a CQC program for control of their own work. Under this approach, if the Contractor implements a CQC program, they may perform CQC activities “in-house”, or may subcontract these activities to an outside party. Whether in-house or subcontracted, the individuals assigned to perform CQC on the Contractor’s behalf are referred to herein as “CQC Personnel.”

3.3.2 Qualifications

CQC Personnel should be experienced in the CQC of earthwork and other activities required for the Project. CQC Personnel should also possess the necessary equipment and materials to conduct CQC activities on behalf of the Contractor. CQC Personnel should be experienced in the preparation and/or review of CQC documentation including manufacturer and supplier documentation, field documentation, field testing procedures, and laboratory testing procedures and results.

3.4 EARTHWORK LABORATORY

3.4.1 Definition

The CQC Earthwork Testing Laboratory (CQC Earthwork Laboratory) is a party of the CQC Consultant and will be responsible for conducting CQC geotechnical laboratory testing in accordance with standards referenced in this CQA Plan and the Permit Drawings. The testing results generated by the CQC Earthwork Laboratory will be used by the CQC Consultant to verify compliance of the earthwork with this CQA Plan and the Permit Drawings.

3.4.2 Qualifications

The CQC Earthwork Laboratory will be experienced in testing of soils and CCR using methods in accordance with American Society of Testing and Materials (ASTM) and other applicable soil test standards and holding appropriate and current industry certification(s)/accreditation(s). The CQC Earthwork Laboratory will be capable of providing test results within a maximum of seven (7) working days of receipt of samples, except for those tests that require longer to perform, and will maintain that capability throughout the duration of the earthwork construction.

Prior to construction, the CQC Earthwork Laboratory will be required to submit their qualifications and QA/QC procedures to the CQA Consultant and the Owner for review and comment.

3.5 DESIGN ENGINEER

The Design Engineer is the engineer-of-record responsible for the AP-1 Closure Design. The Design Engineer shall be a Professional Engineer registered in the State of Georgia. The Design Engineer will be responsible for:

- approving all design and specification changes and making design clarifications that may be required during construction;

- assisting the Construction Manager in reviewing and approving the Contractor's shop drawings and submittals, as necessary;

- periodically visiting the site during construction and attending the project coordination meetings, as required, to verify conformance with this CQA Plan; and

- discussing and interpreting all elements of the design and having the authority to recommend changes or modifications to construction documents for approval by the Owner, as necessary.

The CQA Certifying Engineer and Design Engineer may be from the same organization, but not the same individual.

3.6 SURVEYOR

The Surveyor is the party acceptable to the Owner and retained by the Contractor, who will be responsible for performing surveying activities and issuing survey products in accordance with the Permit Drawings, and for signing and sealing the construction survey record drawings. The Surveyor will be a State of Georgia licensed Professional Land Surveyor, with personnel experienced in the provision of surveying services and their detailed documentation. The Owner may elect to retain a separate third-party surveyor, having similar qualifications, to perform verification surveys.

3.7 CONSTRUCTION MANAGER

The Project Construction Manager, hereafter referred to simply as the Construction Manager, is an individual, appointed by the Owner, who will serve as the Owner’s representative and who will be responsible for overall management of the Construction Project. The Construction Manager will give direction to the Contractor. The CQA Consultant will provide the Construction Manager with notifications, reports, and monitoring logs as requested and as described further throughout this CQA Plan.

3.8 CONTRACTOR

The term “Contractor” refers to the General Contractor (i.e., the Prime Contractor) who is retained by the Owner to conduct the AP-1 closure construction. In general, the Contractor will be responsible for furnishing and installing materials in accordance with the Permit Drawings (unless certain items may be procured and/or installed under separate contracts with or on behalf of the Owner). In this role, the Contractor will be responsible for earthwork activities, CCR dredging and/or excavation, CCR dewatering and transportation, and constructing associated surface water management features and other related site work. The Contractor may subcontract with various parties to conduct certain portions of the Project. The Owner will select a Contractor qualified for this Project through experience constructing projects involving similar work elements, and with personnel and equipment availability as needed to execute a project of this magnitude.

As set forth in the Permit Drawings, the Contractor will prepare various Work Plans for approval by the Owner, or the Owner's Representative. During construction, the Contractor will work with the Owner/Construction Manager to develop an approved schedule, execute the work according to that schedule, and communicate the timing of key milestones/activities with appropriate project parties (e.g., CQA Consultant). Note that the preceding description of the Contractor's roles and responsibilities is only a general summary and does not represent the comprehensive scope of work required by the Permit Drawings. In the event of any discrepancies, the Permit Drawings will govern.

3.9 GEOSYNTHETICS MANUFACTURERS AND INSTALLERS

Geosynthetics are manufactured materials. The Manufacturers who will supply geosynthetic materials for this Project (either procured by the Contractor or procured by the Owner, as established for the scope of work set forth in the Closure Construction Contract) are responsible for the manufacture/fabrication of such materials and for quality control during manufacture/fabrication. The minimum Manufacturer qualifications for the various geosynthetic materials of the Project are set forth in the Permit Drawings.

The geosynthetic Manufacturers must implement an MQC program. MQC refers to actions taken at their manufacturing facility (i.e., prior to shipment to the jobsite) to control the quality of their products and to monitor/verify that the materials and workmanship of the geosynthetics meet the Project requirements as set forth herein. The MQC program will be conducted by MQC personnel who are stationed at the manufacturing facility (i.e., employed or contracted by the Manufacturer), and overseen by an MQC manager.

Manufactured geosynthetics products are placed and installed in the field by an Installer, who will be subcontracted by the Contractor. The minimum geosynthetics Installer qualifications for the various geosynthetic materials of the Project are set forth in this CQA Plan.

4. DOCUMENTATION

4.1 OVERVIEW

The CQA Consultant will prepare and retain necessary documentation related to the CQA monitoring activities performed, including review and evaluation of all CQC daily reports, if any, and other submittals provided by the Contractor. The CQA Site Manager will provide these records to the Construction Manager as requested. The CQA Site Manager will also maintain a complete file of the Permit Drawings, CQA Plan, Contractor's QC Plan(s), Work Plans, checklists, test procedures, daily field reports, QC and QA data sheets and logs, and other pertinent design, construction, and CQA documentation at the site. All such documentation and related data files described in this CQA Plan will be maintained by the CQA Consultant in an organized, complete, and up-to-date manner.

4.2 DAILY RECORD KEEPING

The CQA Consultant's daily reporting procedures will include: (i) daily field report; (ii) monitoring logs; (iii) photographs; (iv) test data sheets; and (v) when appropriate, non-conformance and corrective measures reports.

4.2.1 Daily Field Reports

The CQA Consultant's daily field reports will include the following information as applicable:

- date, project name, location, and other pertinent project identifiers;
- weather conditions;
- site equipment and personnel on-site (including the CQA personnel);
- summary of meetings held and their results;
- a list of off-site materials received, including a list of QA/QC documentation received;
- process description(s) and location(s) of construction activities underway during the time frame of the report;
- descriptions and specific locations of areas, of work being tested and/or observed and documented;
- descriptions, maps, or sketches of locations where tests and samples were taken;
- a narrative summary of field test results;
- decisions made regarding acceptance of work, and/or corrective actions to be taken in instances of substandard testing results; and
- reference to data sheets and non-conformance reports used to substantiate the non-conformances described above.

4.2.2 Monitoring Logs, Test Data Sheets, and Photographs

The CQA Consultant will record CQA monitoring observations and test results on appropriate monitoring logs and test data sheets, respectively. The CQA Consultant will use the monitoring logs and test data sheets to track completeness of the required CQA activities.

The CQA Consultant's monitoring logs and test data sheets will include the following information as applicable:

- project specific information such as project name, location, and other pertinent project identifiers;
- the date the CQA activity was performed;
- a unique identifying sheet number for cross-referencing and document control;
- description or title of the CQA activity, along with the location and type of activity;
- recorded observation or test data;
- results of the CQA activity and comparison with specification requirements (pass/fail); and
- the initials or signature of personnel involved in CQA inspection activity.

The CQA Consultant will maintain separate monitoring logs to track and catalog any QC information received from the Contractor and to document conformance or nonconformance of the information with the requirements of the Permit Drawings. The CQA Consultant will also maintain a log of periodic photographic documentation obtained as a pictorial record of construction.

4.2.3 Non-conformance and Corrective Measures Reporting

A non-conformance is defined herein as material or workmanship that does not meet the specified requirement(s) contained in the Permit Drawings. The CQA Consultant will prepare non-conformance and corrective measures reports as needed and will cross-reference the reports to specific daily field reports, monitoring logs, or test data sheets where the non-conformance was identified. The reports will include the following information, as applicable:

- a unique identifying sheet number for cross-referencing and document control;
- detailed description of the problem;
- location of the problem;
- probable cause;
- how and when the problem was located;

- estimation of how long problem has existed;
- suggested corrective measures;
- documentation of corrections (referenced to test data sheets);
- photographic documentation of the problem, remedial methods, and finished product upon completion;
- suggested methods to prevent similar problems; and
- signature of the appropriate CQA field technicians and the CQA Site Manager.

The CQA Consultant will inform the Construction Manager in writing of any significant recurring non-conformance with this CQA Plan or Permit Drawings. It will be the responsibility of the Construction Manager to direct the Contractor to make appropriate changes in materials or procedures to correct the non-conformance. The CQA Consultant will document the corrective actions taken to mitigate non-conformances.

4.3 CQA CERTIFICATION REPORT

The CQA Consultant is required to keep all CQA documentation, CQC documentation, and related data files described in this CQA Plan in an organized, complete, and up-to-date manner to allow for timely completion of the CQA Certification Report as outlined below.

The CQA Consultant will provide the Owner with a CQA Certification Report once construction is completed. This report will acknowledge that: (i) the work has been performed in compliance with this CQA Plan and the Permit Drawings; (ii) physical sampling, as required, has been conducted with appropriate standards and at pre-defined frequencies; (iii) the Contractor's CQC and Manufacturer's MQC documentation is in conformance with the submittal requirements and Technical Specifications; (iv) the test results met the minimum requirements defined in the Permit Drawings and the CQA Plan; and (iv) the activities were constructed in accordance with GA EPD Permit and approved permit documents.

At a minimum, the CQA Certification Report will include:

- summary of CQA activities;
- daily field reports;
- monitoring logs;
- QA and QC test data sheets (summary sheets/tabulations) including sample locations;

- QA and QC certifications and laboratory test results;
- non-conformance and corrective measures reports;
- documentation of design clarifications or revisions; and
- a summary statement indicating compliance with the Permit Drawings and any approved changes, signed and sealed by the CQA Certifying Engineer.

The record drawings produced by the Surveyor will also be included as part of the CQA Certification Report. Required record drawings and their contents will be set forth in the Permit Drawings, along with related Surveyor requirements. In general, record drawings will include scaled drawings depicting the locations and details pertaining to the extent of construction.

5. EARTHWORK

5.1 INTRODUCTION

CQA monitoring will be performed during earthwork construction. Earthwork may include: (i) general earthwork for preparation of subgrade and installation of dikes, channels, roads, ditches, and other earthwork requirements; and (ii) installation of granular materials such as sand, gravel, base aggregate, and riprap. Material property requirements and minimum acceptance criteria to be used for evaluation of acceptability of the various earthwork components are to be presented in this CQA Plan and the Permit Drawings.

5.2 RECORD DRAWINGS AND AS-BUILT SURVEYS

During construction of the earthwork components, the CQA Consultant will routinely review record drawings submitted by the Contractor. Prior to the placement of successive soil or granular material (i.e., sand, gravel, base aggregate, and riprap), the CQA Consultant will review as-built surveys that indicate compliance of the preceding layer thickness, limits, and grades with the Permit Drawings.

5.3 CONFORMANCE OBSERVATIONS

The CQA Consultant will observe the earthwork components to verify they are uniform and conform to the requirements of the Permit Drawings. For soil materials obtained from on-site sources, visual inspections will be performed by the CQA Consultant prior to the materials being used. If soil materials are obtained from off-site borrow sources, visual inspection may be performed by the CQA Consultant at the source location. Borrow area inspections may also be utilized by the CQA Consultant to verify that only suitable soil materials are transported to the site.

The CQA Consultant will confirm that granular materials (i.e., sand, gravel, base aggregate, and riprap) are certified by the Contractor's supplier to meet the requirements of the material type shown on the Permit Drawings and are free of deleterious materials. All materials failing to comply with conformance standards will be rejected for use at the site.

Initial on-site evaluation of various soil types by CQA personnel during construction will be largely by visual and manual methods; therefore, the CQA personnel will be experienced with visual and manual soil classification procedures.

5.4 CONSTRUCTION MONITORING

During installation of the earthwork components, the CQA Consultant will observe and document the installation of earthwork components to verify they are installed in accordance with the requirements of the Permit Drawings and the CQA Plan. The CQA Consultant will also evaluate the procedures, methods, and equipment used by the Contractor to install the earthwork components.

6. CCR REMOVAL

6.1 INTRODUCTION

This section describes the construction oversight activities that will be performed by the CQA Consultant to verify the removal of CCR to the extents and grades shown on the Permit Drawings.

As detailed in the Closure Plan (Section 7 of Part A in the GA EPD Permit application), the Contractor may complete the bulk removal of CCR from AP-1 via either dredging or conventional excavation. Regardless the method of bulk CCR removal, the final removal of CCR, removal of minimum of 6 inches of native soil, and certification will be completed with the free water within AP-1 removed.

In addition to the activities listed in the below subsections, the CQA Consultant will photograph the Work being conducted and will document monitoring observations on forms specifically designed for this purpose.

6.2 EXCAVATION VERIFICATION PROTOCOL

CCR in AP-1 will be removed and transported to the existing onsite landfill or other solid waste facility approved to accept CCR. CCR removal activities will be observed and documented by the CQA Consultant. The area will be excavated to remove visible CCR plus a minimum 6-inches of additional soil to the extent practicable. Observations will be made with reference to a 100-foot by 100-foot alphanumeric grid system established for the Project so that each grid location is assigned a unique label for reference and documentation purposes. When the interface between the CCR and the underlying soil

material is located during excavation, the following CCR removal verification protocol will be conducted:

- The excavated surface (bottom of CCR) will be jointly observed and documented to confirm removal of visible CCR by a representative of the Owner and the CQA Consultant. Visual observations and the Munsell Soil Color Chart will be used as the basis to confirm that visible CCR has been excavated from the former CCR unit footprint to the extent practicable. At a minimum frequency of one per 100-foot grid, the interface will be photographed by the CQA Consultant, and the area will be surveyed to develop a topographic map denoting the bottom of CCR. A description of the soil using the Unified Soil Classification System (ASTM D2488) together with a determination of the color of the soil based on the Munsell Color Chart will be documented by the CQA Consultant.

- Following the CQA Consultant's approval, concurrence by the Owner, and completion of the bottom of CCR survey, excavation will continue by removing at least six inches of additional soil underlying the bottom of CCR to the extent practicable. Verification of removal thicknesses will be performed by the Surveyor by surveying the excavated area using the project grid system and comparing the elevations of the bottom of excavation to the elevations of the surveyed bottom of CCR. If the bottom of excavation is found to be at least six inches below the surveyed bottom of CCR (provided that it is practicable to achieve the excavation (e.g., competent bedrock has not been encountered)), then the excavated surface will be jointly observed and documented consistent with the procedures in the first bullet point above. The CQA Consultant will confirm that the area has been re-excavated and re-surveyed and that the work conforms with the Permit Drawings.

A summary of CQA activities and tests with their respective frequencies is presented in Appendix A.

7. GEOTEXTILES

7.1 INTRODUCTION

The CQA Consultant will perform conformance testing, review the MQC documentation, and monitor the installation of the geotextile layers to verify that the Manufacturer's specifications and the requirements of this CQA Plan and the Permit Drawings are met.

7.2 TRANSPORTATION, HANDLING, AND STORAGE

The CQA Consultant will monitor the transportation, handling, and storage of the geotextile on the Project site. The CQA Consultant will verify that the geotextile is protected from ultraviolet light exposure, precipitation or other inundation, mud, dirt, dust, puncture, cutting, or any other damaging or deleterious conditions.

The CQA Consultant will monitor that transportation, handling, and storage of geotextile conforms with the Permit Drawings, including:

- handling of the geotextile rolls is performed in a competent manner such that damage does not occur to the geotextile or to its protective wrapping;
- geotextile rolls are not stacked upon one another to the extent that deformation of the core occurs or to the point where accessibility can cause damage in handling;
- geotextile rolls are stacked in such a way that access for conformance sampling is possible;
- protective wrappings are removed less than one hour prior to unrolling the geotextile;
- after unrolling, a geotextile is not exposed to ultraviolet light for more than 30 calendar days;
- outdoor storage of geotextile rolls does not exceed the Manufacturer's recommendations or longer than six months, whichever is less;
- for storage periods longer than Manufacturer's recommendations or six months (whichever is less), a tarp or temporary enclosure is placed over the rolls, or they are moved to an enclosed facility; and
- the location of temporary field storage is not in areas where water can accumulate, and the rolls are elevated off the ground to prevent contact with ponded water.

Upon delivery at the site, the Contractor, Installer, and CQA Consultant will conduct an inspection of the rolls for defects and damage as well as a physical inventory. This inspection will be conducted without unrolling the materials unless defects or damages are found or suspected. The CQA Consultant will indicate to the Construction Manager:

- rolls, or portions thereof, that will be rejected and removed from the site because they have severe flaws; and
- rolls that include minor repairable flaws that do not compromise geotextile functionality.

The CQA Consultant will also compare the bill-of-lading to the physical inventory of materials and to the approved roll list. Any discrepancies will be notified to the Construction Manager.

The CQA Consultant will also monitor that equipment used to handle the geotextiles on site is adequate and does not pose any risk of damage to the geotextiles during handling.

7.3 MANUFACTURER QC (MQC) TESTING AND CONFORMANCE (CQA) TESTING

7.3.1 Geotextile MQC Testing Requirements

The geotextile Manufacturer will perform QC testing on the geotextile materials and rolls that will be used on this Project in accordance with the current versions of the ASTM and other applicable test procedures and at the minimum MQC frequencies as presented in Appendix B.

The CQA Consultant will review the MQC certifications and test results to verify that the Manufacturer's specifications and the requirements of this CQA Plan and the Permit Drawings are met.

7.3.2 Geotextile Conformance CQA Sampling and Testing Requirements

Although sampling can be performed either in-plant before materials are shipped, or on-site post-shipment, it is usually preferred that conformance sampling is completed, and results are reviewed prior to shipping.

In most cases, the material sampling will be performed at the Geosynthetics Manufacturer's plant by a third-party representative, unless a manufacturing plant visit by the CQA Consultant has been approved by the Owner. The CQA Consultant will be responsible for the coordination of the sampling.

When conformance sampling is performed on-site, the CQA Consultant shall coordinate with the Contractor so the Contractor can facilitate the sampling. The CQA Certifying Engineer or CQA Site Manager will direct the sampling activity as needed. The CQA Consultant will verify that the samples are obtained and labeled in accordance with the Permit Drawings.

The CQA Consultant will coordinate, and the CQA Geosynthetics Laboratory will perform, geotextile conformance testing to evaluate the conformance of the geotextile with the requirements of this CQA Plan and the Permit Drawings. The testing will be performed in accordance with the current versions of the ASTM and other applicable test procedures and at the minimum frequencies indicated in Appendix B, corresponding to each geotextile material type that will be used.

The CQA Consultant may conduct additional conformance testing if deemed necessary by the Owner and/or the CQA Certifying Engineer. Such additional testing may only be performed after the CQA Consultant submits, and the Owner approves, a written request that describes the reason(s) for additional testing.

7.3.3 Test Results

All MQC and conformance test results will be reviewed, accepted, and reported by the CQA Consultant before deployment of geotextiles. Any non-conformance

of the material properties with the requirements of the Permit Drawings will be reported to the Contractor and Construction Manager.

7.3.4 Test Failure

In the case of failing test results, the Contractor may request that another sample from the failing roll be re-tested. If the re-test fails or if the option to re-test is not exercised, then two isolation conformance samples will be obtained by the CQA Consultant. These isolation samples will be taken from rolls that have been determined by correlation with the Manufacturer's roll number to have been manufactured prior to and after the failing roll. This method for choosing isolation rolls for testing will continue until passing tests are achieved. All rolls that fall numerically between the passing roll numbers will be rejected.

The CQA Consultant will verify that the Contractor has replaced all rejected rolls. The CQA Consultant will document all actions taken in conjunction with geotextile conformance failures.

7.4 PLACEMENT

The CQA Consultant will monitor, verify, and document that geotextile placement is conducted in accordance with the Permit Drawings and that CQA activities are performed as described below.

The CQA Consultant will monitor the placement of all geotextiles to verify that they are not damaged in any way and the following requirements of the Permit Drawings are met:

- on slopes, the geotextiles are securely anchored in the anchor trench and then deployed down the slope in such a manner as to continually keep the geotextile in tension;
- in the presence of wind, all geotextiles are weighted with sandbags or equivalent; such sandbags are installed during placement and will remain until replaced with earth cover material;
- trimming of the geotextiles is performed using only an upward cutting hook blade and special care is given to protect other materials from damage which could be caused by the cutting of the geotextiles;
- the Installer is taking necessary precautions to prevent damage to underlying layers during placement of the geotextile;
- during placement of geotextiles, care is given not to entrap stones, excessive dust, or moisture that could generate clogging of drains or filters; and

- a visual examination of the geotextile is carried out over the entire surface, after installation, to verify that no potentially harmful foreign objects, (e.g., stones, sharp objects, small tools, sandbags, etc.) are present.

7.5 SEAMS AND OVERLAPS

The CQA Consultant will monitor, verify, and document that geotextile seams and overlaps are in accordance with the Permit Drawings and that CQA activities are performed as described below.

The CQA Consultant will monitor that the following requirements of the Permit Drawings are met:

- all geotextiles are continuously sewn (i.e., no spot sewing);
- geotextiles are overlapped in accordance with the Permit Drawings prior to seaming;
- no horizontal seams are constructed on side slopes that are steeper than 10 horizontal to 1 vertical (i.e., seams to be aligned along, not across the slope), except as part of a patch;
- sewing uses polymeric thread with chemical and ultraviolet resistance properties equal to or exceeding those of the geotextile; and
- seams are sewn using a single row Stich Type 401 two-thread chain stitch.

7.6 REPAIRS

The CQA Consultant will monitor, verify, and document that geotextile repairs are made in accordance with the Permit Drawings and that CQA activities are performed as described below.

The CQA Consultant will monitor that any holes or tears in the geotextile are repaired as follows:

- For slopes steeper than 10 horizontal:1 vertical, a patch made from the same geotextile is double seamed into place (with each seam 1/4 inches to 3/4 inches apart and no closer than 1 inch from any edge) with a minimum 12-inch overlap. Should any tear exceed 50 percent of the width of the roll, that roll is removed from the slope and replaced.
- For slopes milder than 10 horizontal:1 vertical, a patch made from the same geotextile is sewn in place with a minimum of 12-inch overlap in all directions away from the repair area.

The CQA Consultant will observe that care is given to remove any soil or other material which may have penetrated the torn geotextile and all repairs and verify that any non-conformance with the above requirements is corrected.

7.7 PLACEMENT OF SOILS OR GRANULAR MATERIALS

The CQA Consultant will monitor, verify, and document that placement of soils or granular materials on top of geotextiles is conducted in accordance with the Permit Drawings and that CQA activities are performed as described below.

The CQA Consultant will monitor that the Contractor's placement of soil or granular materials on top of the geotextile is in conformance with the Permit Drawings, including:

- that no damage occurs to the geotextile;
- that no shifting of the geotextile from its intended position occurs and underlying materials are not exposed or damaged;
- that excess tensile stress does not occur in the geotextile;
- that equipment does not drive directly on the geotextile; and
- the Contractor uses only low ground pressure equipment on layers less than 3-feet thick above the geomembrane and geotextile separator or cushion layer.

The CQA Consultant will monitor that covering of the geotextile with overlying layers is completed within 30 days of installation to prevent UV degradation and, on side slopes, soil and granular layers are placed over the geotextile from the bottom of the slope upward.

8. GENERAL SITE WORK

8.1 INTRODUCTION

The CQA Consultant will monitor the activities that are to be performed for various general site work items including, but not limited to installation of erosion and sediment control measures, culverts, outfall weirs, pipes, vegetative cover, topsoil, and vegetation for compliance with the Permit Drawings.

In addition, the CQA Consultant will verify that materials are in accordance with the Permit Drawings and are installed in accordance with Manufacturer’s recommendations.

8.2 CONFORMANCE

Conformance of materials and construction techniques to verify compliance with the Permit Drawings will be performed by the CQA Consultant. If non-conformances or other

deficiencies are found by the CQA Consultant in the materials or completed work, they will be reported to the Contractor and Construction Manager. The CQA Consultant will observe the repairs or replacements of any non-conforming items.

APPENDIX A

CQC/CQA Activities/Tests for CCR Removal

TABLE A
CQC/CQA ACTIVITIES/TESTS FOR CCR REMOVAL VIA EXCAVATION

ITEM	REQUIRED ACTIVITY/TEST	MINIMUM CQC FREQUENCY	MINIMUM CQA FREQUENCY
CCR Removal	Verification/documentation of excavation to bottom of CCR	As required	When excavation is completed[1]
	Verification/documentation of excavation of 6-inch layer underlying bottom of CCR	As required	When excavation is completed[1, 2]

Notes:

1) Documentation includes a photograph, a description of the material using the Unified Soil Classification System (ASTM D2488), and a determination of the color of the material based on the Munsell Color Chart for every 100-foot by 100-foot project grid.
2) Documentation includes a verification that at least 6" of soil have been removed by comparing data provided by the Surveyor for every 100-foot by 100-foot project grid.

APPENDIX B

Geotextile MQC/CQA Testing Requirements

TABLE B

Geotextile MQC/CQA Testing Requirements

TEST NAME	TEST METHOD	MINIMUM MQC TESTING FREQUENCY	MINIMUM CQA TESTING FREQUENCY
Polymer Composition	Certification		
Mass per Unit Area	ASTM D5261	One per 90,000 ft^2	One per 100,000 ft^2
Grab Strength and Elongation	ASTM D4632 (1)	One per 90,000 ft^2	One per 100,000 ft^2
Trapezoidal Tear Strength	ASTM D4533 (2)	One per 90,000 ft^2	One per 100,000 ft^2
CBR (Static) Puncture Strength	ASTM D6241	One per 540,000 ft^2	One per 540,000 ft^2
Ultraviolet Resistance	ASTM D4355	Per formulation	--
Apparent Opening Size (5)	ASTM D4751	One per 540,000 ft^2	One per 540,000 ft^2
Permittivity (5)	ASTM D4491	One per 540,000 ft^2	One per 540,000 ft^2

Notes:

1) Minimum of values measured in machine and cross machine directions with 1-inch clamp on Constant Rate of Extension (CRE) machine.
2) Minimum value measured in machine and cross machine direction.
3) Tension testing machine with a 1.75-inch diameter ring clamp, the steel ball being replaced with 0.31-inch diameter solid steel cylinder with a flat tip centered within the ring clamp.
4) At least one test shall be performed for each lot. A lot is defined by ASTM 4354.
5) Apparent opening size and permittivity testing shall be performed for geotextile filter only.