



Location Restrictions Report

Plant McDonough-Atkinson

CCR Unit AP-1

Prepared for:

Georgia Power Company

Environmental Affairs
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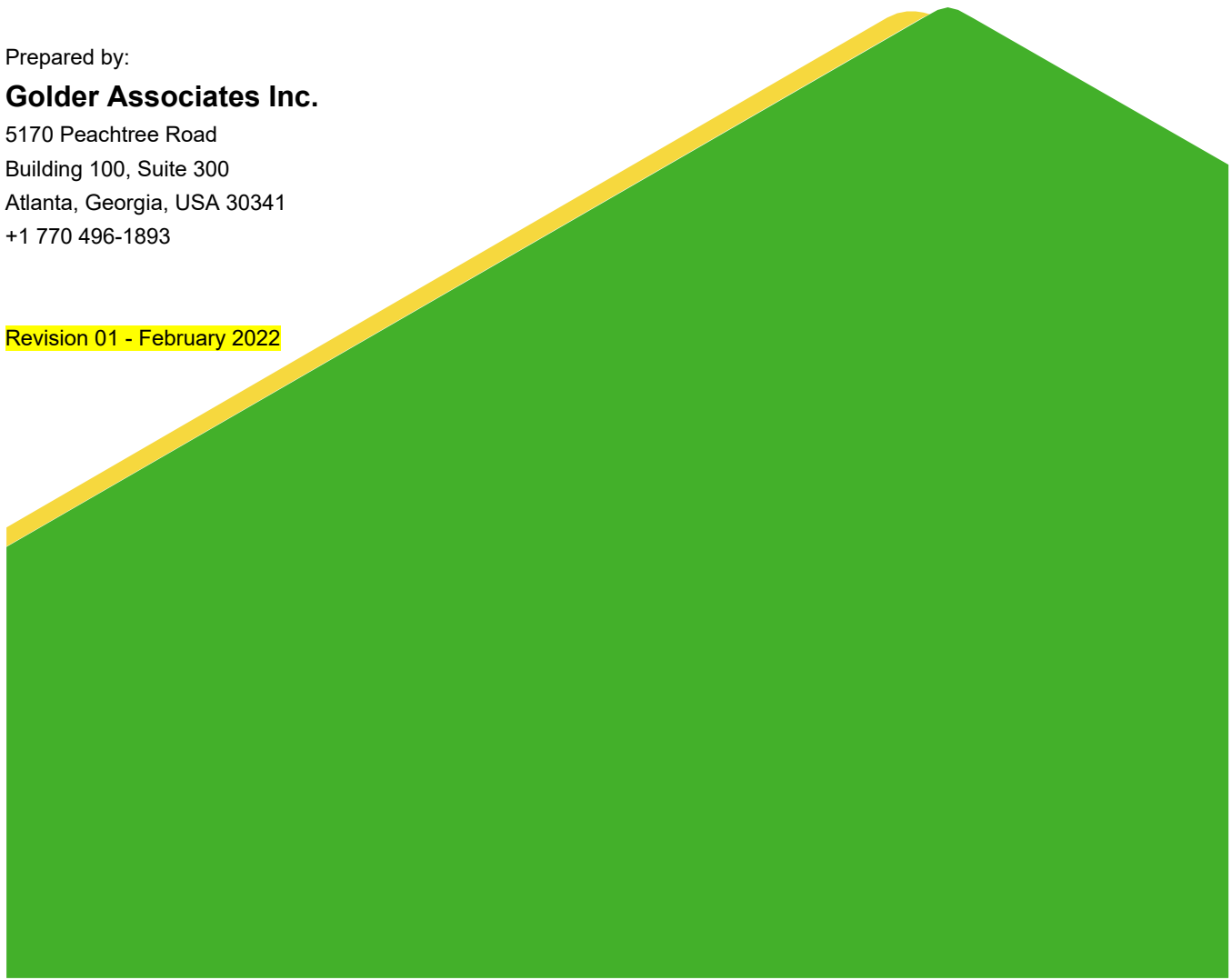


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CERTIFICATION

This Location and Siting Restriction technical report for Georgia Power Company's (Georgia Power) Plant McDonough-Atkinson (Plant McDonough) AP-1 was prepared by Golder Associates Inc. (Golder).

I certify that this Location and Siting Restriction technical report was prepared in accordance with the Georgia Environmental Protection Division Rule 391-3-4-.10 "Rules for Solid Waste Management, Coal Combustion Residuals."

Golder Associates Inc.



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1.0 INTRODUCTION AND GENERAL SITE INFORMATION

Georgia Environmental Protection Division (EPD) Rule 391-3-4-.10 of the Georgia Solid Waste Management Regulations provides the requirements for permitting and closure of coal combustion residual (CCR) regulated facilities in Georgia. As indicated in the State of Georgia Solid Waste Management Rule 391-3-4-.10(9)(c)(6)(iv) for inactive surface impoundments, a siting report is required as part of the permit application. As an inactive CCR surface impoundment prior to initiating closure activities, the applicable location restrictions for siting presented in 391-3-4-.10(9)(c)(6)(iv) demonstrating wetlands, floodplains, and seismic zones as well as 40 CFR §257.60, §257.61, §257.62, §257.63, and §257.64 for Plant McDonough CCR Unit Ash Pond 1 (AP-1) must be completed before April 16, 2020 as indicated in 40 CFR §257.100(e)(2) per the CCR Extension timeline.

Plant McDonough-Atkinson (Plant McDonough) is a power generating facility, owned and operated by Georgia Power, located in Cobb County, GA. In 2011, Plant McDonough ceased coal-fired electric generating activities, and subsequently ceased placing CCR in the units.

AP-1 no longer receives CCR or other waste streams and no longer functions as a CCR Surface Impoundment. Installation of the final cover system for Plant McDonough AP-1 was substantially completed in Q1 2017, and closure construction activities are ongoing in accordance with 40 C.F.R. §257.102(d). During ongoing closure construction activities, surface water management and engineering controls will be implemented such that AP-1 will continue to not function as a surface impoundment.

2.0 LOCATION RESTRICTIONS

This Location Restrictions Report is for Georgia Power's Plant McDonough CCR Unit AP-1 and was prepared in accordance with **State Rule 391-3-4-.10(9)(c)(6)(iv)** for permitting of inactive surface impoundments. Figures A1 and A2 present an overview of the location and topography of Plant McDonough and CCR Unit AP-1.

2.1 Placement above Uppermost Aquifer

State Rule 391-3-4-.10(9)(c)(6)(i) which incorporates by reference 40 C.F.R. Part 257.100 (which incorporates 40 C.F.R. Part 257.60) requires that the CCR surface impoundment must be constructed with a base that is located no less than five feet above the upper limit of the uppermost aquifer, or must not have an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations; otherwise, the unit must undergo closure.

Plant McDonough is located within the Northwest Atlanta, GA United States Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure A2), within the Piedmont/Blue Ridge geologic province and in a regional zone of deformation referred to as the Brevard Zone, which extends from Alabama to Virginia. Based on the development of the site hydrogeologic model, field investigations indicate that the site is underlain by a regional groundwater aquifer that occurs within the overburden and upper (first 30 feet of) bedrock depending on topographic location. A detailed report of the geology and hydrogeology of Plant McDonough is presented in the Hydrogeological Assessment Report for the Plant McDonough-Atkinson CCR Unit AP-1 Closure (HAR Revision 03) (Part B Section 1 of this permit application).

CCR Unit AP-1 does not meet the requirements of separation from the uppermost aquifer as required per §257.60. CCR Unit AP-1 is currently undergoing closure of the inactive CCR surface impoundment per the requirements outlined in §257.101 and §257.102 of the CCR Rule. Closure activities for CCR Unit AP-1 were substantially completed in Q4 2016 and consisted of dewatering, consolidation, and closure in place of CCRs.

The potentiometric surface map for AP-1 is presented in the Groundwater Monitoring Plan located in Part A Section 6 of this permit application.

2.2 Proximity to Wetlands

State Rule 391-3-4-.10(9)(c)(6)(i) which incorporates by reference 40 C.F.R. Part 257.100 (which incorporates 40 C.F.R. Part 257.61) requires that the CCR surface impoundment must not be located in wetlands unless the requirements outlined in §257.61(a)(1) through (5) for wetlands protection are met. Under 40 CFR §232.2, wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (i.e. swamps, marshes, bogs, and similar areas).

Jurisdictional wetlands and stream buffers are presented on Figure B1 as identified. Per EPD Watershed Protection Branch guidance (Field Guide for Determining Presence of State Waters), the perennial and intermittent streams and the corresponding buffers are identified. While wetlands were identified within the permit boundary of AP-1 as seen on Figure B1, no wetlands were identified within the AP-1 CCR boundary based on a wetlands survey dated September 25, 2019. As such, AP-1 meets the locations restriction requirement of §257.61 for proximity to wetlands.

2.3 Fault Areas

State Rule 391-3-4-.10(9)(c)(6)(i) which incorporates by reference 40 C.F.R. Part 257.100 (which incorporates 40 C.F.R. Part 257.62) requires that the CCR surface impoundment must not be located within 200 feet of the outermost damage zone of a fault that has had displacement in the Holocene time, unless an alternative distance is presented to prevent damage to the structural integrity of the unit.

The site is located in the Piedmont/Blue Ridge geologic province, which contains some of the oldest rocks in the Southeastern United States. Since their origin, approximately 276 to 1100 million years ago (Ma), these late Precambrian (Neoproterozoic) to late Paleozoic (Permian) rocks have undergone repeated cycles of igneous intrusions and extrusions, metamorphism, folding, faulting, shearing, and silicification. The latest regional metamorphism and associated deformation has been attributed to the collision of the North America plate with the Eurasian plate approximately 200 to 230 Ma.

Geologic mapping for the area corresponding to Plant McDonough is presented in the Hydrogeologic Assessment Report (HAR Revision 03) (Part B Section 1 of this permit application). The site is located near the inactive Brevard Fault Zone. Several regionally extensive faults have been mapped near and within the site associated with the inactive Brevard Fault Zone. An inactive, unnamed, faulted, intrusive contact traverses northeast-southwest across the site, separating Ordovician-aged bedrock. This contact is observed throughout most of the metro-Atlanta area. Other regional faults characterized by near-vertical, strike-slip movement, occur north and south of the site: the Long Island Creek fault is located approximately one mile north of the site; and a series of strike-slip faults that define a zone of intense shearing within the Brevard Zone occur just south of the site.

The last known displacement in the area of Plant McDonough occurred prior to the Mesozoic Era (Higgins et al, 1988). Therefore, CCR Unit AP-1 meets the location restriction requirement for fault areas with regards to displacement in Holocene time as required per §257.62.

2.4 Seismic Impact Zones

State Rule 391-3-4-.10(9)(c)(6)(i) which incorporates by reference 40 C.F.R. Part 257.100 (which incorporates 40 C.F.R. Part 257.63) requires that the CCR surface impoundment must not be located in seismic impact zones

unless all structural components are designed to resist the maximum horizontal acceleration in lithified earth material for the site. The CCR Rule (§257.53) specifies a seismic impact zone as an area having a probability of 2% that the maximum expected horizontal acceleration, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10 g in 50 years. This probability is equivalent to an event with a return period of approximately 2,500 years, based on the United States Geological Survey (USGS) seismic hazard maps. The USGS has provided online tools to assess this hazard at specific locations using its 2014 seismic hazard model. The seismic hazard calculations in Appendix C of the Engineering Report for Plant McDonough-Atkinson CCR Unit AP-1 (Part B Section 2 of this permit application) detail the use of these tools to obtain seismic hazard data for Plant McDonough CCR Unit AP-1, located at 33.824177°N and 84.48056°W.

According to the USGS seismic hazard model, CCR Unit AP-1 is not located in a seismic impact zone since the maximum horizontal acceleration in lithified earth material associated with a 2% probability of exceedance in 50 years at the site (0.0963g) is below the 0.10g threshold associated with a seismic impact zone. This assessment is also graphically presented in Figure C1. Although not required, the stability of AP-1 was evaluated with regard to seismic loading and found to meet the minimum seismic stability requirements per §257.63. Therefore, CCR Unit AP-1 meets the location restriction requirement for seismic impact zones as required per §257.63.

2.5 Unstable Areas

State Rule 391-3-4-.10(9)(c)(6)(i) which incorporates by reference 40 C.F.R. Part 257.100 (which incorporates 40 C.F.R. Part 257.64) requires that the CCR surface impoundment must not be located in an unstable area unless it is demonstrated that generally accepted good engineering practices have been incorporated into the design to ensure that the integrity of the structural components of the CCR unit will not be disrupted. Per the CCR Rule, an unstable area is defined as a location that is susceptible to natural or human induced events or forces capable of impairing the integrity, including structural components of some or all of the CCR unit that are responsible for preventing release from the unit. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and karst terrains. The National Karst Map (Weary and Doctor, 2014) shows locations of karst and potential karst areas in soluble rocks in the contiguous United States. The site is not located in an area of karst terrain.

Factors considered when evaluating whether an area is unstable include local soil conditions, local geologic features, and local human-made features. CCR Unit AP-1 meets the location restriction requirement for unstable areas as required per §257.64, and the factors previously mentioned are detailed in Sections 2.5.1 through 2.5.3 below.

2.5.1 Local Soil Conditions and Differential Settling

Data on subsurface conditions at Plant McDonough were evaluated and the results summarized in the Materials Calculation Package and the Liquefaction Assessment Calculation Package included as Appendix A and Appendix D respectively in the Engineering Report for Plant McDonough-Atkinson CCR Unit AP-1. The site is located in the Piedmont/Blue Ridge geologic province, characterized by igneous and metamorphic bedrock. In general, underlying rock at the site consists of schist and gneiss with overlying Piedmont soils formed by the in-place weathering of parent rock referred to as residuum soils. Details of the soils and geologic conditions are available in the Hydrogeological Assessment Report (HAR Revision 03) for Plant McDonough (Part B Section 1 of this permit application).

A small unnamed creek flows parallel and adjacent to the western and southern boundary of AP-1 towards the Chattahoochee River. AP-1 is topographically sloped downward to the southwest (SW), creating an impoundment

via side hill embankments constructed along the southern portions of the Unit that tie into higher natural ground in the northeast (NE) quadrant of the Unit.

Subsurface conditions in the vicinity of the embankments of AP-1 consist of:

- Compacted CCR fill
- Sluiced CCR fill
- Earth fill (reworked site residual and alluvial soils)
- Residuum (Silty Sands and Sandy Silts)
- Lower saprolite and weathered rock
- Bedrock (described in Section 2.5.2)

The results of the evaluation of the liquefaction susceptibility for local soils conditions indicate that calculated factor of safety against liquefaction is above 1.2 for all materials analyzed except for portions of the impounded ash originally placed sluiced. Thus, post liquefaction stability was evaluated using a reduced post-liquefaction strength for such materials (modeled as a post liquefaction strength ratio of 0.08). All cases analyzed for slope stability exceeded the factors of safety required (Sections §257.73(e)(i) to (iv)). Settlement evaluations for the closed AP-1 conditions consider settlement following closure from dewatering of the CCR and minimal post capping settlement (less than a few inches) across the unit, as detailed in the Settlement Calculations for AP-1 in Appendix E of the Engineering Report for Plant McDonough-Atkinson CCR Unit AP-1. Based on the engineering evaluations of subsurface conditions, liquefaction, slope stability, and settlement, AP-1 is not considered to be susceptible to significant differential settlement and therefore meets the requirements of §257.64(b)(1).

2.5.2 Local Geologic Features

Plant McDonough is underlain by bedrock consisting of metamorphic Ordovician-aged gneiss and schist, separated by an intrusive contact, which trends northeast to southwest through the site. North of this faulted contact is the Long Island Creek Gneiss (OZli), a felsic gneiss. South of the faulted contact is an interbedded phyllonite, button schist (Ozbs). A regional, unconfined surficial aquifer system is present at the site, existing within the overburden and weathered and fractured upper bedrock (i.e., approximate first 30 feet), depending on topographic location. Deep bedrock (i.e., approximately 30 ft into the bedrock) is generally unweathered with few discontinuities available to store groundwater. The deeper bedrock aquifer is likely not readily interconnected with the uppermost aquifer system.

A detailed discussion of geologic features is presented in the Hydrogeological Assessment Report (HAR Revision 03) for Plant McDonough-Atkinson (Part B Section 1 of this permit application). Based on the local geologic features in the vicinity of AP-1, following closure, the unit will not be prone to disruption due to geologic features at the site and thus meets the requirements of §257.64(b)(2).

2.5.3 Local Human-Made Features

The AP-1 area contains engineered structures and features including containment and diversion dikes, drainage channels, and outlet structures among others. Existing structures in the vicinity of AP-1 include natural gas pipelines to the south and east as part of the plant's power generating infrastructure, overhead electric lines above and adjacent to AP-1, and Cobb County water and sewer utility lines to the west and south of AP-1. There are no known instances of structural instability at AP-1 at the time of this submittal. Additionally, there are no

human-made features or future activities at the site that are anticipated to have a potential adverse impact on the structural components or integrity of the closed unit.

Based on the foregoing, AP-1 will not be prone to disruption due to human-made features at the site and therefore meets the requirements of §257.64(b)(3).

2.6 Identification of Floodplains

The permit requirements for inactive surface impoundments for the GA Solid Waste Rules (391-3-4-.10(9)(c)(6)(iv)) include the identification of wetlands, floodplains, and seismic impact zones. Wetlands and stream buffers in the vicinity of AP-1 are described in Section 2.2 of this report. Seismic impact zones are described in Section 2.4 of this report. Additionally, the 100-year floodplain in the vicinity of AP-1 is identified on Figure D1. The Chattahoochee River and an unnamed creek west of AP-1 contribute to the floodplain to the west and south of AP-1.

3.0 REFERENCES

Georgia Department of Natural Resources Environmental Protection Division, Rules of Solid Waste Management, Chapter 391-3-4-.10 Coal Combustion Residuals.

Golder Associates (2021). Plant McDonough-Atkinson CCR Surface Impoundments (CCR Unit AP-1), Cobb County, Georgia Part A: Permit Documents.

Golder Associates (2021). Plant McDonough-Atkinson CCR Surface Impoundments (CCR Unit AP-1), Cobb County, Georgia Part B: Supporting Documents.

Higgins, M.W., R.L. Atkins, T.J. Crawford, R.F. Crawford III, R. Brooks, and R.B. Cook (1988). The Structure, Stratigraphy, Tectonostratigraphy, and Evolution of the Southernmost Part of the Appalachian Orogen. U.S. Geological Survey Professional Paper 1475.

U.S. Environmental Protection Agency (USEPA) (2015) "40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule," (referred to herein as the USEPA CCR rule).

U.S. Geological Survey, 2014. Dynamic: Conterminous U.S. 2014 (v4.1.1) Interactive Deaggregations. <https://earthquake.usgs.gov/hazards/interactive/>.

Weary, D.J., and Doctor, D.H. (2014). *Karst in the United States: A digital map compilation and database*: U.S. Geological Survey Open-File Report 2014–1156.

Figures



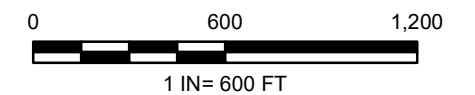
LEGEND

- PERMIT BOUNDARY AP-1 & AP-2, AP-3/4
- - - PLANT McDONOUGH-ATKINSON PROPERTY BOUNDARY

NOTES

REFERENCE

1. AERIAL IMAGERY: GOOGLE
2. COORDINATE SYSTEM: NAD 1983 STATE PLANE GEORGIA WEST (U.S. FEET).
3. PROPERTY BOUNDARY PROVIDED BY SOUTHERN COMPANY (2018) AS SURVEYED BY METRO ENGINEERING AND SURVEY CO, INC. THE DATE OF THE SURVEY IS 10-16-2012.



CLIENT
 GEORGIA POWER COMPANY Georgia Power

PROJECT
 PLANT McDONOUGH-ATKINSON
 CCR UNIT AP-1 AND CCR UNITS AP-2, AP-3/4

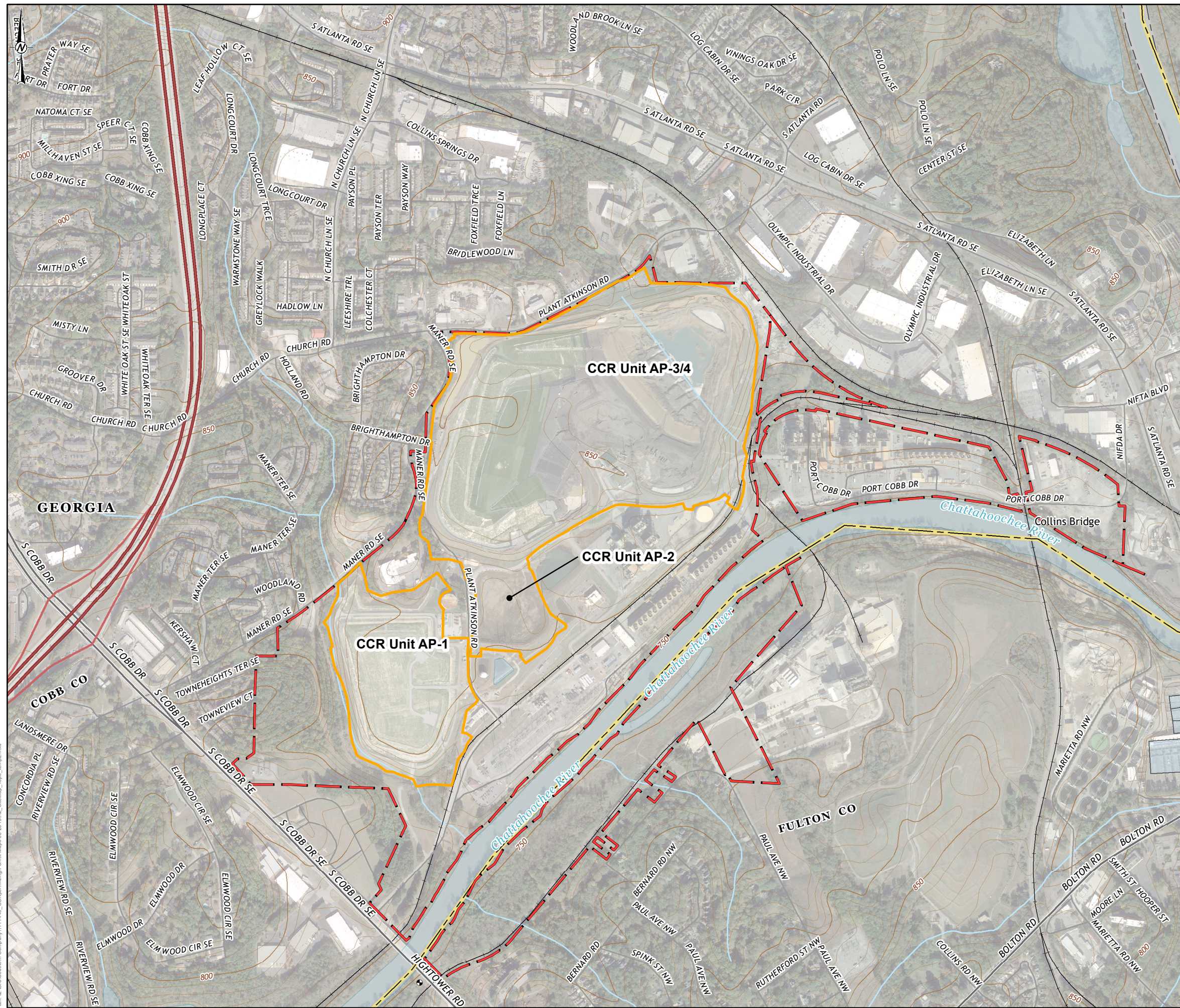
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| CONSULTANT | YYYY-MM-DD | 2021-09-14 |
|------------|------------|------------|
| GOLDER | PREPARED | JDG |
| | DESIGN | LS |
| | REVIEW | GLH |
| | APPROVED | GLH |

PROJECT No.
 1777449

Rev.
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FIGURE
A1

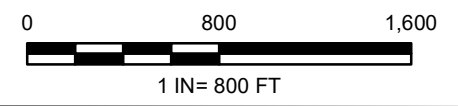


LEGEND

- PERMIT BOUNDARY AP-1 & AP-2, AP-3/4
- - - PLANT MCDONOUGH-ATKINSON PROPERTY BOUNDARY

NOTES

- REFERENCE**
1. AERIAL IMAGERY: GOOGLE, MAXAR TECHNOLOGIES, FEBRUARY 2019
 2. COORDINATE SYSTEM: NAD 1983 STATE PLANE GEORGIA WEST (U.S. FEET).
 3. PROPERTY BOUNDARY PROVIDED BY SOUTHERN COMPANY (2018) AS SURVEYED BY METRO ENGINEERING AND SURVEY CO, INC. THE DATE OF THE SURVEY IS 10-16-2012.
 4. USGS 7.5 MINUTE QUADRANGLE MAP FOR NORTHWEST ATLANTA, GA. 2017



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PROJECT
 PLANT MCDONOUGH-ATKINSON
 CCR UNIT AP-1 AND CCR UNITS AP-2, AP-3/4

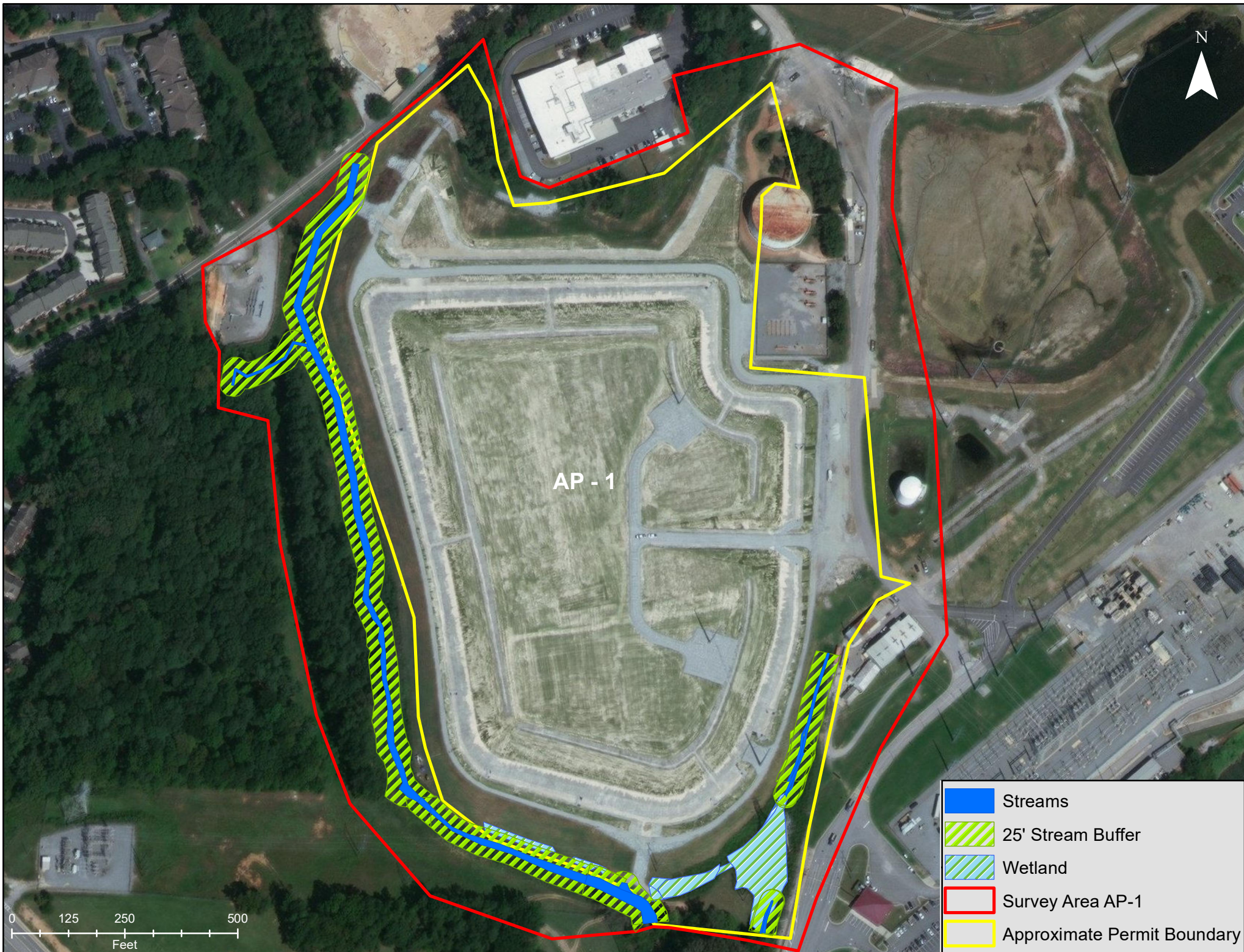
TITLE
SITE MAP - TOPOGRAPHIC VIEW

| CONSULTANT | DATE | REVISION |
|------------|------------|------------|
| | YYYY-MM-DD | 2021-09-14 |
| | PREPARED | JDG |
| | DESIGN | JDG |
| | REVIEW | GLH |
| | APPROVED | GLH |






PROJECT No. 1777449 Rev. 0 FIGURE **A2**

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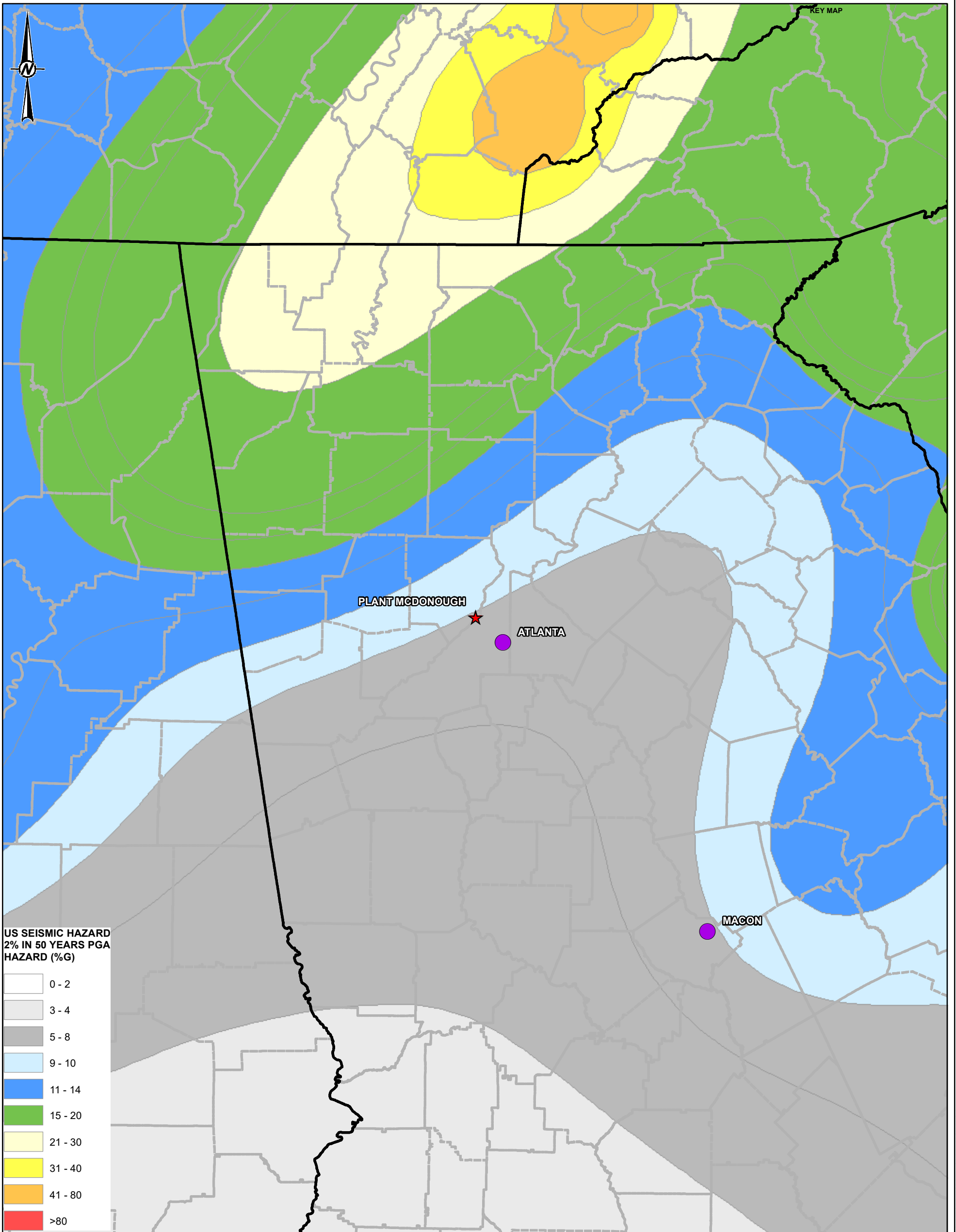
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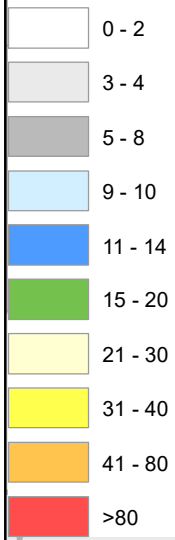
AP - 1

-  Streams
-  25' Stream Buffer
-  Wetland
-  Survey Area AP-1
-  Approximate Permit Boundary

0 125 250 500
Feet



**US SEISMIC HAZARD
2% IN 50 YEARS PGA
HAZARD (%G)**



- LEGEND**
- CITY
 - ★ PLANT MCDONOUGH
 - STATE BOUNDARY
 - COUNTY BOUNDARY

REFERENCE(S)
 1. U.S. GEOLOGICAL SURVEY, 2014. DYNAMIC: CONTERMINOUS U.S. 2014 (V4.1.1) INTERACTIVE DEAGGREGATIONS. [HTTPS://EARTHQUAKE.USGS.GOV/HAZARDS/INTERACTIVE/.](https://earthquake.usgs.gov/ hazards/interactive/)

CLIENT
 GEORGIA POWER COMPANY

PROJECT
 LOCATION DEMONSTRATION REPORT
 PLANT MCDONOUGH ATKINSON
 CCR UNIT AP-1 AND CCR UNITS AP-2, AP-3/4

TITLE
PLANT MCDONOUGH ATKINSON CCR UNIT 1 & CCR UNITS AP-2, AP-3/4 SEISMIC HAZARD MAP

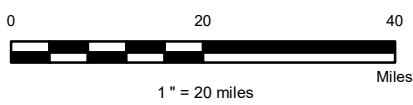
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|------------|------------|------------|
| DESIGNED | LS | |
| PREPARED | JDG | |
| REVIEWED | GLH | |
| APPROVED | GLH | |



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FIGURE
C1



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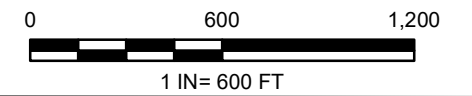
LEGEND

- FINAL LIMITS OF CCR (REFERENCE 4)
- - - PLANT MCDONOUGH-ATKINSON PROPERTY BOUNDARY
- PERMIT BOUNDARY AP-1 & AP-2, AP-3/4
- 100 YEAR FLOODPLAIN (REFERENCE 4)

NOTES

REFERENCE

1. AERIAL IMAGERY: GOOGLE
2. COORDINATE SYSTEM: NAD 1983 STATE PLANE GEORGIA WEST (U.S. FEET).
3. PROPERTY BOUNDARY PROVIDED BY SOUTHERN COMPANY (2018) AS SURVEYED BY METRO ENGINEERING AND SURVEY CO, INC. THE DATE OF THE SURVEY IS 10-16-2012.
4. FINAL LIMITS OF WASTE AND 100 YEAR FLOODPLAIN OBTAINED FROM THE PLANT MCDONOUGH ATKINSON INACTIVE SURFACE IMPOUNDMENT ASH POND NO. 1 CLOSURE DRAWINGS OF THE SOLID WASTE CCR PERMIT APPLICATION SEPTEMBER 2021 AND ASH POND NO. 3 AND NO.4 CLOSURE DRAWINGS OF THE SOLID WASTE CCR PERMIT APPLICATION NOVEMBER 2020.



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 GEORGIA POWER COMPANY

PROJECT
 PLANT MCDONOUGH-ATKINSON
 CCR UNIT AP-1 AND CCR UNITS AP-2 , AP-3/4

TITLE
**IDENTIFICATION OF FLOODPLAIN MAP
 CCR UNIT AP-1 AND CCR UNITS AP-2 , AP-3/4**

| | | |
|------------|------------|------------|
| CONSULTANT | YYYY-MM-DD | 2021-09-14 |
| | PREPARED | JDG |
| | DESIGN | LS |
| | REVIEW | GLH |
| | APPROVED | GLH |

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