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Floodplain and Wetland Assessment of the Effects of Herbicide Application to DOE-SR 115-kV Electricity Transmission Line Rights-of-way on the Savannah River Site

Prepared for

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Savannah River Operations Office
Aiken, South Carolina

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1.0 Introduction

Executive Order 11988-Floodplain Management (May 24, 1977) and Executive Order 11990-Protection of Wetlands (May 24, 1977) require federal agencies to evaluate, and to the extent possible minimize, the impacts of their projects on floodplains and wetlands. The U.S. Department of Energy (DOE) established policy and procedures to consider impacts on floodplains and wetlands as part of its decision-making process in 10 CFR 1022 – *Compliance with Floodplain and Wetland Environmental Review Requirements*. Under this DOE regulation, a floodplain or wetland assessment is required for any activity involving floodplains or wetlands, per 10 CFR 1022 (d) (1) – (2). Furthermore, 10 CFR 1022.11 (a) requires DOE to determine the applicability of the floodplain management and wetlands protection requirements in 10 CFR 1022, Subpart B, concurrent with its review of a proposed action to determine appropriate National Environmental Policy Act (NEPA) or Comprehensive Environmental Response, Liability, and Compensation Act (CERCLA) process requirements. Determination of the appropriate NEPA process is discussed in Section 3.0, Project Description.

This assessment has been prepared by DOE-Savannah River (DOE-SR) in accordance with the requirements of 10 CFR 1022.13 to evaluate potential impacts to floodplains and wetlands from the application of herbicide treatments to effectively control tree growth on DOE-SR 115-kV electricity rights-of-way (r/w's) crossings on the Savannah River Site (SRS). The provisions of 10 CFR 1022.13 (c) permit an assessment to be prepared separately for those floodplain and wetland actions for which neither an Environmental Assessment (EA) nor Environmental Impact Statement (EIS) is required. DOE-SR has determined the need for this floodplain and wetland assessment per 10 CFR 1022.5 (e) since the action has the potential to produce permanent vegetative changes in floodplains and wetlands which are undeveloped except for management as utility r/w's.

2.0 Background

DOE-SR owns a 115-kV electricity transmission grid that provides electrical power to facilities sitewide. The infrastructure and vegetation on the 115-kV r/w's is maintained and managed by Dominion Energy (previously South Carolina Electric & Gas) under a contract with DOE-SR. Electricity transmission lines

are required to meet North American Electric Reliability Corporation's Electric Reliability Standard FAC-003-2, which requires vegetation management in and adjacent to electrical r/w's to prevent outages caused by vegetation contact with a transmission conductor. Locations where r/w's cross floodplains and wetlands are difficult to manage because the plant species composition and water and nutrient availability combine to promote rapid vegetation growth.

3.0 Project Description

Herbicide application to effectively control tree growth is utilized where the DOE-SR 115-kV transmission r/w's cross floodplains and wetlands (Figure 1). A herbicide mix is applied using backpack sprayers to conduct spot treatments of tree species growing in the sapling and shrub strata. Herbicides selected for application on DOE-SR r/w's are approved for use by SRS.

A surfactant is mixed with the herbicide to increase its effectiveness. Polyethoxylated tallow amine, a commonly used surfactant, is not used on SRS because of its recognized high toxicity to amphibian larvae. Further mention of herbicide in this assessment references the herbicide-surfactant mixture.

Selection and application of herbicides used for this action is compliant with the U.S. Environmental Protection Agency (EPA) and South Carolina Department of Health and Environmental Control (SCDHEC) Pesticide National Pollutant Discharge and Elimination System (NPDES) Group Permit for wetland and over water applications and herbicide label directions. Under the action, Dominion Energy has compliance responsibilities as the "Owner-Operator," as defined in Appendix A of NPDES Permit No. SCG160000.

Herbicide application occurs during the later portions of the growing season, typically September and October, but could begin earlier or extend later in the year. Periodic herbicide application is anticipated in a maintenance capacity in the future. The necessity of repeat applications in subsequent years after initial treatment will be determined based on visual r/w inspections by appropriate personnel in accordance with owner-operator internal procedures or other guidance.

DOE-SR conducts this action under its provisions for application of a categorical exclusion pursuant to 10 CFR 1021.410. DOE-SR has deemed that the action is categorically excluded as it satisfies all the requirements under 10 CFR 1021.410 (b) (1) - (3):

- The action fits within the class of actions listed in 10 CFR 1021, Subpart D, Appendix B, specifically Categorical Exclusion B1.3, Routine Maintenance;

- No extraordinary circumstances exist that may affect the significance of the environmental effects of the action, and;

- The action is not being segmented (i.e., is not connected to or otherwise related to other proposed actions with potentially significant or cumulatively significant impacts) to meet the definition of a categorical exclusion. The action is a stand-alone activity and not part of a larger project being evaluated with an EA or EIS.

Furthermore, none of the conditions that are integral elements for Class B actions listed at 10 CFR 1021, Subpart D, Appendix B (1) - (5) exist for the action that would otherwise negate qualification for categorical exclusion. While the action will take place in wetlands and floodplains which are considered an environmentally sensitive resource per 10 CFR 1021, Subpart D, Appendix B (4) (iii), it is not anticipated that the action has the potential to cause significant impacts on these resources.

3.1 Description of Wetlands

The herbicide treatment is applied in 50 locations totaling approximately 148 acres, and includes wetland crossings associated with 7 streams, Four Mile Branch (FMB), Indian Grave Branch (IGB), Meyers Branch (MB), Pen Branch (PB), Steel Creek (SC), Tims Branch (TB), and Upper Three Runs (UTR). Wetlands are identified and marked in the field, located and recorded using a Global Positioning System (GPS), and mapped using the SRS Geographic Information System (GIS). Wetlands were identified using criteria specified in the U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation manual and current USACE supplemental guidance. Wetland crossing locations are depicted in Figure 1.

To be considered a wetland under Section 404 of the Clean Water Act requires positive evidence of three criteria: 1) hydrophytic vegetation, 2) hydric soils, and 3) wetland hydrology. The action negatively affects a small amount of the biomass (tree species growing in the sapling and shrub strata) that comprises the hydrophytic vegetation component of the wetlands. The action is not anticipated to affect hydric soils; it may minimally and insignificantly affect wetland hydrology. The action does not require the deposition of fill material in wetlands, thus there is no loss of wetland acreage.

Wetlands targeted for herbicide treatment have been impacted historically by mowing on a periodic basis, as well as previous broadcast and spot herbicide treatments. The vegetative communities are therefore maintained in a relatively low growing and early successional stage. Wetlands targeted for treatment do not have an overstory stratum because of previous management activities.

Red maple (*Acer rubrum*), river birch (*Betula nigra*), sweetgum (*Liquidambar styraciflua*), and black willow (*Salix nigra*) are dominant tree species occupying the sapling and shrub stratum. Other dominant shrub species include tag alder (*Alnus serrulata*), and elderberry (*Sambucus canadensis*). Dominant herbaceous species include switch cane (*Arundinaria tecta*), sedges (*Carex* spp.), plumegrass (*Erianthus giganteus*), joe-pie weed (*Eupatorium fistulosum*), rushes (*Juncus* spp.), panic grasses (*Panicum* spp.), knotweed (*Polygonum* spp.), meadow-beauty (*Rhexia* spp.), lizard's tail (*Saururus cernuus*), bulrushes (*Scirpus* spp.), bur reed (*Sparganium americanum*), and yellow-eyed grass (*Xyris* spp.).

3.2 Description of Floodplains

Federal Emergency Management Agency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) are the most authoritative information available for floodplains on SRS. Where floodplains of SRS streams are mapped by FEMA, they are classified as a Special Flood Hazard Area (SFHA) subject to inundation by the one percent annual chance flood (100-year flood). The SFHAs are further defined as Zone A (no base flood elevation determined) and Zone AE (base flood elevation determined). The SFHAs meet the definitions of base floodplain and critical action floodplain defined by 10 CFR 1022.4.

The nature and extent of the flood hazard associated with the floodplains subject to the action is potential temporary inundation associated with the 100-year flood. FEMA does not describe these floodplains as high hazard areas.

The DOE-SR 115-kV r/w's cross the 100-year floodplains associated with FMB, IGB, MB, PB, SC, TB, and UTR. Floodplain crossing locations are depicted in Figure 1. The action does not require floodplain modification that would result in a change in flood storage volume.

4.0 Effects of the Action on Wetlands and Floodplains

The primary positive and indirect effect of the action is that the removal of tree species with herbicide will enhance the growth of herbaceous and shrub species. The absence of tree species increases the availability of water, nutrients, and sunlight for the remaining species.

The primary negative and direct effect of the action is the loss of tree species occupying the sapling and shrub strata. There could be a minimal negative impact to non-target species by inadvertent overspray during herbicide application, and by post-application herbicide soil activity associated with imazapyr salt herbicides. Vegetation killed by herbicide may minimally and insignificantly impact wetland hydrology prior to decomposition (also considered a potential short-term effect).

The short-term and long-term effect of the action is tree species removal from the sapling and shrub strata in r/w's crossing wetlands. Another long-term effect of the action is that removing the tree species from the sapling and shrub strata will result in a conversion to a shrub-herbaceous wetland that will require less maintenance than when tree species were present. The shrub-herbaceous wetland will be comprised of low-growing plants that pose no risk to the electrical conductor on the 115- kV electricity transmission r/w's, thus requiring minimal vegetative maintenance to achieve regulatory compliance.

The removal of tree species from the overall vegetative composition of the r/w wetland crossings is not expected to have a substantial impact on the functions or services provided by the subject wetlands. The areas historically were mowed or received broadcast herbicide applications on a periodic as-needed basis, resulting in a fluctuation of wetland functions, the lowest being soon after treatment and increasing after that in proportion to the growth and development of vegetative strata, peaking just before the next treatment. Wetland hydrology was likely minimally impacted with mowing debris and soil rutting by mowing or herbicide equipment. Functions and services related to wetland soils are likely to be unaffected by mowing or herbicide application. There will be no loss of wetland acreage, so most of the wetland function and services will be unaffected.

The action occurs in the floodplains of FMB, IGB, PB, SC, TB, and UTR at specified locations. However, the action will not require floodplain modification that would result in a change in flood storage volume.

The effects of the action on floodplain and wetland values was considered for conservation of existing flora and fauna, cultural resources, cultivated resources, aesthetic values, and public interest. The action

is considered to benefit the conservation of existing flora and fauna by eliminating the need for mowing or broadcast herbicide treatment which negatively impacted the flora and fauna over the entire r/w, a greater impact than herbicide spot treatment. The action will not impact cultural resources because it does not involve ground disturbance and because it will occur on existing r/w's. The action will not impact cultivated resources because they do not exist in the locations of the action. The action is not considered to negatively impact aesthetic values because the action will occur on existing r/w's with minimal aesthetic value. The action will not affect existing public interest associated with the locations of the action.

The floodplains associated with the action are owned by DOE-SR, are uninhabited by people, and are undeveloped beyond the r/w infrastructure; therefore, the action, which does not change base flood elevations, is not anticipated to affect lives and property. The survival, function, and quality of the wetlands subject to the action are anticipated to improve by switching from mowing and broadcast herbicide application to herbicide spot treatment applications because of less disturbance to the wetland soils, vegetation, and hydrology.

The herbicide mix for use in the wetland and floodplain areas is a combination of a glyphosate salt (Rodeo®), a triclopyr salt (Trycera®), and an imazapyr salt (Arsenal®). These herbicides are EPA-approved for wetland application. The effects of the herbicides on aquatic biota are expected to be minimal, based on data presented in the safety data sheets:

Rodeo®

Fish Toxicity

96-hour LC50 for rainbow trout	> 2,500 mg/l

Aquatic Invertebrate Toxicity

48-hour EC50 for *Daphnia*	918 mg/l

Trycera®

Fish and aquatic invertebrate toxicities are not listed on the Trycera® safety data sheet. A similar triclopyr product approved for wetland and aquatic applications, Garlon 3A®, lists the following toxicities on its safety data sheet:

Fish Toxicity

96-hour LC50 for rainbow trout	400 mg/l
96-hour LC50 for bluegill	> 100 mg/l

Aquatic Invertebrate Toxicity

48-hour LC50 for *Daphnia magna* > 1,000 mg/l

Trycera® toxicities are assumed to be similar to those of Garlon 3A® because of the same active ingredient and same approval for wetland and aquatic applications.

Arsenal®

Fish Toxicity

96-hour LC50 for rainbow trout > 100 mg/l
96-hour LC50 for bluegill > 100 mg/l

Aquatic Invertebrate Toxicity

24-hour LC50 for *Daphnia magna* > 100 mg/l

These toxicity values fall in the "practically nontoxic" category as presented in U.S. Environmental Protection Agency ecological risk assessment data.

NOVITA 90® is the surfactant that will be mixed with the herbicides. It is an alkylpolyoxethylene product; this category of surfactants is not recognized as being toxic to aquatic organisms. However, EPA does not require ecological toxicity testing of surfactants because they are not regulated as pesticides. Ecological information is listed as "Not available" from Section 12 of the NOVITA 90® safety data sheet.

5.0 Alternatives Evaluated

Vegetation management on r/w's is required to meet federal standards. The preferred alternative for vegetation management in wetlands and floodplains is herbicide application using backpack sprayers to spot treat tree species growing in the sapling and shrub strata. The herbicide mix used will be foliar and soil active (Rodeo®, Trycera 3A®, Arsenal®) and will control all plant species. The no-action alternative is to continue the previous and more costly management regime of mowing or broadcast herbicide application to achieve vegetation control adequate for regulatory compliance. A third alternative is the spot application of herbicide with mechanized equipment.

The preferred alternative has the least amount of wetland impact because only tree species growing in the sapling and shrub strata are adversely affected, and once control is achieved, r/w wetlands will require much less disturbance than when mowing was used to manage r/w vegetation. The no-action alternative,

continuing to mow or broadcast application of herbicides, resulted in substantial impacts to wetland vegetation at the time of mowing, and likely caused minor negative impacts to wetland hydrology from mowing debris and soil rutting by mowing equipment. Broadcast herbicide application negatively affected the entire plant community over the entire r/w. The third alternative, spot application of herbicide with mechanized equipment, would have greater non-target plant impacts because this herbicide application method lacks the precision associated with backpack sprayer herbicide application. The mechanized equipment also would negatively affect wetland soils and hydrology with equipment rutting in wetlands. None of the alternatives affect floodplain functions.

6.0 Mitigation

The action is the application of foliar and soil active, systemic, broad-spectrum herbicide mix by hand using backpack sprayers to spot treat tree species growing in the sapling and shrub strata. Remaining wetland vegetation will be unharmed and likely will be enhanced by the absence of tree species because of the increased availability of water, nutrients, and sunlight. The action will not impact wetland soils or wetland hydrology.

The effects of the action on wetlands are considered to be insignificant and therefore do not require wetland mitigation. Furthermore, such insignificant wetland impacts cannot be appropriately quantified, which would be needed to determine potential mitigation measures. Existing tools used to quantify wetland impacts and mitigation requirements are based on loss of wetland acreage caused by the discharge of fill material into wetlands. The action does not require the discharge of fill material into wetlands and does not result in the loss of wetland acreage. Similarly, the action has no effect on floodplain functions, thus negating the need for floodplain mitigation. Herbicide will be applied according to herbicide label directions and in compliance with the SCDHEC NPDES Pesticide Group Permit and appropriate internal site pesticide management plans and procedures, thus preventing runoff of applied herbicides.

7.0 Summary and Conclusions

The activity would result in no adverse impacts to the wetlands or floodplains. Herbicide application is utilized at certain r/w wetland and floodplain crossings to effectively control tree growth. Herbicide application is by hand using backpack sprayers to spot treat tree species growing in the sapling and shrub

strata. The herbicide mix used will be foliar and soil active, systemic, and broad-spectrum. The action is not anticipated to negatively affect floodplains. Effects on wetlands are determined to be minimal and insignificant. The no-action alternative of continuing to mow the r/w's, or conduct broadcast herbicide applications, does not reduce maintenance costs and was determined to have greater impact than the preferred alternative. The alternative of spot treatment herbicide application with mechanized equipment also was determined to have a greater environmental impact than the preferred alternative. Cumulative impacts to floodplains and wetlands are negligible to minor under the action; therefore, no floodplain/wetland mitigation is required.

DOE-SR will publish, in accordance with 10 CFR Part 1022.14, a Statement of Findings based on the information in this document. The Statement of Findings will include a brief description of the action, an explanation of why it is located in a floodplain/wetland, the alternatives considered, a statement indicating if the action conforms to state and local floodplain requirements, an explanation of wetland mitigation steps, and a brief description of the steps to be taken to minimize potential harm within the floodplains and wetlands. The Statement of Findings will be made available for a 15-day public review period.

8.0 References

10 CFR 1021, U.S. Department of Energy, *National Environmental Policy Act Implementing Procedures*, Subpart D, Appendix B.

10 CFR 1022, U.S. Department of Energy, *Compliance With Floodplain and Wetland Environmental Review Requirements.*

33 CFR 328, U.S. Army Corps of Engineers, *Definition of Waters of the United States.*

Executive Order 11988. *Floodplain Management.*

Executive Order 11990. *Protection of Wetlands.*

FEMA 2010. FIRM, Barnwell County, SC. Panel 275 of 500, Map Number 45011C0275D.

FEMA 2012. FIRM, Aiken County, SC. Panel 685 of 775, Map Number 45003C0685E.

FEMA 2018. FIRM, Aiken County, SC. Panel 700 of 775, Map Number 45003C0700F.

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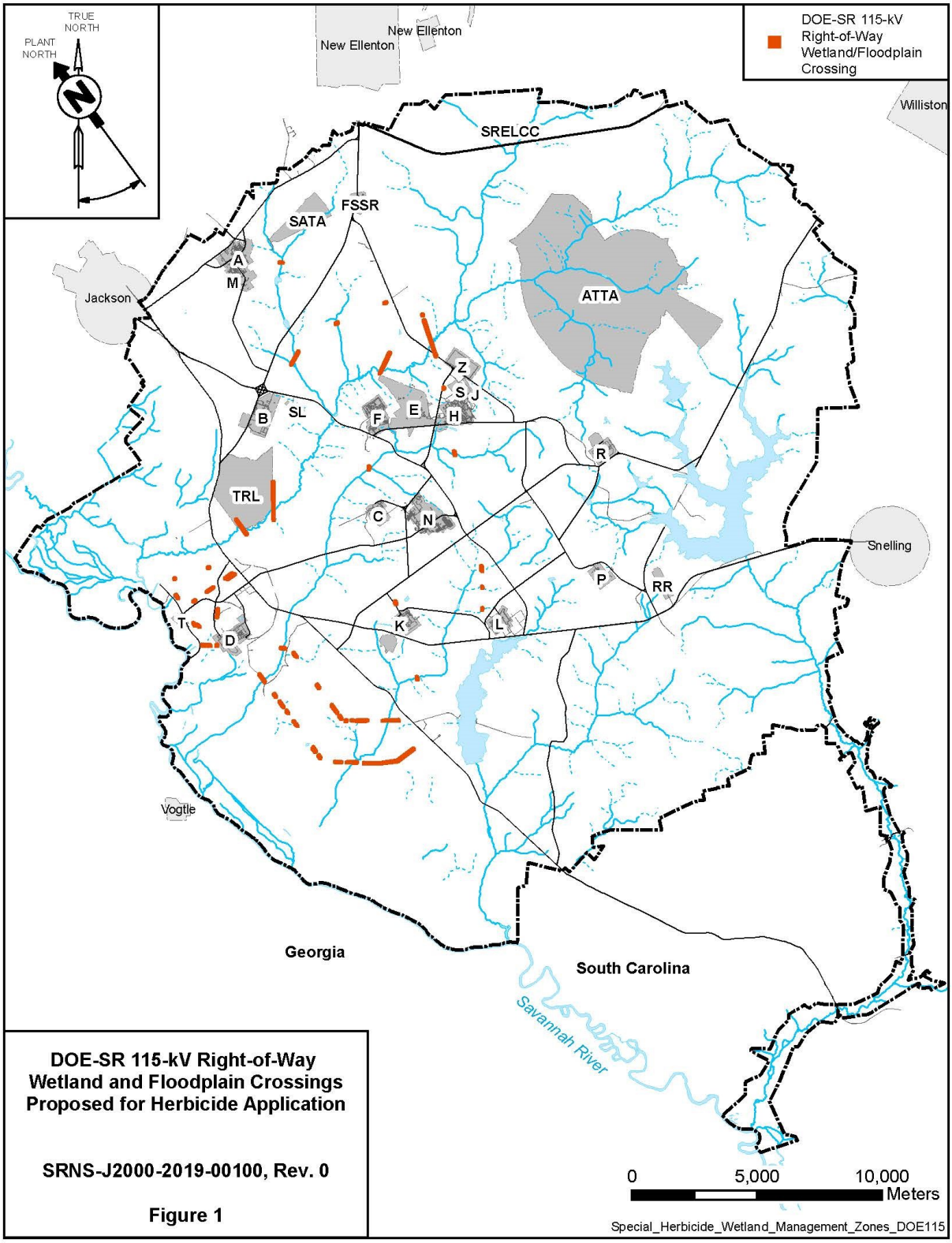
SCDHEC NPDES General Permit for Discharges from the Application of Pesticides, Permit No. SCG160000.

U.S. Army Corps of Engineers, Wetlands Research Program Technical Report Y-87-1, *Corps of Engineers Wetland Delineation Manual.*

U.S. Army Corps of Engineers, *Regional Supplemental to the Corps of Engineers Wetlands Delineation Manual: Atlantic and Gulf Coastal Plain Region.*

U.S. Department of Energy Categorical Exclusion Determination Form: *Herbicide Application to DOE 115-kV Electricity Transmission Line Rights-of-way on the Savannah River Site*, EEC No. DOE-G-2019-0003-0, March 2019.

U. S. Environmental Protection Agency. https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/technical-overview-ecological-risk-assessment-0


TRUE NORTH
PLANT NORTH
N
DOE-SR 115-kV Right-of-Way
Wetland/Floodplain Crossing
New Ellenton
New Ellenton
Williston
SRELCC
FSSR
SATA
A
M
Jackson
ATTA
Z
S
J
B
SL
F
E
H
R
TRL
C
N
Snelling
P
RR
T
D
K
L
Vogtle
Georgia
South Carolina
Savannah River
0
5,000
10,000
Meters
Special_Herbicide_Wetland_Management_Zones_DOE115
DOE-SR 115-kV Right-of-Way
Wetland and Floodplain Crossings
Proposed for Herbicide Application
SRNS-J2000-2019-00100, Rev. 0
Figure 1

Photograph 1. Typical perennial stream wetland crossing of a 115-kV transmission line, the length of the crossing is approximately 300 feet.