

**Floodplain and Wetland Assessment  
of the Effects of Proposed Herbicide Application  
at Environmental Sampling Locations on the Savannah River Site**

**Prepared for**

**U.S. Department of Energy  
Savannah River Operations Office  
Aiken, South Carolina**

**January 2020**

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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 vegetation at environmental sampling locations at 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 proposed action has the potential to produce permanent vegetative changes in floodplains and wetlands which are undeveloped except for management as environmental sampling locations.

### **2.0 Background**

DOE-SR routinely samples environmental media for contaminant analyses. Water and sediment sampling locations, as well as stream flow measurement locations, require vegetation management for safe ingress/egress to sampling locations and to allow proper deployment and operations of sampling

equipment. Streamside and wetland sampling locations are difficult to manage because the plant species composition, water, and nutrient availability combine to promote rapid vegetation growth.

### **3.0 Project Description**

Herbicide application to effectively control vegetation growth is proposed at selected environmental sampling locations in wetlands and floodplains (Figure 1). Herbicide will be applied using backpack sprayers or handheld containers to conduct spot treatments of vegetation growing along access paths, around sampling equipment, at stream access points, and at certain in-stream locations. Herbicides will be selected from a list pre-approved for use on SRS and appropriate for use in wetland and stream habitats.

A surfactant may be 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 to be used for this proposed action will be 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 proposed action, DOE-SR has compliance responsibilities as the “Owner-Operator,” as defined in Appendix A of NPDES Permit No. SCG160000.

Herbicide application will occur annually on an as-needed basis during the growing season, typically April through October, but could begin earlier or extend later in the year. The necessity of repeat applications will be determined based on visual inspections of the environmental sampling locations by appropriate personnel in accordance with owner-operator internal procedures or other guidelines.

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

- The proposed 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 proposed action, and;
- The proposed 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 proposed 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 proposed action that would otherwise negate qualification for categorical exclusion. While the proposed 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 proposed action has the potential to cause significant impacts on these resources.

### **3.1 Description of Wetlands**

Herbicides may be applied to streams and wetlands at 36 locations totaling approximately 0.6 acre, and includes streams and wetlands associated with 11 streams, Castor Creek (CC), Crouch Branch (CB), Four Mile Branch (FMB), Lower Three Runs (LTR), Mary's Branch (MaB), McQueen Branch (McB), Pen Branch (PB), Steel Creek (SC), Tims Branch (TB), Tinker Creek (TC), and Upper Three Runs (UTR). Wetlands were identified in the field and potential herbicide impacts were visually estimated for each environmental sampling location. Wetlands were identified using criteria specified in the U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation manual and current USACE supplemental guidance. Stream and wetland 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 proposed action negatively affects a small amount of plant biomass that comprises the hydrophytic vegetation component of the wetlands. The proposed action is not anticipated to affect hydric soils; it may minimally and insignificantly affect wetland hydrology. The proposed action does not require the deposition of fill material in wetlands, thus there is no loss of wetland acreage.

Wetlands proposed for herbicide treatment have been impacted historically by mechanical management on a periodic basis, as well as previous spot herbicide treatments. The vegetative communities are therefore maintained in a relatively low growing and early successional stage. Wetlands proposed 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 shrub and herbaceous strata. 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 (*Eriophorum 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 (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 proposed action is potential temporary inundation associated with the 100-year flood. FEMA does not describe these floodplains as high hazard areas.

Some of the DOE-SR environmental sampling locations are located in the 100-year floodplains associated with CC, CB, FMB, LTR, MaB, McB, PB, SC, TB, TC, and UTR. Floodplain crossing locations are depicted in Figure 1. The proposed action does not require floodplain modification that would result in a change in flood storage volume.

#### **4.0 Effects of the Proposed Action on Wetlands and Floodplains**

The proposed action is the application of herbicides in wetlands and floodplains, using backpack sprayers or handheld containers, at selected environmental sampling locations to control vegetation growing along access paths, around sampling equipment, at stream access points, and at certain in-stream locations. The proposed action will have a negative and direct effect on wetland vegetation that also is both a short-term and long-term effect. The proposed action will not affect wetland soils and wetland hydrology. The overall effect on wetlands is insignificant because the magnitude of impact is less than 0.6 acre and does not result in a permanent loss of wetlands.

The proposed action will occur in the floodplains of CC, CB, FMB, LTR, MaB, McB, PB, SC, TB, TC, and UTR at specified locations. However, the proposed action will not require floodplain modification that would result in a change in flood storage volume.

The effects of the proposed 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 proposed action is considered to have an insignificant effect on conservation of existing flora and fauna because the magnitude of impact is less than 0.6 acre. The proposed action will not impact cultural resources because it does not involve ground disturbance and because it will occur at existing sampling locations. The proposed action will not impact cultivated resources because they do not exist in the locations of the proposed action. The proposed action is not considered to negatively impact aesthetic values because the proposed action will occur at existing sampling locations with minimal aesthetic value. The proposed action will not affect existing public interest associated with the locations of the proposed action.

The floodplains associated with the proposed action are owned by DOE-SR, are uninhabited by people, and are undeveloped beyond the environmental sampling infrastructure (e.g., ladders, platforms, ISCO samplers, etc.); therefore, the proposed 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 proposed action are anticipated to be insignificantly affected because the magnitude of impact is less than 0.6 acre.

## **5.0 Alternatives Evaluated**

Vegetation control at environmental sampling locations is required for worker safety and proper deployment and operation of sampling equipment. The preferred alternative for vegetation management in wetlands and floodplains is herbicide application using backpack sprayers or handheld containers to spot treat vegetation growing along access paths, around sampling equipment, at stream access points, and at certain in-stream locations. Herbicides used will be selected from a list pre-approved for use at SRS and appropriate for use in wetland and stream habitats. The no-action alternative is to not control the vegetation at environmental sampling locations. The third alternative is to continue the previous and more costly management regime of mechanical vegetation control (e.g., mowing, hand tools).

The preferred alternative has an insignificant effect on wetlands because the magnitude of impact is less than 0.6 acre, wetland soils and hydrology are unaffected, and there is no loss of wetland acreage. The no-action alternative of not controlling vegetation at environmental sampling locations creates worker safety hazards and prevents proper deployment and operation of sampling equipment; it is considered infeasible. The third alternative, mechanical vegetation control with mechanized equipment or hand tools, is more expensive than the preferred alternative with inherent worker safety hazards associated with the equipment. Mechanized equipment also could negatively affect wetland soils and hydrology with equipment rutting in wetlands. None of the alternatives affect floodplain functions.

## **6.0 Mitigation**

The proposed action is the application of herbicides in wetlands and floodplains, using backpack sprayers or handheld containers, at selected environmental sampling locations to control vegetation growing along access paths, around sampling equipment, at stream access points, and at certain in-stream locations. The proposed action will not impact wetland soils or wetland hydrology.

The effects of the proposed action on wetlands are 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 proposed action does not require the discharge of fill material into wetlands and does not result in the loss of wetland acreage. Similarly, the proposed 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 proposed activity would result in no adverse impacts to the wetlands or floodplains. DOE-SR is proposing herbicide application in wetlands and floodplains at certain environmental sampling locations to effectively control vegetation growth. Herbicide application will be by hand using backpack sprayers or handheld containers to treat vegetation growing along access paths, around sampling equipment, at stream access points, and at certain in-stream locations. The herbicides used will be selected from a list pre-approved for use at SRS and will be appropriate for use in stream and wetland habitats. The proposed action is not anticipated to negatively affect floodplains. Effects on wetlands were determined to be insignificant because the magnitude of impact is less than 0.6 acre. The no-action alternative of not controlling vegetation at environmental sampling locations creates worker safety hazards and prevents proper deployment and operation of sampling equipment; it is considered infeasible. The third alternative, mechanical vegetation control with mechanized equipment or hand tools, is a more expensive alternative with inherent worker safety hazards associated with the equipment and potentially greater overall wetland impact. Cumulative impacts to floodplains and wetlands are insignificant under the proposed 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 proposed 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. After publication of its Statement of Findings, a 15-day public review period is required before implementing the proposed action.



## **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 2018. FIRM, Aiken County, SC. Panel 695 of 775, Map Number 45003C0695F.

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

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FEMA 2010. FIRM, Allendale County, SC. Panel 100 of 350, Map Number 45005C0100D.

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

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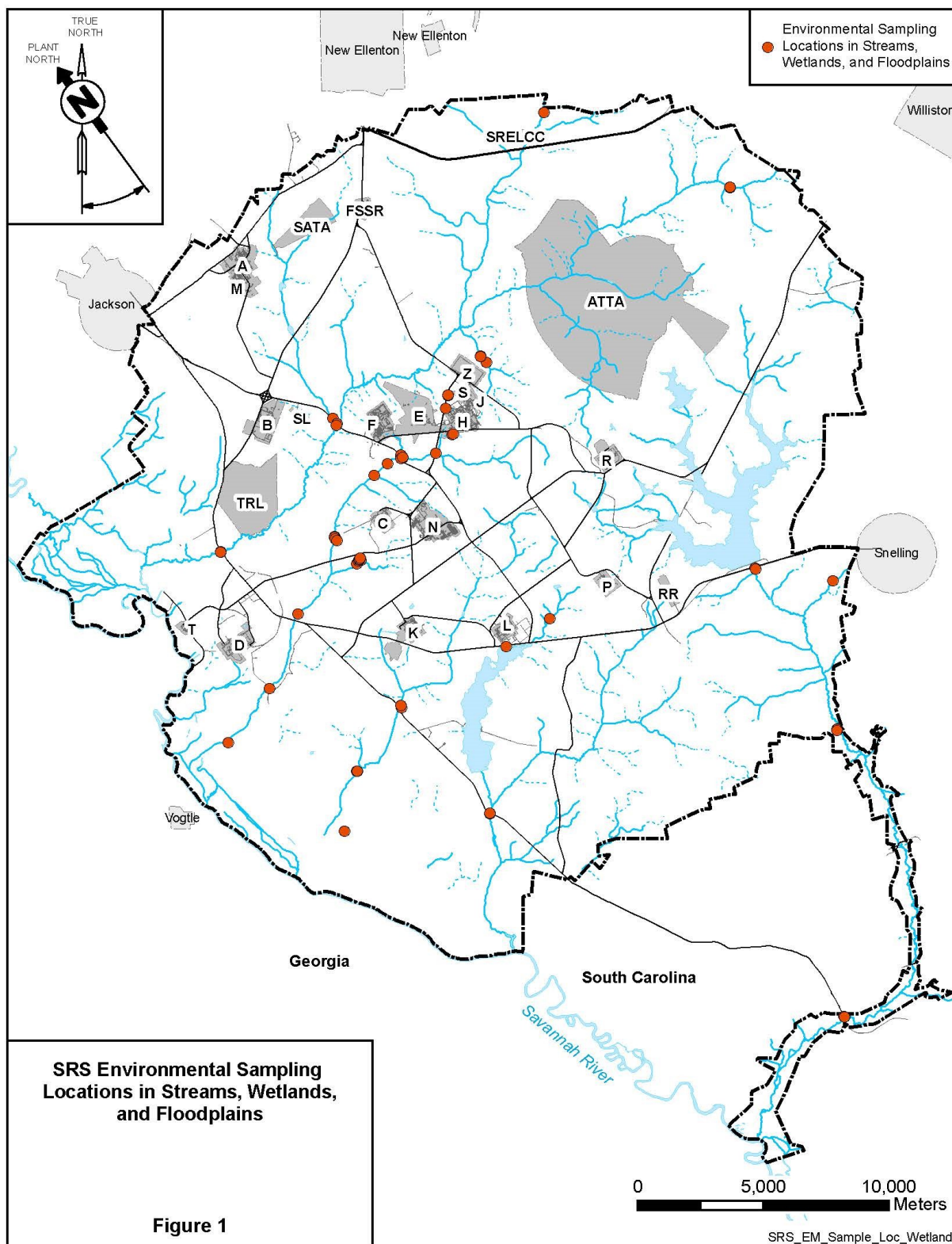
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U.S. Army Corps of Engineers, Wetlands Research Program Technical Report Y-87-1, *Corps of Engineers Wetland Delineation Manual*.

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

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







Photograph 1. Typical environmental sampling location showing a stream and adjacent wetlands but no sampling infrastructure.





Photograph 2. Typical environmental sampling location showing a stream, adjacent wetlands, and environmental sampling infrastructure.