DOE/EA-1285

ENVIRONMENTAL ASSESSMENT FOR THE POND B DAM REPAIR PROJECT AT THE SAVANNAH RIVER SITE

SEPTEMBER 1999

U. S. DEPARTMENT OF ENERGY
SAVANNAH RIVER OPERATIONS OFFICE
SAVANNAH RIVER SITE

DISCLAIMER

Finding of No Significant Impact
and
Floodplain Statement of Findings
for the
Pond B Dam Repair Project
at the Savannah River Site

Agency: U. S. Department of Energy

Action: Finding of No Significant Impact

Summary: The Department of Energy (DOE) has prepared an environmental assessment (EA) (DOE/EA-1285) for the proposed repair of the Pond B dam at the Savannah River Site (SRS), located near Aiken, South Carolina. Based on the analyses in the EA, DOE has determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969 (NEPA). Therefore, the preparation of an environmental impact statement (EIS) is not required, and DOE is issuing this Finding of No Significant Impact (FONSI) and Floodplain Statement of Findings.

Public Availability: Copies of the EA and FONSI or further information on the DOE NEPA process are available from:

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Background: Pond B is one of the former production reactor cooling ponds at SRS. The Pond B dam was constructed in 1960 as a simple earthen dam with sand toe drain systems. Typical of dams built during that period, it has no spillway discharge systems or monitoring devices such as piezometers, inclinometers, or weir boxes. During reactor operation, effluent came into Pond B from R Reactor through the R Canal. In the early 1960s, Pond B received radioactive contaminants, primarily Cs^{137}, via cooling water discharges from R Reactor. Since 1964, this reactor has not been operated, and Pond B has not received any cooling water effluent. Radioactive contaminants currently exist within the sediment, water, and biotic components of Pond B.

All SRS dams are on the Federal Energy Regulatory Commission (FERC) Dam Inventory List and are annually inspected by FERC. Several recent inspections of the Pond B dam by SRS engineers and FERC have indicated that the current structural condition of this dam is a safety issue and is not in compliance with FERC guidelines. Specifically, the increased seepage and saturation through this earthen structure to the downstream face of the dam has caused the soil within the dam to lose shearing strength. This decreases the slope stability and internal friction angle characteristics of the soil, which are the properties by which this type of embankment is held in place. The saturation problem appears to be the result of toe drain failure where the drain has become clogged with excessive fine soil material from the impervious core of the dam and no longer transmits seepage through the dam as it was originally designed. These conditions have severely lowered the intended design factor of safety for the dam, which in turn could result in an embankment or dam failure.

Purpose and Need for Agency Action: The purpose for action is to reduce the potential for structural failure of the Pond B dam. DOE needs to implement the action to reduce the environmental consequences which would result from such a failure scenario.

Proposed Action: DOE proposes to restore and reconstruct the downstream face of the Pond B dam. The scope of the proposed action would include the following: (1) stripping of topsoil and clearing of vegetation on the downstream face and toe of the dam; (2) construction of new underdrain and monitoring systems within the dam; and (3) placement of a soil blanket on the downstream face of the dam. Siting and operation of a borrow pit and upgrades to the site roadway infrastructure providing access to the project location are also components of the proposed action. The proposed action would not require the use of any site utilities and, aside from the proposed borrow pit, only existing SRS infrastructure would be needed to implement the project. The construction start-up would be initiated in Fiscal Year 2001 with the project being completed by Fiscal Year 2002. The estimated budget for the proposed action is $2,300,000.

The first part of the construction would involve the clearing and preparation of the downstream face and toe of the dam for the placement of the soil blanket. All of the woody and herbaceous vegetation on the downstream face and along the toe of the dam would be cut down and removed. The next portion of this work would include the excavation and removal of topsoil from these areas. All of the material removed from the dam's downstream face, toe, and area below the toe would be hauled away and disposed of in an onsite disposal facility. Based on a recent study, none of these materials are expected to be contaminated.

Several measures would be implemented to ensure improved drainage and monitoring capabilities of the Pond B dam. Prior to the placement of the soil blanket, a rock core underdrain system would be constructed on the face and along the entire toe of the dam. To further facilitate the regulation of drainage through the structure, concrete weir boxes would be installed at the toe of the dam after the placement of the new soil blanket. Both piezometers and lateral movement monitors would be installed to enable improved

evaluation of the seepage through the dam and the stability of the new downstream face of the structure.

The proposed soil blanket would consist of approximately 22,940 to 38,230 cubic meters (30,000 to 50,000 cubic yards) of pervious material obtained from an onsite location. The source of suitable cohesionless soils for the proposed soil blanket would be one of several potential areas located along the SRS Road 8 corridor. The surface extent of a borrow pit producing this volume of material would be 0.4 to 2.0 hectares (1 to 5 acres). The selected borrow pit area would be cleared of any merchantable timber, excavated for the necessary volume of material, and graded, stabilized and seeded to prevent erosion. The project site would then be allowed to re-vegetate naturally.

The placement of the new soil blanket would encompass an area of approximately 1.2 to 1.6 hectares (3 to 4 acres) on the downstream face and area below the toe of the dam. The vehicle access to and from the proposed project location would be over existing SRS roads. Because of the remote location of Pond B and the comparatively high volume of heavy truck and construction equipment traffic, the existing secondary access roads to the dam would have to be upgraded or improved to provide reliable access for these vehicles. Approximately 3,125 truckloads of suitable material would be deposited within the general footprint of the proposed soil blanket. These materials would then be compacted and graded into desired slope by construction/earth moving equipment. The soil blanket would be constructed within a semicircular-shaped area below the existing face of the dam. Following the placement of new topsoil over the pervious material, the face of the soil blanket would be graded and seeded to establish new surface vegetation to prevent erosion of the downstream face.

Alternatives: In accordance with NEPA regulations, DOE examined the following alternatives to the proposed action: (1) no action, do not take any action to repair the dam; (2) drawdown or drain the impoundment; and (3) implement the proposed dam repair using borrow material from an offsite source. The no-action alternative would consist of DOE not implementing any action to either repair the dam or reduce the potential impacts of an embankment or structural failure. This alternative could result in a structural failure of the dam and a broad spectrum of both contamination and sedimentation impacts to the downstream corridor. A failure of this type would also result in the exposure of the contaminated lakebed of Pond B. The second alternative would involve the drawing down or draining of the water level in Pond B to minimize the potential for a failure of the impoundment's dam. This action would result in all of the same potential impacts that would be realized from exposing the lakebed in the no-action alternative. This alternative could also result in a required accelerated cleanup of the basin under the Comprehensive Environmental Response, Compensation, and Liability Act, which would be very costly. A third alternative would be to conduct the proposed repair of the dam using soils obtained from an offsite location. This would have most of the same consequences as the proposed action except for those impacts associated with the onsite borrow pit. However, this alternative would be neither cost effective or operationally efficient.

Environmental Impacts: The principal cumulative impacts from the proposed action would be those effects associated with the loss of approximately 1.2 hectares (3 acres) of wetland habitat. This represents less than 0.09 percent of this habitat type on SRS, but would likely require a mitigation action to compensate for this loss. The impacts to the 100-year floodplain in the project area would be minor. The loss of up to 2.0 hectares (5 acres) of either planted pine or mixed pine-hardwood forest for the borrow pit would represent a decrease of 0.004 percent and 0.05 percent of these types of forested habitats, respectively, on SRS. However, these forested lands could be replanted and restored following the closure of the proposed borrow pit. There would be no measurable impact on the local economy as a result of the proposed action. Some individual mortality of wildlife species and a temporary loss of available wildlife habitat on SRS would result from implementing the proposed action. The proposed dam repair project and borrow pit would have no adverse impacts on threatened and endangered species or cultural resources. Cumulative ambient air quality impacts would be negligible. Assuming that both appropriate protective clothing and adequate safety measures are utilized, the proposed action should not pose any potential problems for either human health or worker safety. There would be no measurable impact to either public health and safety as a consequence of the proposed action. Negligible traffic and transportation impacts would result from implementation of the proposed action. No additional safeguard and security measures would be required for implementing the proposed action.

Floodplain Statement of Findings: This Floodplain Statement of Findings was prepared in accordance with 10 CFR 1022. A Floodplain/Wetlands Assessment was prepared for the area to be impacted by implementation of the proposed Pond B dam repair project. The Floodplain/Wetlands Assessment stated that both 100-year floodplain and jurisdictional wetlands did exist in the proposed project location, and that impacts would occur to these sensitive resource habitat types. Temporary construction access in the floodplain and wetland areas would be required to install the soil blanket. Operation of construction equipment in these areas would be minimized. Short-term impacts in these areas would occur from the construction activities. Silt fences and other erosion control structures as needed would be installed to ensure no deposition in downslope areas. Erosional impacts would be expected to be small and temporary. The proposed activities associated with installing the proposed soil blanket would be expected to fall under a U. S. Army Corps of Engineers Section 404 Permit. Depending upon the ultimate amount of acreage filled by the placement of the soil blanket, requirements under Section 404 would likely impose the need for wetland mitigation. The specifics of a mitigation effort would be determined during the Section 404 permitting process for this proposed action. Additionally, an erosion control plan will be developed in accordance with applicable State and local floodplain protection standards and followed to ensure that no additional impacts to wetlands will occur due to erosion and sedimentation. Best management practices would be employed during construction and maintenance activities.

Determination: Based on the information and analyses in the EA (DOE/EA-1285), and after careful consideration of all comments, DOE has determined that the proposed Pond

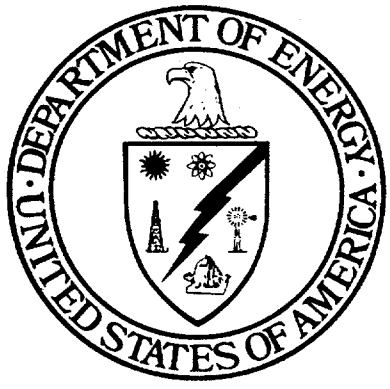
B dam repair project at SRS does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA. Therefore, an EIS is not required and DOE is issuing this FONSI and Floodplain Statement of Findings.

Signed in Aiken, South Carolina, this 27th day of Sept, 1999.

Greg Rudy
Manager
Savannah River Operations Office

DOE/EA-1285

ENVIRONMENTAL ASSESSMENT FOR THE POND B DAM REPAIR PROJECT AT THE SAVANNAH RIVER SITE



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LIST OF ABBREVIATIONS/ACRONYMS

The following is an alphabetized list of the abbreviations and acronyms found within the text of this document:

Bq	-	Becquerel (an international unit of radiation measure)
CERCLA	-	Comprehensive Environmental Response, Compensation and Liability Act
CFR	-	Code of Federal Regulations
Cs^{137}	-	Cesium-137
DOE	-	U. S. Department of Energy
DOT	-	U. S. Department of Transportation
EA	-	environmental assessment
EIS	-	environmental impact statement
FERC	-	Federal Energy Regulatory Commission
ft	-	feet
HNUS	-	Halliburton NUS Corporation
m	-	meter
mrem	-	1/1000 roentgen equivalent man
msl	-	mean sea level
NEPA	-	National Environmental Policy Act
NERP	-	National Environmental Research Park
OSHA	-	Occupational Safety and Health Act
R/P	-	R Area and P Area
sec	-	second
SR	-	Savannah River Operations Office
SRARP	-	Savannah River Archaeological Research Program
SREL	-	Savannah River Ecology Laboratory
SRI	-	Savannah River Natural Resource Management and Research Institute
SRS	-	Savannah River Site
Sr^{90}	-	Strontium-90
USC	-	United States Code
USFWS	-	U. S. Fish and Wildlife Service
USGS	-	U. S. Geological Survey
WSRC	-	Westinghouse Savannah River Company

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1.0 INTRODUCTION

The U. S. Department of Energy (DOE) prepared this environmental assessment (EA) to analyze the potential environmental impacts associated with the proposed Pond B dam repair project at the Savannah River Site (SRS), located near Aiken, South Carolina (Figure 1-1). The proposed action would include the implementation of restoration and reconstruction activities on the downstream slope and toe of the earthen dam impounding Pond B.

This document was prepared in compliance with the National Environmental Policy Act (NEPA) of 1969, as amended; the requirements of the Council on Environmental Quality Regulations for Implementing NEPA (40 CFR 1500-1508); and the DOE Regulations for Implementing NEPA (10 CFR 1021). NEPA requires the assessment of environmental consequences of Federal actions that may affect the quality of the human environment. Based on the potential for impacts described herein, DOE will either publish a Finding of No Significant Impact or prepare an environmental impact statement (EIS).

1.1 Background

Pond B is one of the former production reactor cooling ponds on the R/P reactor canal system at SRS (Figure 1-2). The Pond B dam (SRS Facility No. 685-13G) was constructed in 1960 as a simple earthen dam with sand toe drain systems. Typical of dams built during that period, it has no spillway discharge systems or monitoring devices such as piezometers, inclinometers, or weir boxes. An asphalt concrete mat was placed on the upstream side of the dam to prevent bank erosion of the earthen structure. During reactor operation, effluent came into Pond B from R Reactor through the R Canal. This canal system discharged the thermal effluent into the cooling pond at the southwestern corner of the impoundment. An overflow structure to control the Pond B pool elevation was located on the eastern side of the impoundment (Figure 1-2). In the early 1960s, Pond B received radioactive contaminants, primarily Cs^{137}, via cooling water discharges from R Reactor. This reactor has not been operated, and Pond B has not received cooling water effluent since 1964. Radioactive contaminants currently exist within the sediment, water, and biotic components of Pond B.

All SRS dams are on the Federal Energy Regulatory Commission (FERC) Dam Inventory List and are annually inspected by FERC. The dams are operated using the FERC guidelines put forth under 18 CFR 12. Several recent inspections of the Pond B dam by SRS engineers and FERC have indicated that the current structural condition of this dam is a safety issue and is not in compliance with FERC guidelines. Specifically, the saturation limit or line on the downstream face of the dam has increased dramatically from what is considered an acceptable or safe limit for this type of structure. The increased seepage and saturation through this earthen structure to the downstream face of the dam causes the soil within the dam to lose shearing strength. This serves to decrease the slope stability and internal friction angle characteristics of the soil, which are the

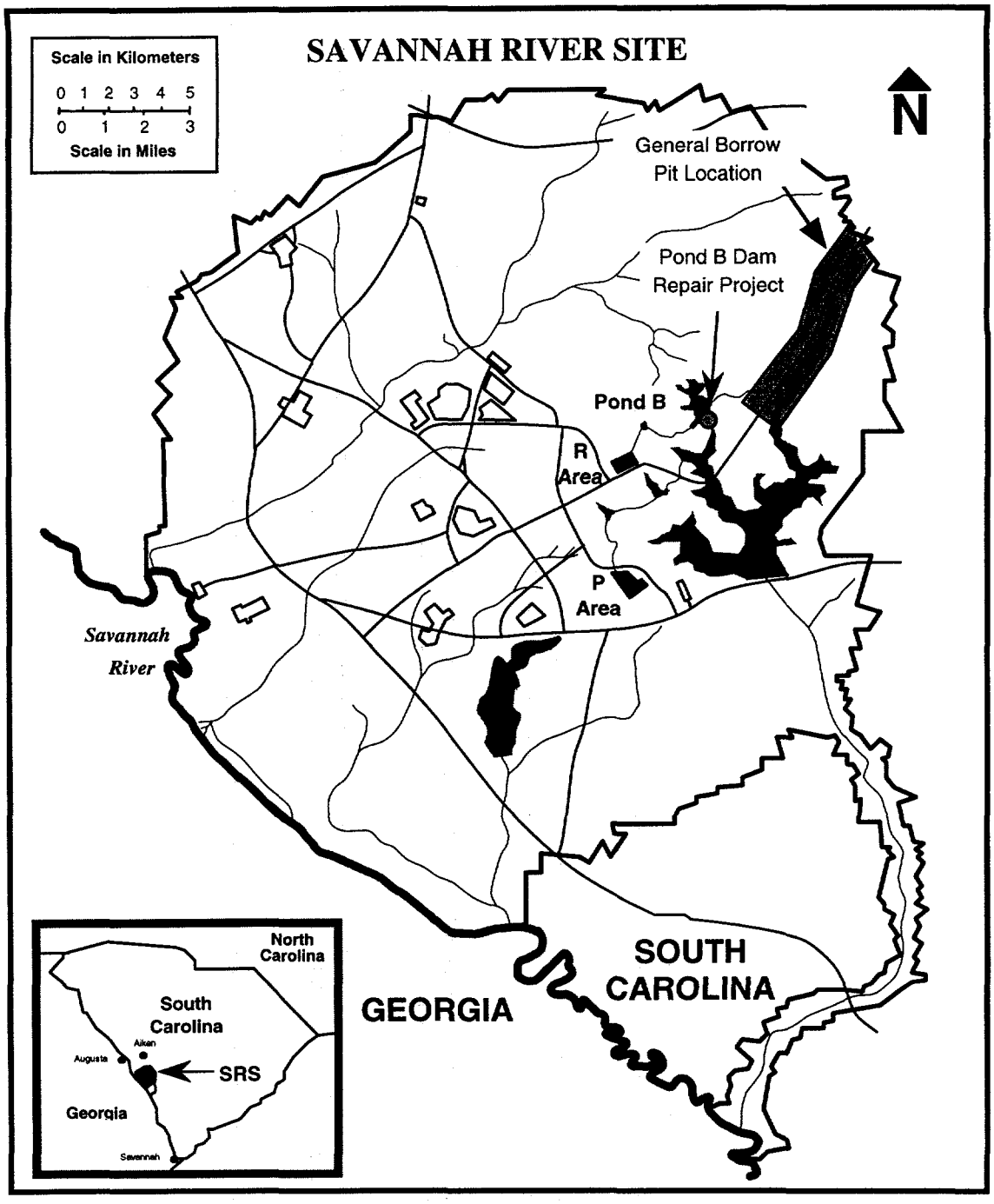

Figure 1-1. Location of the Pond B Dam Repair Project at the Savannah River Site, South Carolina.

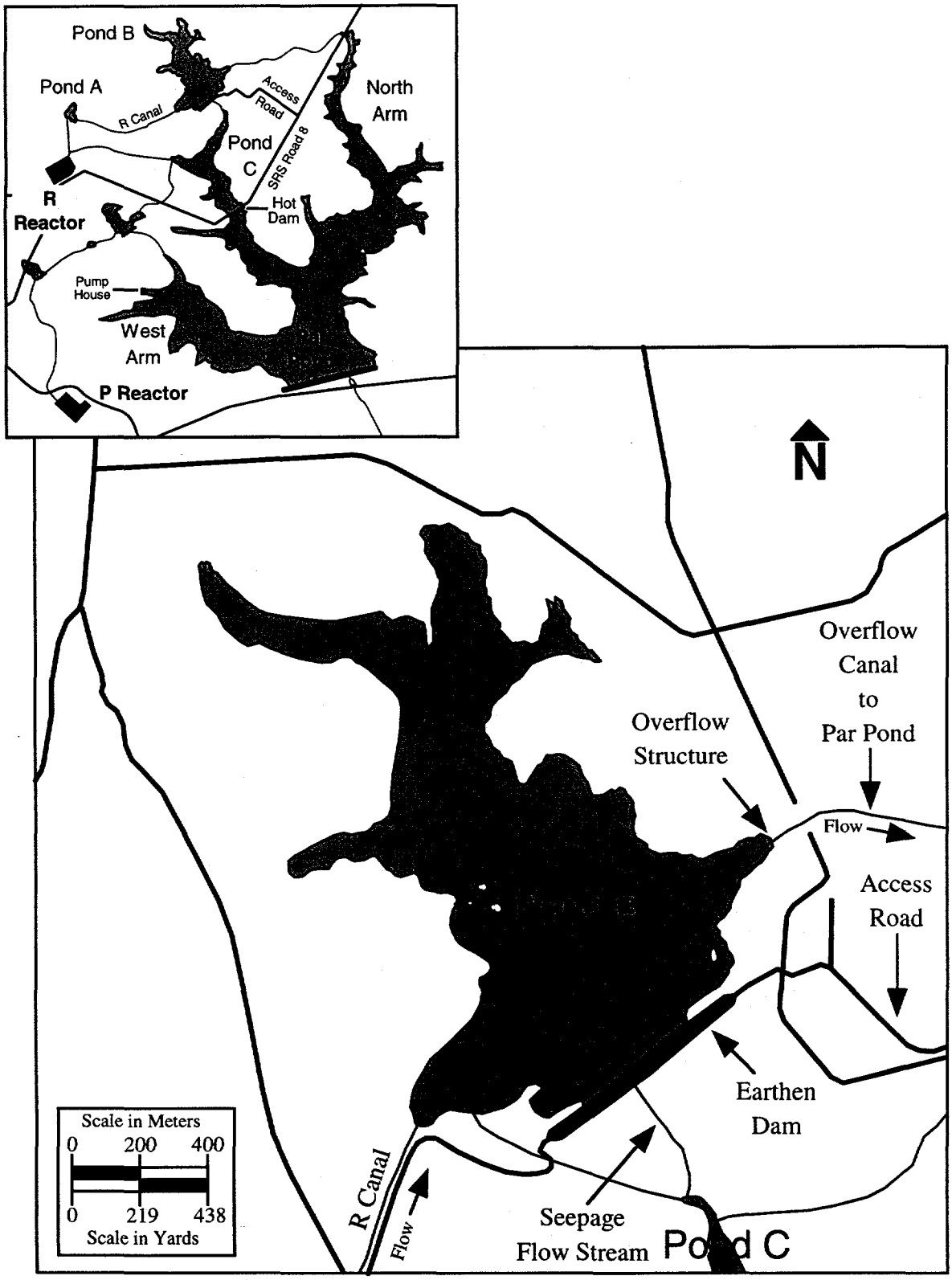

Fig. 1-2. Map of Pond B and the surrounding area, and the location of Pond B within the Par Pond Reservoir System.

properties by which this type of embankment is held in place. The saturation problem appears to be the result of toe drain failure where the drain has become clogged with excessive fine soil material from the impervious core of the dam and no longer transmits seepage through the dam as it was originally designed. Additionally, trees and vegetation were allowed to become established over the dam's entire downstream face for a number of years. During this extended time period, the root systems of these plants worked their way into the embankment and toe drain contributing to the overall seepage problem.

The combination of the these various conditions has severely lowered the intended design factor of safety for the dam, which in turn could result in an embankment or dam failure. Further, without the benefit of built-in monitoring instruments or the original design parameters and construction information, no means are available to either ensure that the structure is safe or accurately predict a structural failure. In addition, the risk of such a failure would increase with time and become critical in a matter of a few years.

1.2 Purpose and Need for Action

The purpose for action is to reduce the potential for structural failure of the Pond B dam. DOE needs to implement the action to reduce the environmental consequences which would result from such a failure scenario.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The proposed action entails the restoration and reconstruction of the downstream face of the Pond B dam (Figures 1-2 and 2-1). DOE proposes to fix and repair the Pond B dam structure to collect seepage and provide for measurement and monitoring of internal characteristics, provide weight to resist the high exit gradient of seepage, and provide stability in the form of weight to resist a rotational slope failure. The construction start-up would be initiated in Fiscal Year 2001 with the project being completed by Fiscal Year 2002. The estimated budget for the proposed action is $2,300,000.

The scope of the proposed action would include the following: (1) stripping of topsoil and clearing of vegetation on the downstream face and toe of the dam; (2) construction of new underdrain and monitoring systems within the dam; and (3) placement of a soil blanket on the downstream face of the dam. Siting and operation of a borrow pit and upgrades to the site roadway infrastructure providing access to the project location are also components of the proposed action. The proposed action would not require the use of any site utilities and, aside from the proposed borrow pit, only existing SRS infrastructure would be needed to implement the project.

The first part of the construction would involve the clearing and preparation of the downstream face and toe of the dam for the placement of the soil blanket. All of the

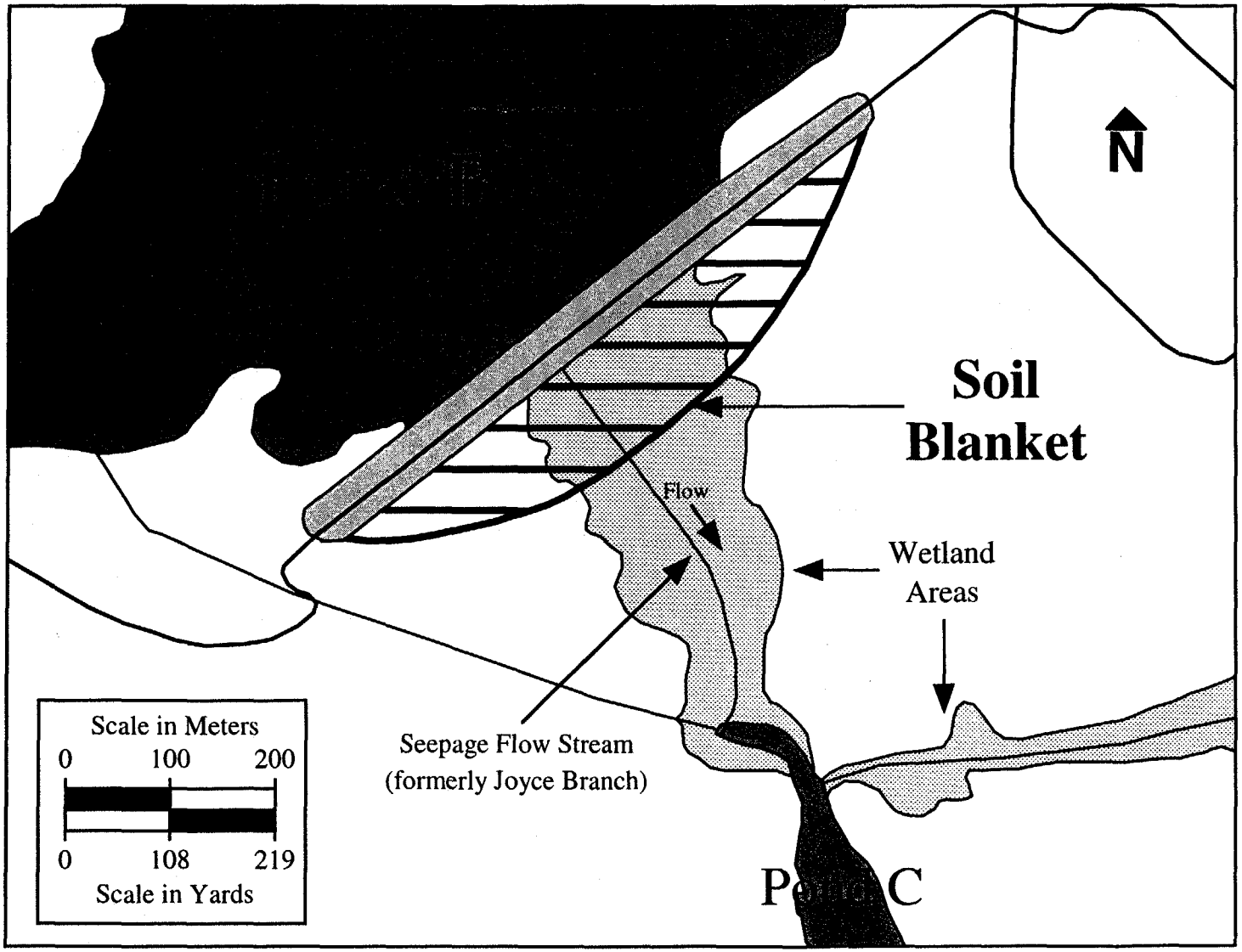

Fig. 2-1. Map of the proposed project location downstream of the Pond B dam.

woody and herbaceous vegetation on the downstream face and at least a 17.5 to 30.5 meter (50 to 100 foot) area along the toe of the dam would be cut down and removed. The area would then be grubbed and cleared of any remaining exposed or subsurface plant material. The next portion of this work would include the excavation and removal of topsoil from these areas. An area downstream for about 100 meters (108 yards) below the dam would also be cleared and grubbed of any vegetation to enable construction vehicle access and preparation for the placement of the soil blanket. All of the material removed from the dam's downstream face, toe, and area below the toe would be hauled away and disposed of in an onsite disposal facility. Based on a recent study (Dunn et al. 1999), none of these materials are expected to be contaminated (Refer to Section 3.5 for further discussion of this issue).

Several measures would be implemented to ensure improved drainage and monitoring capabilities of the Pond B dam. Prior to the placement of the soil blanket, a rock core underdrain system would be constructed on the face and along the entire toe of the dam. To further facilitate the regulation of drainage through the structure, concrete weir boxes would be installed at the toe of the dam after the placement of the new soil blanket. Both piezometers and lateral movement monitors would be installed to enable improved evaluation of the seepage through the dam and the stability of the new downstream face of the structure.

The proposed soil blanket would consist of approximately 22,940 to 38,230 cubic meters (30,000 to 50,000 cubic yards) of pervious material obtained from an onsite location. The source of suitable cohesionless soils for the proposed soil blanket would be one of several potential areas located along the SRS Road 8 corridor (Figure 2-2). The area delineated along the SRS Road 8 corridor in Figure 2-2 does not include wetland habitats or high (Type III) archaeological sensitivity zones for SRS. The surface extent of a borrow pit producing this volume of material would be 0.4 to 2.0 hectares (1 to 5 acres). The area selected for this onsite borrow pit would be cleared of any merchantable timber, excavated for the necessary volume of material, and graded, stabilized and seeded to prevent erosion. The project site would then be allowed to re-vegetate naturally. If additional site preparation (e.g., soil enrichment or fertilization) were implemented, this acreage ultimately could be planted by U.S. Forest Service Savannah River Natural Resources Management and Research Institute (SRI) with tree species for timber management.

The placement of the new soil blanket would encompass an area of approximately 1.2 to 1.6 hectares (3 to 4 acres) on the downstream face and area below the toe of the dam. Access to the work area would be over existing secondary roads leading to the base of the dam. Approximately 3,125 truckloads of suitable material would be deposited within the general footprint of the proposed soil blanket. These materials would then be compacted and graded into desired slope by construction/earth moving equipment (e.g., D-9 caterpillar tractors and road graders). The soil blanket would be constructed within a semicircular-shaped area below the existing face of the dam (Figure 2-1). Following the placement of new topsoil over the pervious material, the face of the soil blanket would be

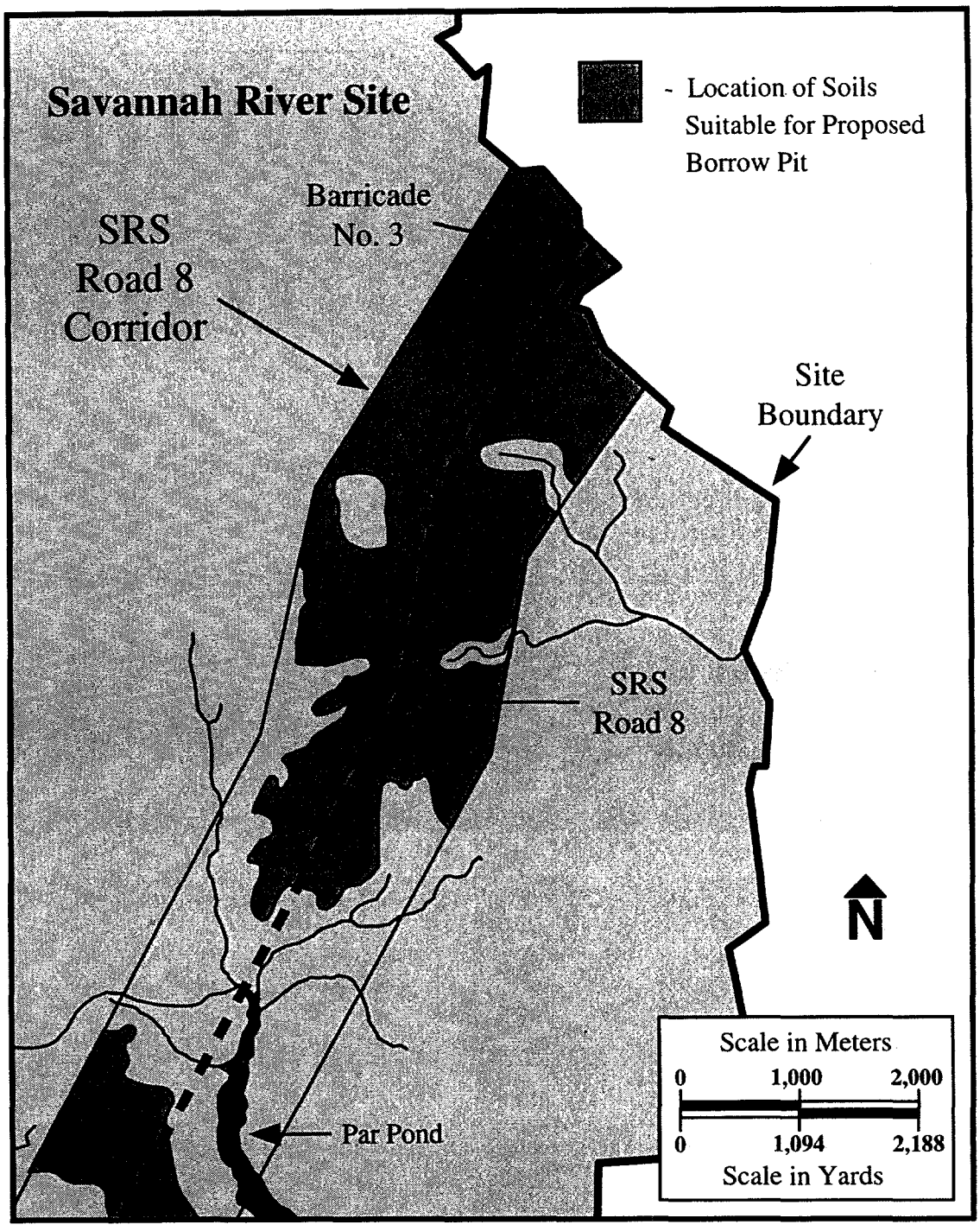

Figure 2-2. Map showing the potential areas for locating the proposed borrow pit along the SRS Road 8 corrdior.

graded and seeded to establish new surface vegetation to prevent erosion of the downstream face.

The vehicle access to and from the proposed project location would be over the existing SRS roadway system. Because of the remote location of Pond B and the comparatively high volume of heavy truck and construction equipment traffic, the existing secondary access roads to the dam would have to be upgraded or improved to provide reliable access for these vehicles. Vehicle access would be via secondary site roads beginning at SRS Road 8 near the former site of the relocated Williston Barricade. A portion of this route is along a surfaced secondary road. The remaining portion of the route is unsurfaced roadway. Upgrades would include the following: (1) implementation of any needed repairs to the surfaced road; (2) grading/leveling of the unsurfaced roads; and (3) placement of gravel of a grade sufficient to improve the quality and durability of the unsurfaced roads.

The facilities involved in the proposed action are located entirely within the general site access portion of SRS. All existing security systems and programs for the general site would be extended to the facilities involved in the proposed action.

2.2 Alternatives to the Proposed Action

In accordance with NEPA regulations, DOE examined the following alternatives to the proposed action:

- No action, do not take any action to repair the dam
- Drawdown or drain the impoundment
- Implement the proposed dam repair using borrow material from an offsite source

2.2.1 No Action, Do Not Take Any Action to Repair the Dam

One alternative to the proposed action is to take no action. This would consist of SRS not implementing any action to either repair the dam or reduce the potential impacts of an embankment or structural failure. Should these structures fail, the selection of this alternative would result in a broad spectrum of both contamination and sedimentation impacts to the downstream corridor below the existing dam (Refer to Section 4.3 for a discussion of this accident scenario). Such a failure would also result in exposure of at least portions of the contaminated lakebed, resulting in human health and environmental impacts associated with the resuspension of contaminated sediments and exposure. The impoundment and portions of the downstream drainage corridor would become a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) operable unit, requiring the implementation of cleanup and restoration activities under that Federal regulation.

2.2.2 Drawdown or Drain the Impoundment

This alternative would involve the drawing down or draining of the water level in Pond B to minimize the potential for a failure of the impoundment's dam. This action would result in all of the same potential impacts that would be realized from exposing the lakebed as discussed in the no-action alternative. Such a decision to drawdown or drain the impoundment would also require implementing the CERCLA process to oversee this action. The potential would also exist that CERCLA could dictate an accelerated cleanup of the basin, which would be very costly. Cleanup of Pond B is not budgeted for at this time; hence, the required funding is not presently available.

2.2.3 Implement the Proposed Dam Repair Using Borrow Material from an Offsite Source

Another alternative would be to conduct the proposed repair of the dam using soils obtained from a offsite location. Most of the onsite impacts associated with the dam location would be identical to those resulting from implementing the proposed action. The potential impacts associated with siting and constructing a borrow area onsite would be shifted to an offsite area. Although this overall option would meet site needs, it would necessitate the purchase of fill material and increase the transportation scope of work to include an offsite component. This alternative would be neither cost effective or operationally efficient.

3.0 AFFECTED ENVIRONMENT

SRS occupies an area of approximately 800 square kilometers (300 square miles) in southwestern South Carolina (Figure 1-1). The site borders the Savannah River for about 27 kilometers (17 miles) near Augusta, Georgia, and Aiken and Barnwell, South Carolina. SRS contains five non-operational nuclear production reactor areas, two chemical separations facilities, waste treatment, storage and disposal facilities, and various supporting facilities. The Final EIS for the Construction and Operation of a Tritium Extraction Facility at SRS (DOE 1999) and the most recent socio-economic survey of the six-county SRS area of influence (HNUS 1997) contain additional information on SRS facilities and the areas surrounding the site.

3.1 Land Use

Pond B was designed and constructed to serve as a reactor cooling water reservoir for R Reactor at SRS. Pond B received inputs of heated reactor effluent from R-Reactor operations during the period of 1961 to 1964. In 1964, the thermal effluent discharges into Pond B ceased. Since that time, Pond B has not been used for any operational purpose. In spite of this lack of a functional basis for retaining Pond B, the reservoir has been maintained because of the contamination present in the basin's soils and water

column. Periodic monitoring is conducted both in the impoundment (i.e., for radioactive contamination in fish) and on the upstream and downstream faces of the dam (i.e., for structural stability). Pond B is currently listed as part of the Par Pond integrated operable unit under CERCLA, and is awaiting decisions regarding its cleanup and closure.

Since the startup of the cooling impoundment in the early 1960s, the area below the dam has been maintained as part of the general Pond B site facility. It has been largely kept cleared of standing woody vegetation up through the present time to facilitate maintenance and inspection of the dam.

Because of the operational history of the impoundment, a number of both radioecological and general ecological research projects have been conducted within this former cooling water basin (e.g., Bowling et al. 1994, Kelly and Pinder 1996, Pinder et al. 1992, 1995, Rea et al. 1998, Whicker 1988, Whicker et al. 1990). Ongoing research projects in the field of radioecology are being conducted by the Savannah River Ecology Laboratory (SREL). However, none of the studies have been conducted in the area on the downstream side of the dam.

3.2 Geology and Seismology

SRS is located in the Aiken Plateau physiographic region of the upper Atlantic Coastal Plain approximately 40 kilometers (25 miles) southeast of the Fall Line which separates the Piedmont Plateau from the Atlantic Coastal Plain. The topographic surface of the coastal plain slopes gently seaward and is underlain by a wedge of seaward-dipping unconsolidated and semiconsolidated sediments from the Fall Line to the coast of South Carolina. The Atlantic Coastal Plain tectonic province in which SRS is located is characterized by generally low seismic activity that is expected to remain subdued (Haselow et al. 1989).

The area encompassing Pond B is comprised of both Vaucluse-Ailey and Fuquay-Blanton-Dothan soil associations. The Vaucluse and Ailey series soils are located in the eastern and southern portions of the basin and consist of well-drained, slowly permeable soils that formed in thick beds of unconsolidated sand and clay in the Sand Hills. These soils are characteristic of long, narrow ridgetops and short, complex side slopes. The Fuquay-Blanton-Dothan complex soils are found in the northern and western portions of the Pond B area and consist of well drained and somewhat excessively drained soils that have a loamy subsoil (Rogers 1990). Within the basin, lakebed sediments range from sand on windy points to 0.5 m (20 inches) thick layers of macrophytic detritus in the ends of the bays to kaolinitic clays and silt overlain by a 2 to 10 cm (0.8 to 3.9 inches) organic layer in most of the remaining portion of the impoundment (Ruhe and Matney 1980).

Within the specific area of the proposed dam repair activities, the soils consists of Udorthents, Blanton sands, and Fluvaquents. Approximately one-half of the area to be impacted by the proposed soil blanket is comprised of Udorthents, well-drained soils

formed in heterogeneous materials placed during construction of the dam. The central portion of the proposed project area below the dam is underlain by Fluvaquents. These are poorly drained, moderately permeable soils that formed along the floodplain of small streams and drainageways in sandy sediment located in the Coastal Plain and Sand Hills. These soils are found in long, narrow, low areas and are frequently flooded. Slopes are generally less than 1 percent. Two smaller areas, characterized by Blanton sands, are found between the two previously discussed soil types are located in the downstream half of the project area. Blanton sands are somewhat excessively drained, moderately permeable soils that formed in sandy and loamy sediments. These soils are typical of low ridges and broad swales adjacent to the lower side slopes. These slopes range from 0 to 10 percent (Rogers 1990).

The area around the proposed project location consists of ridgetops sloping down into the former stream channel currently inundated by Pond B. Elevations vary locally from approximately 95 meters (310 feet) above mean sea level (msl) on the ridges down to 64 meters (210 feet) above msl in the floodplain below the Pond B dam (USGS 1988). The area of the dam repair activities is relatively flat, increasing in elevation toward either side of the drainage corridor.

No geologic faults are located within the proposed project area. The most active seismic zones in the southeastern United States are all located over 160 kilometers (100 miles) away from the site. A recent EIS (DOE 1999) contains information on SRS fault location and earthquake occurrences.

3.3 Hydrology

The Savannah River forms the western boundary of SRS and receives drainage from five major tributaries on the site: Upper Three Runs, Fourmile Branch, Pen Branch, Steel Creek, and Lower Three Runs. These tributaries receive varying types of wastewater discharges from plant processes and sanitary treatment systems, all of which are permitted through the National Pollutant Discharge Elimination System regulatory compliance process. On SRS, various plant processes also require the pumping of Savannah River water and/or onsite groundwater. A recent EIS (DOE 1999) contains information on surface water and groundwater resources on SRS and in the surrounding region.

Pond B was filled in 1961 after completion of an earthen dam across Joyce Branch of Lower Three Runs. In September 1961, Pond B started receiving thermal effluent being discharged from R Reactor through the R Canal at a rate of approximately 11 m^3 (388 ft^3) per sec. This water was partially from the Savannah River and partially from the West Arm of Par Pond, which was ultimately supplied from the Savannah River via P and R Reactors. The water in Pond B was then discharged through an overflow structure and eventually flowed into the North Arm of Par Pond via the continuation of R Canal. Since 1964, Pond B has only received rain and surface water runoff inputs. However, runoff and erosional events from the surrounding watershed are rare due to the well-drained, permeable nature of the soils in this area (Bowling et al. 1994, Whicker et al. 1990).

At present, Pond B covers 87 hectares (215 acres), and has a maximum depth of 12.5 meters (41.0 feet). It has four small islands, six bays, and 9 kilometers (5.6 miles) of shoreline. The mean depth is 4.3 meters (14.1 feet) and the volume is estimated as 3.9 x 10^6 m^3 (137.7 x 10^6 ft^3) (Whicker et al. 1990). The area below the toe of the dam includes a small seepage flow stream [< 0.14 cubic meters (5 cubic feet) per sec mean annual flow] and a floodplain associated with that portion of Joyce Branch.

The depth to uppermost groundwater in the area of Pond B varies from 2.0 to 30.0 meters (6.9 to 98.4 feet) below grade. The direction of flow of the uppermost groundwater is upward and to the south-southwest.

3.4 Ecological and Cultural Resources

Since 1951, when the U.S. Government acquired SRS, natural resource management practices and natural succession outside of the construction and operation areas at SRS have resulted in increased ecological complexity and diversity of the site. Forested areas support a diversity of wildlife habitats that are largely restricted from public use. Forest management practices include controlled burning, harvesting of mature trees, and reforesting. Wildlife management includes control of white-tailed deer (*Odocoileus virginianus*) and wild swine (*Sus scrofa*) populations through supervised hunts. SRS, which was designated as the first National Environmental Research Park (NERP) in 1972, is one of the most extensively studied environments in this country. Halverson et al. (1997) contains additional information on the biotic characteristics of SRS.

Six species on SRS are afforded protection by the Federal Government under the Endangered Species Act of 1973. These are the bald eagle (*Haliaeetus leucocephalus*), wood stork (*Mycteria americana*), red-cockaded woodpecker (*Picoides borealis*), American alligator (*Alligator mississippiensis*), shortnose sturgeon (*Acipenser brevirostrum*), and smooth purple coneflower (*Echinacea laevigata*). Both bald eagles and alligators have been documented as either occurring on or using the lands within or adjacent to the proposed project location (Gibbons and Semlitsch 1991, Mayer et al. 1986).

The wetland area below the dam is believed to have been natural wetlands prior to the construction of Pond B dam, although soil saturation is likely to have increased as a result of the man-made impoundment. This area is dominated by grasses, sedges (*Carex* spp.), hornedrush (*Rhynchospora* spp.), nutrush (*Cyperus* spp.), plume grass (*Erianthus* spp.), and bullrush (*Scirpus* spp.).

The wooded area of the floodplain and wetlands downstream from the dam is dominated by an overstory of tulip poplar (*Lireodendron tulipifera*), red maple (*Acer rubrum*), and sweetgum (*Liquidambar styraciflua*). Other arboreal species include ironwood (*Carpinus caroliniana*), black gum (*Nyssa sylvatica*), loblolly pine (*Pinus taeda*), pond pine (*P. serotina*), red bay (*Persea palustrus*), and sweetbay (*Magnolia virginiana*). A number of

these same species are present in the understory as seedlings, including tulip poplar, red maple, red bay, and sweetgum. Dominant shrubs and vines include greenbrier (*Smilax laurifolia*), bitter gallberry (*Ilex glabra*), highbush blueberry (*Vacinium corymbosum*), fetter-bush (*Lyonia lucida*), tassel-white (*Itea virginiana*), and wax myrtle (*Myrica cerifera*). The herbaceous layer is dominated by maidencane (*Panicum hemitomon*), sensitive fern (*Onoclea sensibilis*), and rush (*Juncus* spp.). Dominant forest floor species include grasses, sedges, and sphagnum moss.

The proposed project location on either end of the dam is dominated by a closed canopy of mesic pine-hardwood forest. This habitat is dominated by a canopy of loblolly pine, black gum, red maple, and sweetgum. Present in the understory are both saplings of these species and American holly (*Ilex opaca*). The herbaceous and vine layer is sparse and consists mainly of grape (*Vitis* spp.), poison oak (*Rhus toxicodendron*), and jessamine (*Gelsemium sempervirens*).

A diverse and productive fauna has become established in and around Pond B. Several wildlife species have been observed in the general area of the proposed project location below the dam. The wildlife species composition is comparable to similar bottomland/floodplain habitat types elsewhere on SRS. Comprehensive listings of wildlife species associated with Pond B and SRS in general can be found in Whicker et al. (1990) and Halverson et al. (1997).

The management and utilization of forests, soils, watersheds, and wildlife at SRS are described in the SRS Natural Resources Management Plan (DOE 1991) and defined under the terms of a Memorandum of Agreement between DOE Savannah River Operations Office (SR), SRI, the Natural Resources Conservation Service, and Westinghouse Savannah River Company (WSRC). DOE-SR uses this Memorandum of Agreement to define the roles and responsibilities of the various agencies and organizations in the management of natural resources on SRS.

The entire proposed project location is situated within the medium or Type II archaeological sensitivity zone for SRS (SRARP 1989). The areas specifically proposed for development have been reviewed by the University of South Carolina's Savannah River Archaeological Research Program (SRARP). No complex archaeological or potential National Register of Historic Places eligible sites were identified within the proposed project location. Cultural resources at SRS are managed under the terms of a Programmatic Memorandum of Agreement among DOE-SR, the South Carolina State Historic Preservation Officer, and the Advisory Council on Historic Preservation. DOE-SR uses this Programmatic Memorandum of Agreement to identify cultural resources, assess these in terms of National Register eligibility, and develop mitigation plans for affected resources in consultation with the South Carolina State Historic Preservation Officer. DOE-SR would comply with the stipulations of the Programmatic Memorandum of Agreement for all activities related to the proposed Pond B dam repair project.

3.5 Radiation Environment

A person residing in the Central Savannah River Area (within 80 kilometers or 50 miles of SRS) receives an average annual radiation dose of about 360 mrem; SRS contributes less than 0.1 percent of that total. Natural radiation sources contribute about 300 mrem, medical exposures contribute about 53 mrem, and consumer products contribute about 10 mrem. The most recent SRS annual environmental report and data summary (Arnett and Mamatey 1997a, 1997b) contain more information on the radiation environment.

During 1963 and 1964, periodic releases from R Reactor operations discharged approximately 1.9×10^{15} Bq of tritium, 5.7×10^{12} Bq of Cs^{137}, 4.4×10^{11} Bq of Sr^{90}, and lesser quantities of other radionuclides into R Canal. The radiological inventory in Pond B is dominated by Cs^{137}, with 4.6×10^{11} Bq of this radionuclide having been accounted for. The sediments contain >98 percent of the Pond B ecosystem inventory of Cs^{137} and transuranic radionuclides and 85 percent of Sr^{90}. The water column was the next most important reservoir of radioactivity within the impoundment. The fraction of the total inventory of radioactivity residing in biotic components was very low, and most of that was found in Pond B's aquatic macrophytes. The water column in the impoundment is effectively precluding dispersal of Pond B's radiological inventory and adequately shielding the surrounding from gamma radiation (Whicker et al. 1990).

In July of 1998, soil samples were collected from the downstream face and toe of the Pond B dam and the area below dam that could be disturbed later during the proposed dam repair project. Samples were analyzed to determine whether the soil contained measurable radioactive contamination as a result of seepage through the dam. The radiological data provided by this study would be used to determine safety, health, and radiological control precautions necessary if soil were to be removed from the dam during the proposed repair project. The results of this study showed no evidence of radionuclide contamination on the downslope face of the dam or migration or transport of contaminates as a result of seepage through the dam (Dunn et al. 1999)

4.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

4.1 Dam Repair Activities

Most of the activities related to the proposed dam repair project would take place within previously developed or impacted areas. The one exception of this would be that portion of the project associated with the onsite borrow pit. This aspect of the proposed action is addressed in the following section. Within the project location below the dam, most of this area would be returned to the same land use activities as those prior to the project's implementation. Therefore, land use impacts due to construction activities associated with the Pond B dam repair project would be small.

The direct and indirect socioeconomic impacts of the peak project construction work force of 32 people would be negligible when compared to the present total SRS employment of approximately 14,000 people. This work force would be drawn from both local and non-local sources as determined by skilled worker availability. No measurable impact on the local economy would be expected from the proposed action.

The clearing of portions of the project location for the dam repair would limit the use of these lands by wildlife species. Some of the small, less mobile species of mammals, reptiles and amphibians would possibly be either physically harmed or killed by the clearing and earth-moving equipment. However, most species of mammals and birds which inhabited or used the project area would be largely displaced by the land clearing, but probably not either injured or killed. Those animals displaced by construction into adjacent or marginal habitats may either die or experience reduced reproduction. The net result would be a lower quality habitat being available and therefore fewer individual animals being present. Following completion of the proposed project, the general area would again be available for use by the local fauna in a manner comparable to that prior to the project's implementation.

Construction-related air quality effects would be due to either the generation of fugitive dust or the temporary use of diesel-powered equipment. During construction activities, adequate measures would be implemented to minimize and control fugitive dust. A significant portion of the diesel-powered construction vehicle traffic associated with the proposed action would come from the round-trip soil hauling between the borrow pit on SRS Road 8 and the dam repair project site. Based on an average dump truck capacity of approximately 12 cubic meters (16 cubic yards), it is estimated that 3,125 trips would be required to haul the needed volume of borrow material for construction of the proposed soil blanket. Assuming a maximum one-way distance of 8.6 kilometers (6 miles) (i.e., all of the way out SRS Road 8 to Barricade 3), the total truck mileage for the proposed action would be 60,313 kilometers (37,479 miles).

The health risks resulting from the proposed project's truck transportation would in the form of excess latent fatal cancers caused by the inhalation of vehicle exhaust emissions. Rao et al. (1982) established a risk factor for latent mortality from pollution inhalation as 1×10^{-7} per kilometers (1.6×10^{-6} per mile) of truck travel in an urban area. This risk factor is based on the effect of sulfur dioxide and particulate releases from diesel exhaust on mortality. Excess latent mortality is assumed to be equivalent to cancer fatalities. The excess latent cancer risk can then be estimated by multiplying the total mileage by the risk factor and the percentage of travel that occurs within urbanized or densely-populated areas (for this analysis conservatively assumed to be 10 percent to adjust for the unpopulated rural setting of SRS). The estimated risk factor for this distance would equal 0.0006 excess latent cancers as a result of the project's vehicle traffic. Therefore, no latent excess fatal cancers would be expected as a result of implementing the proposed action.

The proposed dam repair project would generate minor amounts of some construction-related debris or rubble. These waste streams would then be transported to and disposed of at either the municipal solid waste disposal site in use at that time (e.g., Three Rivers Solid Waste Authority Regional Landfill) or the SRS erosion control pit, as appropriate. The management, transportation, and disposal of such wastes has already been addressed in DOE (1994) and DOE (1995). No new waste streams or types of waste would be generated during implementation of the proposed action. These project activities would be expected to have only a minimal impact on site waste management operations.

On a daily basis, the project construction activities would result in an increase of 24 vehicles (i.e., 12 roundtrips by the trucks hauling the borrow material) on SRS Road 8. Since the current traffic volume on this site road (i.e., 800 vehicles per day) is below the design capacity (i.e., 850 vehicles per hour), transportation impacts associated with a minor increase in volume would be negligible. In addition, the national injury and fatality rates associated with trucks are estimated by DOT (1982) to be 3.2×10^{-7} and 1.2×10^{-7} per mile traveled, respectively. Based on the estimated total truck mileage associated with the proposed action (i.e., 60,313 kilometers or 37,479 miles), these statistics would suggest that neither injuries (i.e., rate of 0.01) nor fatalities (i.e., rate of 0.005) would occur as a result of the truck traffic associated with the proposed action.

A 1.2 to 1.6 hectare (3 to 4 acre) area of 100-year floodplain and jurisdictional wetlands would be impacted by the placement of the soil blanket on the downstream face of the dam and in Joyce Branch. The consequences associated with this portion of the proposed action are discussed in Appendix A of this EA.

No threatened or endangered species have been identified in the vicinity of the proposed project site on the downstream side of the dam from either previous or recent surveys (Halverson et al. 1997, Imm 1999). The habitats in the vicinity of the project site are not suitable for any of the Federally-protected species that have been identified at SRS except for the American alligator. Since the area immediately below the dam does not contain habitat suitable for extended residence by this threatened species, use of this area by alligators would be for only transitory movement between Ponds B and C. Implementation of the proposed action would temporarily impede but not prevent the movement of alligators through this area. Therefore, no impacts on any threatened or endangered species would be expected as a result of the proposed action. A copy of the biological evaluation (i.e., Imm 1999) of the proposed project site has been forwarded to the U. S. Fish and Wildlife Service (USFWS) in Charleston, South Carolina, for concurrence on a determination of no expected impact on threatened or endangered species.

As part of the routine SRS Site Use Permit system, each prospective project site is also reviewed for potential archaeological impacts. There are no known archaeological or cultural resources found within the proposed project area. Since the project location is encompassed within the medium or Type II archaeological sensitivity zone for SRS and

has been previously impacted by the construction of the dam in the 1960s, little to no impacts to site cultural resources would be expected as a result of the proposed action. Care would be taken during the clearing activities to detect the presence of any such artifacts or remains. These construction activities would be temporarily halted until such time as the significance of these resources could be evaluated and removed if necessary.

The Occupational Safety and Health Act (OSHA) requires that employers comply with the safety and health standards set by the act (29 CFR 1910) to provide each employee with a worksite that is free from recognized hazards that are likely to cause death or serious injury. Temporary barricades and signs would be installed during construction to prevent entry of unauthorized personnel at the project site. Aside from unexpected construction accidents, there should be no potential for impacts to human health and worker safety associated with the dam repair portion of the proposed action.

4.2 Borrow Pit Activities

The general soil types present along the SRS Road 8 corridor that would be suitable for the soil blanket would include Dothan sands, Blanton sands, Lakeland sands, and Fuquay sands. The general locations of these soil types in this portion of the SRS are shown on Figure 2-3. Following a more detailed screening of these soil types, a borrow pit location would be selected within the SRS Road 8 corridor later in the current calendar year.

The different areas within the SRS Road 8 corridor being considered for siting the proposed onsite borrow pit are currently occupied by primarily either planted pine or mixed pine-hardwood forest. The future land use of these locations for timber management would be eliminated during the life of the proposed borrow pit. Upon completion of the borrow activities, the site would be graded and seeded. Over time, the site would be expected to re-vegetate naturally. In two to three years, it would be expected that the site would be occupied by an oldfield type of floral habitat. Ultimately, this area could be replanted for timber management purposes.

The proposed borrow pit would be constructed, operated and closed by a subset of the same employees working on the dam repair project. No new employees would be hired in support of this component of the proposed action. Socioeconomic impacts of the implementing the onsite borrow pit would be inconsequential.

The same potential impacts to wildlife species that would anticipated for the clearing of the area below the toe of the Pond B dam would also be likely to occur in the proposed borrow pit location. No protected species have been identified in or near any of the proposed locations being considered for the borrow activities. Therefore, the proposed borrow pit would not be likely to adversely affect any Federally-protected species. When the specific location for the borrow pit is selected, a site survey would be conducted for any Federally-listed protected species.

The general location for the proposed borrow pit is situated within either low (Type I) to moderate (Type II) archaeological sensitivity zones. Little to no impacts to cultural resources would be expected in such areas as a result of this portion of the proposed action. Again, construction activities would be temporarily halted if such resources were encountered during excavation activities.

The only solid waste streams which would be generated during construction and operations of the proposed facility would be in the form of rubble and debris from the land clearing activities. All of this solid waste would be transported to and disposed of at an appropriate waste disposal facility.

The impact to human health and worker safety would be negligible. The potential for impacts to human health and worker safety for the proposed borrow pit would be essentially the same (i.e., unexpected construction accidents) as that associated with the dam repair portion of the proposed action.

4.3 Accident Analysis

The maximum foreseeable accident associated with the proposed action would be a failure of the dam prior to the completion of the repair activities. The impacts associated with this accident scenario would be ultimately the same as those of the no-action alternative. Assuming that the dam failure was catastrophic, the entire volume of water impounded within Pond B would be released into the downstream corridor and ultimately into the Pond C basin. However, such a failure would still be slow enough to allow any workers at the proposed project location to escape to adjacent higher ground on either side of the downstream corridor. Therefore, there should be no loss of life associated with this accident scenario.

The area encompassing the Pond C basin (impounded by the Pond C or Hot Dam at an elevation of 220 ft msl) can hold approximately 6.4×10^6 m^3 (227.4×10^6 ft^3) in addition to the presently impounded volume of Pond C. This additional capacity in that basin would be sufficient to contain the entire amount of water in Pond B (i.e., 3.9×10^6 m^3 or 137.7×10^6 ft^3). Ultimately, this increase in volume would flow through the "bubble-up" under the Pond C dam into Par Pond, equalizing the pool elevations of the two basins.

In addition to the increased water volume in the impoundments below Pond B, the failure would also damage or destroy approximately 12 hectares (30 acres) of forested habitat (i.e., both planted pine and bottomland hardwood forest) in the drainage corridor below the Pond B dam and along the shoreline of the eastern portion of Pond C. The radiological inventory contained within the Pond B water column would be added to that of Pond C and Par Pond. Some contaminated sediment from Pond B would also be expected to be transported downstream into the corridor below the failed dam and Pond C. As mentioned previously, a CERCLA action would have to be implemented to cleanup the past damage exposed by such a catastrophic failure. In addition, the

downstream relocation of hazardous materials released from Pond B would also be subject to CERCLA assessment and subsequent cleanup.

4.4 Environmental Consequences of the Alternatives

The no-action alternative would create none of the construction impacts associated with the proposed dam repair or borrow pit activities. However, implementation of the no-action alternative would ultimately result in either an embankment or structural failure of the dam. Radioactive contamination would be dispersed downstream over a large area to Pond C and eventually reaching Par Pond. Although it is unlikely that contamination would reach the site boundary, it would be spread over a large wooded area where cleanup would be extremely difficult (Refer to Section 4.3 for more details).

The alternative to either drawdown or drain the impoundment would expose potions of the contaminated lakebed. Impacts associated with worker exposure and the resuspension of the contaminated sediment would potentially be realized. Exposure impacts to local terrestrial wildlife using the former lakebed habitat would also take place.

The other alternative to implement the proposed action using borrow material from an offsite source would have largely the same general set of impacts as the proposed action. The exception would be those impacts associated with the onsite borrow pit. These impacts would still occur, but at an offsite location. Therefore, this alternative would result in less impacts to the SRS environment.

4.5 Cumulative Impacts

The principal cumulative impacts from the proposed action would be those effects associated with the loss of approximately 1.2 hectares (3 acres) of wetland habitat. This represents less than 0.09 percent of this habitat type on SRS. In addition, a mitigation action would be required to compensate for this loss (Refer to Appendix A for more details). The loss of up to 2.0 hectares (5 acres) of either planted pine or mixed pine-hardwood forest for the borrow pit would represent a decrease of 0.004 percent and 0.05 percent of these types of forested habitats, respectively, on SRS. However, these forested lands could be replanted and restored following the closure of the proposed borrow pit.

There would be no measurable impact on the local economy as a result of the proposed action. Some individual mortality of wildlife species and a temporary loss of available wildlife habitat on SRS would result from implementing the proposed action. The proposed dam repair project and borrow pit would have no adverse impacts on threatened and endangered species or cultural resources. The impacts to 100-year floodplain and jurisdictional wetlands would be minor. Cumulative ambient air quality impacts would be negligible.

Assuming that both appropriate protective clothing and adequate safety measures are utilized, the proposed action should not pose any potential problems for either human health or worker safety. There would be no measurable impact to either public health and safety as a consequence of the proposed action. Negligible traffic and transportation impacts would result from implementation of the proposed action. No additional safeguard and security measures would be required for implementing the proposed action.

5.0 REGULATORY AND PERMITTING PROVISIONS CONSIDERED

DOE policy is to carry out its operations in compliance with all applicable Federal, State and local laws and regulations, as well as all DOE Orders. This section provides a discussion of the major regulatory permit programs that might be applicable to the proposed action.

5.1 National Environmental Policy Act of 1969, as amended (42 USC 4321 et seq.)

This EA has been prepared in accordance with NEPA of 1969, as amended, and with the requirements of the Council of Environmental Quality Regulations for Implementing NEPA (40 CFR 1500-1508), DOE Regulations (10 CFR 1021), and DOE Order 451.1A. NEPA, as amended, requires "all agencies of the Federal Government" to prepare a detailed statement on the environmental effects of proposed "major Federal actions significantly affecting the quality of the human environment." This EA has been written to comply with NEPA and assess the environmental effects of the Pond B dam repair project at SRS.

5.2 Solid Waste Regulations

Small amounts of solid waste materials (e.g., construction rubble and debris) would be deposited in the municipal solid waste facility being used by SRS at that time or in the SRS erosion control pit, as appropriate. These activities would be part of already permitted waste management activities that are ongoing at SRS.

5.3 Air Emission Regulations

Operation of the class of construction equipment to be used in implementing the proposed action does not currently fall within the South Carolina Department of Health and Environmental Control requirements for air permitting activities. The use of any diesel generators during construction activities would be prescreened for permitting requirements under Title V.

5.4 Clean Water Act Regulations

The placement of fill material in jurisdictional wetlands would have to be permitted under Section 404 of the Clean Water Act. This type of permit would have to be obtained prior to the implementation of any construction activities in the wetlands downstream from the toe of the Pond B dam.

5.5 Executive Orders 11988 and 11990

Executive Order 11988, "Floodplain Management," directs the Federal Government to establish procedures to ensure that the potential effects of flood hazards and floodplain management are considered for any implemented action. Impacts to floodplain areas are to be avoided to the extent practicable. Executive Order 11990, "Protection of Wetlands," requires Federal agencies to avoid short-and long-term adverse impacts to wetlands whenever a practicable alternative exists. DOE issued regulations (10 CFR 1022) that established procedures toward furthering compliance with these two Executive Orders. Pursuant to 10 CFR 1022, Appendix A addresses these floodplain and wetland issues.

5.6 Endangered Species Act

Section 7 of the Endangered Species Act requires Federal agencies to insure that any action authorized, funded, or carried out by the Government is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of any critical habitat as designated under the Act. In compliance with Section 7, a biological evaluation was conducted on the proposed project location by the U.S. Forest Service SRI (Imm 1999). The results of that biological evaluation indicated that the proposed action should have no effect on Federally-listed endangered or threatened species. A copy of that document has been forwarded to USFWS for concurrence.

6.0 AGENCIES AND PERSONS CONSULTED

Staff professionals from the U.S. Forest Service SRI and the U.S. Fish and Wildlife Service were consulted during the preparation of this EA.

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APPENDIX A

Floodplain/Wetlands Assessment
for the
Pond B Dam Repair Project
at the
Savannah River Site

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1.0 DESCRIPTION OF PROJECT

The Department of Energy (DOE) has prepared this Floodplain/Wetlands Assessment in compliance with 10 CFR 1022 as an Appendix to the environmental assessment (EA) (DOE/EA-1285) for the Pond B dam repair project at the Savannah River Site (SRS). DOE proposes to conduct repairs to the downstream slope and toe of the Pond B dam at SRS, located near Aiken, South Carolina. Pond B is one of the former reactor cooling ponds located on SRS which contains low levels of radionuclide contamination within the lakebed sediments and waters of the impoundment. The dam is an earthen embankment constructed in 1960. Inspections by SRS engineers and the Federal Energy Regulatory Commission have found seepage conditions and erosion which threaten the stability of the dam. The purpose of the proposed action is to make repairs to increase the stability of the dam and reduce the risk of failure.

The scope of the proposed action includes the following: (1) stripping of topsoil and clearing of vegetation on both the dam's downstream face and toe and in the area below the toe of the dam; (2) construction of new underdrain and monitoring systems within the dam; and (3) placement of a soil blanket on the downstream face of the dam. The intitial construction phase would involve the clearing and preparation of the downstream face and toe of the dam for the placement of the soil blanket. As part of this activity, an area extending for approximately 100 meters (108 yards) downstream below the dam would be cleared and grubbed for any vegetation to enable both construction vehicle access and preparation for the placement of the soil blanket. The proposed soil blanket would consist of approximately 22,940 to 38,230 cubic meters (30,000 to 50,000 cubic yards) of suitable cohesionless material. The placement of the new soil blanket would encompass an area of approximately 1.2 to 1.6 hectares (3 to 4 acres) in the area below the toe of the dam. These materials would then be compacted and graded into desired slope by construction/earth moving equipment. The soil blanket would be constructed within a semicircular-shaped area below the existing face of the dam. Following the placement of new topsoil over the pervious material, the face of the soil blanket would be graded and seeded to establish new surface vegetation to prevent erosion of the downstream face.

2.0 EFFECT ON FLOODPLAINS OR WETLANDS

The proposed soil blanket and some components of the underdrain system would be installed in both 100-year floodplain and jurisdictional waters/wetlands of Joyce Branch.

At this project location, both the 100-year floodplain and the wetlands are approximately 43 to 49 meters (140 to 160 feet) across the drainage corridor. Most of the floodplain is periodically inundated for periods sufficient to make it jurisdictional wetlands. The soils within the floodplain and wetlands consists of Fluvaquents. These are poorly drained, moderately permeable soils that formed along the floodplain of small streams and drainageways in sandy sediment of the Coastal Plain and Sand Hills. These soils are found in long, narrow, low areas and are frequently flooded. The wetland area below the dam is believed to have been natural wetlands prior to the construction of Pond B dam, although soil saturation is likely to have increased as a result of the man-made impoundment. This area is dominated by grasses, sedges (*Carex* spp.), hornedrush (*Rhynchospora* spp.), nutrush (*Cyperus* spp.), plume grass (*Erianthus* spp.), and bullrush (*Scirpus* spp.). The wooded area of the floodplain and wetlands downstream from the dam is dominated by an overstory of tulip poplar (*Lireodendron tulipifera*), red maple (*Acer rubrum*), and sweetgum (*Liquidambar styraciflua*). Other arboreal species include ironwood (*Carpinus caroliniana*), black gum (*Nyssa sylvatica*), loblolly pine (*Pinus taeda*), pond pine (*P. serotina*), red bay (*Persea palustrus*), and sweetbay (*Magnolia virginiana*).

A number of these same species are present in the understory as seedlings, including tulip tree, red maple, red bay, and sweetgum. Dominant shrubs and vines include greenbrier (*Smilax laurifolia*), bitter gallberry (*Ilex glabra*), highbush blueberry (*Vacinium corymbosum*), fetter-bush (*Lyonia lucida*), tassel-white (*Itea virginiana*), and wax myrtle (*Myrica cerifera*). The herbaceous layer is dominated by maidencane (*Panicum hemitomon*), sensitive fern (*Onoclea sensibilis*), and rush (*Juncus* spp.). Dominant forest floor species include grasses, sedges, and sphagnum moss. Approximately 1.2 to 1.6 hectares (3 to 4 acres) of wetlands would be impacted by the extension of the toe of the dam with the proposed placement of a soil blanket.

Temporary construction access in the floodplain and wetland areas would be required to install the soil blanket. Operation of construction equipment in these areas will be minimized. Short-term impacts in these areas will occur from the construction activities. Silt fences and other erosion control structures as needed will be installed to ensure no deposition in downslope areas. Erosional impacts would be expected to be small and temporary.

The proposed activities associated with installing the proposed soil blanket are expected to fall under a U. S. Army Corps of Engineers Section 404 Permit. Depending upon the ultimate amount of acreage filled by the placement of the soil blanket, requirements under Section 404 would likely impose the need for wetland mitigation. The specifics of a mitigation effort would be determined during the Section 404 permitting process for this proposed action. Additionally, an erosion control plan will be developed in accordance with applicable State and local floodplain protection standards and followed to ensure that no additional impacts to wetlands will occur due to erosion and sedimentation. Best management practices will be employed during construction and maintenance activities.

3.0 ALTERNATIVES CONSIDERED

Alternatives to the proposed action are covered in Environmental Assessment for Pond B Dam Repair Project at the Savannah River Site (DOE/EA-1285).