DOE/EA-1568

ENVIRONMENTAL ASSESSMENT FOR THE REPLACEMENT SOURCE OF STEAM FOR A AREA AT THE SAVANNAH RIVER SITE

OCTOBER 2006

U. S. DEPARTMENT OF ENERGY
SAVANNAH RIVER OPERATIONS OFFICE
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LIST OF ACRONYMS AND ABBREVIATIONS

AEGLs	Acute Exposure Guide Levels
BE	Biological Evaluation
BMP	Best Management Practices
CEQ	Counsel on Environmental Quality
CPRB	Coal Pile Runoff Basin
CO	carbon monoxide
CSWTF	Central Sanitary Wastewater Treatment Facility
DOE	Department of Energy
EPA	Environmental Protection Agency
ERPG	Emergency Response Planning Guidelines
ESCO	Energy Services Company
HVAC	Heating, Ventilation, and Air Conditioning
lb/hr	pounds per hour
MACT	Maximum Achievable Control Technology
MARs	Materials At Risk
msl	mean Sea Level
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
NOx	nitrogen oxides
Pb	lead
PEL/TWA	Permissible Exposure Limit/Time Weighted Average
PM	particulate matter
SCDHEC	South Carolina Department of Health and Environmental Control
SOx	sulfur dioxides
SRARP	Savannah River Archaeological Research Program
SREL	Savannah River Ecology Laboratory
SRNL	Savannah River National Laboratory
SRS	Savannah River Site
T&E	Threatened and Endangered
TEEL	Temporary Emergency Exposure Level
TP	total particulates
VOC	volatile organic carbon
WSRC	Washington 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 of the proposed construction and operation of a replacement steam plant in A Area at the Savannah River Site (SRS) (Figure 1-1). The potential environmental impacts of upgrading the existing steam plant, Building 784-A, and the "no action" alternative are also considered.

1.1 Background

The existing steam plant in A Area is comprised of two coal-fired boilers located in Building 784-A, producing 325 pounds per square inch gauge saturated steam at a minimum of 15,000 pounds per hour (lb/hr). The two 60,000 lb/hr capacity coal fired boilers were installed in 1953. Steam is used in A Area primarily for process loads, space heating, domestic hot water, and heating, ventilation, and air conditioning (HVAC) humidification needs. Multi-cone dust collectors are used as air pollution control devices to collect particulate matter. Savannah River National Laboratory (SRNL) and the Savannah River Ecology Laboratory (SREL) use steam primarily for HVAC and intermittently for process needs.

The existing steam plant was sized to supply a much higher volume of steam demand. Current and projected demands for steam are lower than historical levels as a result of facility deactivation and decommissioning that has taken place in A Area. Steam is vented during most months to maintain boiler operation as the current system is greatly oversized for current steam needs. The pollution control systems on the existing steam plant would not be adequate to meet new air emission limits which go into effect in 2007. Capital investment to upgrade the existing facility would be necessary to meet the new limits if a replacement steam plant is not built.

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 (CEQ) Regulations for Implementing NEPA (40 CFR Parts 1500-1508); and the DOE Regulations for implementing NEPA (10 CFR Part 1021, as amended). NEPA requires the assessment of potential consequences of Federal actions that may significantly impact or affect the quality of the human environment. Based on the potential for impacts described within this EA, DOE will either publish a finding of no significant impact or prepare an environmental impact statement.

1.2 Purpose and Need for Proposed Action

On September 13, 2007, new emission standards promulgated under 40 CFR Part 63, Subpart DDDDD "National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Industrial Boilers and Process Heaters", will go into effect for existing boilers. The A Area steam plant does not currently meet the new Maximum Achievable Control Technology (MACT) air permit restrictions. The purpose of the

proposed and alternative actions is to ensure that A-Area steam needs are satisfied in a timely, technically reliable, and cost-effective manner while compliance with the new air emissions standards is achieved and maintained.

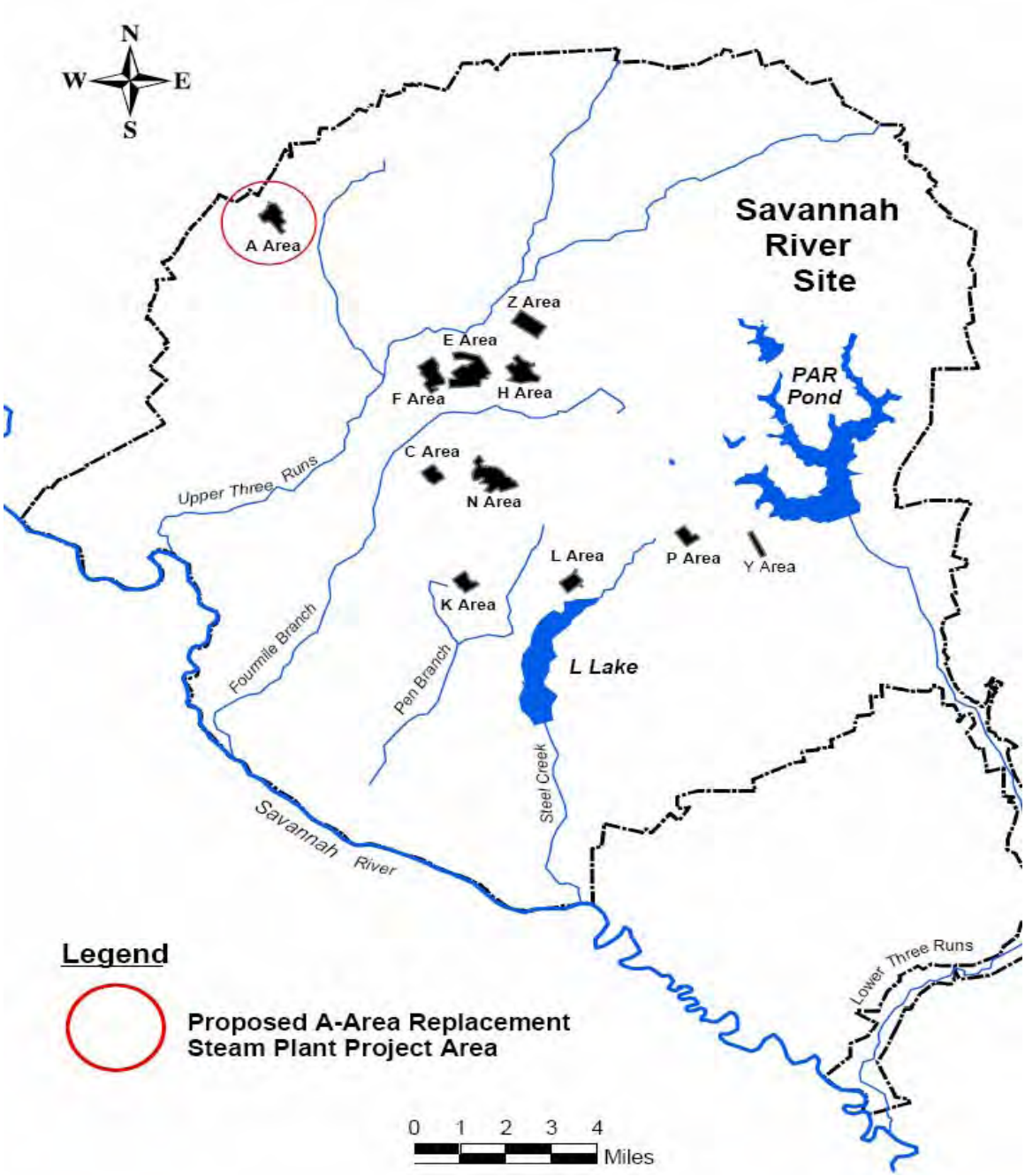

Figure 1-1. Location of Major Production, Support, and Research and Development Areas at the Savannah River Site.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The proposed action is to replace the existing over-capacity steam production system with a new system having controls capable of meeting the new emission standards and appropriately sized to meet current and projected A-Area steam demands. The existing steam plant would cease to operate once the replacement boilers are operational. Dismantlement and removal of Building 784-A would be a separate NEPA action and therefore is not considered in this EA.

DOE proposes to replace the existing coal-fired A-Area boilers with a smaller, less polluting, wood-fired boiler and a backup oil-fired boiler. If DOE decides to replace the existing steam plant, start of construction and completion of the proposed facility are planned for February 2007 and July 2008, respectively. Due to the length of time required for contracting, funding, design, permitting, construction, and startup the new facility would not be in operation by the September 13, 2007, effective date for the new emission standards, and DOE would have to shut down the existing facility. SRS requested, in accordance with South Carolina Department of Health and Environmental Control (SCDHEC) recommendation, a one-year extension to the compliance date for the new emission standard for the existing A-Area steam boilers, as allowed in 40 CFR 63.6 (i), to provide time for installation of the replacement system. SCDHEC has conditionally approved this one-year compliance date extension. The new steam facility would be compliant with the 40 CFR Part 63, Subpart DDDDD standards upon startup. The existing steam facility would be shut down upon startup of the new facility.

The scope of the new A-Area Steam Plant was developed by an Energy Services Company (ESCO) under the requirements of the Federal Energy Management Program, which is managed by DOE. Under this Program, ESCOs must guarantee and annually validate energy and maintenance cost savings that result from the more efficient operations of their projects compared to the costs for the facilities and equipment they replace. For this project the ESCO evaluated the use of natural gas, coal, and fuel oil as the primary fuel source for the new A-Area steam plant. These alternative fuel sources were not selected for the following reasons:

- Natural Gas – No satisfactory supply exists within 20 miles of the Site.
- Fuel Oil –Executive Order 13123, (Greening the Government Through Efficient Energy Management) recommends against the use of petroleum products for new energy sources and the price of fuel oil is highly volatile, making savings estimation highly problematic for large fuel oil expenditures.
- Coal – use of coal would require significant Clean Air Act controls and the equipment for Clean Coal technology is 50 percent of the cost of a new boiler, making it prohibitively expensive for such a small boiler.

The new steam production facility would be sized to meet A-Area steam loads and SRNL process needs. Steam production would meet an average demand of 15,000 lb/hr and a peak demand of approximately 35,000 lb/hr. The steam source would be capable of combusting both solid fuels and fuel oil. Biomass fuels (i.e., wood) would be used the majority of the time, with fuel oil serving as a backup energy source during maintenance outages or peak demands. The most economical fuel that is readily available and allowable by the SCDHEC regulations is woody biomass.

A large quantity of low value woody biomass (tree tops, small diameter trees, branches, limbs, etc.) is generated as a byproduct of forest management practices. During tree harvesting this material is generally left at the logging site before the logs are hauled for processing. The material left at the logging site will either decay or be consumed in a controlled burn prior to tree plantings. SRS would utilize a contract with a fuel supplier/vendor for the woody biomass. Harvesting this currently underutilized byproduct of timber production offers a tremendous opportunity for energy systems to use this resource. The primary source of wood fuel for the A-Area Powerhouse will be obtained from SRS and offsite timber and wood waste left over from logging operations. No additional harvesting is planned on SRS; however, the possibility of planting and utilizing short rotation woody crops may be evaluated as a sustainable source of fuel through establishing and monitoring of experimental and demonstration sites.

The facility would be equipped with pollution control and monitoring equipment required to meet current and anticipated environmental requirements. The design of the new facility would minimize operating and maintenance costs.

A steel framed industrial structure would be constructed on a concrete pad to house the steam generators and all piping necessary to interface with existing site utilities. The existing A-Area well water system would supply process water for the steam system. The steam supply would be connected to the existing steam system at the nearest convenient overhead location. Domestic water would be supplied from the existing domestic water system. Boiler blowdown would be routed to the existing sanitary sewer system. Generated ash would be disposed of in an appropriate approved solid waste management facility. The balance of the plant, which would include all associated fuel handling, storage equipment, and a three- to five-day biomass supply, would be contained inside a protective structure located on the site of the coal storage area adjacent to the existing A-Area steam plant.

The primary location being considered for the proposed facility is an area adjacent to the site of the existing steam generation plant. An alternative location for the proposed facility is an existing asphalt parking lot located near SRNL.

2.2 Alternative Action: Upgrade the Existing Steam Generation Plant

The pollution control systems on the existing steam plant (Building 784-A) are not adequate to meet new air emission limits which go into effect in 2007. An alternative action would be to upgrade the existing coal-fired boilers with new emission control technology and continuous opacity monitoring to meet new regulatory requirements.

Although these upgrades would provide for regulatory compliance, the cost of a new pollution control system for the existing boilers would be approximately $3 million and the upgraded plant would still be oversized and too large to efficiently and cost effectively provide steam to A Area.

2.3 'No Action' Alternative

The no action alternative consists of DOE continuing to operate the existing A-Area steam plant with no changes in air emissions control technology. If the 'no action' alternative is implemented, DOE would not be in compliance with the requirements of the new MACT air quality permit requirements.

3.0 AFFECTED ENVIRONMENT

SRS is a 310-square-mile Federal reservation located along the Savannah River in southwestern South Carolina (Figure 1-1). The site is approximately 25 miles southeast of Augusta, Georgia and 20 miles south of Aiken, South Carolina. The initial mission at SRS was the production of heavy water and strategic radioactive isotopes (e.g., plutonium-239 and tritium) in support of national defense. However, with the end of the Cold War, the site's primary mission has evolved into environmental cleanup and restoration. Following is a brief description of selected environmental components of the SRS-affected (existing) environment. Characterization of the affected environment is important because it provides a baseline for assessing the potential environmental impacts of the proposed and alternative actions considered in this EA.

3.1 Land Use

Forestland (mostly southern pine plantation) is the dominant land use at SRS (approximately 80 percent of land area), with the remainder consisting of aquatic habitats and developed areas (Halverson et al. 1997). The developed landscapes consist primarily of roadways, administrative, and industrialized areas that are continually exposed to high levels of human disturbance (Noah 1995). Both the primary and secondary sites being considered for the proposed new steam generation plant are located within a previously developed, industrial landscape (A Area) of SRS.

3.2 Meteorology and Climatology

The SRS region possesses a humid subtropical climate characterized by relatively short, mild winters and extended, hot summers. Summer-like weather conditions typically last from May through September, with July and August normally being the hottest months. January and February are typically the coldest months. Due to its proximity to the sea, the region can be significantly impacted by maritime weather conditions (e.g., hurricanes).

Precipitation in the region averages in excess of 47 inches per year (Kilgo and Blake 2005). Generally, the spring and autumn seasons tend to be drier than the winter and

summer seasons. Spring and summer thunderstorms can be intense. More detailed information regarding SRS meteorology and climatology can be found in Bauer et al. (1989). The general meteorological and climatological data reported for SRS would be representative of conditions present in the project area.

3.3 Geology and Soils

The physiography of SRS is comprised of two major components: The Aiken Plateau and the alluvial terraces of the Savannah River. The Aiken Plateau is a dissected sandy plain situated between the Savannah and Congaree Rivers in the Upper Atlantic Coastal Plain of South Carolina. Its sandy sediments dominate the SRS landscape and range in elevation from 250-400 feet above mean sea level (msl). The alluvial terraces of the Savannah River occur below 250 feet msl. The proposed A-Area steam plant project area lies north of the interface between these two physiographic components at an approximate elevation of 350 feet above msl.

Seven soil associations are represented within SRS (Rogers 1990). Generally, sandy soils occupy the uplands and ridges and are less fertile than the loamy-clayey soils of the stream terraces and floodplains. Dominant soils in previously developed or disturbed areas such as the proposed sites for the new steam plant are mapped as Udorthents (Uu; Urban land, 0 – 6 percent slope) (Rogers 1990).

3.4 Surface Hydrology

The Savannah River forms the western boundary of SRS and receives drainage from five major tributaries which originate on or drain through the site. These tributaries are Upper Three Runs, Fourmile Branch, Pen Branch, Steel Creek, and Lower Three Runs. There are also two major surface water impoundments (PAR Pond and L Lake) on SRS.

A small Carolina bay is located to the east of the existing steam plant location. This waterbody, which historically has received wash down water from the steam plant, is part of the Metallurgical Laboratory Hazardous Waste Management Facility. Surface waters in the Carolina bay drain to Tims Branch, a tributary to Upper Three Runs. Surface runoff from the existing coal pile storage area flows to the outfall A-10 Coal Pile Runoff Basin (CPRB). This retention basin does not overflow to State waters. Surface runoff from the alternative site located between Road A-1 and the 713-A Pad flows to an existing outfall which discharges to an unnamed tributary to Tims Branch.

3.5 Ecological Resources

Since 1951, when the U.S. Government acquired SRS, natural resource management practices and natural succession outside of the developed areas have resulted in increased ecological complexity and diversity on the site. As noted in Section 4.1, SRS terrestrial habitat is primarily comprised of forestland. However, over 20 percent of the SRS surface area is covered by water, including wetlands, bottomland hardwoods, cypress-tupelo swamp forests, two large cooling water reservoirs (PAR Pond and L Lake), creeks and

streams, and over 300 isolated upland Carolina bays and wetland depressions (Davis and Janecek 1997; Halverson et al. 1997).

SRS has seven Federally-listed species which are afforded protection under the Endangered Species Act of 1973 (Hyatt 1994). These include the bald eagle (*Haliaeetus leucocephalus*), wood stork (*Mycteria americana*), red-cockaded woodpecker (*Picoides borealis*), American alligator (*Alligator mississippiensis*), shortnose sturgeon (*Acipenser brevirostrum*), smooth purple coneflower (*Echinacea laevigata*), and pondberry (*Lindera melissifolia*). No Federally-listed threatened and endangered (T&E) species are known to occur on or near the proposed A-Area steam plant sites. Additional information regarding the ecological characteristics of SRS can be found in Halverson et al. (1997).

3.6 Cultural Resources

Through a cooperative agreement, DOE and the South Carolina Institute of Archaeology and Anthropology of the University of South Carolina conduct the Savannah River Archaeological Research Program (SRARP) to provide services required by Federal law for the protection and management of archaeological resources. To facilitate the management of these resources, SRS is divided into three archaeological zones based on an area's potential for containing sites of historical or archaeological significance (DOE 1995). Zone 1 represents areas with the greatest potential for having significant resources; Zone 2 possesses areas with moderate potential; and Zone 3 represents areas of low archaeological significance.

The proposed sites for the replacement steam Industrialized areas of SRS possess a low archaeological sensitivity because it is likely that any resources that may have been originally present were destroyed during construction of the A-Area industrial complex.

4.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTIONS AND ALTERNATIVES

Two potential sites within A Area have been identified for the proposed new steam generation plant. Both sites, which are encompassed within a previously developed industrial landscape, were selected to facilitate plant tie-in to existing site infrastructure (e.g., power, domestic water, steam lines, sanitary sewer).

The primary site is located within the area of the coal pile storage area of the existing steam plant. The benefits of this site are (a) its proximity to the 751-A Operations Center, (b) minimal site preparation required for construction, and (c) the existing tie-in to the A-10 CPRB for the collection/treatment of storm water runoff. Conversely, implementation of the proposed action on this site could (a) extend the future remediation of a portion of the coal pile storage area and downstream retention basin, (b) interfere with existing powerhouse operations during facility construction, (c) be more costly with respect to provision of utilities, and (d) potentially allow for minor contamination of the

wood supply with left over coal constituents, i.e. coal dust. The alternative or secondary site is located in a parking lot near SRNL. The benefits of choosing this site are (a) reduced steam losses to SRNL, (b) less costly to install utilities, (c) no impact on future remediation of the coal pile storage area and downstream retention basin, (d) no interference with existing steam plant operations during facility construction, and (e) fewer underground interferences. The cons of this location include (a) greater site preparation requirements (e.g., asphalt disposal), (b) potential aesthetic impacts (plant would be located adjacent to both SRNL and SREL), (c) loss of parking spaces, and (d) close proximity to parking areas used by privately-owned vehicles.

4.1 Construction-Related and Soil Disturbing Activities

The proposed and alternative actions (excluding the 'no action' alternative) would involve construction-related and soil disturbing activities (e.g., site preparation and facility construction, infrastructure tie-ins) within a previously developed area. These activities would be relatively short-lived, cause minimal disruption to other facility or area operations, and be conducted using appropriate best management practices (e.g., storm water and sediment erosion control measures). No known waste sites or contaminated soils would be disturbed. Regardless of the site chosen, the potential for these activities to significantly adversely impact the human environment would be negligible.

4.2 Water Quality Impacts

Liquid waste generated by the proposed replacement steam plant (e.g., boiler blowdown, wash waters) would be discharged to the sanitary sewer system for treatment in the Central Sanitary Wastewater Treatment Facility (CSWTF). The volume of waste water generated by the new plant would be less than that currently being generated by the existing facility. The impacts of constructing and operating the CSWTF have been assessed in a previous NEPA document (DOE 1993). The potential impacts of the receipt and treatment of effluent from the new steam plant by the CSWTF would be negligible and bounded by previous NEPA review.

Surface runoff from the primary site is routed to the A-10 CPRB which does not normally discharge to State surface waters. Emergency overflow from the basin would be to an unnamed tributary to Tims Branch (Upper Three Runs drainage). The existing retention basin has sufficient capacity to accommodate any additional storm water runoff resulting from implementation of the proposed action. Since there is no surface discharge from the basin, floodplain hydrology or wetlands within the downstream drainage would not be impacted. Storm water runoff from the alternative site presently discharges to an unnamed tributary of Tims Branch via Outfall A-05. Since this site is currently a paved parking lot, it is not expected that the placement of the proposed facility at this location would (a) significantly increase the volume of surface runoff generated during storm events or (b) adversely impact floodplain hydrology or wetlands within the receiving stream.

4.3 Air Quality Impacts

The National Ambient Air Quality Standards established by the EPA define the maximum allowable concentration of criteria air pollutants that may be present in the ambient air over a specific averaging time period. These standards were established to protect human health (primary standards) and welfare (secondary standards) with a regional margin of safety. Criteria pollutant standards establish maximum concentrations for ozone, nitrogen oxides (NOx), sulfur dioxides (SOx), carbon monoxide (CO), lead, and particulate matter with a diameter of 10 microns or less (PM_{10}). Ozone is formed by the photo-oxidation of reactive hydrocarbons in the presence of nitrogen oxide.

Air emissions resulting from construction-related activities would be generated by diesel-powered equipment (e.g., trucks, backhoes, bulldozers, equipment emissions, and fugitive dust) would be short-lived, minimal, and not require permitting. Since both the primary and secondary sites for the proposed action are already developed, there would be no land clearing or open burning of debris required.

Implementation of the proposed action would involve construction of a wood-fired boiler with a fuel oil fired backup boiler equipped with air emission control technology capable of meeting the new air permit requirements which go into effect in 2007. Preliminary calculated air emissions from operation of the wood-fired and oil-fired boilers are presented in Table 4-1. Current A Area emissions are presented in the "A Area" column in tons per year (tons/yr). Preliminary air emissions calculated for the wood- and oil-fired boilers are totaled in the "total" column. Differences from current air emissions are listed in the "Difference" column. Pollutants calculated to increase compared to current operations are CO (53.653 tons/year), and volatile organic carbon (VOC) (2.411 tons/yr). Many pollutants, such as SO_2 (-244.198 tons/yr), total particulates (-69.700 tons/yr), and PM_{10} (-32.063 tons/yr), were calculated to decrease after ceasing operation of the current boilers and starting operation of the new wood- and oil-fired boilers.

Table 4-1. Calculated air emissions from the wood- and low NOx oil-fired boilers.

Pollutant	A-Area	Wood	Oil	Total	Difference
	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
CO	43.205	94.608	2.250	96.858	53.653
NO_2	54.005	34.690	4.500	39.190	-14.815
PM_{10}	38.820	6.307	0.450	6.757	-32.063
TP	79.115	8.515	0.900	9.415	-69.700
SO_2	283.465	3.942	35.325	39.267	-244.198
VOC	0.360	2.681	0.090	2.771	2.411
Pb	0.320	0.008	0.001	0.008	-0.312
$PM_{2.5}$	26.825	5.519	0.113	5.631	-21.193

The equivalent consumption of coal per pound of steam exported would decrease due to the use of wood for fuel, the improved efficiency, and turndown of the new boilers. The decreased coal consumption in favor of wood as a fuel would result in less total ash and combustion by products. In addition, emissions of NOx, SOx, and toxic air pollutants would be reduced. The use of wood versus coal as a fuel source would significantly benefit regional air quality because of reduced emissions of carbon dioxide (a greenhouse gas) and particulate matter (specifically $PM_{2.5}$). This latter air pollutant constituent is a major causative factor in asthma. Additionally, the combustion of wood is much less polluting in terms of sulfur dioxide (SO_2) a known precursor to secondary $PM_{2.5}$ formation and acid rain.

SRS currently receives approximately 500 truck loads of coal per year to supply steam to the area. Due to the lower British thermal unit content and density of wood, it is expected that the amount of truck traffic associated with fuel delivery would be double that required for coal (i.e., 1000 deliveries per year versus the current 500). Each truck would carry approximately 20 tons of woody biomass per load. Vehicular traffic in the A Area has decreased as operations and facilities are being decommissioned and demolished. Any particulate air emissions from increased truck traffic would be offset by the reduced emissions from the combustion of woody biomass fuel.

Fuel handling and storage, for an approximate three- to five-day biomass supply, would be contained inside a protective structure at the plant site to minimize the emission of fugitive airborne particulates associated with fuel handling. Air emissions from the proposed replacement steam plant would be in compliance with applicable air quality regulations and would not significantly impact the human environment.

4.4 Waste Disposition

Implementation of the proposed action would generate some building material debris and associated rubble. These waste streams would be disposed of onsite in a permitted land fill. Waste ash generated by the combustion of the woody material would be deposited in an approved solid waste management facility. The current method of disposal for coal ash generated by the existing steam production facility is by trucking to an approved ash disposal basin. The impacts of constructing and operating the aforementioned waste disposal facilities have been assessed in a previous NEPA document (DOE 1995). The potential impacts associated with the disposition of waste streams generated by implementation of the proposed action would be negligible and bounded by previous NEPA review.

4.5 Human Health and Environmental Justice

The use of personal protective equipment/clothing and enforcement of Occupational Safety and Health Act compliant work conditions would minimize impacts to human health and safety. Any air impacts associated with the proposed action would be minimal, and not evidenced beyond the region of SRS. There would be no disproportionately high

and adverse human health or environmental effects on minority and low income populations in the SRS region of influence.

4.6 Socioeconomic Resources

Workforce requirements and costs associated with implementation of the proposed and alternative actions would be minimal when compared to the total SRS budget and employment (approximately $1.5 billion and 9,000 personnel, respectively). Construction personnel (approximately 50) would be offsite craftsman. Operational staff (approximately 11 individuals) would be derived from the existing SRS workforce. The cost (~$6.7 million) of upgrading the existing facility to ensure regulatory compliance with respect to the new air emission requirements would be cost prohibitive for the 50-year-old plant. However, the upgraded facility would still be too large to efficiently and cost effectively provide steam to the A Area. The socioeconomic impacts associated with implementation of the proposed action would be negligible.

4.7 Archaeological and Cultural Resources

The primary and secondary sites for the proposed action possess a low archaeological sensitivity because they have both been subjected to prior development and construction related activities. The potential for the proposed and alternative actions to significantly impact archaeological or cultural resources at SRS would be negligible.

4.8 Threatened and Endangered Species and Floodplain/Wetland Resources

Federally-listed T&E species do not occur within or near the proposed project area. No effect is expected on the smooth purple coneflower, pondberry, red-cockaded woodpecker, bald eagle, shortnose sturgeon, or wood stork population status within the selected project areas or on a site-wide level. Project implementation in the currently industrialized area would not significantly impact floodplain/wetland resources within the receiving drainage or be expected to have a measurable impact on any migratory avian species. Logging residues, when left to decay, can contribute nutrients to the site and habitat for various organisms. Removal of logging residues for use as biomass fuel would reduce this nutrient input and alter the habitat.

4.9 Transportation

Construction and operation of the proposed facility would not result in the rerouting of either pedestrian or vehicular traffic within or near the project area. Due to the lower British thermal unit content and density of wood, it is expected that the amount of truck traffic associated with fuel delivery would be double that required for coal (i.e., 1000 deliveries per year). Each truck will deliver approximately 20 tons of woody biomass per load. SRS currently receives approximately 500 truck loads of coal per year to supply steam to the area. This increase in vehicular truck traffic could easily be accommodated by the existing site infrastructure (e.g., roadways) and not significantly impact area operations or create local traffic congestion. No measurable impact on local

transportation-related resources or site operations would be expected from implementation of the proposed action.

4.10 Accident Analysis

The maximum reasonable foreseeable accident associated from the proposed action would be release of the chemicals that would be used to treat steam plant boiler makeup water. The release may be accidental or malicious. The bounding credible releases are considered to be 1) fire, which results in the boiling and airborne release of chemical tank contents, and 2) spill, which includes an immediate airborne release from splashing of tank contents and longer term airborne re-suspension of spilled chemicals. The chemicals of interest are Olin Sodium Hydroxide Solution, ChemTreat BL-1253 (sodium sulfite solution), and ChemTreat BL-1106. These Materials At Risk (MARs) would be stored in chemical tanks located within a single structure.

A worst case engineering calculation to evaluate the most bounding credible release of the chemicals was performed for two tanks (twice the volume) of chemicals instead of the one tank that is planned. Chemical concentrations are determined for receptors (individuals) at 328 feet and 2099 feet (assumed to be offsite for the A-Area steam plant). Where Acute Exposure Guide Levels (AEGL), Emergency Response Planning Guidelines (ERPG), or Temporary Emergency Exposure Level (TEEL) threshold quantities are not available, Permissible Exposure Limit/Time Weighted Average (PEL/TWA) values are used for risk level determinations. There are three levels of ERPGs:

- ERPG-1. The maximum concentration in air below which it is believed nearly all individuals could be exposed for up to one hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor.
- ERPG-2. The maximum concentration in air below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action; and
- ERPG-3. The maximum concentration in air below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing life-threatening health effects.

The threshold quantities of the MARs were compared to ERPG to qualitatively evaluate the risk. Release of the MAR chemicals was not evaluated as a composite, such as might be the case if the tank contents were to spill and become mixed. The concentrations are then compared to the individual threshold quantities provided in Revision 21, of AEGLs, ERPGs, and TEELS for Chemicals of Concern to determine whether the consequence risk to receptors would be such that safety related controls would be required to prevent or mitigate a release.

Release of the quantities of chemicals evaluated would result in concentrations well below the ERPG-3 limits for the onsite worker (100 meters) and ERPG-2 for the offsite public.

At these concentrations no safety related controls would be required to prevent or mitigate a release of the MARs.

4.11 Cumulative Impacts

The CEQ regulations define cumulative impacts as impacts on the environment that result when the incremental impact of an action is added to the impacts of other past, present, and reasonably foreseeable future action within a given spatial or temporal boundary. The incremental impacts associated with implementation of the proposed and alternative actions considered in this EA are so small that their potential contribution to a cumulative effect on an area- or region-wide basis would be negligible. The application of air pollution control technology and the use of wood fuel would minimize the potential for air emissions resulting from project implementation to interact with other SRS pollutant sources or have a cumulative impact on criteria air pollutants. The calculated increase in CO release, while double the amount currently produced, is still below Prevention of Significant Deterioration limits thresholds of 100 tons per year. The significant reduction of SO_2 and particulate matter greatly overshadows the increase in CO. Additionally, the disposition of waste streams generated by facility construction and operation would easily be accommodated by onsite wastewater treatment and landfill capacity. Harvesting and utilizing a renewable resource (woody biomass) would have less impact on the environment and is preferred to the burning of non-renewable resources (fossil fuels). The potential for the incremental impacts of the proposed action to contribute to a cumulative effect is further minimized by the constantly improving quality of the SRS environment resulting from ongoing cleanup and restoration efforts. A summary of the potential environmental consequences of the new steam generation facility is presented Table 4-2.

Table 4-2. Summary of the potential impacts from the construction and operation of the replacement steam generation facility.

Impact Subject	Environmental Consequences
Water Quality	Water use by the proposed facility construction and operation would be minimal and would tie into existing groundwater wells and distribution systems. Facility effluents and storm water run off would be treated in existing SRS facilities. Negligible impacts would be realized on ground and surface waters.
Air Quality	Air emissions from construction of the proposed facility would be minimal. Burning wood instead of coal in a new and more efficient plant would reduce toxic air pollutant emissions and benefit regional air quality.

Table 4-2 (cont.) Summary of the potential impacts from the construction and operation of the replacement steam generation facility.

Impact Subject	Environmental Consequences
Land	Impact to land resources would be minimal. The proposed action would be constructed within an existing developed area on a less than 3-acre site and would comprise less than 0.002 percent of undeveloped land on SRS. The proposed project would be compatible with other industrial land use in A Area.
Socioeconomic Resources	Direct and indirect socioeconomic impacts of the proposed action would be negligible
Waste Disposition	Impacts on SRS waste management operations as a result of the proposed action would be minimal. The proposed project would be compatible with existing SRS waste handling infrastructure.
Ecology and Cultural Resources	No impacts on sensitive ecological (e.g., threatened and endangered species, fish/wildlife habitat, and wetlands) or known archaeological /cultural resources would be realized.
Transportation	Truck trips for fuel delivery would double; however, impacts on onsite transportation resources from the new facility construction and operation would be minimal.
Accident Analysis	Release of the quantities of chemicals evaluated would result in concentrations well below the ERPG-3 limits for the onsite worker (328 feet) and ERPG-2 (2099 feet) for the offsite public. At these concentrations no safety related controls would be required to prevent or mitigate a release.
Cumulative Impacts	Incremental impacts of the actions considered in this EA are so small that their potential contribution to a cumulative effect on an area or region wide basis would be negligible.

5.0 REGULATORY AND PERMITTING REQUIREMENTS CONSIDERED

DOE policy is to conduct its operations in compliance with all applicable Federal, State and local laws and regulations, as well as DOE Orders. The following provides discussion of major regulatory permit programs that may be applicable to the proposed action.

5.1 National Environmental Policy Act of 1969 as amended

This EA has been prepared in compliance with the NEPA of 1969, as amended; the requirements of the CEQ Regulations for Implementing NEPA (40 CFR Parts 1500-1508); and DOE Regulations (10 CFR Part 1021), and DOE Order 451.1B. 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 analyze the potential environmental impacts for the replacement source of steam for A Area at SRS.

5.2 Air Quality Regulations

A SCDHEC Title V air emissions permit would be required and MACT regulations would be addressed. Air emission permits and controls would comply with 40 CFR 61-62 Air Pollution Control Regulations and Standards. Air emission permits and sources must comply with 40 CFR Part 63 NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters.

5.3 Solid Waste Regulations

Small amounts of nonradioactive, nonhazardous waste materials (e.g., building material debris, construction rubble and office waste) would be deposited in a permitted sanitary landfill, a construction and demolition landfill, or erosion control pit during construction and operation of the new replacement source of steam.

A permit would be required to land apply ash resulting from combustion of solid fuels. The preferred ash disposal method is at a permitted solid waste landfill. Construction activities shall comply with the National Pollutant Discharge Elimination System (NPDES) general permit requirements for storm water discharges from construction activities. Storm water discharges associated with normal facility operation would meet the requirements for storm water discharges from industrial activities. Bulk petroleum storage shall comply with the NPDES permit for Discharge to Surface Waters for discharges from bulk petroleum storage facilities. Bulk petroleum storage shall also comply with requirements of 40 CFR Part 60, Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984.

5.4 Domestic Water Regulations

The domestic water tie-in for the toilets, showers, and sinks would require a Public Water Works permit from the State of South Carolina (SCDHEC Regulation R61-58).

5.5 Liquid Discharge Regulations

Both a Sanitary Sewer Construction Permit (SCDHEC Regulation R61-67) and a Sanitary Sewer Operation NPDES permit (SCDHEC Regulation R61-68) would be needed from the State of South Carolina for construction and operation of the proposed facility's sanitary waste system.

6.0 AGENCIES AND PERSONS CONSULTED

The United States Department of Agriculture Forest Service-Savannah River, SRARP, and SREL were consulted during the preparation of this EA.

7.0 REFERENCES

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