Chapter 2: **Environmental Management System**

The Savannah River Site (SRS) Environmental Management System (EMS) implements the U.S. Department of Energy (DOE) commitment to sound environmental stewardship policy and practices. These safeguards protect air, water, land, and natural resources, as well as archaeological and cultural resources that SRS potentially affects.

The EMS plans and evaluates SRS construction, operations, maintenance, and decommissioning projects to protect public health and the environment, prevent pollution, and comply with applicable environmental and cultural resource protection requirements. The way SRS conducts its actions demonstrates the Site's commitment to minimize waste, manage water, foster renewable energy, reduce greenhouse gases, acquire sustainable services, remediate with a focus on sustainability, and observe best management practices. All these attributes are vital components of environmental management. The "SRS Site Sustainability Plan" (SSP) contains more information on DOE and SRS goals and the progress the Site has made toward achieving these goals.

2022 Highlights

DOE sets objectives for carrying out its mission in an environmentally sustainable manner that supports a policy of national energy security and addresses global environmental challenges. SRS continues to make substantial progress in meeting the goals for the Site. Below are the highlights of the EMS program:

Pollution Prevention and Waste Minimization

SRS recycled 84.3% (812 metric tons) of nonhazardous solid waste.

Greenhouse Gas (GHG) Reduction

SRS continued to reduce emissions, exceeding federal goals. The Site has reduced Scope 1 and 2 GHG emissions by 79.4% and Scope 3 GHG emissions by 90.8% since 2008.

Transportation and Fleet Management

SRS continued to exceed its fleet management goals. Approximately 86% of the current light-duty fleet are plug-in hybrids or vehicles that use E-85 (85% ethanol, 15% unleaded gasoline) fuel.

2022 Highlights (continued)

Awards

- SRS won the 2022 DOE Sustainability Award in the "Innovative Approach to Sustainability" category for the SRS Phytoremediation Project.
- The Accelerated Basin De-Inventory, SRS Lower Three Runs Final Remedial Decision, and SRS Phytoremediation Project Teams received the Secretary of Energy Achievement Award.
- SRS received the Global Electronics Council Electronic Product Environmental Assessment Tool (EPEAT) Purchasers Award in three categories: computers and displays, mobile phones, and servers.
- SRS was also recognized for participating in the Sustainable Climate-Ready Sites (SCRS) pilot project.

2.1 SRS ENVIRONMENTAL MANAGEMENT SYSTEM

DOE Order 436.1, *Departmental Sustainability*, requires federal facilities to use EMS as a platform to implement their SSP. Sites must also maintain their EMS as being certified to or conforming to the International Organization for Standardization's (ISO) 14001. The DOE Site Manager has determined the Savannah River Nuclear Solutions, LLC (SRNS) EMS (which covers Battelle Savannah River Alliance, LLC [BSRA] and Savannah River Mission Completion, LLC [SRMC]) conforms to ISO 14001. An accredited independent certification body has certified Centerra-SRS (the Site's protective force services contractor) to ISO 14001:2015. SRS implements an EMS that uses the ISO 14001:2015 standard to fulfill compliance obligations and address risks and opportunities. By design, the "Plan-Do-Check-Act" approach of the ISO 14001:2015 standard continually improves environmental performance.

The SRS EMS is a systematic approach or process to manage environmental impacts, compliance obligations, and environmental performance. Environmental compliance obligations and monitoring programs set forth by federal, state and local requirements, agreements, and permits address Site environmental impacts. Additionally,

Chapter 2—Key Terms

Environmental impacts *are any positive or negative changes to the environment caused by an organization's activities, products, or services.*

Environmental objectives *define the organization's environmental goals.*

Environmental sustainability *is interacting responsibly with the environment to conserve natural resources and promote long-term environmental quality. It includes reducing the amount of waste produced, using less energy, and developing processes that maintain the long-term quality of the environment.*

environmental objectives SRS sets forth to encompass both compliance and environmental sustainability goals address environmental impacts. These sustainability goals promote and integrate initiatives such as energy and natural resource conservation, waste minimization, green remediation, and using sustainable products and services.

2.1.1 SRS Environmental Policy

The goal of the SRS Environmental Policy is to protect the public and future generations from any impacts from Site operations. SRS commits to this by doing the following:

- Promoting sound environmental stewardship
- Preventing pollution onsite and in surrounding communities
- Conducting science and energy research
- Continuing the national security mission

SRS accomplishes this through

- Complying with environmental laws and regulations
- Continuing process improvements
- Conducting safe operations
- Communicating with the workforce, public, and stakeholders

2.1.2 Integration with Integrated Safety Management System

SRS incorporates the Integrated Safety Management System (ISMS) with EMS to provide a comprehensive framework under which it manages the environmental, safety, and health programs. This makes it possible for the Site to accomplish all work while protecting the public, workers, and the environment. The integration confirms that SRS can evaluate work and associated hazards, and that the Site adapts standards, practices, and controls in a DOE-approved safety management system. Figure 2-1 depicts the relationship between ISMS and EMS and how both management systems integrate.

ISMS execution involves five functions: 1) defining scope of work, 2) analyzing hazards, 3) developing and implementing controls, 4) performing work, and 5) providing

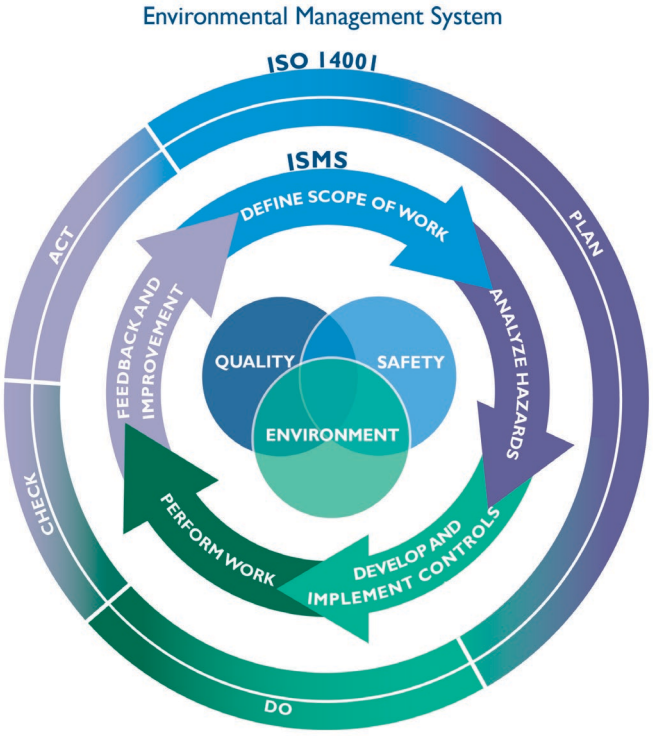

Figure 2-1 Integrated Safety Management System Continual Improvement Framework within the ISO 14001 Environmental Management System

feedback and improvement. Likewise, SRS accomplishes the EMS goals using the **Plan-Do-Check-Act** approach, where

- **Plan**—defines work scope and objectives, identifies environmental aspects and analyzes hazards, and develops controls
- **Do**—implements these controls and performs the work (operations)
- **Check**—evaluates performance (feedback) and management reviews
- **Act**—embodies corrective actions, improvements, and incorporating lessons learned into practices

2.2 EMS IMPLEMENTATION

The Plan-Do-Check-Act approach is interactive and iterative through the various work activities and functions, including policies, programs, and processes. It also is an integral part of the Site's overall management of environmental compliance and performance.

2.2.1 Plan

The Site establishes environmental goals, objectives, and targets for each project and activity. Before SRS undertakes any actions or projects, it evaluates associated environmental aspects and their impacts (or potential environmental hazards) to ensure that SRS can control or mitigate the hazard or risk to reduce or eliminate impacts to the environment. The Site performs these evaluations against all applicable federal and state regulations, state permits, and local laws. These regulations and permits are the foundation for internal manuals, standard operating procedures, and standard requirement-implementing documents. Additionally, before DOE-Savannah River (DOE-SR) or the National Nuclear Safety Administration-Savannah River Field Office (NNSA-SRFO) take any actions, the Site develops a National Environmental Pollution Act (NEPA) checklist to identify potential environmental impacts and regulatory requirements (for example, federal and state permits) associated with proposed actions. This ensures proposed activities and projects consider the potential environmental aspects and provide mitigative solutions as necessary.

Another aspect of planning involves sitewide training for personnel, as well as training to perform specific tasks and activities within a project's scope. SRS trains all employees on various policies and job-related requirements. The Site requires General Employee Training or Consolidated Annual Training at a minimum, annually, for every employee so they will be aware of the potential hazards and risks associated with work onsite. Task- and project-specific training includes skills development and safe-work practices.

Incorporating training and evaluating environmental aspects and their impacts into work planning ensures SRS will perform activities in a manner that protects the public, workers, and the environment. Additionally, the Site generates regular and routine employee written and multimedia communications as a reminder of the SRS commitment to sustainability and the environment.

2.2.2 Do

Environmental Compliance Authorities (ECAs) and Environmental Subject Matter Experts (SMEs) support the facilities and programs in identifying and carrying out their environmental responsibilities. The SMEs communicate environmental regulatory requirements and required document submittals to the United States Environmental Protection Agency (EPA), the South Carolina Department of Health and Environmental Control (SCDHEC), and other stakeholders. The ECAs work with the facilities to ensure that they implement the regulatory requirements.

DOE requires SRS to develop its annual *SRS Environmental Report* to inform the public of Site compliance with applicable environmental requirements and of the risk assessment of DOE operations. Chapter 3, *Compliance Summary,* of this report describes SRS's environmental compliance, provides the number of NEPA reviews, the number of SRS construction and operating permits, and the status of key federal environmental laws. Chapter 7, *Groundwater Management Program,* identifies SRS efforts to monitor, conserve and protect groundwater, and to restore contaminated SRS groundwater to EPA drinking-water quality standards while conforming to state and federal laws.

The Site plans and conducts emergency drills and exercises by implementing the EMS and ISMS principles and tools. Some of these drills include local, state, and federal emergency response organizations. Throughout the year, the Site performs safety drills for employees to ensure maximum participation through various weather, nuclear incident, environmental release, and fire scenarios.

2.2.3 Check

2.2.3.1 Internal Checks

SRS assesses and evaluates Site work to make certain that personnel are performing it as planned, and that Site operations are not adversely impacting worker and public health and the environment. The environmental monitoring and environmental surveillance programs at SRS follow applicable requirements to collect and analyze samples across SRS and within a 25-mile radius extending from the center of the Site. Both the environmental monitoring and surveillance programs ensure that potential exposure to the public and environment is minimal and as low as reasonably achievable (ALARA). Chapter 3, *Compliance Summary*; Chapter 4, *Nonradiological Environmental Monitoring Program*; Chapter 5, *Radiological Environmental Monitoring Program*; Chapter 6, *Radiological Dose Assessment*; and Chapter 7, *Groundwater Management Program* describe the SRS environmental monitoring and surveillance programs.

The Site also performs management field observations and program assessments to detect potential issues early to prevent performance shortfalls and to identify processes, practices, behaviors, roles, responsibilities, and organizational expectations that SRS needs to improve. Chapter 8, *Quality Assurance,* documents how SRS ensures the accuracy of its environmental data.

2.2.3.2 External Checks

SRS uses external assessments to evaluate Site work to make certain that personnel are performing it as planned, and that Site operations are not adversely impacting worker and public health and the environment. Regulators from various state and government organizations perform external assessments of Site operations. SCDHEC conducts several inspections and audits annually to verify that the Site is complying with state permits. The EPA and SCDHEC participate in Federal Facility Act (FFA)-driven inspections. The EPA may participate alongside SCDHEC in compliance evaluation inspections for waste management. Chapter 3, *Compliance Summary,* lists and gives results of the annual external agency audits and inspections of the SRS Environmental Program.

In 1995, SCDHEC enrolled in an Agreement in Principle (AIP) program with the DOE at SRS. As a result, SCDHEC created the Environmental Surveillance Oversight Program (ESOP). Through the AIP grant, ESOP evaluates the adequacy of DOE activities related to environmental monitoring and reporting and confirms that DOE's activities have not adversely impacted public health and safety and the environment.

DOE Order 436.1 requires SRNS EMS to conform to ISO 14001:2015. Every three years, a qualified independent certification auditor performs a conformity assessment. Since the last audit was in 2021, the next formal SRNS EMS compliance audit will be in 2024. As Centerra-SRS is certified to ISO 14001:2015, an accredited independent certification body conducts yearly certification assessments.

2.2.4 Act

SRS enhances environmental performance and the health of the EMS through corrective actions and continual improvement. The Site establishes, implements, and maintains the corrective actions program in accordance with an internal manual for contractor assurance. It deals with actual or potential conditions of nonconformity, such as Notices of Violation or findings and opportunities for improvement from internal assessments and audits. Chapter 8, *Quality Assurance,* summarizes annual improvements to the Site's Environmental Monitoring Program and laboratory performance in various proficiency and certification programs.

Communication is vital throughout all programs and activities to facilitate feedback and to incorporate lessons learned for improvement. This report and the accompanying *SRS Environmental Report Summary* also serve as communication tools for stakeholders (such as the public, academia, SRS Citizen's Advisory Board, regulators, and other DOE sites).

2.3 SUSTAINABILITY AND STEWARDSHIP GOALS AND IMPLEMENTATION

DOE Order 436.1, *Departmental Sustainability*, defines DOE Sites' requirements and responsibilities to manage operations and activities necessary for sustainability and ensure that they are carrying out the DOE mission in a manner that addresses energy efficiency goals, GHG reductions, waste minimization, and pollution prevention. SRS has integrated environmental stewardship into many remediation and closure projects, addressing requirements for resource conservation, pollution reduction, and

environmental surveillance. The current DOE sustainability goals align with and are on target with reaching those set forth in the following executive orders:

- Executive Order No. 14008, *Tackling the Climate Crisis at Home and Abroad,* signed in February 2021, places the climate crisis at the forefront of the nation's foreign policy and national security planning, based on statutory requirements. It requires agencies to
  - Use the power of federal procurement and management of real property to support robust climate action and lead by example
  - Submit a Climate Action Plan that identifies agency climate vulnerabilities, steps to bolster adaptation, and increases climate resilience of facilities
  - Adhere to the requirements of the Made in America Laws in making clean energy, energy efficiency, and clean energy procurement decisions
- Executive Order No. 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*, signed in December 2021, which set new Federal-level sustainability goals—based on statutory requirements—and require agencies to
  - Reach 100% carbon pollution-free electricity by 2030, including 50% on a 24-hours-a-day, 7 days-a-week basis
  - Reach 100% zero-emission vehicle acquisition by 2035, including 100% light-duty acquisitions by 2027
  - Achieve net-zero building emissions by 2045, including a 50% reduction by 2032
  - Reduce Scope 1 and 2 GHG emissions by 65% from 2008 levels by 2030
  - Establish targets to reduce energy and potable water use intensity by 2030
  - Reduce procurement emissions to net-zero by 2050
  - Have climate resilient infrastructure and operations
  - Develop a climate- and sustainability-focused workforce
  - Advance environmental justice (EJ) and equity-focused operations
  - Accelerate progress through domestic and international partnerships

SRS uses the SSP to document the sustainability goals SRS plans to achieve and to provide a strategic roadmap for accomplishing those essential activities. As Figure 2-2 illustrates, this includes a summary of actions implemented to meet sustainability goals, progress, results, cost savings, and strategies for continued progress and performance improvements. The goals, which DOE sets annually for all sites, include the following:

- Reducing total energy use
- Increasing renewable energy use
- Reducing water use

- Purchasing environment-friendly, or "green," products and services
- Generating less solid waste
- Increasing the number of sustainable buildings
- Reducing fleet and petroleum use
- Using energy-compliant electronic devices

ISO 14001:2015 requires SRS to establish and document measurable environmental objectives consistent with SRS's Environmental Policy and SRS's strategic direction. Appendix A presents the EMS goals and objectives for fiscal year (FY) 2022. This chart names sustainability goals as well as environmental compliance goals for 2022, identifies the related environmental objectives and strategies for implementation, and provides the status of SRS's progress toward achieving them. This chapter contains additional information on how SRS is making progress in supporting DOE objectives.

Figure 2-2 SRS Environmental Management System and Sustainability Goals

Updated annually, the SRS SSP outlines the strategies in place and identifies the Site's contributions to meeting DOE's sustainability targets outlined in the Sustainability Report and Implementation Plan. DOE maintains an online DOE Sustainability Dashboard that tracks the progress of facilities in the complex in meeting their sustainability goals. The dashboard is the source of the goal performance information in Table 2-1. This table summarizes specific metrics and SRS's FY 2022 performance against the sustainability goals to complement the more general discussion in the text that follows.

Table 2-1 FY 2022 Sustainability Goals, Metrics, and SRS Performance

Energy Management	
Goal: 25% energy intensity reduction by FY 2025 from FY 2015 baseline	**Goal Met**: 27.3% energy intensity reduction from various Energy Conservation Measures (ECMs)
Interim Target (FY 2022): 17.5% reduction from FY 2015 baseline	**Interim Target Met**
Renewable Electricity	
Goal: 30% renewable energy as a percentage of total agency electric use by FY 2025	**Goal On Track**: 28% of the electric energy in FY 2022 is from renewable resources (biomass plants)
Interim Target (FY 2022): 25%	**Interim Target Met**
Water Management	
Goal: 36% reduction in potable water intensity by FY 2025 from FY 2007 baseline	**Goal Not Met**
Interim Target (FY 2022): 30% reduction from FY 2007 baseline	**Interim Target Not Met**: 28% potable water intensity reduction
Goal: 36% reduction in non-potable water intensity by FY 2025 from FY 2010 baseline	**Goal Met**: 89% non-potable water intensity reduction
Interim Target (FY 2022): 24% reduction from FY 2010 baseline	**Interim Target Met**
Performance Contracting	
Goal: Implement life-cycle, cost-effective efficiency and conservation measures with appropriated funds and performance contracting, or both	**Goal Met**: SRS has one active energy saving performance contract (ESPC), which is with Ameresco to operate the Biomass Cogeneration Facility (BCF), K-Area, and L-Area biomass plants.
Sustainable Buildings	
Goal: 17% of owned existing buildings comply with Guiding Principles for Sustainable Buildings by FY 2025.	**Goal at Risk**
Interim Target (FY 2022): 16.3%	**Interim Target Not Met**: 0% of SRS's buildings qualify as sustainable. This is due to a recent update to the Guiding Principles guidance, which increased the square footage requirements to be greater than 25,000 square feet.
Waste Management	
Goal for Municipal Solid Waste: Divert at least 50% of nonhazardous solid waste (excluding construction and demolition [C&D] debris)	**Goal Met**: SRS diverted 84.3% of municipal solid waste from the waste stream through recycling.
Interim Target (FY 2022): 50%	**Interim Target Met**

Table 2-1 FY 2022 Sustainability Goals, Metrics, and SRS Performance (continued)

Waste Management (continued)	
Goal for C&D Waste: Divert at least 50% of C&D material and debris	**Goal Not Met**: SRS diverted 14.5% of waste from the onsite C&D landfill by recycling items such as concrete and asphalt, and office furniture identified in Table 2-2.
Interim Target (FY 2022): 50%	**Interim Target Not Met**
Fleet Management	
Goal for Petroleum Reduction: 20% reduction in petroleum use by FY 2015 and thereafter relative to FY 2005 baseline	**Goal Exceeded**: 72.5% reduction in petroleum consumption relative to the FY 2005 baseline
Interim Target (FY 2022): 20% reduction from FY 2005 baseline	**Interim Target Met**
Goal for Alternative Fuel Use: 10% increase in alternative fuel use by FY 2015 and thereafter relative to FY 2005 baseline	**Goal Met**: 38.2% alternative fuel usage increased, relative to the FY 2005 baseline.
Interim Target (FY 2022): 10%	**Interim Target Met**
Acquisition and Procurement	
Goal: 95% of new contract actions for products and services meet sustainable acquisition requirements.	**Goal Met**: SRS reviewed 100% of purchase-order line descriptions of eligible contract actions to determine whether the products met the BioPreferred® definition.
Interim Target (FY 2022): 95%	**Interim Target Met**
Electronics Stewardship	
Goal for Environmentally Sustainable Electronics Acquisition: 100% of eligible electronics procurements must be environmentally sustainable (for example, Electronic Product Environmental Assessment Tool [EPEAT]).	**Goal at Risk**
Interim Target (FY 2022): 95%	**Interim Target Not Met**: 92.2% of eligible electronics procured are environmentally sustainable, meeting EPEAT standards. However, 100% of eligible electronics were ENERGY STAR® qualified.
Goal for Disposal of Electronics: 100% of electronics disposed through government programs and certified recyclers	**Goal Met**: SRS recycled 100% of used electronics using authorized recycling companies.
Interim Target (FY 2022): 100%	**Interim Target Met**
Goal for Power Management: 100% of eligible computers (desktops and laptops) and monitors implement and actively use power management features.	**Goal Met**: 100% of eligible desktops, laptops, and monitors have power management enabled.
Interim Target (FY 2022): 100%	**Interim Target Met**

Table 2-1 FY 2022 Sustainability Goals, Metrics, and SRS Performance (continued)

Electronics Stewardship (continued)	
Goal for Duplex Printing: 100% of eligible printers implement and actively use duplex printing features. **Interim Target (FY 2022)**: 100%	**Goal Met**: 100% of eligible printers have duplex enabled. **Interim Target Met**
Data Center Efficiency	
Goal: Implement practices that promote energy efficient management of servers and federal data centers	**Goal on Track**: SRS utilizes power usage effectiveness (PUE) for data centers that have meters to obtain a baseline of energy-use effectiveness.
Resiliency	
Goal: Enhance the resilience of the federal infrastructure and operations and enable more effective accomplishment of its mission	**Goal Met**: SRS utilized a Vulnerability Assessment and Climate Change Resilience Plan and Active Risk Manager tool to address resilience of SRS infrastructure and operations for the future.
Greenhouse Gas (GHG) Management	
Goal for Direct (Scope 1 and 2) GHG Emissions: 50% reduction in direct GHG emissions by FY 2025 from FY 2008 baseline **Interim Target (FY 2022)**: 40% reduction in direct GHG emissions from FY 2008 baseline	**Goal Met**: 79.4% reduction in direct GHG emissions relative to FY 2008 baseline. **Interim Target Met**
Goal for Indirect (Scope 3) GHG Emissions: 25% reduction in indirect GHG emissions by FY 2025 from FY 2008 baseline **Interim Target (FY 2022)**: 19% reduction in indirect GHG emissions from FY 2008 baseline	**Goal Exceeded**: 90.8% reduction in indirect GHG emissions relative to FY 2008 baseline **Interim Target Met**

2.3.1 Energy Management

The DOE Sustainability Performance Division's Sustainability Dashboard tracks energy intensity metrics. SRS has a goal of reducing the amount of energy per square foot (energy intensity) used in an identified class of buildings annually. By the end of FY 2022, SRS reduced energy intensity by 27.3% relative to the FY 2015 baseline, thereby meeting the FY 2025 goal of 25%. SRS has implemented a wide variety of energy-efficient strategies:

- Upgrading utility and heating, ventilation, and air conditioning (HVAC) systems
- Improving chiller plant efficiencies
- Using the Biomass Cogeneration Facility (BCF) and biomass facilities in A Area, K Area, and L Area
- Upgrading through right sizing the pumps
- Upgrading to light-emitting diodes (LED) lighting

- Using more energy-efficient equipment in facilities (lighting timers, lighting sensors, and programmable thermostats).

SRS has deactivated and decommissioned outdated facilities and buildings that are energy inefficient. Additional reductions might have been due to a percentage of the workforce teleworking, which was likely a factor in achieving and surpassing the FY 2025 goal.

SRS conducted energy audits of buildings under Section 432 of the Energy Independence and Security Act of 2007 (EISA). Under this program, SRS has identified 63 Site buildings that are responsible for 76.3% of the Site's energy consumption. The Site completed the third cycle of audits in FY 2022. SRS has completed 75% of the audits to date. Focusing on these buildings allows EISA audits, which identify energy conservation measures (ECMs), to be most effective. Of the 16 buildings audited, 18 ECMs were identified primarily for LED lighting upgrades.

During FY 2022, SRS updated its contract to reflect that all roof replacements and retrofitting will use cool-roof technology. Additionally, SRS has 38 buildings equipped with individual electrical meters. The metering program in place includes 237 electrical meters and 16 steam meters, providing energy use data to determine each building's energy consumption.

2.3.2 Renewable Energy

The Sustainability Dashboard tracks renewable energy and consumption metrics. SRS has the goal to increase renewable energy as a percentage of total agency electric consumption. By the end of FY 2022, SRS used 28% renewable energy, thereby meeting the FY 2022 interim target of 25%. The Site has achieved the interim target by generating power onsite from the BCF, A-Area, K-Area, and L-Area biomass plants. SRS no longer uses coal to generate energy from on-site producers. Using renewable energy at the Site is a high-level priority. The BCF, which uses wood chips as its primary fuel source and fuel oil and tires as a secondary fuel source, plays a significant role in supporting renewable goals.

2.3.3 Water Management

The Sustainability Dashboard tracks potable and non-potable water consumption metrics. It is SRS's goal to reduce potable and non-potable water use.

By the end of FY 2022, SRS decreased potable water use by 28%, thereby not meeting the FY 2022 interim target of a 30% reduction relative to the FY 2007 baseline. The Site has been significantly decreasing its potable water use over many years. By installing a primary domestic water system and continuing to replace old and leaky piping, the Site has saved several hundred million gallons of water annually. SRS also has installed water meters on the main supply lines and periodically conducts a water balance to monitor use and help detect leaks. SRS has been using WaterSense products, a U.S. EPA-sponsored program for water-efficient products, and other water-conserving products, including low-flow toilet flush valves, low-flow urinal flush valves, and low-flow faucets. In recent years, the Site has substituted several hundred less-efficient faucets and flush valves with more-

efficient low-flow units as they needed replacing. However, retrofitting with low-flow flush valves and faucets is not cost-effective outside of repairs. This will pose a further challenge to reaching the FY 2025 goal, due to budget limitations for upgrading to new major water-efficient equipment. Additionally, SRS's gross square footage increased from 7.450 million square feet in FY 2007 to 9.004 million square feet in FY 2022. Since potable water intensity is a function of water usage over gross square footage, the increase in gross square footage offsets the decrease in potable water use. This additional square footage and the transition away from maximum use of telework (an anticipated increase in potable water demand by returning personnel) may make the FY 2025 goal of a 36% reduction against the baseline more challenging. The amount of water used is also dependent on facilities such as H Canyon, Tank Farms, Savannah River National Laboratory (SRNL), and Salt Waste Processing Facility, which have processes that require potable water. The water management sustainability goal also does not account for potable water conservation measures, such as the primary domestic water system, installed prior to 2007. It will be more difficult for SRS to decrease potable water usage in the future because it has already achieved large decreases in the programs that have the biggest impact. Potable water use can also fluctuate from year-to-year based on various factors, such as the number of employees and the amount of potable water used for non-potable purposes.

By the end of FY 2022, SRS decreased non-potable water use by 89% relative to the FY 2010 baseline, thereby meeting the FY 2025 goal of a 36% reduction. The Site has reduced non-potable water consumption, mostly industrial, landscaping, and agricultural (ILA) water. SRS reduced ILA water consumption to 512.9 million gallons, which is a 78.1% reduction, against the baseline FY 2010 consumption of 2.34 billion gallons. The utilization of the biomass facility, which uses significantly less water than the previously utilized coal-fired power plants, dramatically improved ILA water consumption.

2.3.4 Performance Contracting

The SSP describes how performance contracting is utilized to achieve energy, water, building modernization, and infrastructure goals.

SRS has used Energy Saving Performance Contracting (ESPC) to engage Ameresco Federal Solutions in several projects that conserve energy and water. ESPC funds energy- and water-saving building improvements with future energy savings. Ameresco Federal Solutions operates the BCF at SRS. This facility produces steam and electricity on a 24-hour, full-time basis. Ameresco also operates steam-only biomass plants for heating buildings in K Area and L Area at SRS.

2.3.5 Sustainable Buildings

The Sustainability Dashboard tracks sustainable buildings metrics. SRS has the goal for new construction and major renovations to conform to applicable building energy-efficiency requirements and sustainable design principles, consider building efficiency when renewing or entering leases, and implement space utilization and optimization practices. By the end of FY 2022, SRS had 0% of its building count complying with the Guiding Principles for sustainable buildings, thereby not meeting the FY 2022 interim target of

16.3%. The Guiding Principles address the following six sustainable principles for new construction and modernization, as well as existing buildings:

- Employ integrated design principles
- Optimize energy performance
- Protect and conserve water
- Enhance the indoor environmental quality
- Reduce the environmental impact of materials
- Assess and consider building resilience

The updated Guiding Principles includes a new requirement that the square footage must be greater than 25,000 square feet for a project to be considered a sustainable building. Therefore, the two buildings SRS historically claimed no longer count toward the goal due to the square footage being less than 25,000 square feet. However, SRS has identified several buildings that can meet the Guiding Principles with minor renovations within the next five years. The Site is also planning to review proposed building projects for future possible inclusion.

Most buildings at SRS are aging and are not cost-effective to upgrade. This is based on the type of construction (process facilities) and budget constraints required to modify existing facilities. However, the SRS emphasis on maintenance, repairs, and energy conservation measures identified in EISA audits (LED lighting upgrades and more efficient HVAC systems) supports the goals detailed in the directive.

2.3.6 Waste Management

The Sustainability Dashboard tracks municipal solid waste (nonhazardous solid waste [excluding construction and demolition (C&D) debris]) and C&D materials and debris metrics. SRS has the goal to implement waste prevention and recycling measures.

Pollution prevention is a commitment in the SRS Environmental Policy as required under the ISO 14001:2015 standard. Environmentally safe and cost-effective reuse or recycling diverts pollutants and wastes from the waste stream. Pollution prevention at SRS reduces wastes, mitigates health risks, and protects the environment.

By the end of FY 2022, SRS diverted 84.3% of municipal solid waste, thereby surpassing the annual goal of 50% diversion. SRS diverted 812 metric tons of municipal solid waste out of 964 metric tons. The Site recycled 141 metric tons of routine waste (typically office and municipal-type waste) through the North Augusta Material Recovery Facility (NA-MRF). SRS works with the NA-MRF to enhance the process to attain and improve upon a 50% recovery rate. SRS continues to monitor this waste stream for opportunities to recycle materials. In addition, SRS shredded and recycled 671 metric tons of sensitive office paper through its contract with Augusta Data Storage. Increased shredding has had a large impact on the diversion rate. The quantity of sensitive paper shredding is variable from year to year. Since the

height of the COVID-19 pandemic, shredding rates and office waste have fluctuated depending on the amount of remote work and telework and onsite personnel. The paper-shredding rate may also vary depending on the sensitivity of missions. There may be challenges maintaining this goal in the future.

By the end of FY 2022, SRS diverted 3.8% of C&D materials and debris, thereby not meeting the 50% diversion goal. C&D debris includes waste generated from constructing, remodeling, repairing and deconstructing buildings, roads, bridges, and drainage and sewage systems. This debris is often concrete, asphalt, glass, metal, plastic, and land-clearing scrap. In FY 2022, the Site diverted 6,293.4 metric tons of the 38,517.5 metric tons of C&D waste generated. The minimal amount of C&D waste diverted was primarily due to the limited concrete and asphalt recovery or reuse from 2020 to 2022. Future road projects and construction projects may present opportunities for diverting C&D waste. However, the low cost of onsite C&D landfill services and limited cost-effective reuse options for scrap debris significantly challenge cost-effective recycling options beyond what is already executed.

SRS has improved the diversion rate of waste streams from landfills by initiatives such as recycling nonradioactive scrap metal and scrap furniture. Universal waste is another source that includes batteries, mercury-containing equipment, and light bulbs. Universal waste must be recycled when generated by businesses; otherwise, the waste must be sent to a Resource Conservation and Recovery Act-permitted facility. Table 2-2 breaks down the recycled waste amounts for FY 2022.

Table 2-2 SRS Recycling and Sustainability in 2022 by Amount

Items Recycled in FY 2022	Amount Recycled
Concrete and Asphalt	13,720,000 pounds
Clean Lead Salvage[a]	0 pounds
Lead Acid Batteries	54,288 pounds
Scrap Metal	1,892,930 pounds
Silver Fixative	581 pounds
Consumer Electronics (including cell phones)	150,237 pounds
Toner Cartridges	15,789 pounds
Mixed Paper	310,764 pounds
Furniture and Cabinets	156,860 pounds
Used Tires	26,320 pounds
Used Motor Oil[a]	0 gallons
Refrigerants	1,400 pounds
Universal Waste—Fluorescent Lamps	14,520 pounds
Universal Waste—Rechargeable Batteries	4,566 pounds
Universal Waste—Mercury Containing Devices	3 pounds
Industrial Sludge (land applied)[b]	0 cubic yards

[a] These items are being generated and stored but have not been shipped offsite for recycling.
[b] Industrial sludge is being generated but land application only occurs periodically.

2.3.7 Fleet Management

The Sustainability Dashboard tracks fleet petroleum use, alternative fuel use, and GHG emissions per mile metrics. SRS has the goal to improve energy and environmental performance of vehicles in a manner that increases efficiency, optimizes performance, and reduces waste and costs.

SRS installed two 85% ethanol (E-85) fueling stations in FY 2000 and added a third in FY 2015. In FY 1999, the year prior to installing the first two fueling stations, the Site consumed more than 700,000 gallons of unleaded gasoline and no E-85 alternative fuel. As Figure 2-3 shows, the total fuel consumption in FY 2022 was less than the FY 2005 baseline. SRS has continued to decrease use of unleaded gasoline and diesel and consume more E-85.

By the end of FY 2022, SRS increased its alternative fuel usage by 38.2% relative to the FY 2005 baseline, thereby meeting the goal of 10% usage. The primary goal for fleet management is to use less petroleum and more alternative fuel. Figure 2-4 shows SRS FY 2022 performance in meeting key fleet-management goals.

SRS continues to implement the Site Vehicle Allocation Methodology Plan completed in 2016. This plan helps organizations eliminate fleet vehicles that are unnecessary, oversized, or not fuel-efficient. SRS updates its plan at least every five years. Each year, SRS emphasizes leasing alternative fuel vehicles in the light-duty fleet. At the end of FY 2022, SRNS (fleet for DOE, SRNS, and SRMC) managed an inventory of 951 vehicles. Of these, 817 (85.9%) were either E-85, hybrid, or electric, which accounted for the reduction in petroleum consumption and the continued use of E-85. In FY 2022, SRS continued working on developing the infrastructure to support transition of 10% of the light-duty fleet to electric vehicles (EVs) by 2023. Of the 107 vehicles that the Site ordered, 62 were light-duty EVs. SRS is increasing the federal EV charging infrastructure to add to the one charger onsite. It completed design of a charging station with eight charging points in B Area and started designing four charging points in A Area and four charging points in N Area in FY 2022.

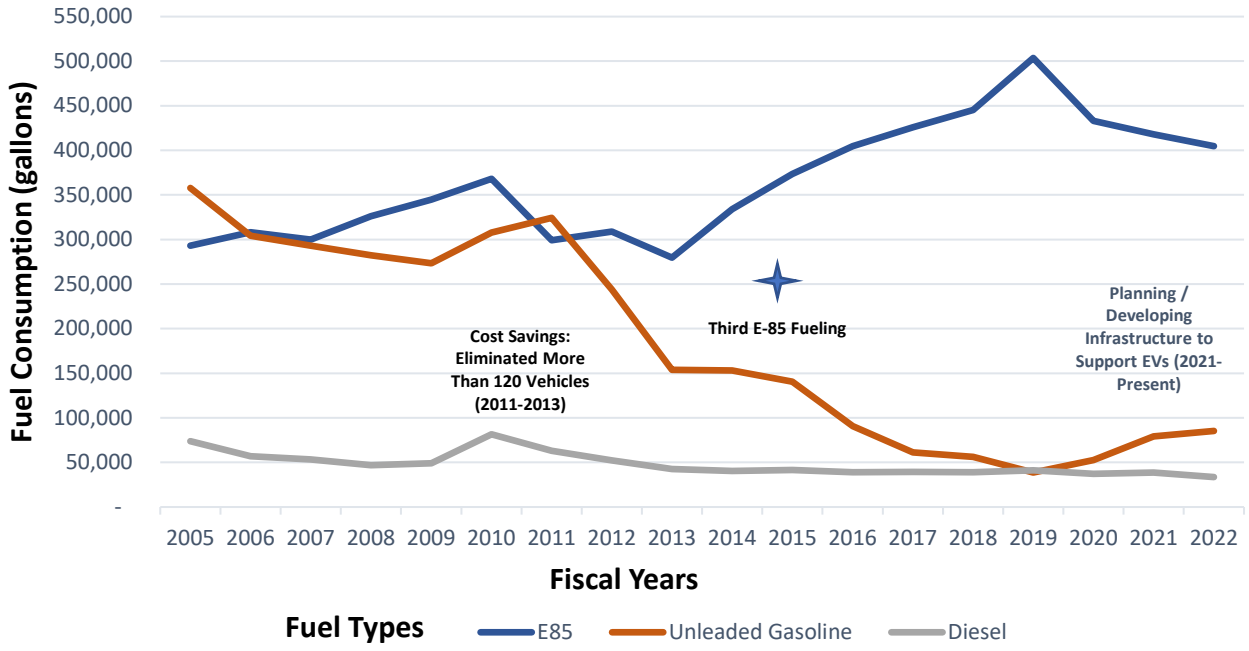

Figure 2-3 GSA Fuel Consumption by Type for FY 2005 to FY 2022

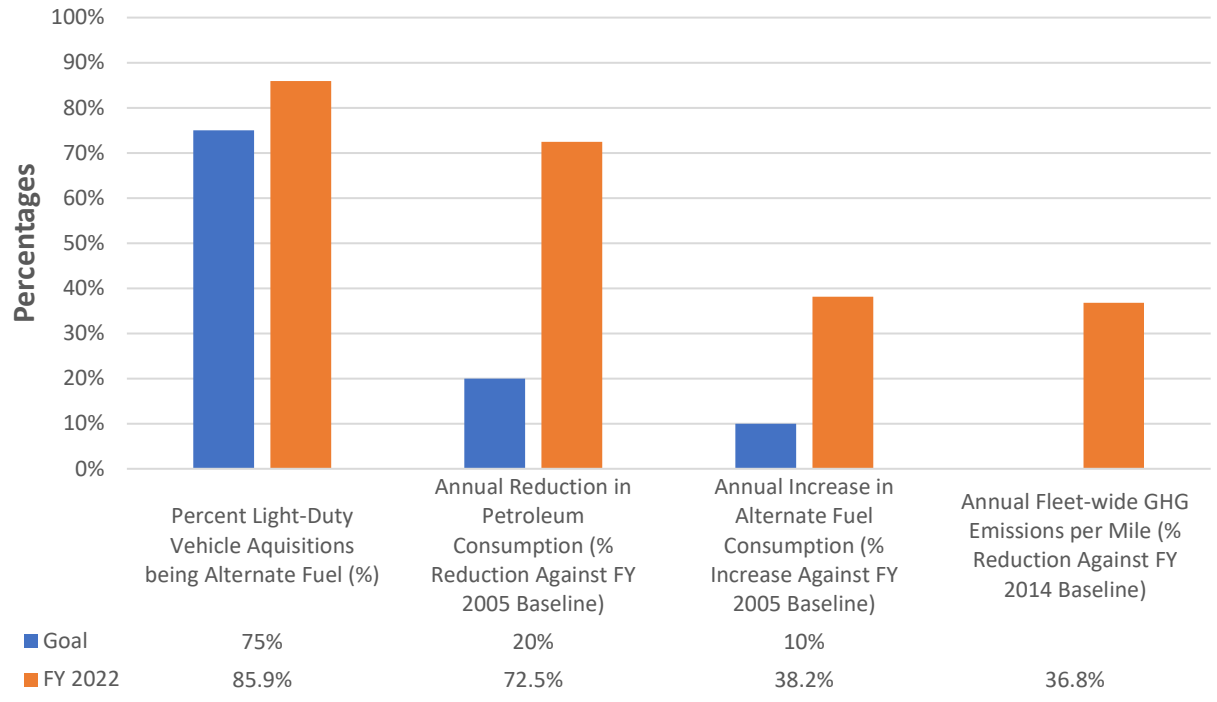

Figure 2-4 SRS Performance in Meeting Fleet Management and Transportation Goals for FY 2022

2.3.8 Acquisition and Procurement

The Sustainability Dashboard tracks sustainable acquisition metrics. SRS has the goal to track and make improvements for acquiring, using, and disposing of products and services (including electronics). SRS maximizes acquisition of designated products by procuring

- Products that meet minimum requirements for recycled content as the EPA identifies
- Products that the United States Department of Agriculture (USDA) designates as biobased or BioPreferred®
  - SRS procurement personnel review purchase-order line descriptions of eligible contract actions to determine whether the product meets the definition of BioPreferred.
- Products that maximize substituting alternatives to ozone-depleting substances identified under the EPA's Significant New Alternatives Policy (SNAP)
- Products that meet Electronic Product Environmental Assessment Tool (EPEAT) standards or those that the EPA's ENERGY STAR® program designates as having the potential to generate significant energy savings

Procurement continues to support the subsequent actions and initiatives of other SRS entities (engineering, maintenance, and infrastructure organizations) by procuring environmentally preferable products (EPP) alternatives as recommended for Site utilization. The EPP purchases have led to the practices outlined below:

- The SRS Chemical Management Center reviews and approves chemical acquisitions. This review monitors hazardous chemicals use and, where appropriate, recommends EPPs.
- SRS has procured EPP substitutions under various new and existing contracts, including bulk janitorial supplies (cleaners, paper products) and safety items (earplugs, filters).

2.3.9 Electronics Stewardship

The Sustainability Dashboard tracks electronic acquisitions, electronic recycling, power management, and duplex printing metrics. SRS has the goal to manage electronics and the environmental impacts as well as reduce energy use.

SRS implements many strategies to reduce energy use, waste, and costs associated with electronics by

- Purchasing computers rather than leasing
- Procuring desktops, laptops, and monitors that meet EPEAT standards and copiers that are ENERGY STAR-compliant
- Setting up all eligible computers and imaging equipment to automatically print on both sides of paper (duplex printing)

- Programming all eligible desktops, laptops, and monitors to default to power-save mode when in standby

By the end of FY 2022, 92.2% of eligible electronics procurements were EPEAT products, thereby falling short of the FY 2022 interim target of 95%. Of the 5,204 electronic acquisitions 4,799 met EPEAT standards, and the remaining 406 were ENERGY STAR-compliant.

The Site either recycles or reuses electronics in an environmentally sound manner by donating to schools and nonprofit organizations or by recycling through authorized vendors. SRS recycled 100% of its electronics through a certified recycler, thereby meeting the goal of 100% recycling or donating.

In FY 2022, 100% of eligible computers and monitors implemented and actively used power management features, and 100% of eligible printers implemented and actively used duplex printing features.

Additionally, SRS's extension of the timeframe for replacing a computer from three to five years has significantly reduced the number of computers being retired and the amount of generated scrap electronics.

2.3.10 Data Center Efficiency

The SSP tracks data center efficiency goals and metrics. SRS has the goal to implement practices that promote managing servers and federal data centers in an energy-efficient manner. Data centers are energy-intensive operations that contribute to agency energy and water use and costs.

One measure of energy efficiency for data centers is power-usage effectiveness (PUE), which is the ratio of total energy used by a computer data center facility to the energy delivered to the computing equipment. While no specific target PUEs have been set, agencies are collecting data. Of the nine data centers at SRS, only the Central Computing Facility has an electrical meter to determine actual power consumption. Therefore, determining the actual power consumption (and thus, PUE) is not currently possible.

2.3.11 Resiliency

The SSP tracks resiliency goals and metrics. SRS has the goal to prioritize actions that enhance the resilience of federal infrastructure and operations. Resilience is the ability of an agency to adapt to changing conditions and withstand or recover from disruptions. SRS ensures that federal operations and facilities can continue to protect and serve citizens in a changing climate.

SRS has collected weather data onsite for decades to define extreme events and make decisions regarding extreme weather event procedures for resilience planning scenarios. The SRNL Atmospheric Technologies Group developed a Vulnerability Assessment and Climate Change Resilience Plan in 2022. This report analyzed the impacts of climate change on SRS assets and operations. The report also presented results from a vulnerability analysis of energy requirements for mission critical infrastructure, as well as the health, safety, and productivity of the outdoor workforce.

SRS utilizes the Active Risk Manager tool to manage the risks and opportunities of each organization. Once the Site evaluates these risks and opportunities, it puts into place the appropriate strategies and executable plans to prioritize and mitigate or eliminate the risks. The process identifies climate-related vulnerabilities and solutions. SRS provides support to emergency situations through the Emergency Response Organization (ERO). The ERO provides an in-command response to emergencies and recoveries as applicable. The organization also has regularly scheduled facility and sitewide drills and exercises involving accidents, spills, and natural disaster scenarios to better respond to and recover from such disruptions should they occur.

2.3.12 Greenhouse Gas Management

The Sustainability Dashboard tracks direct (Scope 1 and 2) and indirect (Scope 3) GHG metrics. SRS has the goal to track and report on GHG emissions. By the end of FY 2022, SRS reduced direct emissions by 79.4% relative to the FY 2008 baseline, thereby meeting the goal of 50% reduction by FY 2025. Scope 1 GHG emissions consist of direct emissions from sources that SRS owns or controls, such as onsite combustion of fossil fuels and fleet fuel consumption. Scope 2 GHG emissions consist of indirect emissions from sources that SRS owns or controls, such as emissions from generating electricity, heat, or steam SRS purchases from a utility provider.

The following inventoried sources at SRS currently generate Scope 1 and 2 emissions:

- Purchased electricity
- Wood (biomass)
- Fuel oil
- Propane
- Gasoline
- Diesel
- E-85 (ethanol)
- Jet fuel
- Fugitive emissions

Biomass Cogeneration Facility

SRS continues to substantially reduce Scope 1 and 2 GHGs due to the BCF and the three additional biomass facilities. SRS tracks GHG data from various impact sources such as Site energy use, alternative workplace arrangements and space optimization, as well as vehicle and equipment use.

By the end of FY 2022, SRS reduced indirect emissions by 90.8% relative to the FY 2008 baseline, thereby meeting the goal of 25% reduction by FY 2025. Scope 3 GHG emissions are from sources SRS does not own or directly control but are related to SRS activities, such as employee travel and commuting. SRS continues to reduce Scope 3 GHG emissions by such efforts as using webinars and conference calls to reduce business travel and by promoting employee carpooling. Increased employee teleworking has also contributed to reducing Scope 3 GHG emissions.

2.4 EMS BEST PRACTICES

2.4.1 2022 Awards and Recognitions

SRS won the 2022 DOE Sustainability Award in the "Innovative Approach to Sustainability" category for the SRS Phytoremediation Project. The project uses an effective, low-energy process that remediates groundwater contaminated with tritium by irrigating a 60-acre pine tree forest. Since the project began in 2001, approximately 190 million gallons of water containing nearly 7,000 curies of tritium have been responsibly irrigated. This remediation method prevents contaminated groundwater from discharging into a nearby stream.

SRS Pines Phytoremediation Project

The Secretary of Energy Achievement Award recognized the contributing members of seven SRS teams, based on their accomplishments in 2022. The Office of the Assistant Secretary for Environmental Management presented two of these awards to projects related to sustainability and environmental restoration: the SRS Phytoremediation Project and the Lower Three Runs (LTR) Final Remedial Decision. The LTR Final Remedial Decision reached for the LTR Integrator Operable Unit was a significant step in environmental stewardship at SRS, protecting both ecological habitats and field research opportunities associated with the LTR stream system. The Record of Decision resulted in the long-term protection of approximately 30 miles of aquatic stream system habitat and over 3,000 acres of wetlands. This avoided significant environmental disturbance and construction costs. For example, capping and covering all areas elevated above permissible thresholds would have entailed an additional $4 million in cleanup costs. Excavating all contaminated sediments would have cost more than $1 billion. Instead, the final remedial action consists of Land Use Controls (signage and permits), long-term monitoring of environmental media, inspections and maintenance associated with two dams, and requires only a small excavation in an easily accessible canal within the LTR system.

Additionally, the Global Electronics Council recognized SRS at a virtual ceremony in July 2022 for its efforts in procuring sustainable technology. SRS received the EPEAT Purchaser Award in three categories: computers and displays, mobile phones, and servers. This award recognizes the SRS Information Technology and Procurement groups and demonstrates the Site's commitment to purchase sustainable electronics that meet voluntary environmental performance criteria to conserve energy, utilize environmentally sensitive materials and packaging, and have a greener life cycle. Using EPEAT products helps the Site fulfill the mission of protecting the environment for future generations.

2.4.2 Sustainable Climate-Ready Sites Pilot Project

SRS participated in the Sustainable Climate-Ready Sites (SCRS) pilot project. Through the Self-Assessment Tool, the Site provided a full-site perspective on environmental performance. It did this through reporting on 15 component program categories spanning natural and cultural resource stewardship, sustainability, climate resilience, and environmental justice (EJ). SRS presented on its experience at the DOE-HQ Environmental Management and Fossil Energy and Carbon Management Sustainable Acquisition Workshop.

2.4.3 Environmental Justice

SRS is committed to EJ and will continue to provide opportunities for community engagement and decision-making through information sharing and empowering the communities around the Site. SRS continues to expand its outreach with educational opportunities and access to information on SRS operations and environmental and public health risk-assessments. DOE's Office of Legacy Management funds the EJ program, which encourages groups to express concerns that influence the decision-making process. EJ programs at the Site include educational opportunities, workforce development, and community advocacy and outreach.

2.4.3.1 Educational Opportunities

SRS works with community educators to increase interest in science, technology, engineering, and mathematics (STEM) fields. Sponsorships and partnerships with educators and students create a conduit of college- and career-ready students. The following are some of the programs related to educational opportunities in 2022:

- The annual Teaching Radiation, Energy, and Technology (TREAT) workshop focuses on Central Savannah River Area (CSRA) middle school math and science teachers. As a partner with Savannah State University (a Historically Black College and University [HBCU] institution in Savannah, Georgia), SRS presents the basics of radiation and provides an overview of the environmental monitoring program and a demonstration of equipment. Other workshop presentations include workforce initiatives and opportunities for scholarship and leadership programs across the CSRA.
- The SRS Science and Technology Enrichment Program (STEP) is a cooperative effort by DOE-SR, SRNS, the Ruth Patrick Science Education Center at the University of South Carolina Aiken, the National Audubon Society, and the United States Forest Service-Savannah River (USFS-SR). Through this program, teachers and students participate in onsite and virtual environmental science field trips. The STEP lessons correlate to academic STEM standards for third through twelfth grade students and utilize real-world investigations that focus on responsible environmental stewardship.
- The Traveling Science Program is a cooperative effort between SRNS and the Ruth Patrick Science Education Center. The Education Outreach Programs at SRS invite individuals to request Site volunteers, who explain STEM concepts, conduct STEM demonstrations, mentor, judge, and

offer career information for teachers and students to bring science to life in kindergarten through twelfth grade classrooms.

- The SRNS Innovative Teaching Mini Grants Program recognizes innovative teaching methods by providing funds to enhance elementary, middle, and high school curriculum. SRS presents mini grants to teachers in neighboring counties.
- SRNS donated funds to help develop STEM-related Advanced Placement (AP) coursework at South Aiken and North Augusta High Schools in Aiken County, South Carolina. This encourages those who had previously not been able to qualify for AP coursework to experience a positive change in academic aptitude. This has also allowed for students who do not qualify for college credit through the AP exam to be more likely to enroll in college and perform well in introductory classes, as described in *A Broader View of College Readiness*, an article written in The Elective, the College Board's solution-oriented education magazine.
- SRNS and the Ruth Patrick Science Education Center, along with various special award sponsors, presented the South Carolina Regional Future City Competition on January 22. The competition is a project-based learning experience that asks sixth through eighth grade students to design cities of the future. This competition covers all STEM curriculum as well as writing and presentation skills.
- The DOE Savannah River Regional Science Bowl is a competition that tests students' academic skills in areas such as biology, chemistry, earth and space science, mathematics, and physics. DOE-SR, SRNS, and the Ruth Patrick Science Education Center, sponsored the event held on February 20.
- The CSRA Regional Science and Engineering Fair is for students in fourth through twelfth grade who have won local school science fairs in South Carolina and Georgia. This fair covers all STEM curriculum, provides hands-on learning, and is affiliated with the International Science and Engineering Fair. SRNS and Ruth Patrick Science Education Center held the annual event on March 11-12.
- CSRA College Night, held on September 15, is a cooperative effort by DOE-SR, SRNS, Centerra, SRP (Savannah River Plant) Federal Credit Union, iHeartRadio, and other local businesses and industries. The event informs local high school students and their parents of college education opportunities and professional and technical societies. This gives students the opportunity to speak with representatives from accredited colleges and universities across the United States. CSRA College Night offers seminars on financial aid, financial literacy, SRS apprenticeships, and Workforce Opportunities in Regional Careers (WORC) scholarship opportunities. SRS also provides resources and information on workforce opportunities at the Site. Students attending the event visit the career exploration center and counseling center to receive guidance on school and career paths. Seniors can register for the opportunity to win a $1,000 scholarship.

2.4.3.2 Workforce Development

SRS engages the local workforce through funding, outreach programs, and hands-on training to create a capable workforce. These programs provide individuals in the local communities with technical skillsets necessary for DOE mission critical careers. This outreach allows for meaningful involvement of individuals from the affected surrounding communities in Site operations. The following are some of the programs in 2022 related to workforce development:

- SRNS hosted two job fairs to enhance technical and skilled worker job recruitment in the local area and provide on-the-spot job offers.
- SRNS partnered with Hiring Our Heroes, an organization that helps companies provide on-the-job training to active-duty members of the U.S. Military who are transitioning out of service. This program provides highly skilled service members to the benefit of both SRNS and military veterans.
- Local universities and colleges partnered with DOE and SRS are educating the workforce on DOE-Environmental Management (DOE-EM) and NNSA missions. The WORC Grants discussed above and in Section 2.4.3.3. also fund this mission and work with various local colleges to ensure their success. WORC I academic partners in South Carolina are Aiken Technical College, the University of South Carolina Aiken, and the University of South Carolina Salkehatchie; and in Georgia are Augusta Technical College and Augusta University. WORC II academic partners are Aiken Technical College, Augusta Technical College, Augusta University, Claflin University, the University of South Carolina Aiken, and the University of South Carolina Salkehatchie.
- SRS internships during the summer and year-round provide technical skills and workplace experience in the student's field of study. This allows students in schools across the country, but specifically in South Carolina and Georgia, to gain technical experience and creates a conduit for transitioning from internships to jobs at SRS. Additionally, the internship program educates students on historical and current operation missions at the Site and provides opportunities to network and volunteer in the community.
- The SRNS apprenticeship program, partnering with Apprenticeship Carolina and the Lower Savannah Council of Governments, is developing a viable workforce in the counties neighboring SRS. This provides apprentices paid on-the-job experience while they pursue a technical education. Unlike internships, apprenticeships promote and document knowledge transfer and provide participants with proof of skill mastery. The program also consists of youth- and collegiate-levels, which provide an important avenue for students who are facing social, educational, and economic barriers.
- SRS holds many events for collegiate students. SRNS personnel sponsor events that encourage casual conversations about professional development. The South Carolina HBCU Science, Technology, Engineering, and Math Program sponsored one of these events in May, known as a "Fireside Chat." As part of National Nuclear Science Week in October, SRS hosted technical college students for a tour to learn about SRS missions and the SRNS apprenticeship program.

2.4.3.3 Community Advocacy and Outreach

SRS engages the community by working with advocacy groups, updating residents on current operations, and providing resources and materials. These programs provide individuals in the communities meaningful involvement in decision making, educational opportunities, and tangible resources. The following are some of the programs related to community advocacy and outreach:

- The SRS Citizens Advisory Board (CAB) is a stakeholder group of individuals from diverse backgrounds in South Carolina and Georgia counties affected by Site operations. The SRS CAB provides DOE advice, information, and recommendations on issues that affect environmental management at SRS.
- The SRS Community Reuse Organization (SRSCRO) is a private, nonprofit organization that develops and implements a comprehensive strategy to diversify the economy around the Site. SRSCRO ensues that SRS excess and operating resources benefit the economic well-being of the surrounding areas. SRSCRO also assists new and expanding businesses and industries through its programs. SRSCRO has several grants from U.S. DOE that help advance education, training, and historical preservation in the region. Additionally, the organization has two WORC grants in effect to strengthen the local workforce pool needed to support DOE-EM and NNSA missions, particularly at SRS.
  - For the WORC I Grant (2016-2026), SRSCRO is the fiscal agent coordinating the WORC program with regional colleges and universities to support training in various science, technology, and engineering-based fields.
  - For the WORC II Grant (2020-2025), SRSCRO received a boost to workforce development to support the NNSA-proposed plutonium pit mission, the long-standing tritium mission, and the surplus plutonium disposition missions at SRS. SRSCRO accomplishes this through partnerships with local colleges and universities.
- The SRS Tour program offers both virtual and onsite tours to the public. The tours allow visitors to gain an understanding of the DOE facilities, missions, and workforce that changed the face of nearby counties and helped the United States during the Cold War. Guests will also learn about current and future DOE Environmental Management and NNSA missions at SRS. The tour includes a visit to the University of Georgia's Savannah River Ecology Laboratory (SREL), where participants learn about the laboratory's history and mission and get an up-close view of animals found on the Site.
- SRS Corporate Communications mails Environmental Bulletins to neighboring landowners. This makes certain the property owners, who wish to receive a bulletin, are aware of activities occurring at the Site. SRS also publishes the document on its webpage.

2.4.4 Earth Day

For 2022, SRS held an Earth Day celebration with the theme "Invest in our Planet." SRS Earth Day celebrations increase awareness of Environmental Stewardship and, more specifically, the EMS program. Earth Day Booths were available during the SRS 2022 Safety Exposition. The booths consisted of SRNS Environmental Compliance, SRNS Environmental Monitoring, and the South Carolina Department of Health and Environment Control (SCDHEC) State and Aiken County offices. SRNS Environmental Compliance conducted a trivia game on the history of Earth Day and discussed environmental programs in the United States. Environmental Monitoring displayed a portable air monitoring device and discussed surveillance monitoring around SRS. The SCDHEC State Office discussed recycling initiatives such as the "Don't Waste Food SC" program and consumer electronics waste. The SCDHEC Aiken County Office discussed local environmental concerns. Additionally, SRS produced an Earth Day video, which featured a roundtable of senior leadership from across the Site discussing their personal and professional commitment to leaving the earth a better place. The video entitled, "SRS Earth Day 2022 Round Table," is available on the SRS YouTube channel.

2.4.5 Reuse or Recycling of Equipment and Materials

SRS partnered with SRSCRO to turn excess equipment and material into revenue that benefits Aiken, Allendale, and Barnwell counties in South Carolina and Richmond and Columbia counties in Georgia. Surplus equipment and materials include the following:

- Small items such as office equipment, valves, and glassware for laboratory experiments
- Large items of potentially much greater value such as electrical turbines, diesel-powered pumps, and fire engines
- Hundreds of thousands of tons of metal

SRSCRO is the interface organization that takes in items that the Site no longer needs through the Asset Transition Program and Asset Removal Projects. The organization sells these items and uses the proceeds for the economic good of numerous businesses throughout the large region surrounding SRS. In FY 2022, SRS dispositioned to SRSCRO more than $14.7 million in usable assets for reuse and recovery. Based on SRSCRO's 2022 annual report, the program generated approximately $350,315 during the SRSCRO's fiscal year (July 1, 2021 to June 30, 2022).

SRS utilizes the Federal Prison Industries, Inc. (UNICOR) services to recycle electronics. UNICOR operates electronics recycling centers to convert electronics into recyclable materials for resale to registered vendors. UNICOR vendors must abide by an environmental commitment that requires signing no-landfill certifications, following restrictive export policies, and agreeing to site inspections. UNICOR's services directed 100% (150,237 pounds) of SRS scrap electronics for recycling in FY 2022.

2.4.6 Sustainable Environmental Compliance and Environmental Remediation

SRS continues to excel in sustainable remediation. Of the 41 remediation systems currently operating, 21 are completely passive, requiring no energy to implement, and 17 are low-energy systems. These low-energy systems use sustainable technologies (such as solar-powered microblowers and barometric pressure-driven BaroBalls™) to pump volatile organic contaminants from the subsurface, thus reducing contamination in soils and groundwater. SRS is also using the HydraSleeve sampling methodology for more than 240 wells, which significantly reduces excess groundwater that requires management as waste.

In 2022, SRS continued monitoring to ensure the effectiveness of the lower-energy, innovative methods to address groundwater cleanup implemented in 2019. These included

- Injecting a vegetable-oil microbe mixture into the subsurface to intercept a groundwater plume and break down trichlorethylene (TCE)
- Injecting recycled iron into a series of wells to form these in situ remediation systems that intercept the groundwater plume and breaks down TCE (See photograph below.)

In both examples, using these in-situ remediation systems utilizes the natural flow of the groundwater plume so the systems are low energy and do not require pumps or equipment to move groundwater. SRS anticipates the vegetable oil to be effective for three to five years before it needs to reinject into the subsurface, and the iron by design is effective for decades with little maintenance.

A Subcontractor Loads Zero-Valent Iron Filings during Injections to Support Installation of the P-Area Reactive Barrier

SRS continues to deploy innovative methods to address compliance. From 2019 to 2022, SRNS Environmental Compliance implemented a commercially available Comprehensive Environmental Permits Linking Tool (CEPLT) to track regulatory and DOE commitments. The SRS CEPLT web applications achieve the following criteria:

- Track regulatory commitments (tasks) that can be assigned to a user
- Organize permits, regulations, and other environmental requirement documents (for example, Consent Orders and DOE Orders)
- Provide Geographic Information System capability for mapping data to associated Site location (compliance points)

From 2020 to 2022, SRS has expanded the CEPLT to integrate remaining Site tenants and organizations. This includes DOE (Environmental Quality Management Division), BSRA, SRMC, Savannah River Tritium

Enterprises, USFS-SR, SREL, Ameresco, NNSA Capital Projects, and Centerra-SRS. Additionally, several air-, water-, and waste-related permits link to specific permit requirements and conditions.

SRS continues to use remotely operated devices (drones and wireless stormwater sampling equipment) discussed in *SRS Environmental Reports* from previous years. Not only do these devices address environmental compliance, improve worker safety, and increase productivity, but they also decrease vehicle and fuel use, thereby supporting fleet management goals.

2.4.7 Challenges and Barriers to Implementation

In 2022, SRS continued to conserve and manage resources to meet the sustainability goals in the SSP. However, infrastructure continually presents challenges to initiating sustainable projects. Achieving new goals is becoming significantly difficult with the high cost of implementing sustainability upgrades at SRS's many aging facilities (administrative, shops, laboratories, warehouses). SRS reduces potable water use when feasible by continuing to install water-efficient toilet systems when repairs indicate the need. However, sitewide retrofitting with low-flow flush valves and faucets is not cost-effective. Likewise, SRS reduces energy intensity when possible in maintenance and repair situations through such actions as replacing fluorescent lighting with a more energy-efficient LED lighting, replacing HVAC systems with higher Seasonal Energy Efficiency Ratio units, and rightsizing pumps. Retrofitting entire buildings or systems is not typically cost-effective.

SRS continues to study, track, and discuss sustainability requirements to ensure implementation. While SRS is inserting sustainable acquisition clauses in all applicable solicitations, there is work to be done tracking sustainable acquisition purchases (Biobased, SNAP, and others). SRS continues to determine and implement ways to increase end-user awareness of sustainable acquisitions.

At the end of FY 2022, 86% of the SRS vehicle fleet for DOE, SRNS, and SRMC consisted of E-85, hybrid, or EVs. In FY 2022, the Site ordered 107 vehicles, of which 62 were light-duty EVs. At the end of FY 2022, supply chain complications prevented the delivery of most (103) of the vehicles. In FY 2022, SRS continued developing the infrastructure to support transitioning 10% of the light-duty fleet to EVs by the end of FY 2023. Given the Site has one charger, SRS is increasing the Federal EV charging infrastructure by completing the design of eight charging stations and starting the design of eight additional charging stations.

In FY 2022, SRS diverted 3.8% of C&D waste generated, which is below the 50% Interim Target. The decrease was primarily the result of no concrete or asphalt recovery or reuse in 2022. Future road projects and construction projects may present opportunities to divert C&D waste. However, the low cost of onsite C&D landfill services and limited cost-effective reuse options for scrap debris significantly challenge cost-effective recycling options beyond what is already being executed.

SRS identified the following programmatic opportunities for improvement (OFIs) during the 2021 ISO 14001:2015 conformity assessment:

- An environmental scope and policy that is more organizationally focused

- Criteria that are more rigorously defined to determine significant environmental aspects
- Sustainability initiatives that are more systematically integrated with the EMS
- Personnel that are more aware and well-informed of ISO 14001:2015 programmatic requirements

SRNS continued to make progress on these OFIs in 2022 by formalizing the integration of EMS principles and promoting awareness across the Site. This was done through the following mechanisms:

- Developing a drafted EMS awareness training course
- Creating a stringent template to determine Significant Environmental Aspects
- Collaborating on the SCRS pilot program between EMS and sustainability personnel
- Integrating sustainability into EMS through continual initiatives

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