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.

2023 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 Site goals. Below are the highlights of the EMS program:

Pollution Prevention and Waste Minimization

SRS recycled 79.4% (918 metric tons) of its 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 54.4% and Scope 3 GHG emissions by 90.7% since 2008.

Transportation and Fleet Management

SRS continued to exceed its fleet management goals. Approximately 84.3% of the current light-duty fleet are electric, plug-in hybrids, or vehicles that use E-85 (85% ethanol, 15% unleaded gasoline) fuel.

2023 Highlights (continued)

Awards

SRS received the Global Electronics Council Electronic Product Environmental Assessment Tool Purchasers (EPEAT) Award in five product categories.

2.1 SRS ENVIRONMENTAL MANAGEMENT SYSTEM

U.S. Department of Energy (DOE) Order 436.1A, *Departmental Sustainability*, requires DOE sites (including the National Nuclear Security Administration [NNSA]) use an Environmental Management System (EMS) as a framework to implement programs to meet sustainability goals and fulfill environmental compliance obligations in accordance with approved instructions from the DOE Office of Environment, Health, Safety and Security. Sites must also maintain their EMS as being certified to or conforming to the International Organization for Standardization's (ISO) 14001:2015. The DOE Site Manager has determined the Savannah River Nuclear Solutions (SRNS) EMS, which includes Battelle Savannah River Alliance (BSRA) and Savannah River Mission Completion (SRMC), conform 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 to meet the ISO 14001:2015 standard continually improves environmental performance.

The Savannah River Site (SRS) EMS is a 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, environmental objectives SRS sets forth to encompass both compliance and environmental sustainability goals address environmental impacts. These sustainability goals promote and integrate initiatives, including energy and natural resource conservation, waste minimization, green remediation, and using sustainable products and services.

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.*

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 the following:

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

2.1.2 Integration with the Integrated Safety Management System

SRS incorporates the Integrated Safety Management System (ISMS) with the EMS to provide a comprehensive framework under which it manages 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 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)

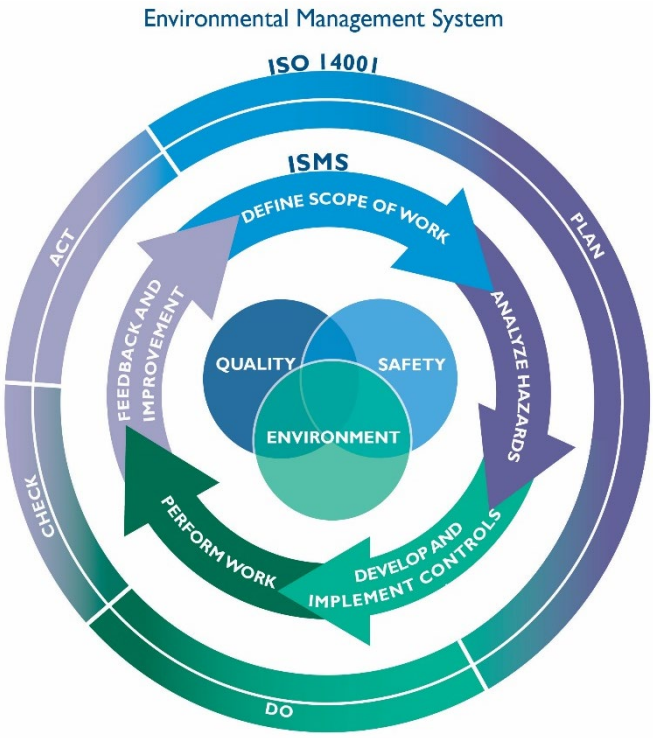

Figure 2-1 Integrated Safety Management System Continual Improvement Framework within the ISO 14001 Environmental Management System

- **Check**—evaluates performance (feedback) and management reviews
- **Act**—embodies corrective actions, improvements, and incorporates 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 integral to the Site's overall management of environmental compliance and performance.

2.2.1 Plan-Do-Check-Act: 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 Security Administration-Savannah River Field Office (NNSA-SRFO) take any actions, the Site develops a National Environmental Policy 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 and 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 that every employee complete annual training. Employees must have General Employee Training upon beginning employment at SRS, and each year thereafter, they must pass Consolidated Annual Training. Both of these courses ensure all employees are 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 Plan-Do-Check-Act: Do

Environmental Compliance Authorities (ECAs) and Environmental Subject Matter Experts (SMEs) support facilities and programs in identifying and carrying out their environmental responsibilities. The SMEs communicate environmental regulatory requirements to the SRS workforce and submit required documents to the United States Environmental Protection Agency (EPA), the South Carolina Department

of Health and Environmental Control (SCDHEC), and other stakeholders. ECAs work with the facilities to ensure that they implement the regulatory requirements.

DOE requires the Site to develop its *SRS Environmental Report* annually 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 and state 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 Plan-Do-Check-Act: Check

2.2.3.1 Internal Checks

SRS assesses and evaluates Site work to ensure personnel are performing the work 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. 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 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 confirm that personnel are performing the work as planned and that Site operations are not adversely impacting worker and public health and the environment. Regulators from various state and federal 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-driven inspections. The EPA may conduct compliance evaluation inspections or participate alongside SCDHEC

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

2.2.4 Plan-Do-Check-Act: 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 provides guidance to manage actual or potential conditions of nonconformity, for example, Notices of Violation (NOVs) 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, including the public, academia, SRS Citizen's Advisory Board, regulators, and other DOE sites.

2.3 SUSTAINABILITY AND STEWARDSHIP GOALS AND IMPLEMENTATION

DOE Order 436.1A, *Departmental Sustainability*, defines DOE Sites' requirements and responsibilities to manage operations and activities necessary for sustainability and to ensure that they are carrying out the DOE mission in a manner that addresses sustainability goals (Greenhouse Gas Management, Facility Management, Fleet Management, Waste Management, Acquisitions, Electronics Stewardship) and environmental compliance obligations. To direct sites on how to meet the requirements of the order, DOE provided further guidance on September 18, 2023, in the memorandum, "Departmental Use of Environmental Management Systems." This memo and its attachments provide instructions on EMS annual reporting, triennial declaration of conformance, and integrating environmental justice (EJ). SRS ensures environmental compliance and stewardship are seamlessly incorporated into its remediation and closure projects and addresses requirements for resource conservation, pollution reduction, and environmental surveillance. Sustainability reporting in this chapter utilizes the DOE sustainability goals, which are driven by the executive orders. These sustainability goals, which Figure 2-2 identifies, represent those in the DOE Sustainability Dashboard that DOE's Sustainability Performance Division

manages. The current DOE sustainability goals align with and are on target to reach those the following executive orders set forth:

- 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

Figure 2-2 SRS Environmental Management System and Sustainability Goals

- Executive Order No. 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*, signed in December 2021, which sets new federal-level sustainability goals—based on statutory requirements—and requires agencies to
  - Reach 100% carbon pollution-free electricity on a net annual basis by 2030, including 50% 24-hour-a-day, 7-day-a-week carbon pollution-free electricity
  - 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 EJ and equity-focused operations
  - Accelerate progress through domestic and international partnerships

SRS uses the DOE Sustainability Dashboard and Site Sustainability Plan (SSP) to document the sustainability goals SRS plans to achieve and to provide a strategic roadmap for accomplishing those essential activities. 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) 2023. This chart reflects sustainability goals and environmental compliance goals for 2023, identifies the related environmental objectives, and lists strategies used to achieve objectives. This chapter contains additional information on how SRS is making progress in supporting DOE-driven objectives. Chapter 3, *Compliance Summary,* documents and provides additional reference for the environmental compliance portion of the EMS goals and objectives.

Updated annually, the Sustainability Dashboard and SSP outline the strategies in place and identify the Site's contributions to meeting DOE's sustainability targets. 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 2023 performance against the sustainability goals to complement the more general discussion in the text that follows.

Table 2-1 FY 2023 Sustainability Goals, Metrics, and SRS Performance

Energy Management	
Goal: 50% energy intensity reduction by fiscal year (FY) 2030 from FY 2021 baseline. Per the FY 2024 Site Sustainability Plan (SSP), reduce energy intensity by 15% by FY 2025 from FY 2021 baseline.	**Goal at Risk**
Interim Target (FY 2023): 24% reduction from FY 2021 baseline	**Interim Target Not Met:** 13.8% energy intensity increase from FY 2021 baseline. This is due to a change to the goal's baseline from utilizing FY 2015 to FY 2021. The Savannah River Site (SRS) has developed a path forward for meeting this goal through various Energy Conservation Measures (ECMs).
Clean and Renewable Energy	
Goal: 30% renewable energy as a percentage of total agency electric use by FY 2025	**Goal on Track**
Interim Target (FY 2023): 25%	**Interim Target Met:** 29.2% of the electric energy in FY 2023 is from renewable resources.
Water Management	
Goal: 50% reduction in potable water intensity by FY 2030 from FY 2021 baseline. Per the FY 2024 SSP, reduce water intensity by 16% by FY 2024 from FY 2021 baseline	**Goal at Risk**
Interim Target (FY 2023): 18% reduction from FY 2021 baseline	**Interim Target Not Met**: 2.0% potable water intensity increase from FY 2021 baseline. This is due to a change to the goal baseline from utilizing FY 2007 to FY 2021. SRS has developed a path forward for meeting its goal.
Goal: 36% reduction in non-potable water intensity by FY 2025 from FY 2010 baseline	**Goal Exceeded**: 78.9% non-potable water intensity reduction
Interim Target (FY 2023): 26% 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 existing owned buildings comply with Guiding Principles for Sustainable Buildings by FY 2025.	**Goal at Risk**
Interim Target (FY 2023): 16.3%	**Interim Target Not Met**: 0% of SRS's buildings qualify as sustainable. This is due to a recent Guiding Principles guidance update, which increased the square footage requirements to be greater than 25,000 square feet.

Table 2-1 FY 2023 Sustainability Goals, Metrics, and SRS Performance (continued)

Waste Management	
Goal for Municipal Solid Waste: Divert at least 50% of nonhazardous solid waste (excluding construction and demolition [C&D] debris)	**Goal Exceeded**: SRS diverted 79.4% of municipal solid waste from the waste stream through recycling.
Interim Target (FY 2023): 50%	**Interim Target Met**
Goal for C&D Waste: Divert at least 50% of C&D material and debris	**Goal Not Met**: SRS diverted 4.4% of waste from the onsite C&D landfill. However, this value can be further offset by recycling totals reported in Table 2-2, including, but not limited to, concrete, asphalt, and office furniture.
Interim Target (FY 2023): 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**: 71.6% reduction in petroleum consumption relative to the FY 2005 baseline
Interim Target (FY 2023): 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 Exceeded**: 37.9% alternative fuel usage increased, relative to the FY 2005 baseline.
Interim Target (FY 2023): 10%	**Interim Target Met**
Acquisition and Procurement	
Goal: 95% of new contract actions for products and services meet sustainable acquisition requirements.	**Goal Exceeded**: SRS reviewed 100% of purchase order line descriptions of eligible contract actions to determine whether the products met the BioPreferred® definition.
Interim Target (FY 2023): 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 Not Met**
Interim Target (FY 2023): 95%	**Interim Target Not Met**: 80.3% 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 of through government programs and certified recyclers	**Goal Met**: SRS recycled 100% of used electronics using authorized recycling companies.
Interim Target (FY 2023): 100%	**Interim Target Met**

Table 2-1 FY 2023 Sustainability Goals, Metrics, and SRS Performance (continued)

Electronics Stewardship (continued)	
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 2023): 100%	**Interim Target Met**
Goal for Duplex Printing: 100% of eligible printers implement and actively use duplex printing features.	**Goal Met**: 100% of eligible printers have duplex enabled.
Interim Target (FY 2023): 100%	**Interim Target Met**
Data Center Efficiency	
Goal: Implement practices that promote energy-efficient management of servers and federal data centers	**Goal Met**: SRS utilizes power usage effectiveness (PUE) for data centers that have meters to obtain a baseline of energy use effectiveness.
Adaptation and 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 infrastructure and operations for the future.
Greenhouse Gas (GHG) Management	
Goal for Direct (Scope 1 and 2) Greenhouse Gas (GHG) Emissions: 65% reduction in direct GHG emissions by FY 2030 from FY 2008 baseline	**Goal on Track**
Interim Target (FY 2023): 45% reduction in direct GHG emissions from FY 2008 baseline	**Interim Target Met:** 54.4% reduction in direct GHG emissions relative to FY 2008 baseline
Goal for Indirect (Scope 3) GHG Emissions: 25% reduction in indirect GHG emissions by FY 2025 from FY 2008 baseline	**Goal Exceeded**: 90.7% reduction in indirect GHG emissions relative to FY 2008 baseline
Interim Target (FY 2023): 21% reduction in indirect GHG emissions from FY 2008 baseline	**Interim Target Met**

2.3.1 Energy Management

The DOE Sustainability Dashboard and SSP track energy intensity metrics. SRS has a goal to reduce the amount of energy per square foot (energy intensity) used in an identified class of buildings annually. By the end of FY 2023, SRS increased its energy intensity by 13.8% relative to the FY 2021 baseline. Per the FY 2024 SSP, this puts the Site at risk of not reducing energy intensity by 15% in FY 2025 relative to the FY 2021 baseline. This is due to a recent change in the goal's baseline from FY 2015 to FY 2021. SRS demonstrated continued success in FY 2023 by completing the following energy efficiency efforts:

- Upgraded building exterior lighting by utilizing light-emitting diodes (LEDs)
- Upgraded building interior lighting by utilizing LEDs

- Upgraded heating, ventilation, and air conditioning (HVAC) units by using more energy-efficient units
- Reduced the footprint of SRS infrastructure through right-sizing
- Performed utility isolations and deactivation actions for high-priority facilities to support right-sizing efforts

One key challenge to energy management at the Site is the inability to accurately measure, monitor, and control energy usage of individual buildings. Of the thousands of buildings and structures at the Site, only 46 buildings have individual meters. The most effective way to monitor and reduce overall energy consumption and reduce or shift the peak load of a building is by installing an Energy Management System (EnMS). An EnMS allows automated control of a building's energy usage. Once installed, multiple buildings can be controlled through one central hub. For an EnMS to function, it must connect to "smart" meters, which use Wi-Fi technology to "communicate." Currently, the 46 building meters onsite are analog, and readings must be made manually. The sensitive nature of some of the missions at the Site does not currently allow for smart meters. This also impacts benchmarking of a facility, which would need to utilize individual metering to be effective.

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 64 Site buildings that are subject to EISA audits because each one helps to constitute 75% of the Site's energy use. The number of buildings subject to EISA audits may change annually as buildings are constructed, repurposed, or removed from service. Identified buildings must undergo a comprehensive energy and water evaluation once every four years. The Site completed the fourth cycle of audits in FY 2023, thereby completing 100% of the audits. Although 19 buildings were reviewed in FY 2023, 3 of those buildings were either decommissioned or demolished, so only 16 buildings were audited. Focusing on these buildings allows EISA audits, which identify energy conservation measures (ECMs), to be most effective. Of the 16 buildings audited, 15 ECMs were identified, including conversions to LED lighting, replacement of end-of-life HVAC units, and roof replacements that utilize cool-roof technology. Since FY 2022, SRS's contract requires that all roof replacements and retrofitting use cool-roof technology.

2.3.2 Clean and Renewable Energy

The Sustainability Dashboard and SSP track 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 2023, SRS used 29.2% renewable energy, thereby meeting the FY 2023 interim target of 25%. The Site has achieved the interim target by generating power onsite from the Biomass Cogeneration Facility (BCF); A-Area, K-Area, and L-Area biomass plants; and through the energy portfolio for Dominion Energy. SRS no longer uses coal to generate energy from onsite 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. Additionally, the Dominion Energy mix for South Carolina (published 2022) is 5% total renewable energy (either hydro, solar, wind or biomass, or all), 43% nuclear, 41% natural gas, and 11% coal.

2.3.3 Water Management

The Sustainability Dashboard and SSP track 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 2023, SRS increased potable water use by 2%, thereby not meeting the FY 2023 interim target of an 18% reduction relative to the FY 2021 baseline. Per the FY 2024 SSP, this puts the Site at risk of not reducing potable water intensity by 16% in FY 2025 relative to the FY 2021 baseline. This is due to a recent change in the goal's baseline from FY 2007 to FY 2021. However, the Site has been significantly decreasing its potable water use over the last 15 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.

In a multiyear project, SRS has outlined a strategic plan to replace at-risk sections of pipe to mitigate leaks resulting from aged and degrading underground pipe. SRS routinely monitors for leaks and maintains response crews that quickly and efficiently respond and conduct necessary repairs to minimize service interruptions and water waste. SRS continuously monitors water pressure across the Site and routinely conducts physical examinations of above-ground piping.

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, an 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 increased demand from events, such as constructing additional buildings, increased headcount, and water-dependent processes being added to the Site as part of new missions associated primarily with National Nuclear Security Administration (NNSA) initiatives. Additionally, DOE Order 436.1A requires life-cycle, cost-effective analysis for water conservation opportunities. The water management sustainability goal also does not account for potable water conservation measures, such as the primary domestic water system, installed prior to the baseline. 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, for instance, the number of employees and the amount of potable water used for non-potable purposes.

By the end of FY 2023, SRS decreased non-potable water use by 78.9% 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 495 million gallons, which is a 78.9% 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-a-day, full-time basis. The BCF was constructed and completed in 2012 and replaced the more than 50-year-old coal-fired steam and electrical-generation plant. The BCF is in the 11th year of a 21-year ESPC period. Realization of cost savings will increase significantly after year 21, when the facility's mortgage debt has been satisfied. 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 and SSP track 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 2023, SRS had 0% of its building count as complying with the Guiding Principles for sustainable buildings, thereby not meeting the FY 2023 interim target of 16.3%. The Guiding Principles address the following six sustainable principles for new construction and modernization and for 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 include 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 possible future 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 ECMs 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 2023, SRS diverted 79.4% of municipal solid waste, thereby surpassing the annual goal of 50% diversion. SRS diverted 918 metric tons of municipal solid waste out of 1,156.8 metric tons. The Site recycled 230 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 688 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, 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 2023, SRS diverted 4.4% 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 2023, the Site diverted 1,750.3 metric tons of the 40,095.2 metric tons of C&D waste generated. A limited amount was recovered during each year (2020−2023).

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 through initiatives, such as removing items that include nonradioactive scrap metal and scrap furniture from the waste stream and creating avenues for recycling. 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 2023.

Table 2-2 SRS Recycling and Sustainability in FY 2023 by Amount

Items Recycled in FY 2023	Amount Recycled
Concrete and Asphalt	20,140,800 pounds
Clean Lead Salvage	0 pounds
Lead Acid Batteries	53,088 pounds
Scrap Metal	2,058,860 pounds
Silver Fixative	788.5 pounds
Consumer Electronics (including cell phones)	136,511 pounds
Toner Cartridges	12,433 pounds
Office Paper	1,521,600 pounds
Furniture and Cabinets	206,360 pounds
Used Tires	61,480 pounds
Used Motor Oil	28,883 gallons
Refrigerants	0 pounds
Universal Waste—Fluorescent Lamps	14,047 pounds
Universal Waste—Rechargeable Batteries	4,104 pounds
Universal Waste—Mercury-Containing Devices	32 pounds
Universal Waste—Aerosol Cans	4,208 pounds
Industrial Sludge (land-applied)[a]	0 cubic yards

[a] Industrial sludge is being generated, but land application only occurs periodically.

2.3.7 Fleet Management

The Sustainability Dashboard and SSP track fleet petroleum use, alternative fuel use, GHG emissions per mile metrics, and fleet inventory. 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 before 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 2023 was less than the FY 2005 baseline. SRS has continued to decrease unleaded gasoline and diesel use and consume more E-85.

By the end of FY 2023, SRS had achieved all Site fleet management goals specifically related to using less petroleum and more alternative fuels. Figure 2-4 shows SRS FY 2023 performance in meeting key fleet management goals.

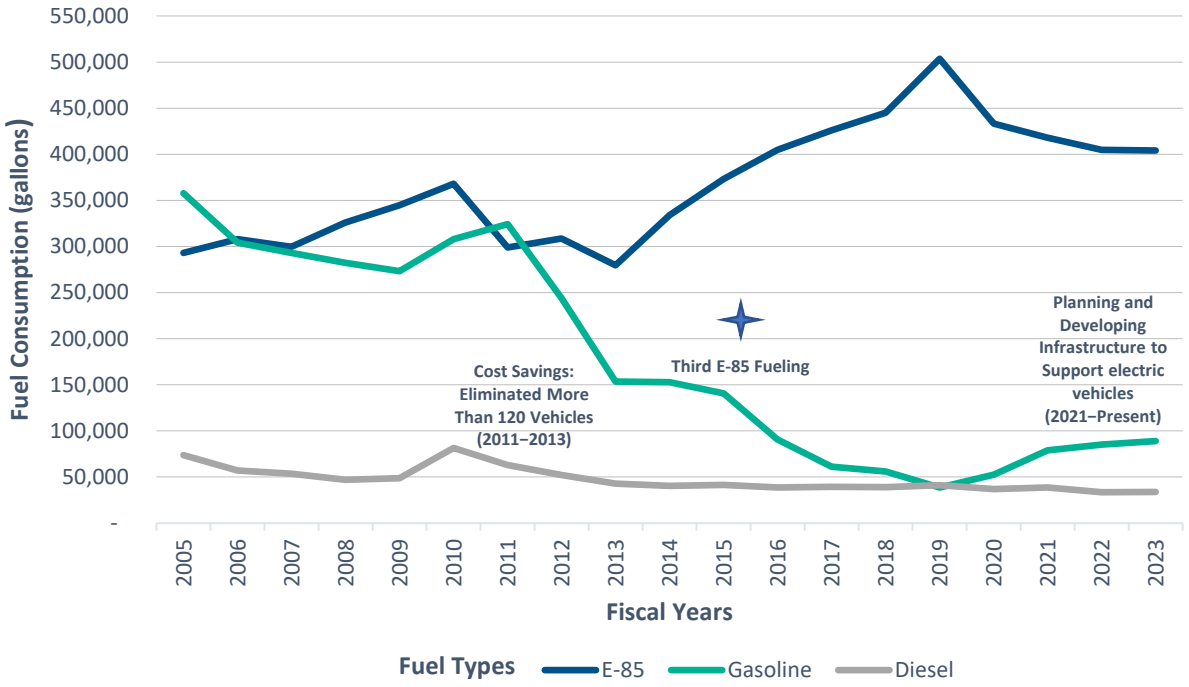

Figure 2-3 U.S. General Services Administration Fuel Consumption by Type for FY 2005 to FY 2023

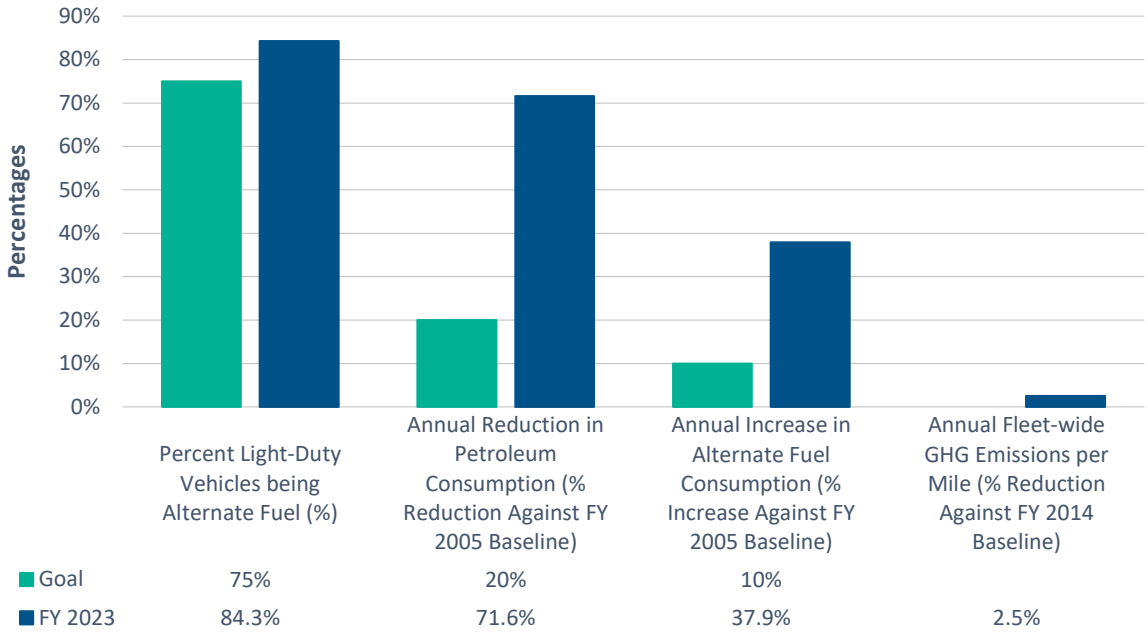

Figure 2-4 SRS Performance in Meeting Fleet Management and Transportation Goals for FY 2023

Each year, SRS emphasizes leasing alternative fuel vehicles in the light-duty fleet. At the end of FY 2023, Savannah River Nuclear Solutions (SRNS) managed an inventory of 964 vehicles for itself, DOE, and Savannah River Mission Completion (SRMC). In this fleet, 813 (84.3%) were either E-85, hybrid, or electric, which accounted for the reduction in petroleum consumption. In FY 2023, SRS continued

working on developing the infrastructure to support transition of the light-duty fleet to electric vehicles (EVs). SRS has 24 charging ports in service at 3 strategically placed charging locations constructed across the Site.

2.3.8 Acquisition and Procurement

The Sustainability Dashboard and SSP track 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 line descriptions of eligible contract actions on purchase orders to determine whether the product meets the definition of BioPreferred.
- Products that maximize substituting alternatives to ozone-depleting substances the EPA's Significant New Alternatives Policy (SNAP) identifies
- 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 product (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).

In FY 2023, SRS Procurement increased its purchase of biobased products by 17%, from $4.2 million in FY 2022 to $4.9 million in FY 2023. In addition to responsible purchasing, SRS made a concerted effort in FY 2023 to repurpose and reuse equipment. Recognizing supply chain issues, SRS was able to reuse six pole-mount transformers for various projects around the Site. SRS also isolated two river water surge tanks to be earmarked for repurposing through a third-party agency. In FY 2023, SRNS reviewed its supply chain processes. SRNS will continue to conduct mission-critical supply chain vulnerability assessments. The assessments are incorporated into the procurement process, reducing risk, while continuing to support sustainability efforts.

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 and to 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 2023, 80.3% of eligible electronics procurements were EPEAT products, thereby falling short of the FY 2023 interim target of 95%. Of the 13,841 electronic acquisitions 11,121 met EPEAT standards, and the remaining 2,720 were ENERGY STAR-compliant. This was due primarily to supply chain shortages. However, the Site did receive the 2023 EPEAT Purchaser Award in five categories.

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 2023, 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 time frame for replacing a computer from three to five years has significantly reduced the number of computers being retired and the amount of scrap electronics generated.

2.3.10 Data Center Efficiency

The Sustainability Dashboard tracks data center efficiency goals and metrics. SRS's goal is 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 Adaptation and 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 Savannah River National Laboratory (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 and 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. Throughout this process, SRS identifies and tracks climate-related vulnerabilities and solutions for implementation. The FY 2023 review identified additional resilient solutions, which were added to the Sustainability Dashboard.

SRS supports 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 (GHG)

SRS has the goal to track and report on GHG emissions. The Sustainability Dashboard and the SSP track direct (Scope 1 and 2) GHG metrics, indirect (Scope 3) GHG metrics, and fugitive emissions from refrigerants. By the end of FY 2023, SRS reduced direct emissions by 54.4% relative to the FY 2008 baseline, thereby meeting the interim goal of 45% reduction. Scope 1 GHG emissions consist of direct emissions from sources that SRS owns or controls, including onsite combustion of fossil fuels and fleet fuel consumption. Scope 2 GHG emissions consist of 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

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, for instance, Site energy use, alternative workplace arrangements and space optimization, and vehicle and equipment use.

The Biomass Cogeneration Facility is One of the Facilities that Generate Power Onsite.

By the end of FY 2023, SRS reduced indirect emissions by 90.7% 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 in part by 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 2023 Awards and Recognitions

The Global Electronics Council recognized SRS at a virtual ceremony in July 2023 for its efforts in procuring sustainable technology. SRS received the EPEAT Purchaser Award in five electronics categories. 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 Environmental Justice (EJ)

SRS is committed to continuing to support programs and activities to secure EJ for disadvantaged communities that have been historically marginalized and overburdened by climate-related impacts. The threshold for identifying disadvantaged communities uses parameters the NEPA process establishes. Past NEPA evaluations and analyses for EJ have identified SRS's disadvantaged communities within 50 miles of the center of SRS. The population distributions of the potentially affected areas were calculated using data at the block-group level of spatial resolution from U.S. Census Bureau population estimates to be consistent with human health analysis. The identified disadvantaged communities include Burke, Columbia, Emanual, Jefferson, Jenkins, McDuffie, Richmond, and Screven counties in Georgia and Allendale, Aiken, Bamberg, Barnwell, Calhoun, Colleton, Edgefield, Hampton, Jasper, Lexington, Orangeburg, and Saluda counties in South Carolina.

SRS provides opportunities for community engagement and decision making through information sharing and empowering the disadvantaged 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.

2.4.2.1 Educational Opportunities

DOE-SR partners with SRNS's Education Outreach Programs (EOPs) to provide a variety of science and literacy outreach programs that focus on enhancing interest in Science, Technology, Engineering and Mathematics (STEM) and to support improvements in education in the Central Savannah River Area (CSRA) service area by using the unique resources available at the Site.

Additionally, SRNS's EOPs provide employees the opportunity to support the education community through volunteering. These initiatives help build programs and partnerships with regional educational institutions that encourage a diverse mix of students to pursue careers in STEM disciplines. Through these efforts, the intent is to create a local pool of job candidates with the necessary core competencies to support future missions at SRS and other regional industries.

Typically, EOPs reach students and teachers in an eight-county area within the CSRA through a variety of programs and events mostly aimed at a diverse population of students and teachers. The service area includes Aiken, Allendale, Bamberg, Barnwell, Edgefield, and Orangeburg counties in South Carolina and Columbia and Richmond counties in Georgia. In 2023, EOPs reached CSRA students through the various outreach programs intended to expand educational achievement. The following are some of the educational programs offered in 2023:

- The **SC Regional Future City Competition** returned to an in-person event on January 21 for the first time since COVID-19 restrictions. This middle school competition introduces students to the various fields of engineering through a hands-on challenge to create a city of the future. Using the engineering design process, students submit a project plan, build a model, write an essay, and present to judges. In 2023, nine teams competed, impacting 27 students and 9 educators. One hundred and thirty volunteers supported the event by judging competition deliverables and through special awards. The South Carolina Regional Future City Competition is sponsored and coordinated by SRNS EOPs, in partnership with the Ruth Patrick Science Education Center (RPSEC) and with support of professional engineering societies. McCracken Middle School's team, "New Eden," from Spartanburg, South Carolina, won the regional competition and represented South Carolina at the International City Finals in Washington, DC.
- Education Outreach coordinated the 33rd annual **Savannah River Regional Science Bowl** in-person competition on February 11. Many of the country's future scientists and engineers participated in a timed competition of fast-paced questions and answers covering a range of academic disciplines in science and math. This year's winning team Lakeside High School-Team 1, from Evans, Georgia, earned the right to compete nationally in late April. Students not

in the double-elimination matches participated in a *Brain Teaser* activity sponsored by SRNS and the American Chemical Society. The Science Bowl impacted 90 students and 19 educators. SRS is one of only three DOE sites that have participated since inception.

- The **CSRA Regional Science and Engineering Fair** was held on March 11, with 89 students and 42 volunteers attending the event. Local first place school winners with exemplary projects in inquiry-based learning attended the regional level to showcase their efforts and compete for science and math awards. The first place overall school winner, from Lakeside High School, competed at the Regeneron International Science and Engineering Fair in May.
- The **SRNS Innovative Teaching Mini Grants Program** is a competitive program that recognizes and celebrates innovative teaching methods by providing funds to enhance elementary, middle, and high school classroom instruction. SRNS funded grants of $500, $750, and $1,000 to purchase STEM equipment, materials, and supplies for the classroom for educators in Aiken, Allendale, Bamberg, Barnwell, Edgefield, and Orangeburg counties in South Carolina and Columbia and Richmond counties in Georgia. In 2023, SRNS increased funding from $50,000 to $75,000, and, for the first time, high school educators were eligible to apply, expanding a continuum of support for kindergarten through 12th grade. Awarded grants impacted 18,635 students and 114 educators. Forty-one volunteer SRS judges supported the program.
- The **Science and Technology Enrichment Program (STEP)** is a cooperative effort between SRNS and RPSEC environmental science field trips for teachers and students. STEP lessons correlate with academic standards for 3rd through 12th grade students and utilize real-world investigations that focus on responsible environmental stewardship. Educators have two styles of field trip options: traditional in-person, which utilizes outdoor settings at SRS; or virtual, which brings SRS resources to the student. Educators may select the programs that best correlate with their grade and state standards as identified on the RPSEC website. In-person field trips impacted 372 students and 50 educators. Virtual field trips impacted 5,892 students and 27 educators.
- The SRS STEM **Job Shadow Program** is a company best practice that fosters students developing career literacy before making a career choice. Participants engage in career exploration in STEM fields and critical skill needs at SRS. At the present time, the program is offered to high school students who are 16 years or older and college students. The Job Shadow Program provides an opportunity to observe the work environment and occupational skills in practice. The students spend a day, or specified time, with an employee or workplace host to gain insight and exposure to real-world work. In 2023, job shadowing impacted 24 students and the numerous volunteers who supported it.
- SRNS EOPs partnered with Augusta University, Savannah River Site Community Reuse Organization (SRSCRO), and Richmond County Schools for the 2023 SRNS Workforce Opportunities in Regional Careers (WORC) **WORCshop** at Augusta University. SRS volunteers mentored classes at A.R. Johnson Health Science and Engineering Magnet School in Richmond County, Georgia, to bring real-world application to teaching standards. Classroom projects were showcased at a final WORCshop event on December 9. This event was open to the public,

allowing community involvement in STEM-related SRS career events. This event included 142 students with 8 mentors and 8 educators.

- The **Traveling Science Program** is a partnership between SRNS and the RPSEC at the University of South Carolina Aiken. Through this program, STEM professionals from the Site interact with students and educators, offering hands-on learning and career discussions that shape the workforce. This also includes mentor support through programs such as the SRNS WORCshop. The partnership impacted 3,133 students and 68 educators in 2023.
- The SRS event **Introduce a Girl to Engineering–STEM Like a Girl,** organized and managed for the first time since COVID-19 restrictions, was held in October at the RPSEC as part of Nuclear Science Week. The event encouraged 64 eighth-grade girls from middle schools in the CSRA service area to pursue STEM career fields, such as engineering or information technology (IT). Forty-seven SRS female STEM volunteers interacted with the girls, mentoring them through six different activities: *Robotics, Building Contest, Protect the Pringle,* the planetarium show *"Dream Big," Graphite Circuits,* and *Animate Your Name.* The day ended with a discussion on the connection between art and engineering and a career question and answer session. Follow-up surveys indicated a positive impact, with most girls expressing a new interest in pursuing STEM career fields as a result of the activities.
- **Student and Educator Career Tours, Fairs, and Expos** in 2023 worked with public school districts, local colleges and universities, Aiken Works, the Lower Savannah Workforce Development Area, and the South Carolina Department of Commerce. Several high school events focused solely on students from the low country counties of the service area. Fairs and expos targeted primarily high school students, informing them of critical skill careers at SRS and providing valuable information on internships and apprenticeships. During multiple events, 2,140 students and 81 educators were impacted.
  - The Aiken County Career & Technology Center career tour had students from the Emergency and Fire Management Program tour SRS to observe a drill organized by the SRS Fire Department. This event partnered SRNS EOPs with the Apprenticeship School. The drill involved a simulated injury on the second level of a Site structure. SRNS has "adopted" programs at the Aiken County Career & Technology Center in emergency and fire management and IT, offering this unique experience to encourage students to pursue their interest in such careers. These efforts support the SRNS goal to build a workforce for SRS and surrounding communities.
  - Additional visits as part of National Science Week were made to Aiken Technical College; Augusta Technical College; Barnwell Career Center; Aiken Career & Technology Center; and an educator tour for South Carolina teachers from Aiken, Allendale, Bamberg, Barnwell, and Edgefield counties. Tours included discussions with subject matter experts from various critical skill areas, which allowed students and educators to explore the wide variety of nuclear career opportunities found at SRS. Opportunities, such as these held in 2023, bring real-world experience and a clear path from the classroom to the workforce.

- SRNS EOPs coordinated the **2023 CSRA College Night** at the James Brown Arena in Augusta. DOE-SR, SRNS, SRP Federal Credit Union, Probe, South Carolina Society of Professional Engineers-Midlands Chapter, iHeart Media, Centerra-Savannah River, and Bridgestone sponsored the event. More than 3,000 students, parents, and members of the community had the opportunity to meet with representatives from more than 115 colleges and universities, professional societies, and 4 branches of the military. Career Lane, an education consultant, offered discussions on workforce opportunities from DOE and SRS contractors. SRS contractor and federal agencies included DOE, SRNS Engineering, SRNS IT, SRNS Savannah River Plutonium Processing Facility, SRNS Fire and Emergency Management Services, SRNL, Centerra, and the USDA's Forest Service (USFS-SR). Seminars on financial aid in South Carolina and Georgia, SRS apprenticeships, and financial literacy were offered to students and parents to ensure success following high school. Fifteen seniors were awarded $1,000 scholarships in random drawings for them to apply to higher education goals. To date, more than $215,000 in scholarships has been awarded, and more than 103,000 residents have attended the recruiting fair since its start 30 years ago.

2.4.2.2 Workforce Development

SRS engages the local workforce to create a capable workforce through funding, outreach programs, and hands-on training. 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 surrounding communities affected by Site operations. The following are some of the programs in 2023 related to workforce development:

- SRNS partners 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.
- Local universities and colleges partnered with DOE and SRS are educating the workforce on DOE-Environmental Management (DOE-EM) and National Nuclear Security Administration (NNSA) missions. The WORC Grants discussed above also fund this mission and partner with various local colleges to ensure its success. WORC I academic partners are Aiken Technical College, University of South Carolina Aiken, University of South Carolina Salkehatchie, Augusta Technical College, and Augusta University. WORC II academic partners are Aiken Technical College, Augusta Technical College, Augusta University, Claflin University, University of South Carolina Aiken, and University of South Carolina Salkehatchie.
- Internships offered at the SRS 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, creating a conduit for transitioning from internships to jobs at SRS. Additionally, the internship program educates students on historical and current operation missions at SRS and provides opportunities for students to network and volunteer in the community. In 2023, SRNS hosted its first Intern Signing Day, providing many interns with full-service contingent offers.
- The apprenticeship program, partnered with Apprenticeship Carolina and the Lower Savannah Council of Governments, is developing a viable workforce in the counties neighboring SRS. The

program provides apprentices paid on-the-job experience as they pursue a technical education. Unlike internships, apprenticeships promote and document knowledge transfer and provide participants with proof of skill mastery as portable U.S. Department of Labor credentials. The program also consists of youth- and collegiate-levels, which provide an important avenue into employment for students who are facing social, educational, and economic barriers.

- SRS attended local technical schools, university, and veteran outreach recruiting events, specifically ensuring representation in South Carolina low country counties (Barnwell, Allendale, Denmark, Bamberg, and Orangeburg).
- SRS hosted a low country region recruiting event in Blackville, South Carolina, for radiological protection and control, maintenance, and production operators. Additionally, in-person recruiting events for IT, engineering, and project controls, resulted in successful hires in critical skill areas.
- SRS increased its number of memoranda of understanding to support SRS workforce development needs and missions that bridge the gap between academic study and professional practice. SRNS now has agreements with 13 different educational institutes, 9 of which are Historically Black Colleges and Universities (HBCUs)
- In support of pipeline development efforts by assisting NNSA with the Higher Education Workforce Development funding initiative, SRS facilitated the award of $5.9 million in funding through collaboration with local HBCUs.

2.4.2.3 Community Advocacy and Outreach

SRS engages the community by working with advocacy groups, updating the community on current operations, and providing resources and materials. SRNS continues to support community outreach initiatives to foster a climate of trust and partnership with diverse stakeholders on a variety of community- and SRS-related issues. Through direct corporate sponsorship and responding to community and regional needs, SRNS and its employees are active leaders in community service. SRS has a significant economic development impact across the region, and the company supports local colleges and schools, nonprofits, and many other worthwhile causes in both Georgia and South Carolina.

Since 2008, SRNS and its parent companies—Fluor and Huntington Ingalls Industries—have contributed more than $13 million to the CSRA service area in corporate philanthropic charitable causes; education outreach investments in kindergarten through 12th grade schools and regional two- and four-year colleges and universities; and economic development and community partnerships. More than 50 SRNS employees serve in leadership roles in nonprofit, education, and economic development organizations in both South Carolina and Georgia. Specifically, employees are volunteer leaders and top contributors to the United Way, the American Heart Association's regional Heart Walk, and the Marine Corps Reserve Toys for Tots and Salvation Army Angel Tree holiday campaigns in South Carolina and Georgia.

These and other programs provide individuals in the community with 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 advice, information, and recommendations to DOE 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. It also assists new and expanding businesses and industries through its programs. SRSCRO has several grants from 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 an additional grant to boost 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 the workforce that changed the face of nearby counties and helped the United States during the Cold War. Guests to the Site will also learn about current and future DOE-EM 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.
- SRNS 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.

2.4.3 Earth Day

For 2023, 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 Environmental Management System program. Earth Day booths were available during the SRS 2023 Safety Exposition.

The SRNS booths represented Environmental Compliance, Environmental Monitoring, Site Services, Strategic Planning, and Supply Chain Management. SRNS Environmental Compliance presented information on recycling and waste minimization and introduced individuals to the Environmental Compliance Authorities at each facility. The group also conducted a haiku and photography contest for Site employees to encourage engagement in 2023 Earth Day. Environmental Monitoring displayed an electrofishing boat to demonstrate how sampling is done on fish and discussed surveillance monitoring around SRS. Site Services displayed one of the first electric vehicles (EVs) to arrive at SRS. Supply Chain Management presented on how attendees could purchase sustainably at home and reduce their carbon footprint.

Outside organizations with booths included the South Carolina Department of Health and Environmental Control (SCDHEC) State Office and the SCDHEC Aiken County Office, which discussed local environmental concerns. The Aiken Beekeepers also participated and presented on the importance of pollinators and protecting the environment.

Additionally, SRS senior leadership presented Site EVs at the Earth Day event held in Aiken for members of the community.

2.4.4 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, in addition to coordinating the WORC grants discussed above, takes in items that the Site no longer needs through the Asset Transition Program and Asset Removal Projects. In its 30th year, the organization, sells these items and uses the proceeds for the economic good of numerous businesses throughout the large region surrounding SRS. SRSCRO helps technology-based startups, business expansion, and new ventures across the Aiken, Allendale, and Barnwell

counties in South Carolina and Columbia and Richmond counties in Georgia. The program has had an estimated savings from the SRS asset transition program (since 2013) of $12 million.

SRS utilizes the Federal Prison Industries, Inc. (UNICOR) services to recycle electronics. UNICOR operates electronics recycling centers that 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% (136,511 pounds) of SRS scrap electronics for recycling in FY 2023.

The Site Excess Operations team arranged for the reuse or disposal of nearly $11 million in government assets (equipment and supplies) in FY 2023. Excess equipment is reused by SRS workers, offsite state and federal government agencies, and community organizations and programs, such as SRSCRO and the Laboratory Equipment Donation Program, which donates surplus and available used laboratory equipment to college and universities for educational programs.

2.4.5 Sustainable 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 needs to be managed as waste.

In 2023, 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

In both examples, using these *in-situ* remediation systems utilizes the natural flow of the groundwater plume. 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 be reinjected into the subsurface, and the iron by design is effective for decades with little maintenance.

Zero-Valent Iron Filings Undergo Preparation Before Being Injected into Wells during the P-Area Reactive Barrier Installation.

Additionally, the Lower Three Runs (LTR) project was the first stream system at SRS to reach a final remediation decision. The remedial decision 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 more than 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 contaminated sediments would have exceeded $1 billion. With regulator approval, 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 only a small excavation in one of the canals within the LTR system that is easily accessible. In FY 2023, the accelerated remediation was completed by removing cesium-137 contaminated sediments from a discharge canal and installing all Land Use Controls signage.

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 remediation, improve worker safety, and increase productivity, but they also decrease vehicle and fuel use, thereby supporting fleet management goals.

2.4.6 Innovative Environmental Compliance

SRS continues to deploy innovative methods to address compliance efforts. From 2019 to 2023, Environmental Compliance implemented a commercially available Comprehensive Environmental Permits Linking Tool (CEPLT) to track regulatory and DOE commitments. During the initial search for a CEPLT, SRS established implementing objectives that were central to developing the CEPLT's scope and requirements. To qualify as SRS's CEPLT, the linking tool must 1) be a unifying tool for environmental permit management and compliance, 2) be able to map Site permits to their governed locations and regulatory requirements, and 3) be capable of being implemented sitewide to include all Site tenants. After a comparison of a few off-the-shelf products, the Site determined that Benchmark ESG I Gensuite (Benchmark) would be utilized as SRS CEPLT.

SRS utilizes three web application tools from Benchmark:

- Compliance Calendar—This allows SRS users to create and track regulatory commitments (tasks) that can be assigned to an SRS Benchmark user.
- Permit Manager—This organizes permits, regulations, and other environmental requirement documents (for example, consent orders, DOE Orders) and links to Compliance Calendar.
- Mapper (custom built application)—This provides Geographic Information System-capability for mapping Permit Manager and Compliance Calendar data to associated Site locations (compliance points).

In 2019, during the implementation of Phase I, SRS integrated one of multiple site tenants (SRNS) in Benchmark by creating Compliance Calendar tasks; identifying, uploading, and linking Compliance Points to Compliance Calendar tasks; and adding SRS's regulatory documents into Permit Manager. For 2020-

2023, during the implementation of Phase II, III, and IV, SRS integrated remaining Site tenants into Benchmark. This included DOE (Environmental Compliance and Protection Division [ECPD]), SRNL (BSRA), Area Completion Projects (Federal Facility Agreement), Liquid Waste Operator Contractor (SRMC), Savannah River Tritium Enterprises (SRTE), United States Forest Service-Savannah River (USFS-SR), SREL, AMERESCO Biomass Cogeneration Facility, NNSA Capital Projects, and Security Operations (Centerra). Additionally, several air-, water-, and waste-related permits were linked to specific permit requirements and conditions using Permit Manager and Compliance Calendar. Using Benchmark increases accountability and awareness of regulatory and DOE Order commitments and helps improve environmental compliance.

In FY 2023, CEPLT allowed all Compliance Calendar task metric reporting to be tracked, completed, and supplied to DOE-SR ECPD on or ahead of schedule.

2.4.7 Challenges and Barriers to Implementation

In 2023, SRS continued to conserve and manage resources to meet the sustainability goals in the Sustainability Dashboard and SSP. However, infrastructure continually presents challenges, such as sustainable buildings that meet the Guiding Principles, 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 energy intensity, when possible, in maintenance and repair situations through actions including replacing fluorescent lighting with a more energy-efficient LED lighting, replacing HVAC systems with higher Seasonal Energy Efficiency Ratio units, and right-sizing pumps. Retrofitting entire buildings or systems is not typically cost effective. Likewise, 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. Additionally, affordable landfill disposal of construction and demolition waste and supply chain problems for electronic acquisitions will continue to pose a reasonable challenge in the future.

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, the EPA's SNAP program, and others). SRS continues to determine and implement ways to increase end-user awareness of sustainable acquisitions.

SRS identified the following programmatic opportunities for improvement 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 who are more aware and well-informed of ISO 14001:2015 programmatic requirements

SRS continued to make progress on these opportunities for improvement in 2023 by formalizing the integration of EMS principles and promoting awareness across the Site. This was done through the following mechanisms:

- Providing EMS awareness training course
- Utilizing a stringent template to determine significant environmental aspects
- Collaborating routinely with sustainability personnel on Site sustainability initiatives
- Integrating sustainability into EMS through continual initiatives.