SALT WASTE PROCESSING FACILITY PROJECT

ENVIRONMENTAL PLAN

DELIVERABLE: 7.3

Contract No. DE-AC09-02SR22210
Phase II

Function: Environmental Compliance
Doc. No.: S-EIP-J-00001
Revision: 2
Date: 11/26/2007

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SUMMARY OF CHANGES

Revision No.	Date	Description of Change
Q-CRT-J-0050: Phase I (Conceptual Design)		
A	11/25/02	Issued for Internal Distribution and Submittal to DOE for Consideration
B	01/10/03	Revisions
0	02/26/03	Revisions
0A	09/12/03	Revised/updated based on DOE guidance on the Optimal-Scale for the SWPF
1	09/19/03	Incorporation of DOE comments
S-EIP-J-00001: Phase II		
A1	10/27/04	Intradiscipline Check
A2	11/03/04	Interdiscipline Review
B	11/24/04	Issued for DOE Formal Review
0	01/11/05	Issued for DOE Approval
0A1	04/03/06	Intradiscipline Check
0A2	04/03/06	Interdiscipline Review
0B	04/26/06	Issued for DOE Formal Review
1	06/21/06	Issued for DOE Approval
1A1	10/02/07	Issued for Intradiscipline Check
1A2	10/02/07	Issued for Interdiscipline Review
1B	10/25/07	Issued for DOE Formal Review
2	11/26/07	Issued for DOE Approval

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LIST OF ACRONYMS AND ABBREVIATIONS

%	Percent
°F	Degrees Fahrenheit
AB	Authorization Basis
AFF	Alpha Finishing Facility
AFP	Alpha Finishing Process
ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
ASER	Annual Site Environmental Report
ASP	Alpha Strike Process
C&D	Construction and Debris
CCA	Cold Chemicals Area
CD	Critical Decision
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFF	Cross-flow Filter
CFR	Code of Federal Regulations
CO	Carbon Monoxide
Cs	Cesium
CSS	Clarified Salt Solution
CSSX	Caustic-side Solvent Extraction
CSWTF	Central Sanitary Wastewater Treatment Facility
CWA	Clean Water Act
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DSS	Decontaminated Salt Solution
DWPF	Defense Waste Processing Facility
EDE	Effective Dose Equivalent
EFD	Enhanced Final Design
EPA	U.S. Environmental Protection Agency
EPC	Engineering, Procurement, and Construction (Contractor)
EPCRA	Emergency Planning and Community Right-to-Know Act
EPD	Enhanced Preliminary Design
ERP	Exemption Request Package
ES&H	Environmental, Safety, and Health
ESH&Q	Environmental, Safety, Health, and Quality
ETF	Effluent Treatment Facility
FEC	Facility Emergency Coordinator
ft^3	Cubic feet
$H_2C_2O_4$	Oxalic Acid
HazMat	Hazardous Material
HEPA	High-Efficiency Particulate Air
Hg	Mercury
HNO_3	Nitric Acid

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

HPS	Health Physics Society
hr	Hour
HW	Hazardous Waste
ICD	Interface Control Document
IWWF	Industrial Wastewater Facility
lb	Pound
LLW	Low-level waste
LRW	Liquid Radioactive Waste
M	Molar
M&O	Management and Operating (Contractor)
Mgal	Million gallons
MH	Manhole
mm	Millimeter
MOI	Maximally Exposed Offsite Individual
mRem	Millirem
MSDS	Material Safety Data Sheet
MST	Monosodium Titanate
MW	Mixed Waste
Na	Sodium
NaOH	Sodium Hydroxide (Caustic)
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	Nitrogen dioxide
NOI	Notice of Intent
NO_x	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
P.E.	Professional Engineer
P2	Pollution Prevention
PBVS	Process Building Ventilation System
PER	Preliminary Engineering Report
PIC	Potential Impact Category
PMVS	Pulse Mixer Ventilation System
PP	Project Procedure
PVVS	Process Vessel Ventilation System
RCRA	Resource Conservation and Recovery Act
RICE	Reciprocating internal combustion engines
ROD	Record of Decision
RQ	Reportable Quantity
SARA	Superfund Amendments and Reauthorization Act
SCDHEC	South Carolina Department of Health and Environmental Control
SCR	South Carolina Regulation

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

SDF	Saltstone Disposal Facility
SEPC	Site Environmental Protection Coordinator
SMSCP	Stormwater Management and Sediment Control Plan
SO_X	Sulfur oxides
SPCC	Spill Prevention, Control, and Countermeasures
SPF	Saltstone Production Facility
Sr	Strontium
SRS	Savannah River Site
SRSOC	Savannah River Site Operations Center
SW	Solid Waste
SWPF	Salt Waste Processing Facility
SWPPP	Stormwater Pollution Prevention Plan
TEDE	Total Effective Dose Equivalent
TOA	Tri-n-octylamine
TPQ	Threshold Planning Quantity
tpy	Tons per year
TRML	Three Rivers Municipal Landfill
TRU	Transuranic Waste
TSDF	Treatment, Storage, or Disposal Facility
UAP	Utilities Acceptance Permit
VOC	Volatile Organic Compound
WAC	Waste Acceptance Criteria
WMP	Waste Management Plan
WSRC	Westinghouse Savannah River Company
WTL	Waste Transfer Line
yr	Year

1.0 INTRODUCTION

Nuclear material production operations at the U.S. Department of Energy (DOE) Savannah River Site (SRS) resulted in the generation of salt waste that was sent to the F- and H-Area Tank Farms for storage. Approximately 37 million gallons (Mgal) of salt waste are currently being stored on an interim basis in 49 existing underground waste storage tanks in the F- and H-Area Tank Farms. The salt waste in these tanks includes approximately 3 Mgal of sludge containing precipitated solids and insoluble waste and 34 Mgal of salt solution and crystallized salts. The function of Salt Waste Processing Facility (SWPF) is to extract and concentrate the radioactive constituents of the salt waste solution and crystallized salts.

The SRS Washington Savannah River Company (WSRC)-TR-94-0608 (*Savannah River Site Approved Site Treatment Plan, 2005 Annual Update*[1]) and WSRC-OS-94-92 (*Federal Facility Agreement for the Savannah River Site*[2]) require that DOE remove the liquid radioactive waste (LRW) from the noncompliant tanks in the F- and H-Area The high-level waste portion of these liquid wastes is immobilized in glass by a process called vitrification. The vitrification process is carried out at the Defense Waste Processing Facility (DWPF) and vitrified waste will ultimately be transported to the national nuclear waste repository. A primary function of the SWPF is to reduce the volume of vitrified waste. This will be accomplished by separating the non-radioactive salts for disposal as grout produced at the Saltstone Production Facility (SPF) and disposed at the Saltstone Disposal Facility (SDF). Perfect separation between the radioactive and non-radioactive waste components is not practicable; however, the salt solution must be decontaminated sufficiently to meet the SDF Waste Acceptance Criteria (WAC), which are listed in the Engineering, Procurement, and Construction (EPC) Contractor's SWPF Contract (DE-AC09-02SR22210: *Design, Construction, and Commissioning of a Salt Waste Processing Facility [SWPF]*[3]).

The SWPF is being designed and built to remove and concentrate the major radioactive constituents of the salt waste. DOE/EIS-0082-S2 (*Savannah River Site Salt Processing Alternatives Final Supplemental Environmental Impact Statement*[4]) and associated *Record of Decision: Savannah River Site Salt Processing Alternatives*[5] (ROD) and Amended *ROD*[6] document DOE's analysis and selection of the technologies currently being integrated into SWPF design. The preferred technologies selected in the *ROD* included the monosodium titanate (MST)-based Alpha Strike Process (ASP) for removal of actinides and strontium (Sr) and Caustic-side Solvent Extraction (CSSX) for the removal of cesium (Cs).

Tank Farm salt waste feed is first treated by ASP at the SWPF. The ASP uses MST to sorb actinides and ^{90}Sr in a process vessel. The resulting MST and other suspended solids in the salt waste feed are then dewatered and concentrated by filtration. The concentrated MST/sludge is washed to reduce the sodium (Na) concentration and is then transferred to the DWPF. The filtered or clarified salt solution (CSS) is then treated by the CSSX process to remove ^{137}Cs.

The CSSX treatment process removes Cs by using an engineered solvent[A] designed specifically to extract Cs from caustic aqueous solutions (e.g., CSS). The solvent and CSS are mixed together and then separated in a series of extraction contactors. The Cs-laden organic (solvent) outlet is then mixed with a low-flow dilute nitric acid (HNO_3) stream in a series of stripping contactors. The Cs is released to the HNO_3 stream (referred to as "strip effluent") and the solvent is returned to the extraction stage for reuse.

The Cs-depleted salt solution from the extraction contactors is sampled and analyzed to verify that the ASP has removed enough Sr and actinides to allow final treatment and disposal at the SPF. If the Sr and actinide concentrations are below the Saltstone WAC limits, the salt solution is transferred directly to the SPF. If the Sr and/or actinide concentrations are above limits, the salt solution will be treated by the Alpha Finishing Process (AFP), where a second MST addition and filtration step is performed. At the end of the AFP, the bulk salt solution will again be sampled and analyzed to verify that the Saltstone WAC limits have been met. If the decontaminated salt solution (DSS) meets the Saltstone WAC limits, it will be transferred to the SPF.

MST/sludge from the AFP is washed and transferred to the DWPF, together with MST/sludge from the ASP. The strip effluent from the CSSX process is also transferred to the DWPF.

The SWPF processing operations will be authorized under an Industrial Wastewater Facility (IWWF) permit issued by the South Carolina Department of Health and Environmental Control (SCDHEC). Because the levels of radionuclide emissions and volatile organic compounds (VOCs), criteria pollutants, and toxic air pollutants are below regulatory thresholds, the SWPF will be exempt from the requirement to obtain a Permit to Construct contained in 40 Code of Federal Regulations (CFR) 61, Subpart H (*National Emission Standards for Radionuclides Other Than Radon from Department of Energy Facilities*[7]) and South Carolina Regulation (SCR) 61-62.5 (*Air Pollution Control Standards*[8]). Stormwater discharges will be regulated under SCR000000 (*NPDES General Permit for Storm Water Discharges Associated with Industrial Activity [except construction activity]*[9]). Sanitary waste collection will be authorized under a Permit to Construct, pursuant to SCR 61-67 (*South Carolina Standards for Wastewater Facility Permitting*[10]).

Interface requirements that govern waste transfers between the SWPF and the Site Management and Operating (M&O) Contractor facilities are contained in V-ESR-J-00003 (*SWPF Radioactive Solid Waste, Mixed Waste, and Hazardous Waste Interface Control Document [ICD-03]*[11]) and V-ESR-J-00005 (*SWPF Radioactive Liquid Effluents Interface Control Document [ICD-05]*[12]), V-ESR-J-00010 (*SWPF Waste Transfer Interface Control Document [ICD-10]*[13]), and V-ESR-J-00021 (*SWPF Non-Radioactive Solid Waste Interface Control Document [ICD-21]*[14]).

[A] Solvent, as used in this document, means an organic solution comprising Isopar®L diluent, with extractant (BOBCalixC6), a modifier (Cs-7SB), and a suppressant (tri-n-octylamine). See Section 5.1 of this document for further description of the solvent and its components.

2.0 PURPOSE AND SCOPE OF THE ENVIRONMENTAL PLAN

This Environmental Plan defines the EPC's approach for environmental protection, compliance, permitting, environmental monitoring, and reporting during each life-cycle phase of the SWPF Project.

2.1 Purpose

This Environmental Plan defines the EPC's approach to establishing an Environmental Protection Program for the SWPF. During SWPF Design, Construction, Commissioning, and Operations, the EPC will submit plans and permit applications to DOE for review and comment and to the Site M&O and SCDHEC for approval, as detailed in this document.

2.2 Scope

The Environmental Plan describes the EPC's approach for implementing selected permitting and other regulatory requirements in accordance with the requirements of Section (g)(1) of Standard 7 of the EPC Contract (DE-AC09-02SR22210[3]). It identifies applicable environmental regulations and describes selected strategies for acquiring permits and other approvals needed for the Project. The Plan will be used to support the life-cycle operations of the Facility from Conceptual Design through Hot Commissioning and Hot Operations.

General scheduling information is provided within each Plan section that describes proposed activities, activity durations, and logic for implementing selected permitting requirements and regulatory requirements. The permitting and compliance schedules have been integrated into the overall Project schedule baseline.

Environmental media covered by this plan include water, air, and soil. The EPC has evaluated all potential release pathways that could adversely impact the environment and the public, and identified applicable requirements for controlling risks associated with these releases. These requirements were derived from the U.S. Environmental Protection Agency (EPA), SCDHEC, U.S. Department of Transportation (DOT), and DOE directives and regulations.

2.2.1 Basis

This Environmental Plan establishes the approach and schedules for meeting South Carolina and Federal environmental regulatory requirements applicable to the SWPF Design, Construction, Commissioning, and Operations. These regulations form the basis of this Plan. Determination of which regulations apply and the necessary compliance activities derive from fundamental information about the SWPF.

2.3 Document Control

Throughout the Design, Construction, Commissioning, and Operations phases of the SWPF, environmental information will be continuously developed and refined. The EPC will review and update this Environmental Plan at least annually, whenever significant changes to the permitting schedules warrant, and whenever a Critical Decision (CD) point milestone (CD-1

through -4) is completed. The Environmental Plan is subject to the Document Control process, as defined in the EPC's Project Procedure (PP)-DC-3001 ("Document Control"[15]). When it is necessary to revise the Environmental Plan, the EPC will comply with requirements of that PP.

3.0 APPROACH TO ENVIRONMENTAL MANAGEMENT

This section states the EPC's policy on environmental protection and establishes environmental protection and compliance goals and objectives. The EPC's approach to reducing threats to the environment is briefly outlined in this section and more fully developed in the following sections of this document. Finally, this section describes roles and responsibilities for implementing the Environmental Plan. This includes interfaces among the EPC, DOE, Site M&O, and State and Federal regulators.

3.1 EPC Policy on Environmental Protection

The EPC for the SWPF is committed to designing, constructing, commissioning, and operating the SWPF in a manner that protects the environment, workers, and the public and has documented that commitment by signature of senior managers on the *SWPF Environmental Management System Policy* (P-CRT-J-0101[16]). Additionally, the SWPF is a co-signer, along with DOE-Savannah River and all other SRS contractors for the *Savannah River Site [SRS] Environmental Management System Policy*[17].

3.2 Goals and Objective

The key objective of the EPC's environmental protection program is to design, construct, commission, and operate the SWPF such that releases of hazardous effluents and emissions to the environment are maintained within design and permit limits and maintained as low as reasonably achievable (ALARA). This objective includes minimizing planned releases through design features and process controls and protecting against inadvertent releases of hazardous materials (HazMat) to the environment by providing successive physical barriers for containment.

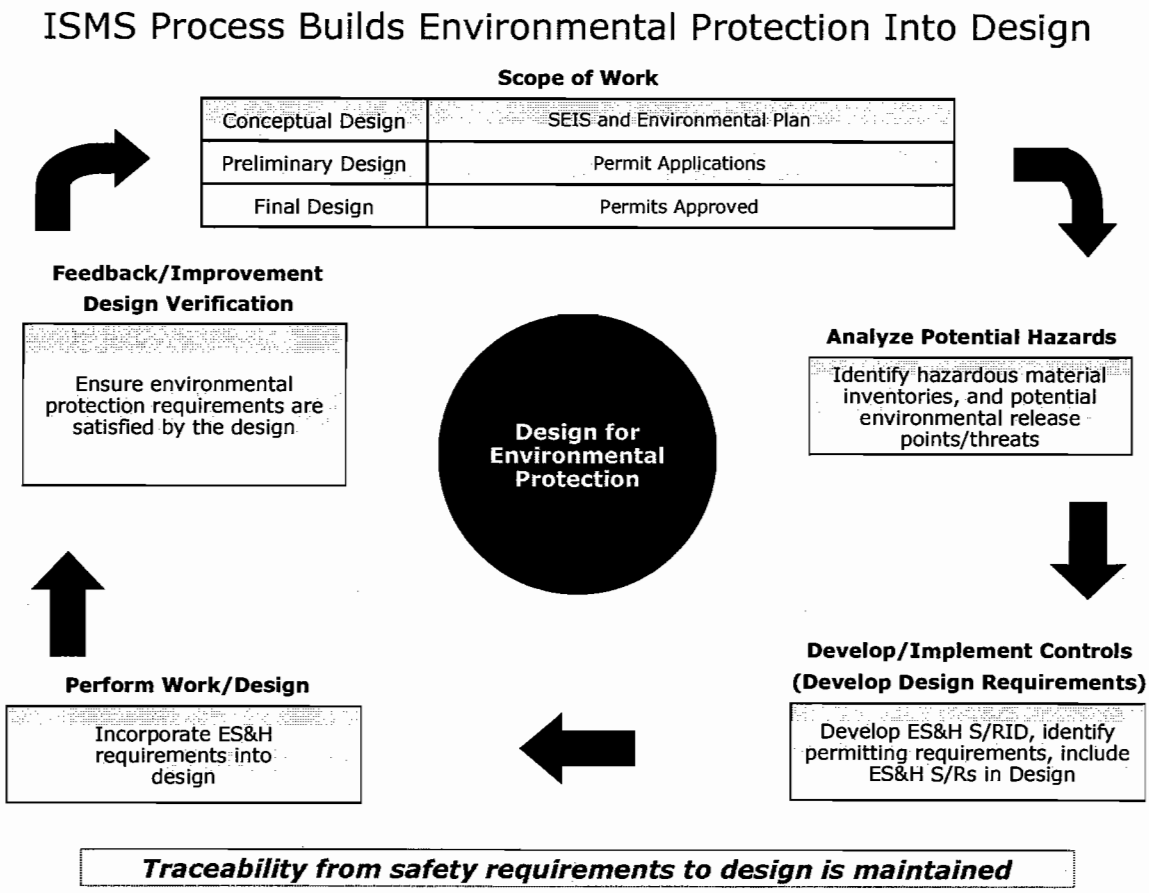
The EPC will design, construct, commission, and operate the SWPF in compliance with applicable South Carolina and Federal environmental regulations, laws, and directives (e.g., DOE O 450.1 [*General Environmental Protection Program*[18]], DOE O 5400.5 [*Radiation Protection of the Public and the Environment*[19]], DOE O 435.1 [*Radioactive Waste Management*[20]], and DOE M 435.1-1 [*Radioactive Waste Management Manual*[21]]). Required permit applications, plans, and Notices of Intent (NOI) will be completed as early as possible in the Design and Construction phases to avoid jeopardizing the SWPF Project schedule.

3.3 Reducing the Environmental Threat

The SWPF Design and Construction phases include: 1) Conceptual Design, 2) Preliminary Design/Enhanced Preliminary Design (EPD), 3) Final Design/Enhanced Final Design (EFD), and 4) Construction. Each phase culminates in a CD that must be made at the assigned level of DOE management, as defined in DOE O 413.3A (*Program and Project Management for the*

Acquisition of Capital Assets[22]). The design phases end with CD-1, CD-2, and CD-3, respectively. Figure 3-1 provides a graphical depiction of the way in which the EPC incorporates environmental protection into the design process. Details of the EPC's approach for incorporating environmental protection into all life-cycle phases of the SWPF Project are discussed in the following sections.

Figure 3-1. Integration of Environmental Protection into the SWPF Design



3.3.1 Conceptual Design

During the Conceptual Design phase (Pre-CD-1), the EPC:

- Defined the Scope of Work: SWPF scope was defined in the EPC's Phase I Contract (DE-AC09-02SR22210[3]). In addition to the Contract, the baseline for environmental protection was provided in DOE/EIS-0082-S2[4];
- Analyzed Environmental Threats: During Conceptual Design, the EPC identified a preliminary listing and inventory of hazardous and regulated substances to be used during SWPF Commissioning and Operations. Based on this initial inventory, assumptions were

developed about the nature and types of potential hazards, waste stream composition, and the potential for releases. These were the environmental hazards or threats that would require mitigation, control, permitting, and avoidance;

- Developed Controls: During Conceptual Design, the EPC identified a preliminary set of permits and plans that would be required for construction and operation. The EPC also identified applicable environmental, safety, and health (ES&H) standards and requirements that were relevant to the design process. These were compiled into S-CRT-J-0048 (*SWPF Standards/Requirements Identification Document*[23]) and into P-CRT-J-0012.1 (*SWPF Design Criteria Database*[24]). The standards include numerical release and dose/exposure thresholds on air emissions and stormwater effluents, as well as HazMat thresholds that required specific design considerations or administrative actions;
- Performed Work: Conceptual Design was developed to satisfy the Contract (DE-AC09-02SR22210[3]), as well as requirements identified in S-CRT-J-0048[23] and P-SPC-J-00002 (*SWPF Functional Specification*[25]); and
- Feedback/Improvement: During the design process, continuous feedback was provided via design reviews by the ES&H staff to ensure that the CD-1 Package met the environmental requirements in S-CRT-J-0048[23] and to ensure that design deliverable and preliminary emission calculations and models were internally consistent. The design staff and ES&H developed several strategies to minimize impacts to the environment. For example, early Conceptual Design included the use of a Reverse Osmosis system that discharges thousands of gallons of water per day to the environment that is concentrated in chlorine and dissolved solids. To minimize the impact to surface water biota, an ion exchange system was selected as a preferred technology, reducing wastewater discharges to the environment. Similarly, estimated emissions of VOCs, predominantly Isopar®L, were significantly reduced by passively venting the Solvent Hold Tank to the cell atmosphere, instead of actively ventilating the tank.

3.3.2 Preliminary Design

During the Preliminary Design phase (Pre-CD-2), the EPC's approach to identifying and controlling environmental threats included the following:

- Define Scope of Work: The Preliminary Design scope is defined by the SWPF Contract (DE-AC09-02SR22210[3]) and by the DOE-approved Conceptual Design Package. During Preliminary Design, the EPC developed a Draft Preliminary Engineering Report (PER) (Q-PER-J-00002: *Draft Preliminary Engineering Report for an Industrial Wastewater Treatment Facility*[26]) as a first step of obtaining an IWWF Permit to construct. Q-PER-J-00002 was provided to SCDHEC for review and comment. The Project also completed radioactive air dispersion-dose calculations and the chemical air emissions Exemption Request Package (ERP), both of which were approved by the Site M&O (ESH-EPG-2004-00292: "Salt Waste Processing Facility Project Radionuclide NESHAP Evaluation"[27] and ESH-EPG-2005-00050: "Exemption Approval: Salt Waste Processing Facility Project, Savannah River Site"[28]).

- Analyze Environmental Threats: The Preliminary Design process developed more accurate analyses of the facility source term, chemical and radioactive air emissions, and secondary wastewater discharges (i.e., air compressor and air conditioner condensate). After CD-1, exemption application packages were completed for air emissions and the Draft PER (Q-PER-J-00002[26]) for the IWWF construction permit application was developed. Detailed calculations were developed, which determined that air emission rates of hazardous/toxic and criteria air pollutants were below thresholds for air quality permitting (Q-PER-J-00001: *SWPF Air Quality Permit Exemption Request for Toxic Air and Criteria Pollutant Emissions: Engineering Report*[29]). The SWPF air dispersion-dose model and non-radioactive ERP were submitted to the Site M&O via DOE and were approved in ESH-EPG-2005-00050[28]. During Preliminary Design, a Stormwater Management and Sediment Control Plan (SMSCP) (P-ERP-J-00001: *SWPF Storm Water Management and Sediment Control Plan*[30]) was developed pursuant to SCR100000 (*South Carolina NPDES General Permit For Storm Water Discharges From Large and Small Construction Activities*[31]) and SCR 72-300 (*Standards for Storm Water Management and Sediment Reduction*[32]) to evaluate potential environmental impacts caused by construction activities such as grubbing, grading, and excavation and the storage of fuel and construction materials onsite;
- Develop/Implement Controls: The assumptions and calculations used as the bases of air emissions calculations became part of the design requirements. For example, the ERP submitted for radiological emissions required that process vessels, such as a Filter Feed Tank, be vented to a demister prior to discharge to the environment. Removal of the demister from the emission path renders the calculations in the ERP invalid, requiring instead that the SWPF submit a permit application package for Construction. Assumptions that are part of approved environmental permits and ERPs became part of the Facility's Authorization Basis (AB) and were incorporated into the SWPF Technical Baseline. Based on the environmental threats identified in P-ERP-J-00001[30], Administrative Controls on refueling operations and chemical storage, detention basins, retention basins, sediment screens, and seeding will be identified and established in these plans and implementing procedures;
- Perform Work: The work leading to CD-2 included development of Preliminary Design drawings and equipment specifications that incorporated and maintained the assumptions included in emission calculations and exemption request deliverables; and
- Feedback and Improvement: During the design process, the ES&H staff conducted routine reviews of the design drawings and other Contract (DE-AC09-02SR22210[3]) deliverables to ensure that assumptions used in emission calculations were preserved.

3.3.3 Enhanced Preliminary Design

During the EPD phase, the EPC's approach to identifying and controlling environmental threats included the following:

- Define Scope of Work: The EPD work scope was defined by the Contract (DE-AC09-02SR22210[3]) and the DOE-approved CD-1;

- Analyze Environmental Threats: During EPD, a formal Environmental Aspects and Impacts Analysis was completed. During EPD, air emission calculations, including those for stack height, were reviewed to ensure that they are consistent with the current design and to determine whether exemptions granted during Preliminary Design remained valid;
- Develop and Implement Controls: Based on the Environmental Aspects and Impacts Analysis, environmental performance objectives and goals were derived to reduce impacts to the environment. Based on the environmental threats identified in P-ERP-J-00001[30], Administrative Controls on construction refueling operations, chemical storage, and other pollution prevention activities were identified. The appropriate configuration of detention basins, retention basins, sediment screens, and seeding were identified and established in P-ERP-J-00001;
- Perform Work: P-ERP-J-00001[30] was completed and fully integrated into SWPF design. Procedures were drafted for approval for conduct of pollution prevention, water runoff control, dust abatement controls, and other construction-related environmental controls; and
- Feedback and Improvement: Feedback on the emerging regulatory requirements regarding water quality standards applicable to stormwater outfalls led the EPC to route condensate from air compressors and air conditioning chillers and blowdown water from cooling towers to sanitary sewer, rather than stormwater, discharge.

3.3.4 Enhanced Final Design

During the EFD phase (pre-CD-3), the EPC's approach to identifying and controlling environmental threats includes the following:

- Define Scope of Work: The EFD work scope was defined by the DOE-approved CD-2 Package for EPD;
- Analyze Environmental Threats: During EFD, P-ERP-J-00001[30] was completed in September 2006, but revised in 2007 to reflect: changes to the building footprint and yard configuration; the environmental impacts caused by construction activities such as grubbing, grading, and excavation; and the storage of fuel and construction materials onsite. The SMSCP/Stormwater Pollution Prevention Plan (SWPPP) for SWPF Construction activities was approved by SCDHEC to obtain coverage under SCR100000[31];
- Develop and Implement Controls: Based on P-ERP-J-00001[30], procedures were developed for: implementing pollution prevention measures, monitoring the detention basin and retention basins, constructing and maintaining sediment screens, and seeding. Specifications issued for construction activities flow down requirements from P-ERP-J-00001 and associated procedures, as applicable;
- Perform Work: P-ERP-J-00001[30] was fully integrated into SWPF design. Procedures were completed and approved for conduct of pollution prevention measures, water runoff control, dust abatement controls, and other construction-related environmental controls; and

- Feedback and Improvement: ES&H will review and comment on design outputs to ensure that they are consistent with environmental regulations, emission calculations, and DOE requirements.

3.3.5 Construction

During the Construction phase (CD-3A, -3B, and -3), the EPC's approach to identifying and controlling environmental threats will include the following:

- Define Scope of Work: Work scope is defined in the DOE-approved EFD Package, approved construction P-ERP-J-00001[30], and construction subcontracts and work packages;
- Analyze Environmental Threats: During the Construction phase, an NOI and SWPPP Associated with Industrial Activity will be developed to obtain coverage under SCR000000[9] and to analyze potential releases of pollutants to surface water. Also, a Spill Prevention, Control, and Countermeasures (SPCC) Plan will be developed to minimize threats from potential storage of diesel fuel. Threats to the environment during construction activities will be routinely assessed by construction personnel and management in accordance with the approved P-ERP-J-00001[30];
- Develop and Implement Controls: The SWPPP for Industrial Activities for SWPF, developed to obtain coverage under SCR000000[9], will identify any necessary administrative or engineering controls needed to prevent the inadvertent release of pollutants to the environment. During early Construction, a Construction Permit Application for Phase 1 Waste Transfer Line (WTL) Segments was submitted to SCDHEC. The application contains information concerning construction and installation of the WTLs that ultimately will connect to the Site M&O inter-area waste lines. Approval of construction for these WTLs was requested by SCDHEC. Also during Construction, the Engineering Report and Construction Permit Application will be submitted to SCDHEC for Phase 2 final approval. The Engineering Report will contain Revision 0 of General Arrangements and Process Flow Diagrams. During the Construction phase, the EPC will implement environmental controls established by P-ERP-J-00001[30] and the SPPC Plan, supporting pollution prevention procedures and dust control procedures developed pursuant to environmental regulations. Subcontractors shall also be evaluated on a routine basis for compliance with the ES&H provisions in their contracts. The Environmental Program Manager will review as-builts and design changes to ensure that the environmental requirements and permitting assumptions have been satisfied;
- Perform Work: The Construction phase involves construction of the Facility, equipment placement, piping, electrical, instrumentation and controls installation, and construction acceptance testing. The EPC will ensure that dust and runoff controls are being implemented according to P-ERP-J-00001[30] and associated procedures; and
- Feedback and Improvement: During Construction, the effectiveness of the EPC's environmental protection and monitoring programs will be evaluated on a routine basis through assessments performed by the Environmental, Safety, Health, and Quality (ESH&Q) Manager (or designee) and Environmental Program Manager. The ESH&Q Manager and

Environmental Program Manager will also use feedback from assessments conducted by DOE, the Site M&O, and regulatory authorities to improve environmental performance. Based on routine monitoring and assessment of activities, plans and procedures will be modified as needed. The Environmental Program Manager will routinely review the facility and as-built drawings to ensure that they are consistent with the Construction Permit Engineering Report.

3.3.6 Commissioning and Operations

During the SWPF Commissioning and Operations phases, the EPC's approach to identifying and controlling environmental threats will include the following:

- Define Scope of Work: Work scope is defined in the DOE-approved EFD, SCDHEC-issued IWWF permit, Operations SWPPP developed to obtain coverage under SCR000000[9], and Site M&O-approved air emission ERPs (i.e., Engineering Report and supporting calculations).
- Analyze Environmental Threats: During the Commissioning and Operations phases, the major environmental threats come from environmental releases to the air and stormwater runoff into adjacent surface waters. Commissioning and Operations plans and procedures will be implemented to identify and reduce environmental hazards;
- Develop and Implement Controls: During the Commissioning and Operations phases, the EPC will implement environmental controls established by the SWPPP and monitor effluents transferred to the SPF to ensure that SWPF treatment performance meets approved WAC. ES&H will review environmental monitoring data to ensure that environmental requirements and permitting assumptions are satisfied;
- Feedback and Improvement: During the Commissioning and Operations phases, effectiveness of the EPC's environmental protection and monitoring programs will be evaluated on a routine basis, through self-assessments performed by the ESH&Q Manager or designee and Environmental Program Manager. The ESH&Q Manager and Environmental Program Manager will also use feedback from assessments conducted by DOE, the Site M&O, and regulatory authorities to improve environmental performance. Based on routine monitoring and assessment of activities, plans and procedures will be modified as needed.

3.4 Roles and Responsibilities

Protection of the environment and the public is the responsibility of the EPC's line management during all phases of the SWPF life cycle. The Project Manager, Design/Build Manager and Construction Manager are accountable for designing and constructing a facility that protects workers, the public, and the environment. The ESH&Q Manager is responsible for providing technical support to the line managers and is accountable to the Project Manager for providing ES&H deliverables and verifying compliance with ESH&Q requirements. The Environmental Program Manager reports to the ESH&Q Manager and is responsible for identifying applicable environmental requirements and ensuring that the SWPF is designed, built, and operated in accordance with these requirements. This includes responsibility for developing and submitting

permit applications, plans, and ERPs for approval by SCDHEC or its Site M&O designee. The EPC's organizational structure and detailed roles and responsibilities are documented in V-IM-J-00001 (*SWPF Organization, Roles, and Responsibilities Manual*[33]).

During the SWPF Design and Construction phases, the EPC is responsible for developing SWPF environmental compliance deliverables, including the IWWF Construction Permit Applications (Phases 1 and 2), ERPs, and required plans and procedures. The EPC is responsible for completing appropriate calculations and documentation to support the aforementioned compliance deliverables. An EPC Engineer with a South Carolina Professional Engineer (P.E.) license will sign and seal all completed forms, calculations, and drawings, as required by State regulations. The EPC will be the permit holder for the IWWF Construction Permit and will provide permit application deliverables to SCDHEC through the Site M&O via DOE. Detailed roles and responsibilities for developing permit and other compliance deliverables agreed upon by the EPC, Site M&O, and DOE are documented in V-ESR-J-00019 (*SWPF Permitting and Monitoring Requirements Interface Control Document [ICD-19]*[34]).

The SWPF is part of the Liquid Radioactive Waste System that includes the F- and H-Area Tank Farms, DWPF, SPF, SDF, and Effluent Treatment Facility (ETF). The Liquid Radioactive Waste System is operated by the Site M&O; consequently, it is critical that the EPC and Site M&O maintain clear and effective interfaces during development of compliance deliverables. The EPC will interface with the Site M&O through DOE for all negotiations pursuant to V-ESR-J-00019[34].

3.5 Environmental Monitoring and Reporting

The SWPF will be integrated into the SRS environmental monitoring and reporting system. Environmental monitoring will include radiological air emissions monitoring, monitoring of heating, ventilating, and air conditioning and compressor condensate and blowdown water discharges to the sanitary sewer, and will include stormwater monitoring, as required by the approved Construction SMSCP/SWPPP to obtain coverage under SCR100000[31] and the Industrial Activities SWPPP completed to obtain coverage under SCR000000[9].

The SWPF stack will be monitored as a Potential Impact Category (PIC)-2 facility, with periodic quarterly sampling of emissions and off-line analysis (see Section 6.1.10). Quarterly monitoring data will be forwarded to DOE for communication to the Site M&O, who reviews and validates the data prior to its being forwarded to the Site M&O National Emission Standards for Hazardous Air Pollutants (NESHAP) Subject Matter Expert.

Stormwater will be monitored and analyzed, as required by the approved SWPPP during Construction and Operations. If there are any requirements for periodic monitoring and analysis, the analytical results will be forwarded to DOE for communication to the Site M&O.

Utility water from the air chillers, compressors, and cooling towers will be sampled and analyzed quarterly for metals and pH prior to discharge to the sanitary sewer. Because a small additional fee is charged for the discharge of utility water to the Central Sanitary Wastewater Treatment Facility (CSWTF), the flow of utility water to the sewer must be measured. Utility water

discharge volumes, metal concentrations, and pH will be transmitted to the CSWTF via DOE on a quarterly basis (00-300-00375: "Approval for SWPF Clean Water Disposal Request"[35]).

4.0 SWPF PROCESS DESCRIPTION

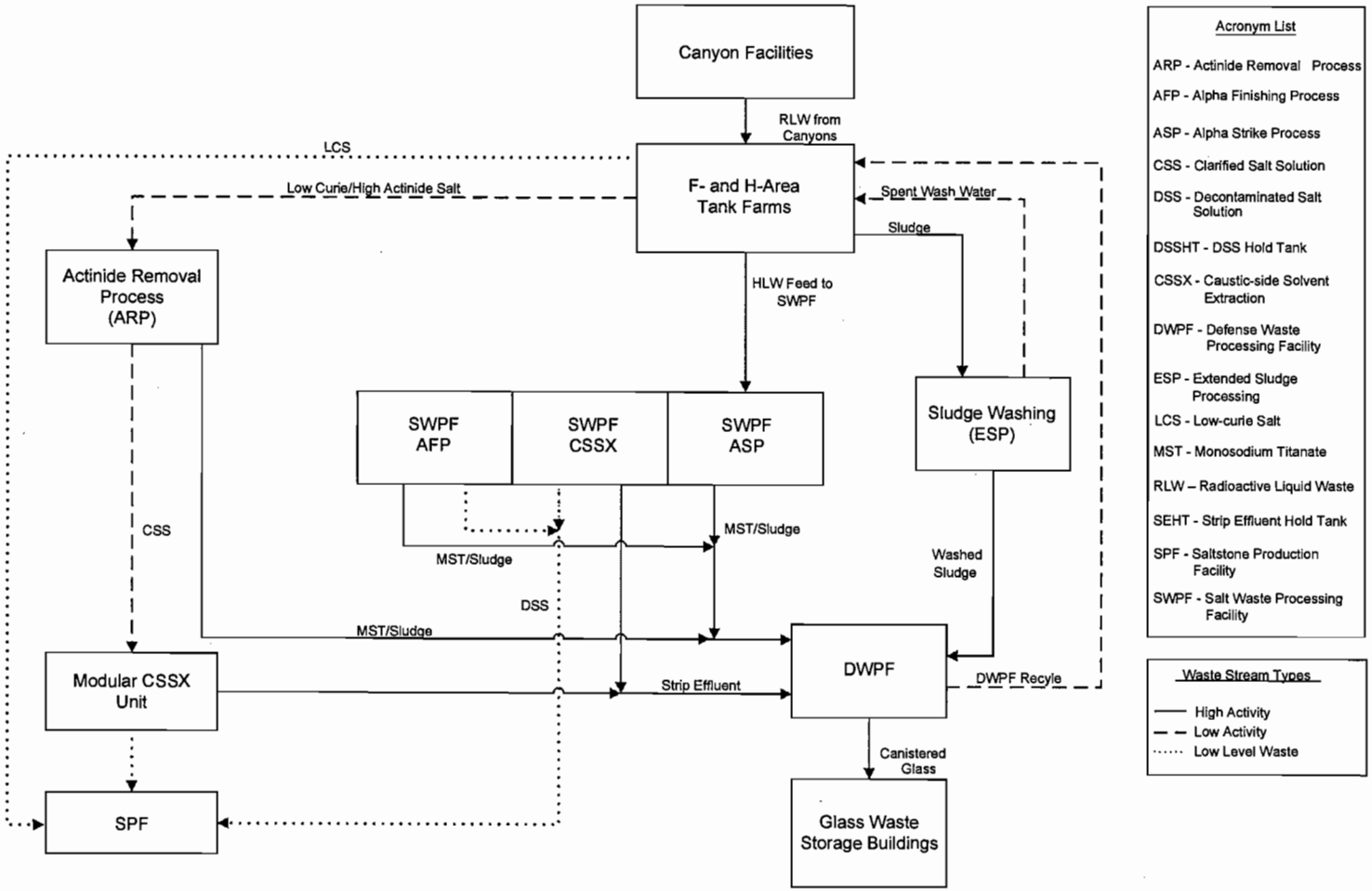
This section of the Environmental Plan briefly describes how the SWPF is integrated into the SRS Liquid Radioactive Waste System. This review provides the context for understanding the regulated processes for control of SWPF effluents and air emissions. Figure 4-1 schematically depicts the flow of wastewater effluents and waste streams through the Liquid Radioactive Waste System. The existing and proposed processes are shown in rectangles. Liquid Radioactive Waste System interfaces resulting from the SWPF processes (as currently planned) are shown as dashed lines in Figure 4-1.

The high-curie fraction of salt waste removed from the tanks will be transferred to the SWPF, where ^{137}Cs, ^{90}Sr, and actinides will be separated from the salt solution. The concentrated Sr and actinide sludge from the SWPF will be transferred to the DWPF for final treatment (vitrification). The strip effluent Cs concentrate from the SWPF CSSX process is also transferred to the DWPF for vitrification. The DSS will be transferred to the SPF, where liquid wastes from the SWPF and/or the ETF will be combined with cement and pumped as a wet grout to a vault in the SDF. The cement hydrates and cures in the vault, forming a solid saltstone monolith. These vaults will eventually be closed as an industrial solid waste landfill, in accordance with applicable SCDHEC regulations.

DSS transferred from the SWPF to the SPF will be required to meet the WAC for the SPF and SDF (DE-AC09-02SR22210[3]). The WAC is based on limits in the Saltstone AB and permits. The DSS must meet specific curie limits for radiation protection defined in the SPF AB, as well as the radionuclide and chemical limits established by the SDF Performance Assessment and the SPF and SDF permit requirements. The high-activity waste products generated by the SWPF will be required to meet the DWPF WAC for nitrates/nitrites. The DWPF WAC has not yet been developed for the SWPF; the EPC will cooperatively develop with the Site M&O a DWPF WAC specific to the SWPF products.

The SWPF will be permitted as an IWWF that processes Tank Farm wastewater and transfers the wastewater to either the DWPF or the SPF. The SWPF will have no radioactive process liquid discharges to the environment. The ETF contains the Liquid Radioactive Waste System's only permitted industrial wastewater discharge. The DWPF recycle wastewater is sent to an evaporator and the overheads (concentrated salt solution) are transferred back to the H-Area Tank Farm or to the ETF, where effluent is either released to the wastewater discharge point or sent to a liquid waste system tank for use as Deliquification, Dissolution, and Adjustment material in accordance with the Saltstone Industrial Solid Waste Landfill Permit. The SWPF will have secondary utility wastewater discharges, comprising air conditioner / air compressor condensate and cooling tower blowdown water. SWPF utility water will be discharged to the sanitary sewer (00-300-00375[35]).

Figure 4-1. Major Interfaces in Proposed Liquid Radioactive Waste System (2010)



SWPF wastewater treatment processes will not cause any significant air emissions of criteria, hazardous or toxic air pollutants. The SWPF main emission point will be a stack that receives air from the Process Building Ventilation System (PBVS), Process Vessel Ventilation System (PVVS), and Pulse Mixer Ventilation System (PMVS), as well as from the Alpha Finishing Facility (AFF) Ventilation System and the Analytical Laboratory Hot Cell Ventilation System. The PBVS, PVVS, PMVS, AFF Ventilation System, and Analytical Laboratory Ventilation System all treat air with two banks of High-Efficiency Particulate Air (HEPA) filters to remove entrained particulates prior to emitting the air to the stack. The PVVS, PMVS, and AFF Ventilation System also include demisters to remove any trace amounts of aerosolized waste and condensers to reduce vapor phase constituents (i.e., largely water vapor). Condensate will be routed back to the waste treatment process.

5.0 WATER QUALITY

This section identifies processes associated with SWPF Design, Construction, Commissioning, and Operations that are regulated under South Carolina and Federal water quality laws and regulations. Regulated processes include:

1. Treatment of salt waste prior to transfer of radioactive effluents to either the DWPF or SPF;
2. Sanitary sewer and domestic water system tie-in;
3. Discharges of secondary wastewater effluents derived from air conditioner and air compressor condensate and cooling tower blowdown; and
4. Construction and operational activities affecting stormwater discharges that are regulated by South Carolina and Federal water quality regulations.

This section describes the EPC's compliance approach to each of these four regulated activities.

5.1 Regulated Process

Several components of the SRS Liquid Radioactive Waste System are operated under South Carolina Industrial Wastewater Treatment permits including the Tank Farms, DWPF, and SPF. The SWPF will be permitted and operated as an Industrial Wastewater Treatment Facility, in accordance with SCR 61-67[10].

Waste processing at the SWPF occurs in three basic unit operations: ASP, CSSX, and AFP. The ASP occurs first and is used to separate Sr/actinides from the waste feed by MST sorption and filtration. The CSSX process follows the ASP and is used to remove Cs from the ASP filtrate by solvent extraction. The AFP is an optional process step that mimics the ASP and is used for additional Sr/actinide removal downstream of the CSSX process.

The ASP is operated as a batch-wise process. For each batch of incoming salt waste, MST is added and the contents are well mixed (12 hours for single strike and 6 hours each for multiple strikes) to allow the MST to sorb the Sr and actinides. The resulting MST slurry is filtered to produce a concentrated MST/sludge and CSS filtrate. The concentrated MST/sludge is washed

to reduce Na in preparation for transfer to the DWPF, while the CSS is routed to the CSSX process.

The second SWPF processing stage is CSSX, a continuous flow process that utilizes 36 centrifugal contactor stages for extraction, scrubbing, stripping, and washing of aqueous and organic streams. The Cs is captured by contacting the aqueous phase CSS with an organic phase solvent in the extraction stage contactors. The solvent used in the CSSX process is primarily Isopar®L[B], with a specialty extractant (BOBCalixC6)[C] at 0.007 Molar (M), a modifier (Cs-7SB)[D] at 0.75M, and a suppressant (tri-n-octylamine [TOA]) at 0.003M. The Cs is captured in the organic phase by the extractant and is then released into a low-volume, slightly acidic strip solution in the stripping stages. The strip effluent, containing a high concentration of Cs, is sent to the DWPF for vitrification. The DSS from the extraction stages is sent to either the SPF to be solidified with a cementitious grout mixture or to the AFP for an additional MST strike.

The AFP is located downstream of the CSSX process to provide an additional MST strike to reduce residual Sr and actinide concentrations. The AFP is only used if the Sr/actinide content of the waste feed is sufficiently high that a single MST strike operation cannot reduce the concentrations low enough for the DSS to meet Saltstone WAC (DE-AC09-02SR22210[3]) limits. The AFP is located in a separate structure abutting the SWPF Process Building. The AFF is configured to permit AFP operations in a limited contact-handled maintenance mode, without the extensive shielding and remote-handling provisions required in the SWPF Process Building.

5.2 Environmental Compliance and Permitting Activities

Water quality protection requirements applicable to SWPF Design, Construction, and Operations are summarized in this section and in Table 5-1. Table 5-1 also establishes the completion sequence for deliverables and reviews, relative to the various SWPF life-cycle phases. Compliance deliverables include permit application forms, engineering calculations, engineering reports, ERPs, NOIs to receive coverage under the State's general permits (completed by the Site M&O), SWPPP (for Industrial Activity), and the SMSCP (for Construction) (P-ERP-J-00001[30]). The EPC is responsible for preparing all compliance deliverables. The Site M&O plays a major role in the permitting and compliance process. The EPC will submit all compliance deliverables to DOE to be forwarded to the Site M&O for review and comment. The Site M&O will forward the P.E.-stamped Phases 1 and 2 Construction Permit Applications for Industrial Wastewater Treatment Facility to SCDHEC. The Site M&O has been delegated approval authority for the SWPPP and SMSCP (P-ERP-J-00001). The Site M&O will forward the completed Sanitary Wastewater Collection System Permit to Construct to SCDHEC, when it determines that the compliance deliverables are complete and accurate. The interfaces among the EPC, DOE, and Site M&O for each compliance deliverable are defined in V-ESR-J-00019[34].

[B] The Isopar®L diluent is a branched 12-carbon (average) aliphatic with a density of 0.852 g/ml at 68°F.
[C] The chemical name for the extractant is Calix[4]arene-bis(tert-actylbenzo-crown-6).
[D] The chemical name for the modifier is 1-(2,2,3,3-Tetrafluoropropoxy)-3-(4-sec-butylphenoxy)-2-propanol.

Table 5-1. SWPF Clean Water Act Permit Schedule

Process/Output	Regulatory Driver(s)	Regulatory Milestones (Permits, Plans, Other Deliverables	Life Cycle Design, Construction, Commissioning, and Operations
Industrial Wastewater Treatment Facility Construction Permits (Phases 1 and 2)	SCR 61-67[10] and SCR 61-9 (*South Carolina Water Pollution Control Permits*[36])	1. Submit Letter to SCDHEC requesting provisional approval to begin construction for CD-3A and CD-3 activities 2. Submit Draft PER (Q-PER-J-00002[26]) to DOE/Site M&O for review and comment 3. Revise Q-PER-J-00002[26], per Site M&O/DOE comments 4. Submit Q-PER-J-00002[26] to SCDHEC via DOE for informational purposes 5. Revise PER (Q-PER-J-00002[26]), per SCDHEC comments 6. Submit Engineering Report with Revision 0 drawings and completed application package to SCDHEC via Site M&O	1. Early EFD 2. EFD 3. EFD 4. EFD 5. EFD 6. EFD
Stormwater discharges associated with SWPF industrial activity	SCR000000[9] and the Federal *Clean Water Act*[37] (CWA)	1. Submit SWPPP for Operations to DOE and Site M&O 2. Revise SWPPP for Operations per DOE and Site M&O comments 3. Submit revised SWPPP for Operations to DOE and Site M&O for approval	1. Construction 2. Construction 3. Construction
Sanitary Waste Water Collection System and Sewer Lines	SCR 61-67[10]	1. Develop and submit complete Utilities Acceptance Permit (UAP), Engineering Report and Permit to Construct Application Package to Site M&O and DOE 2. Revise, based on Site M&O and DOE feedback 3. Submit revised Engineering Report and Permit to Construct Application Package to Site M&O/DOE for submission to SCDHEC	1. EFD 2. EFD 3. EFD
Domestic Water Connection		1. Perform flow tests near tie-in 2. Complete flow calculation, complete system drawings and site maps, showing tie-ins and connections 3. Develop and submit Complete UAP and Domestic Water Distribution System Extension Application to DOE/Site M&O	1. EFD 2. EFD 3. EFD

The requirements discussed in this section will be reviewed and revised, as appropriate, throughout the Facility's life cycle. Table 5-1 summarizes SWPF process and regulatory requirements associated with water quality protection.

5.2.1 SWPF Industrial Wastewater Facility Permit to Construct (Phases 1 and 2)

Per guidance provided by SCDHEC on October 10, 2006, a Permit Application was submitted to construct and install proposed WTL segments that will be connected in the future to transfer LRW influent to and effluent from the proposed SWPF. This application constitutes Phase 1. The Phase 2 permit application will be completed and submitted to SCDHEC for approval to construct the SWPF as an IWWF, pursuant to SCR 61-67[10]. Phases 1 and 2 Engineering Reports and other application deliverables will be prepared by the EPC and submitted to DOE and the Site M&O for review and comment before being submitted to SCDHEC. DOE and the EPC will be responsible for interfaces with SCDHEC, with full participation of the Site M&O in formal discussions with SCDHEC regarding the permit application. The IWWF permitting process began in Preliminary Design, with development of a Draft PER (Q-PER-J-00002[26]). The EPC submitted Q-PER-J-00002 to the Site M&O for review and comment during Preliminary Design. After incorporation of comments, the Site M&O submitted the Draft PER (Q-PER-J-00002) to SCDHEC for review and comments. The primary purpose of Q-PER-J-00002 was to provide SCDHEC with a detailed overview of the primary treatment processes. The EPC notified SCDHEC that the EPC would begin limited (CD-3A) construction prior to finalization of the IWWF Engineering Report and associated drawings. After SCDHEC approval of the Engineering Report and associated drawings, any changes to the drawings require approval by SCDHEC. DOE and the EPC will, therefore, submit the PER and supporting Revision 0 drawings during Construction.

For both Phases 1 and 2, the EPC will complete the Construction Permit Application package, including the:

- Completed Application Form;
- Engineering Report;
- Maps, if applicable;
- Calculations, if applicable; and
- Drawings.

An EPC P.E. licensed in South Carolina will sign and seal the completed Construction Permit Application, Engineering Report, calculations, specifications, and drawings. It is anticipated that the IWWF Permit Application will be completed and submitted to the Site M&O for review and comment during early Construction. After the Site M&O comments are incorporated, the EPC will submit the final application package to SCDHEC through the Site M&O via DOE.

The EPC will obtain an SCDHEC "Wastewater Approval to Place in Operation" prior to initiating Hot Commissioning at the SWPF. This approval is required prior to initiating operation of newly constructed wastewater treatment facilities (SCR 61-67.100.E.7: *General Approval to Place in Operation*[10]). The SWPF wastewater process and regulatory requirements are listed in Table 5-1. To obtain startup SCDHEC approval, the EPC's design P.E. will submit a letter specifically identifying the Project by permit number, certifying that construction is complete and in accordance with the approved plans and specifications, and information to confirm ownership and operation and maintenance of the Facility with documentation of leakage and pump tests.

Prior to finalizing its review of the request for approval to place the SWPF in operation, SCDHEC may perform an inspection to verify that the Facility conforms to the submitted design plan and data contained in the Permit Application and Engineering Report.

5.2.2 Stormwater Discharges: Construction Activities

- Prior to the commencement of any land-disturbing activity associated with SWPF construction, the EPC completed P-ERP-J-00001[30] to obtain approval to receive a Grading Permit and receive coverage under the State's National Pollutant Discharge Elimination System (NPDES) General Permit, #SCR100000[31]. The Site M&O has been delegated approval authority by SCDHEC for P-ERP-J-00001 and submitted the NOI to the State for coverage under SCR100000. The State has authorized stormwater discharges from SWPF construction activities under its General Permit SCR100000 and has issued Permit SCR10H152, in which the SWPF-specific coverage was granted, effective September 14, 2007[38]).

The EPC will implement the stormwater and sediment erosion controls established in P-ERP-J-00001[30], such as using check dams, a sedimentation control basin, silt fencing, a lined concrete truck washout facility, etc., and perform monitoring of stormwater runoff, as required by the approved plan.

A Notice of Termination will be transmitted to DOE and the Site M&O when construction is completed and final stabilization has been achieved on all portions of the site.

5.2.3 Stormwater Discharges: Industrial Activities

An SWPPP for SWPF operations will be developed during the Construction phase and submitted to DOE and the Site M&O for comment, review, and approval. The Site M&O will submit an NOI to SCDHEC to obtain coverage under the State of South Carolina Permit SCR000000[9] during the Construction phase. The General Permit authorizes discharges of stormwater associated with industrial activity that are not covered by an individual NPDES Permit. All discharges authorized under the General Permit will be composed of stormwater and exempted discharges allowed by SCR000000 (Part III.A [e.g., fire hydrant flushing, water used to wash vehicles or control dust,]).

The SWPPP will include:

- Description of potential pollutant sources;
- Description of stormwater management measures and controls;
- A pollution prevention plan for appropriate controls of Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III: Section 313 (*Toxic Chemical Release Inventory Reporting*[39]);
- Procedures for comprehensive site compliance evaluations; and
- A report summarizing the scope of each inspection, personnel conducting the inspection, date(s) of the inspections, major observations, and actions taken.

Procedures will be developed and implemented to ensure that SWPF operations are conducted in compliance with SCR000000[9] and the approved SWPPP.

5.2.4 Secondary Wastewater Discharges – Utility Waters

The SWPF has been granted provisional permission by the Site M&O to discharge secondary or utility wastewater, composed of air conditioner and air compressor condensate and cooling tower blowdown water, to the sanitary sewer. The following conditions have been placed on condensate discharges:

Maximum Flow Rate:	10,800 gallons per day
Maximum Copper Concentration:	200 parts per billion
pH Range:	5.0-9.0

These discharge limits may be modified in the future to ensure CSWTF regulatory compliance for Outfall G-10 and NPDES SC0000175 (*National Pollutant Discharge Elimination System Industrial Wastewater Discharge Permit*[40]) or to accommodate other site outfall redirect requests (00-300-00375[35]).

5.2.5 Sanitary and Domestic Water

The SWPF Process Building and Administration Building will require domestic water and sanitary sewer connections. Calculations for the domestic water supply demands will be completed during EFD. The domestic water connection permit application package will be completed in late EFD and will include:

- Domestic Water Distribution System Extension Application;
- Documented flow tests obtained near the tie-in, including static pressure and residual pressure while the line is flowing in excess of the proposed maximum instantaneous demand, sealed and signed by an engineer licensed to practice in the State of South Carolina;
- An area map showing the construction area in detail;

- Design calculations signed and sealed by the Design P.E.;
- Complete UAP; and
- An 8-1/2 x 11-inch sketch showing the tie-in, piping layout, facilities to be served, valves, backflow preventers (as necessary), and coordinates of the new system, sealed and signed by a South Carolina-licensed P.E.

As described in V-ESR-J-00006 (*SWPF Project Liquid Sanitary Wastes Interface Control Document [ICD-06]*[41]), the SWPF Liquid Sanitary Waste System will handle sanitary waste water generated in the Process and Administration Buildings and condensate from the air chillers and compressors and cooling tower blowdown water. The SWPF Liquid Sanitary Waste System will tie into the Site Sanitary Sewer System by connecting a new gravity line to existing Manhole (MH)-96. Sanitary waste lines will be routed from the SWPF Process and Administration Buildings via gravity. These two waste streams will be combined at a new lift station, where a force main will route the combined sanitary waste streams to a new Drop MH just inside the SWPF site fence. From the Drop MH, the waste will be routed via a gravity line to MH-96. No sanitary waste treatment will be performed at the SWPF.

The EPC has completed and received a Power Services Utilization Permit from the Infrastructures and Support Department Water Services Manager. The EPC will also prepare the SCDHEC permit application to construct the sanitary sewer collection system and connection. The draft permit application package will include:

- SCDHEC "Construction Permit Application Form for Wastewater Facilities",
- Engineering Report,
- Maps,
- UAP,
- Calculations, and
- Drawings.

The draft permit application package will be submitted to DOE and the Site M&O for initial review. The EPC Design P.E. will sign and seal the "Application for Permit to Construct a Wastewater Treatment or Collection System", engineering flow and pump calculations, and drawings.

The EPC will also prepare a Certification Package in order to obtain a permit to operate the system. Prior to operation of the wastewater collection system, the EPC and Site M&O will conduct a site walkdown and inspection of the wastewater collection system. After this inspection is completed, the Site M&O will notify SCDHEC that the system is ready for review and inspection.

5.2.6 Spill Prevention, Control, and Countermeasures Plan

An SPCC Plan will be required to be developed to prevent oil from reaching navigable waters and to contain discharges of oil. The SPCC Plan will be developed under the auspices of 40 CFR 112 (*Oil Pollution Prevention*[42]) and in accordance with 40 CFR 112.7 (*General Requirements for Spill Prevention, Control, and Countermeasure Plans*). The EPC plans to place a 9,000-gallon diesel tank adjacent to the Central Processing Area as a fuel supply to a stand-by generator. The EPC has designed the containment for this above-ground tank to be a double-wall tank and have spill control mechanisms for unloading from tanker trucks. The SPCC Plan will encompass the controls designed for this facility.

5.2.7 Groundwater

There are no regulatory requirements associated with the design or operation of an Industrial Wastewater Treatment Facility such as the SWPF that require the installation of groundwater monitoring wells. As stated in V-ESR-J-00019[34], the Site M&O will be responsible for conducting any required groundwater monitoring within J-Area related to WSRC-OS-94-92[2] or WSRC-TR-2007-00008 (*Savannah River Site Environmental Report for 2006*[43]).

6.0 AIR QUALITY PROTECTION

This section identifies the SWPF processes that have potentially regulated air emissions and describes actions the EPC will take to obtain required exemptions. Analyses conducted during Enhanced Conceptual and Preliminary Designs indicated that SWPF emission rates for regulated substances are below thresholds established both in SCDHEC air quality regulations and in TV-0080-0041 (*Savannah River Site Part 70 Air Quality [Title V Operating] Permit*[44]).

6.1 Regulated Processes

This section identifies air emissions associated with SWPF Construction and Operations. A summary of air quality regulatory compliance deliverables and a schedule for their completion are provided in Table 6-1. The EPC develops compliance deliverables and submits them to DOE for review and comment, prior to forwarding the deliverables to Site M&O for review and approval. Specific interfaces are defined in V-ESR-J-00019[34]. Compliance deliverables for the SWPF air emissions consist of ERPs, with supporting calculations and engineering reports.

Table 6-1 identifies the regulatory drivers, required permits, and milestones for obtaining the required permits for each regulated process or emission source for the SWPF.

Table 6-1. Processes, Emissions, Milestones, and Schedule

Process/Output	Regulatory Driver	Permits, Plans, Reports	Life-cycle Milestones
SWPF Stack Emissions – Radionuclides (see list analyzed in Table 3-45 of Q-CLC-J-00001 (*SWPF Radionuclide Emissions During Normal Operations of Vented Process Vessels: Source Term Derivation, Air Dispersion and Total Effective Dose Rate Calculations Performed Pursuant to* 40 CFR 61.96[b][45])	40 CFR 61[7]	Q-PER-J-00004 (*SWPF Radionuclide Emissions from Ventilated Process Tanks: Source Term Derivation and Effective Dose Equivalent Evaluation*[46]), and Calculation Q-CLC-J-000052[45] and 40 CFR 61.96(b) (*Applications to construct or modify*[7]). The air dispersion and dose model calculation 52 has been revised and submitted to the Site M&O/DOE for final review and approval.	Calculation: Q-CLC-J-000052[45] was completed during Enhanced Conceptual Design and approved during early Preliminary Design. Dose to Maximally Exposed Offsite Individual (MOI) is < 0.1 millirem (mRem)/year (yr). SWPF is exempt from the requirement to obtain a Permit to Construct under 40 CFR 61, Subpart H[7]. Submitted Q-PER-J-00004[46], to the Site M&O for final approval of the exemption from 40 CFR 61, Subpart H[7], permitting requirements.
SWPF process ventilation system Stack Emissions • VOCs • Nitrogen oxides (NO_x) • HNO_3 • Mercury (Hg) • Methanol	TV-0080-0041[44] and SCR 61-62.5: Standards 2 (*Ambient Air Quality Standards*), 7 (*Prevention of Significant Deterioration*), and 8 (*Toxic Air Pollutants*[8])	Submitted ERP (Q-PER-J-00001[29]) to Site M&O during Preliminary Design. Q-PER-J-0001[29] will be revised during EPD to ensure that emissions are still below levels of regulatory concern. After EFD is approved by DOE, Q-PER-J-0001[29] will be revised and submitted to the Site M&O, DOE, and/or SCDHEC for final review and approval.	Q-PER-J-00001[29] and supporting calculations approved by the Site M&O in Preliminary Design. Submit final Q-PER-J-00001[29] and supporting calculations after EFD is approved by DOE to the Site M&O and/or SCDHEC for final approval of the exemption from toxic and criteria pollutant emissions permitting requirements.
SWPF Diesel Generator Emissions: • NO_x • Sulfur oxides (SO_x) • Carbon Monoxide (CO) • Particulates	TV-0080-0041[44]	SCR 61-62.70 (*Title V Operating Permit Program*[8]) Operating Permit Modification. Submit Part 70 application forms and supporting emissions calculations during Construction.	Submit Part 70 forms to Site M&O at least four weeks prior to placing in operation

The EPC's design approach is to eliminate regulated emissions to the greatest extent practicable. The air emission points include the SWPF Process Building stack, the Cold Chemicals Area (CCA) ventilation system, and the diesel generator. The SWPF Process Building stack will emit air from the PBVS, PVVS, PMVS, Laboratory Ventilation System, and AFF Vent Systems. The PBVS maintains air flow from areas with the least potential for radiological and non-radiological contamination (e.g., administrative areas) to areas of increasing potential for contamination (e.g., radiological controlled areas, as defined in 10 CFR 835: *Occupational Radiation Protection*[47]). The SWPF PBVS, PVVS, PMVS, Laboratory Ventilation System, and AFF Vent Systems exhaust through their own sets of two banks of HEPA filters before being released through the stack. Air from the AFF Vent System, PVVS, and PMVS will pass through demisters prior to the HEPA filter banks. The exhaust stack is a potential pathway for release of hazardous vapors, radioactive particulate emissions, and trace amounts of gas phase radionuclides, including tritium (see Calculation Q-CLC-J-00001[45]), for a list of analyzed radionuclide emissions). The condensate formed from PVVS, PMVS, and AFF Process Vent System will be returned to the radioactive industrial wastewater treatment process.

A diesel generator will be available to provide power to essential plant equipment, if normal site power is lost. During periodic surveillance testing, the generator will emit small amounts of NO_x, SO_x, CO, and particulate emissions. Emergency diesel generators are recognized as exempt emission sources under, Section II.B.2.f.ii of SCR 61-62.1 (*Definitions and General Requirements*[8]) if they operate 500 hours per year or less and have a method to record the actual hours of use, such as an hour meter. The diesel generator must also emit less than 5.0 tons per year (tpy), as allowed by SCR 61-62.70, Title V[8]. The EPC will ensure that the procured diesel generator meets Tier 2 emission standards established in 40 CFR 60, Subpart IIII (*Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*[48]). Stationary reciprocating internal combustion engines (RICE) or diesel generators are also exempt from the requirements of Subpart ZZZZ (*National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*) of 40 CFR 63 (*National emission standards for hazardous air pollutants for source categories*[49]), if they are classified as emergency or limited-use generators. The SWPF generator will require a Part 70 permit (TV-0080-0041[44]) modification for installation and operation. The EPC will complete all applicable Part 70 forms and supporting calculations and submit them for inclusion in TV-0080-0041 as a modification.

6.1.1 Radioactive Air Emissions

During SWPF Enhanced Conceptual Design, the EPC developed a stack emission calculation and air dispersion-dose model that evaluated the need to obtain a Permit to Construct under 40 CFR 61, Subpart H[7]. This Calculation, Q-CLC-J-00001[45], documents that the total effective dose equivalent (TEDE) rate to the MOI is 0.04 mRem/yr. Because the MOI TEDE is below 0.1 mRem/yr, the SWPF is exempt from the requirement to apply for a Permit to Construct, according to 40 CFR 61.96(b)[7]. This exempted emission level was concurred with by the Site M&O Radioactive NESHAP Coordinator in November 2004 (ESH-EPG-2005-00050[28]). In the same memorandum, the Site M&O Radioactive NESHAP Coordinator defined the SWPF

Process Building Stack as a PIC-2 emission point (American National Standards Institute/Health Physics Society [ANSI/HPS] N13.1–1999: *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities*[50]). PIC-2 facilities must, at a minimum, provide continuous air sampling with periodic off-line analysis.

Radiological air emission and dose rate calculations were revised during EPD to ensure that the exemption is still valid (Q-PER-J-00004[46]) (i.e., the annual TEDE rate to the MOI is less than 0.1 mRem/year). Calculation Q-CLC-J-00052[45] was revised to reflect the EFD, and was submitted to the Site M&O Radioactive NESHAP Coordinator for final concurrence on the modeled dose rate and the validity of the SWPF's exemption status under 40 CFR 61, Subpart H[7].

6.1.2 Toxic Air Pollutants

The SWPF waste feed and process chemicals will result in small amounts of HNO_3, Hg, and methanol emissions. HNO_3 is used in the CSSX process. Hg is a component of SWPF waste feed from the Tank Farms (e.g., WSRC-TR-2004-00381: *Characterization of Supernate Samples from High Level Waste Tanks 13H, 30H, 37H, 45F, and 49H*[51]), and methanol is a trace residual component in MST that is added in the ASP and AFP processes in the SWPF.

The calculated maximum emission rates for the toxic air pollutants Hg, HNO_3, and methanol were calculated and the results were submitted to DOE and the Site M&O in the ERP (Q-PER-J-00001[29]). SCR 61-62.5, Standard 8[8] requires a permit for any source emitting more that 1,000 pounds (lbs)/yr and may require a permit for emissions that are less than 1,000 lbs/yr. TV-0080-0041 (Section 7.B.3, Page 8[44]) exempts new emission sources that emit less than 0.05 lb/hour (hr) of any toxic air pollutant. Q-PER-J-00001, with supporting calculations, was submitted to the Site M&O during Preliminary Design and an exemption was granted (ESH-EPG-2005-00050[28]) under TV-0080-0041.

Toxic air emission rate calculations will be revised during EFD to ensure that the exemption is still valid (i.e., maximum toxic emission rates are less than 0.05 lb/hr). Subsequent to DOE approval of EFD, Q-PER-J-00001[29] and supporting calculations will be revised to reflect the EFD and submitted to the Site M&O for final approval of the exemption under TV-0080-0041[44].

6.1.3 Prevention of Significant Deterioration

SWPF emissions regulated under SCR 61-62.5, Standard 7[8], include ozone measured indirectly as VOCs, Hg, and NO_x. Isopar®L-based solvent used in the CSSX process is the major source of VOCs at the SWPF, with trace amounts of methanol introduced into the ASP and AFP as a residue in MST. SCR 61-62.5, Standard 7, establishes 40 tpy of VOC emissions as a "significant" increase for a Major Source. SRS is regulated as a Major Source under this Standard, and increases in VOC emissions exceeding this threshold require application for a Permit to Construct under this Standard. A significant increase of NO_x emissions is defined as 40 tpy in SCR 61-62.5, Standard 7. There should be no major source of NO_x emissions from SWPF; however, HNO_3 could evolve small amounts of nitrogen dioxide (NO_2) that remain in solution from the manufacturing process.

Additionally, TV-0080-0041 (Section 7.B.3, Page 8[44]) exempts new emission sources that emit less than 0.5 lb/hr of VOCs and NO_x from the requirement to obtain a Permit to Construct. An ERP with supporting criteria pollutant emissions calculations (Q-PER-J-00001[29]) was submitted to DOE and the Site M&O, and an exemption was approved under TV-0080-0041 during Preliminary Design (ESH-EPG-2005-00050[28]).

6.1.4 New Source Performance Standards

SCR 61-62.60 (*South Carolina Designated Facility Plan and New Source Performance Standards*[8]) adopts the Federal standard 40 CFR 60[48] by reference. Other than the Final Rule for diesel generator emissions (40 CFR 60, Subpart IIII), there are no specific New Source Performance Standards (NSPSs) listed in 40 CFR 60 that apply to SWPF operations. The final NSPS for the diesel generator exempts emergency diesels that meet Tier II emission levels. The volume of organic solvent that will be stored and used in the CSSX process is approximately 500 gallons. This volume is much less than the applicability threshold of 40,000 gallons established in 40 CFR 60, Subpart Kb (*Standards of Performance for Volatile Organic Liquid Storage Vessels [Including Petroleum Liquid Storage Vessels] for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984*) for organic compounds with a vapor pressure less than 26 millimeters (mm) Hg. Isopar®L, the major component of the solvent, has a vapor pressure of ~1 mm Hg at 25 degrees Celsius.

SCR 61-62.5, Standard 5.1 (*Best Available Control Technology [BACT]/Lowest Achievable Emission Rate [LAER] Applicable to Volatile Organic Compounds*[8]) establishes regulations for specific industrial processes that utilize VOCs that have total potential emissions more than 550 lbs/day (nominal size - 100 tpy) or more than 150 lbs/hr. The SWPF utilizes none of the regulated processes and has emission rates far below these limits (Q-PER-J-00001[29]).

6.1.5 National Emission Standards for Hazardous Air Pollutants for Source Categories

There are no SWPF processes regulated under 40 CFR 63[49]. Diesel generators are regulated in Subpart ZZZZ of 40 CFR 63. The SWPF generator, according to 40 CFR 63.6590(b) (1) (*The stationary RICE is a new or reconstructed emergency stationary RICE*), is exempt from all but the notification requirement of 40 CFR 63.9 (*Notification requirements*) if it is categorized as emergency or limited use. The SWPF generator will be a limited-use generator, routinely used less than 100 hrs/yr for preventive maintenance.

6.1.6 Title V Operating Permit

SRS air emissions are permitted under TV-0080-0041[44]. No major permit modifications will be required due to SWPF operation. The installation and operation of a diesel generator used less than 100 hrs/yr will require a modification to TV-0080-0041. This modification includes completing the required Part 70 Application Forms, with supporting emissions calculations, and submitting them to the Site M&O through DOE no less than four weeks prior to the date of placing in service.

6.1.7 As Low As Reasonable Achievable

Emission of radionuclides into the atmosphere is governed by the requirement of DOE O 5400.5[19] to limit all releases to ALARA. The EPC will design the SWPF to not only achieve the limits imposed through NESHAP, but also incorporate the ALARA approach in designing the SWPF PBVS, AFF Ventilation System, PVVS, and PMVS filtration systems.

6.1.8 Chemical Accident Prevention

Any stationary source utilizing or storing a regulated substance in quantities exceeding thresholds in SCR 61-62.68 (*Chemical Accident Prevention Provisions*[8]) and 40 CFR 68 (*Chemical Accident Prevention Provisions*[52]) must comply with chemical accident prevention requirements defined in 40 CFR 68. HNO_3 is the only process chemical that will be used and stored at the SWPF that is regulated under this regulation. HNO_3 is regulated at concentrations of $\geq$ 80 percent (%) by weight. The SWPF will receive, store, and dilute HNO_3 with a maximum concentration of 20% by weight; consequently, the requirements of SCR 61-62.68 are not applicable.

6.1.9 Fugitive Emissions

Anticipated emissions generated by construction will include:

- Dust from excavation and soil transfer,
- Dust from vehicle traffic on unpaved surfaces, and
- Vehicle exhaust.

Emissions associated with construction will be particulates from vehicles, excavation, and concrete mixing, as well as NO_2, SO_x, carbon dioxide, and particulates from vehicle/heavy machinery exhaust. Because the SRS is in an attainment area under 40 CFR 81 (*Designation of areas for air quality planning purposes*[53]), with respect to 40 CFR 50 (*National Primary and Secondary Ambient Air Quality Standards*[54]), no permit will be required for fugitive emissions associated with construction.

During SWPF construction, the EPC will ensure that actions are taken to mitigate generation of airborne particulates and fugitive emissions, pursuant to SCR 61-62.6 (*Control of Fugitive Particulate Matter*[8]). Mitigation approaches include:

- Use of water or chemicals for control of dust in construction operations;
- Application of asphalt, water, or suitable chemicals on dirt roads, material stockpiles, and other surfaces that can give rise to airborne dust;
- Providing adequate containment during sandblasting and other similar operations;

- Paving of roadways and prompt removal of earth or other materials deposited on paved streets;
- Imposition of speed limits for vehicular traffic at the construction site; and
- Proper loading of trucks, trailers, front-end loaders, etc., to prevent spillage on paved roadways.

The EPC is participating in the SRS program to reduce PM-2.5 air emissions and will pursue efforts to minimize generation of fugitive emissions.

6.1.10 Monitoring and Reporting Activities

Estimated emission rates and associated air dispersion-dose modeling indicate a potential Effective Dose Equivalent (EDE) rate of 0.04 mRem/yr to the MOI. The ANSI/HPS N13.1-1999[50] specified in 40 CFR 61, Subpart H[7], requires periodic sampling and off-line analysis for emission points with potential EDEs $\leq$ 0.1 mRem/yr. The EPC will develop and implement an air monitoring program that follows ANSI/HPS N13.1-1999 and Appendix B of 40 CFR 61 (*EPA Method 114: Test Methods for Measuring Radionuclide Emissions from Stationary Sources*[7]) prior to Hot Commissioning.

The Site M&O will conduct the site-wide air monitoring for the Annual Site Environmental Report (ASER).

6.1.11 Schedule

Based on analysis of emissions during EFD (Calculation Q-CLC-J-00052[45]), radiological emissions will be less than 0.1 mRem/yr and are, therefore, exempt from the requirement to obtain a Permit to Construct under 40 CFR 61, Subpart H[7]. An ERP for toxic and criteria pollutant emissions was approved by the Site M&O during Preliminary Design. Part 70 Forms and supporting calculations will be submitted for the SWPF diesel generator during the Construction phase.

7.0 WASTE MANAGEMENT

Solid waste (SW) will be generated during SWPF Construction, Commissioning, and Operations. Waste streams will include construction waste, sanitary waste, low-level radioactive waste, hazardous waste (HW), and low-level mixed waste (MW) will be generated by SWPF operations. Transuranic (TRU) Waste could result if a cross-flow filter (CFF) failed and retained a sufficient inventory of irremovable transuranic solids. Radioactive waste is anticipated to comprise failed equipment, including pumps and valves, expended or failed CFFs, HEPA filters, and job control equipment such as decontamination supplies, wipes, and disposable protective equipment. HW and MW may include spent solvent and miscellaneous debris resulting from maintenance activities or spill response, and Analytical Laboratory waste.

This section describes processes that result in the generation of various types of waste and describes the EPC's compliance approach. This waste management section is applicable to all SWPF activities during Construction, Commissioning, and Operations that generate or have the potential to generate non-radioactive and non-hazardous SW, HW, low-level waste (LLW), MW, or TRU waste.

7.1 Regulated Processes

Information concerning the secondary wastes generated by the SWPF was obtained from P-SPC-J-00001 (*SWPF Feed Strategy and Product and Secondary Waste Specification*[55]).

The SWPF wastewater feed will be received from the H-Area Tank Farm. The SWPF product wastewater will be transferred to the DWPF and SPF via underground transfer lines. The SWPF waste treatment operations will not generate any routine secondary liquid hazardous, radioactive, or MW streams that require packaging and handling.

The SWPF will generate incidental or secondary SW from routine maintenance operations, and may generate secondary solid wastes from unanticipated equipment failures or process upsets. P-SPC-J-00001[55] provides preliminary estimates for the generation rates for low-level, hazardous, and MW streams associated with Commissioning and Operations (Table 7-1). No TRU waste is expected to be generated during Operations; however, appropriate planning will be carried out for the unanticipated generation of TRU waste from failed filters. SW generated during Construction, Commissioning, and Operations will be characterized, classified, and managed pursuant to the following regulations and DOE directives:

- SW – Federal Subtitle D regulations covering solid waste and SCR 61-107 (*Solid Waste Management*[56]);
- HW – Federal Subtitle C regulations covering hazardous waste and SCR 61-79 (*Hazardous Waste Management Regulations*[57]);
- LLW and TRU – DOE O 435.1[20] and DOE M 435.1-1[21]; and
- MW – DOE O 435.1[20], DOE M 435.1-1[21], Federal Subtitle C regulations covering solid waste, and SCR 61-79[57].

Individual Waste Management Plans (WMPs) will be developed for each respective waste type. The Construction solid and hazardous waste management plan and implementing procedures were developed during the early Final Design phase. Waste management plans and procedures for the Commissioning phase and operations will be developed during the Construction phase. These WMPs will document the EPC's approach to implementing policies, programs, and procedures required in the applicable DOE directives and South Carolina waste management regulations. Required procedures for critical waste management activities, including characterization, are certification, packaging, labeling, marking, manifesting, record keeping, inspection, and housekeeping.

In addition to development and implementation of the WMPs and procedures, the EPC will ensure that all design requirements established in the South Carolina and Federal waste management regulations are incorporated in the SWPF design.

Table 7-1. Estimated SWPF Radioactive, Hazardous, and Mixed Waste Generation Rates

Classification		Description	Waste Quantity	Disposition and Compliance Activity
LLW	Dry Active Waste	Job-Control waste, sample vials, other contaminated solids packaged in B-25 boxes	4,400 cubic feet (ft^3)/yr	• Disposition: SRS Radioactive Waste Burial Grounds for disposal as LLW • Establish Waste Staging and Packaging Area within SWPF • Develop LLW Plan that addresses waste minimization, disposition path, storage limits, characterization processes, certification program, waste condition, segregation packaging procedures, record keeping
LLW	Process Equipment	Failed equipment to be decontaminated and transferred to the SRS Radioactive Waste Burial Grounds for disposal as LLW	Piping/valve sections – 50 ft^3/yr 2 motors/yr 1 contactor internals/5 yr	
LLW	Filtration Equipment from Alpha/Sorption CSSX	Failed filter unit due to leak, break, or plug	3 units/5 yr	
TRU	TRU waste	Although not anticipated, it is possible that CFFs may contain sufficient inventory to be classified as TRU waste	3 units/5yr	• Disposition: Waste Isolation Pilot Plant • Establish Waste Staging and Packaging Area within SWPF • Develop TRU Plan that describes waste characterization procedures, the waste certification program, the TRU waste transfer process, and waste packaging procedures

Table 7-1. Estimated SWPF Radioactive, Hazardous, and Mixed Waste Generation Rates (cont.)

Classification		Description	Waste Quantity	Disposition and Compliance Activity
HW	HW	Oils, grease, cleaning solvents sorbed on solid, hazardous metals or chemicals, other materials classified as HW that must be packaged and stored by the Solid Waste Division until final treatment and disposal can be completed	55 ft^3/yr	Establish 90-day Accumulation Area and Satellite Accumulation Areas that meet design requirements of SCR 61-79.262.34 (*Accumulation Time*[57]), • Procedures and qualified personnel for waste inventory records, packaging, designation (i.e., classification), and custody control • Procedures that ensure all wastes are removed from the Accumulation Area drip pad and associated collection system at least once every 90 days • SRS Solid Waste Division will receive HW waste from SWPF for appropriate disposition or the EPC may elect to contract to a commercial facility • HW Management Plan that addresses waste minimization, waste classification, manifesting, packaging, labeling, marking, placarding, record keeping, and reporting pursuant to SCR 61-79.262 (*Standards Applicable to Generators of Hazardous Waste*[57])

Table 7-1. Estimated SWPF Radioactive, Hazardous, and Mixed Waste Generation Rates (cont.)

Classification		Description	Waste Quantity	Disposition and Compliance Activity
MW	MW - Solids	HW potentially contaminated with low concentrations of radioactive species that must be packaged and stored by the Solid Waste Division until final treatment and disposal can be completed	900 ft^3/yr	• Establish 90-day Accumulation Area that meets requirements of SCR 61-262.34[57], and SCR 61-79.265, Subpart DD[57] • Procedures and qualified personnel for waste inventory records, packaging, designation (i.e., classification), and custody control • Procedures that ensure all wastes are removed from the Accumulation Area drip pad and associated collection system at least once every 90 days • SRS Solid Waste Division will receive MW from SWPF for appropriate disposition • MW Management Plan that addresses waste minimization, waste classification, manifesting, packaging, labeling, marking, placarding, record keeping, and reporting pursuant to SCR 61-79.262[57]
MW	MW or Radioactive Waste Liquids	Laboratory sample waste and possibly degraded solvent waste	110 gallons/yr	

7.2 Solid Non-Hazardous Waste

Beginning with the Construction phase, the SWPF will generate non-hazardous, non-radioactive SW. Construction waste and consumable products will be the largest sources of SW.

Waste and debris will be generated during SWPF Construction and Commissioning. Construction debris consists of organic debris from site clearing and grubbing, soils, and waste generated from construction materials (e.g., wood, block, and solidified concrete fragments). To the extent practicable, construction soils will be used either in the construction process as berm and fill material or sent to the Central Shops soil repository. Pursuant to V-ESR-J-00021[14], SW generated during SWPF construction will be disposed at the construction and debris (C&D) landfill. Waste not meeting C&D landfill WAC will be disposed at Three Rivers Municipal Landfill (TRML). SW will be disposed in a manner that is consistent with the Site M&O's approved SW management procedures.

Non-hazardous, non-radioactive SW generated during SWPF Operations will be evaluated and approved for release by the SWPF Generator Certification Official(s) for shipment to either the C&D landfill or TRML, in accordance with the appropriate landfill WAC requirements (V-ESR-J-00021[14]).

Pursuant to V-ESR-J-00021[14], SW that is generated in a Radiological Buffer Area or a Radiological Materials Area will be disposed in a manner that is consistent with the Site M&O's approved SW management procedures.

7.3 Radioactive Waste

SWPF Operations will generate low-level and potentially TRU radioactive SW, as defined in DOE M 435.1-1[21]. Table 7-1 summarizes estimated SWPF radioactive waste generation rates, specific types of waste, and specific compliance activities and requirements. Radioactive waste generated in the SWPF Process Building will be packaged in SRS- and DOT-approved containers. A waste inventory of all contents will be maintained for each radioactive waste container. The SWPF ESH&Q Manager will be responsible for obtaining radiation survey/assay data of the container or for obtaining samples and analysis of the container contents, in order to characterize the waste. Filled LLW containers shall be stored in a Radioactive Materials Area inside the SWPF, in accordance with DOE O 435.1[20] staging requirements, until it can be transported to the onsite LLW disposal facility.

The SWPF is anticipated to generate incidental radioactive waste derived from contaminated failed equipment, filtration equipment, waste from routine sampling and analysis activities, and personal protective equipment contaminated during maintenance activities. Pursuant to the requirements of DOE M 435.1-1[21], the EPC will establish a radioactive waste management program that addresses generator requirements, including:

- Waste certification,
- Identification of waste disposition,
- Waste characterization,
- Transfer of responsibility,
- Storage and staging, and
- Packaging and transportation.

The EPC will develop a waste tracking system to ensure that the waste acceptance requirements of facilities receiving radioactive waste for storage, treatment, and disposal are met. The EPC will designate trained and qualified waste management personnel with the authority to certify and release waste for shipment and to specify documentation that is required for waste generation, characterization, shipment, and certification. The waste certification program will establish a records management program that tracks the disposition of SWPF-generated radioactive waste and maintains these records for the duration of the SWPF Project.

Radioactive waste from the SWPF will be characterized by the EPC to ensure safe management and compliance with the waste acceptance requirements of the facility receiving the waste. The EPC's radioactive waste management program will ensure that characterization data includes: physical and chemical characteristics; volume, weight, identities, activities, and concentrations of major radionuclides; and the generating source.

The EPC will develop procedures for transferring custody of radioactive waste that assigns responsibilities and methods for ensuring that no radioactive waste is transferred to a Treatment, Storage, or Disposal Facility (TSDF) until personnel responsible for the facility receiving the waste authorize the transfer via a written agreement. The EPC will develop a tracking system with manifests for the waste receiving facility to sign upon transfer of the waste. Waste characterization data, container information, and generation, storage, treatment, and transportation information for radioactive waste will be transferred with, or be traceable to, the waste.

Radioactive waste awaiting treatment and/or disposal will be stored in a controlled area and managed in accordance with the requirements of 10 CFR 835[47] (entry control, posting, entry and exit monitoring). LLW will be accumulated in quantities that are necessary to facilitate transportation, treatment, and disposal. Staging longer than 90 days will meet the requirements for storage just mentioned and the requirements defined in Chapter I of DOE M 435.1-1[21]. In accordance with DOE M 435.1-1, radioactive waste that has an identified path to disposal will not be stored longer than one year prior to disposal, unless authorized by DOE or other authorized disposal facility.

V-ESR-J-00003[11] and V-ESR-J-00005[12] define the waste management roles and responsibilities of the SWPF generator and the Site M&O TSDF operator. The EPC will disposition radioactive waste in compliance with V-ESR-J-00003 and V-ESR-J-00005. Radioactive waste that requires

packaging prior to shipment from the SWPF to the SRS disposal facility will be classified according to DOT regulations in 49 CFR 172 (*Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements*[58]) and 49 CFR 173 (*Transportation: Shippers—General Requirements for Shipments and Packagings*[59]) and packaged following the requirements of 49 CFR 173, Subpart I, Class 7 (*Radioactive Material*). All waste packaging will undergo an inspection after they have arrived at the site or prior to use to verify and document that the packaging meets all specifications stemming from Federal and site requirements. Packaging will be labeled and shipping papers prepared according to the requirements of 49 CFR 172.

7.4 Hazardous and Mixed Waste

SWPF will be constructed and operated under an IWWF Permit; therefore, salt waste treatment operations are exempt from Resource Conservation and Recovery Act (RCRA)[60] permitting requirements. RCRA waste generator requirements specified in SCRs: 61-79.262[57], 61-79.263 (*Standards Applicable to Transporters of Hazardous Waste*[57]), and 61-79.268 (*Land Disposal Restrictions*[57]) apply to SWPF management and disposition of HW generated during the SWPF life cycle. Table 7-1 summarizes estimated SWPF HW and MW generation rates, the specific types of waste, and the specific compliance activities and requirements applicable to its management.

Waste generated during Construction, Commissioning, and Operations will be evaluated according to waste characterization procedures developed as part of the HW Management Plan to determine if it is HW under SCR 61-79.261 (*Identification and Listing of Hazardous Waste*[57]) definitions. HW will be sampled and analyzed in accordance with EPA SW-846 (*Test Methods for Evaluating Solid Waste, Physical Chemical Methods*[61]). HW/MW generated in the SWPF Process Building will be packaged in Site M&O-/DOT-approved containers or other special approved containers for truck shipment to N-Area or to the SRS TSDF. HW may also be packaged and shipped offsite to a commercial offsite vendor for treatment/disposal. A waste inventory of all contents will be maintained for each HW/MW container. The SWPF will be responsible for obtaining radiation survey/assay data of the container or for obtaining samples and analysis of the container contents in order to characterize the waste. Filled HW/MW containers will be stored in a RCRA[60]-compliant Satellite Accumulation Area or 90-day Staging Area inside the facility until it can be transported for treatment and disposal. These areas will be designed and/or configured to comply with the requirements of SCR 61-79.262.34[57], and SCR 61-79.265, Subpart DD[57].

7.4.1 Review of SWPF Processes for Possible Hazardous Waste Streams

All process chemicals are considered potential future waste streams. During normal operations, process chemicals and treated wastewaters will be transferred via underground pipelines to either the DWPF or SPF. These waste streams are industrial wastewaters and may become hazardous MW only if released from their primary and secondary containment or their intended means of conveyance and transfer (i.e., DOE M 435.1-1[21] defines LRW as an MW, unless demonstrated otherwise). Process chemicals may become waste if they lose their effectiveness (i.e., are spent),

if they are spilled and are unrecoverable, or if they are determined to not meet SWPF specifications. In the latter case, the chemicals will be returned to the manufacturer.

HW may be Listed, Characteristic, or both. The following analysis first evaluates whether any of the process chemicals could become Listed HW, and then evaluates if any of the process chemicals could become Characteristic HW (i.e., ignitable, reactive, toxic, or corrosive).

None of the SWPF chemicals are components of listed waste, as defined in SCR 61-79.261[57]. The solvent contains no halogenated aliphatics. Waste solvent will not be an F-Listed as defined in SCR 61-79.261.30 (Subpart D: *Lists of Toxic Hazardous Wastes*[57]). Spilled, spent, or off-specification process chemicals, including the solvent, will not generate a Listed HW.

Table 7-2 lists process chemicals, with respect to physical properties that could lead these materials to become characteristic HW. A characteristic HW has the properties of being reactive, ignitable, corrosive, or toxic, as defined in SCR 61-79.261[57].

RCRA[60] defines reactive as normally unstable and readily undergoes violent change without detonating, reacts violently with water, forms potentially explosive mixtures with water or, when mixed with water, generates toxic gases (SCR 61-79.261.23, *Characteristic of reactivity*[57]). HNO_3 can react violently if water is rapidly added to its concentrated form. The Nitric Acid Receipt Tank (TK-304) is the only tank with acid of sufficiently high concentration to be a potential precursor to a reactive waste. Waste generated from this tank should, therefore, be considered reactive until neutralized. No other chemicals are identified as having a reactive characteristic.

Chemicals used in SWPF process operations will contain none of the chemical constituents that are listed in SCR 61-79.261.24 (*Toxicity characteristics*[57]). The solvent may, however, become contaminated with one or more of the metals listed in the Toxicity Characteristic Leaching Procedure. Spent solvent will be analyzed by EPA Methods (EPA Publication SW–846[61]) to determine if it contains sufficient quantities of RCRA[60] toxic metals to be characteristic HW. Chemical analysis will be conducted by a State-certified laboratory.

None of the process chemicals have flash points that are less than 140 degrees Fahrenheit (°F), the defined threshold for the ignitability characteristic (SCR 61-79.261.21: *Characteristic of ignitability*[57]). The solvent is composed largely of Isopar®L with 0.75M Cs-7SB, 0.003M TOA, and 0.007M BOBCalixC6. Isopar®L has a flash point of ~144±3°F, according to the manufacturer, Exxon Mobile Chemical (2003). The flash point of the solvent mixture is 148±1°F (WSRC-TR-2006-00083: *Flash Point of CSSX Solvent*[62]). TOA has a flash point that is > 235°F. The flash point of Cs-7SB is 572°F. BOBCalixC6 is solid at room temperature.

Table 7-2. Potential Process Chemical Waste Sources

Chemical	Chemical and Physical Parameters of SWPF Process Chemical	RCRA Hazardous Characteristic Threshold	Hazardous Waste Code
• HNO_3 – 20% by weight	pH < 1	Corrosive - pH ≤ 2.0	D002
	May react violently with water	Violent reaction with water	D003
• Sodium Hydroxide (NaOH)– 50% by weight	pH = 13 to 14	Corrosive - pH ≥ 12.5	D002
• Oxalic Acid ($H_2C_2O_4$) - Received in Solid Form/Mixed to 0.5M Solution in CCA	pH = 1.9 (0.5 M)	Corrosive - pH ≤ 2.0	D002
• Solvent	Flash Point >148±1°F	Ignitability - Flash Point < 140°F	No Applicable Code
Solvent Components:			
– Isopar®L	Flash Point > 144±3°F	Ignitability - Flash Point < 140°F	No Applicable Code
– BOBCalixC6	Solid at Room Temperature	Ignitability - Flash Point < 140°F	No Applicable Code
– Cs-7SB	Flash Point > 140°F	Ignitability - Flash Point < 140°F	No Applicable Code
– TOA	Flash Point > 140°F	Ignitability - Flash Point < 140°F	No Applicable Code

HNO_3, $H_2C_2O_4$, and NaOH could result in the generation of characteristic corrosive HW. Spills will be neutralized under the HW treatment exemption in Subsection(g)(6) of 40 CFR 264.1 (*Purpose, scope and applicability*[63]) for elementary neutralization units. The current disposition of the neutralized waste has not been determined. Options include discharge to the sanitary sewer, if allowed by the SRS CSWTF, transport to the SRS ETF for treatment, or disposal by a commercial wastewater vendor. The neutralized corrosives are not HW and may be stored in the Neutralization Tank (TK-317) for greater than 90 days and either discharged to the sewer or containerized and disposed offsite. Use of the sanitary sewer for small and non-routine discharges will depend on the acceptability of neutralized waste by the SRS CSWTF (i.e., non-routine discharges of neutralized acids and bases, comprising largely sodium nitrate, are approved by the by the SRS CSWTF on a case-by-case-basis).

The EPC intends to utilize the Site M&O for waste disposal services, pursuant to V-ESR-J-00003[11] and V-ESR-J-00005[12]. If the Site M&O cannot receive the waste or make arrangements for its disposal in accordance with V-ESR-J-00003 or V-ESR-J-00005, the EPC will subcontract for waste disposal outside of these agreements. The selected vendor will ensure that all waste manifesting paperwork (including land disposal restrictions notifications) is completed. The EPC will review paperwork submitted by the subcontractor for completeness and transmit it to DOE. Any manifests or paperwork associated with manifesting will be signed and will include the statement "On Behalf of the EPC, Operator". Regardless of the contractor performing disposal or manifesting, the EPC will ensure that all waste material is properly characterized, packaged, marked, and labeled and is in good condition for transportation in accordance with SCR 61-79.262[57], 49 CFR 172[58], 49 CFR 173[59] and/or 10 CFR 71 (*Packaging and transportation of radioactive material*[64]).

For all HW, the EPC will prepare and submit a quarterly report to DOE for submittal to SCDHEC no later than 30 days after the end of each calendar quarter (SCR 61-79.262.41: *Quarterly reporting*[57]) The report will include, but not be limited to, the following information:

1. DOE's Generator EPA Identification Number, name, and address;
2. Calendar quarter covered by report;
3. EPA Identification Number, name, and address of each offsite TSDF to which waste was shipped during the quarter;
4. Name and EPA Identification Number of each transporter used during the quarter;
5. Description, EPA HW number, DOT hazard class, and quantity of each HW shipped offsite (listed by EPA Identification Number of each offsite facility to which waste was shipped);
6. Types and quantities of wastes shipped offsite for treatment and disposal;
7. Types and quantities of wastes remaining in storage at the end of the reporting period; and
8. Certification signed by the generator or authorized representative.

The EPC will retain a copy of each manifest signed by the generator for three years or until a copy signed by the designated TSDF is received. All manifests that are less than three years old will be turned over to the operating contractor from the EPC. Copies of manifests signed by the designated facility will be retained for at least three years from the date the initial transporter accepted the waste. The EPC will retain copies of reports for at least three years from the due date of the report. Records of any test results, waste analyses, or other methods used to determine whether a waste is hazardous must be retained for a minimum of three years from the date the waste was last sent for onsite or offsite treatment, storage, or disposal (SCR 61-79.262.40: *Record Keeping*[57]).

7.4.2 Analytical Laboratory Hazardous and Mixed Waste Stream

The Analytical Laboratory will utilize a wide variety of chemical reagents that will be a source of both Listed and Characteristic hazardous and mixed waste (e.g., P-SOW-J-00001: *SWPF Analytical Laboratory Functional Scope of Work*[65]). Small amounts of F- and U-listed waste will derive from organic reagents including acetonitrile, benzene, chloroform, ether, toluene, and xylene. The laboratory waste stream will also include D-listed ignitable (ether, hexane, benzene, toluene, xylene), reactive (HNO_3), corrosive (various acids), and toxic (chloroform) characteristic wastes. The wastes will be accumulated in one or more laboratory satellite waste accumulation areas that meet requirements of 40 CFR 262 (*Standards applicable to generators of hazardous waste*[66]), 29 CFR 1910 (*Occupational Safety and Health Standards*[67]), and 10 CFR 835[47]. Prior to the amount of waste exceeding a maximum of 55 gallons (40 CFR 262.34[c][1]: *Accumulation time*) or lower levels established by the Documented Safety Analysis, Fire Hazard Analysis, industrial hygiene, or radiation protection, the waste will be transferred to the SWPF 90-Day Storage Area for packaging, labeling, and marking for treatment and disposal by the Site M&O in accordance with V-ESR-J-00003[11] and V-ESR-J-00005[12].

7.5 Waste Minimization and Pollution Prevention

Waste minimization and pollution prevention (P2) are integral parts of the EPC's SWPF design, construction, testing, and commissioning process and will be included in all phases of the SWPF Project. The EPC will implement a waste minimization policy in accordance with RCRA Section 3002 (a)(6) (*Standards Applicable to Generators of Hazardous Waste*[60]), which includes efforts that will be undertaken to reduce the volume and toxicity of HW generated and reporting on actual changes achieved in the volume and toxicity of HW. The EPC will develop WMPs during Construction that detail specific approaches to Waste Minimization and P2. Waste minimization is implemented in the Design phase of the SWPF Project, and efforts to reduce the volume and toxicity of waste generated will be incorporated into design features and operational controls. During process testing and Cold Commissioning, a non-radioactive chemical simulant will be used for feed. It will be a caustic solution containing the soluble salts present in the salt waste. Passage of this simulant through the process will generate MST/sludge, strip effluent, and DSS. The DSS and any simulant that is spilled or that is left after process testing will be hazardous and must be managed and disposed in accordance with applicable regulations. Disposition options include:

- Beneficial reuse,
- Chemical adjustment and disposal as industrial waste, and
- Stabilization and disposal at an appropriately permitted facility.

The EPC has contacted waste management firms that have identified potential beneficial reuse customers. Implementation of the beneficial reuse disposition strategy would require appropriate and adequate sampling and characterization of the process fluids (simulant, DSS, and strip effluent) to verify compatibility with the industrial waste treatment process. The EPC would also need to perform facility inspections to verify proper configuration for the management of HazMat.

Hot Commissioning operations will generate streams chemically similar to those in Cold Commissioning; however, these streams will be radioactive. The EPC intends for all the product streams to be directed to their respective design downstream disposition (i.e., MST/sludge and strip effluent to the DWPF, and DSS to the SPF).

As much as possible, all liquids spilled and collected will be recovered and recycled through the process.

7.6 Personnel Training

The EPC Waste Management staff will complete a training and qualification program that will include classroom instruction and on-the-job training on waste packaging, characterization, and container management. Waste management training will be tailored for those individuals who have waste management-specific activities. For example, only those individuals responsible for signing HW manifests and managing HW will be required to be DOT Hazardous Materials- and RCRA[60]-certified and be SRS Generator Certification Official trained and qualified. Contingency plan and emergency response training relevant to each employee's position will also be provided (SCR 61-79.265.16: *Personnel Training*[57]). The EPC's employees will complete the training program during Commissioning, prior to the generation of waste. New hires will not be allowed to work in unsupervised positions until all required training is complete. All EPC Waste Management personnel will be required to complete an annual re-qualification/refresher training program after initial qualification.

7.7 Schedule

The EPC has developed waste management and P2 plans and procedures for Construction waste management and P2 plans for Commissioning and Operations will be developed during the Construction phase. Plans and procedures will be developed to manage SWPF waste "from cradle to grave".

8.0 OTHER REGULATED ACTIVITIES

This section of the EPC's Environmental Plan addresses other regulated SWPF process activities, permitting and compliance activities, schedules for completion, and any associated monitoring and reporting activities. The SWPF Project is a dynamic process that will require the EPC to track the design and continually evaluate the processes to determine if any additional regulatory requirements are identified that require plan modification. If the Plan requires modification, the EPC will submit the revised Plan to DOE for review and approval.

8.1 Federal Facilities Compliance Act/Site Treatment Plan

The EPC will develop a plan for treatment capacities and technologies to treat MW and submit this plan to DOE in compliance with Contractual (DE-AC09-02SR22210[3]) requirements and the *Federal Facilities Compliance Act of 1992*[68]. WSRC-TR-94-0608[1] was prepared for SRS MW, in accordance with the *Federal Facilities Compliance Act* requirements and also with RCRA Section 3021 (*Mixed Waste Inventory Reports and Plan[s]*[69]), which was approved by SCDHEC on September 20, 1995. SCDHEC issued a Consent Order (95-22-HW) requiring compliance with the plan, which was issued and signed by DOE in late September 1995. The EPC will prepare and submit information relevant to the SWPF MW streams to DOE for incorporation into WSRC-TR-94-0608, if necessary.

8.2 Updates to Annual Site Environmental Report

The ASER is prepared annually for SRS and is distributed to the Environmental Health Lead at DOE Headquarters by June 1 of each year. The EPC will supply relevant information to DOE for incorporation into the ASER Annual Update Reports. These reports will be transmitted to DOE by March 31 of each year during which a regulated discharge occurred.

8.3 National Historic Preservation Act

The EPC has reviewed DOE/EIS-0082-S2[4], in which DOE concluded that the proposed location of the SWPF is within "fenced, disturbed industrial areas" or "without suitable habitat". Federal law provides for the protection of antiquities located on land owned or controlled by DOE, per the EPC's SWPF Contract clause: *"Antiquities include Indian graves or campsites, relics, and artifacts"* (DE-AC09-02SR22210[3]).

The EPC will comply with the National Historic Preservation Act[70] by ensuring that:

- Prior to start of Construction, training is provided to all workers that will enable them to identify an article or artifact that is covered under the Act; and
- Any suspicious article or artifact discovered will remain undisturbed; the EPC's Project Manager will be informed and will notify the SRS Archeology Program through DOE.

9.0 NATIONAL ENVIRONMENTAL POLICY ACT

This section describes the EPC's approach and plan for complying with the *National Environmental Policy Act*[71] (NEPA) during SWPF Design, Construction, Commissioning, and Operations. This part of the Environmental Plan describes the NEPA-regulated process and the EPC's approach to compliance with NEPA regulations.

9.1 Regulated Processes

The NEPA[71] process requires preparation of an Environmental Impact Statement for major decisions that have the potential to adversely impact the human environment. DOE completed the Supplemental Environmental Impact Statement, DOE/EIS-0082-S2[4], in June 2001; the document evaluated three processes for removing ^{137}Cs and other radionuclides from H- and F-Area Tank Farms' salt waste and sending them to the DWPF for vitrification. The CSSX process, combined with the MST-based ASP for Sr and actinide removal, was identified as the preferred alternative.

In January 2006, DOE issued DOE/EIS-0082-S2-SA-01 (*Supplement Analysis: Salt Processing Alternatives at the Savannah River Site*[72]) to evaluate the need for further NEPA[71] review as a result of the proposed change in the processing and disposition pathway for a fraction of the salt waste stored in the F- and H-Area Tank Farms. As a result of this analysis, DOE determined that no new NEPA review was required and, on January 24, 2006, issued 71 FR 3834 (*Amended Record of Decision: Savannah River Site Salt Processing Alternatives*[73]). DOE decided to implement Interim Salt Processing.

9.2 Compliance Activities

The NEPA[71] process is an inherently Federal activity. If it is determined during any phase of the SWPF life cycle that the Facility cannot be designed, constructed, or operated within the bounds of the analysis performed in DOE/EIS-0082-S2[4], the EPC will notify DOE of the issue and provide DOE with all necessary documentation and technical analyses to explain the need for deviation from decisions contained in DOE/EIS-0082-S2 and the associated *ROD*[5]. The decision to conduct further NEPA analyses, such as Supplemental Analysis for the Environmental Impact Statement will be DOE's responsibility. The EPC will support DOE, as requested, in making any such decisions.

10.0 RELEASE REPORTING

This section describes the EPC's approach to complying with release reporting requirements promulgated by the Federal CWA[37] and the Emergency Planning and Community Right-to-Know Act (EPCRA)[74].

10.1 Regulated Processes

The regulatory requirements for release reporting and the EPC's approach to meeting these requirements are summarized in the following sections. The EPC's primary point of contact and interface for all release reporting events will be the Site M&O Savannah River Site Operations Center (SRSOC). The SRSOC and the Site Environmental Protection Coordinator (SEPC) will be responsible for notification of the National Response Center in the event of a chemical release covered under EPCRA[74] or the CWA[37].

10.2 Compliance Activities

Federal release reporting regulations are promulgated under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Chapter 103, Superfund Amendments and Reauthorization Act (SARA) Title III, Section 304 (*Emergency notification*[75]), EPCRA[74], and the CWA Section 311 (*Oil and Hazardous Substances Liability*[37]).

This section identifies the release reporting requirements the EPC will implement during SWPF Construction and Commissioning. South Carolina release requirements are essentially identical to Federal requirements and are promulgated under South Carolina Code §§ 48-1-10 (*Pollution Control Act*[76]) and §§ 48-43-510(South Carolina Oil and Gas Act of 1977[77]). Release reporting requirements will remain consistent throughout the Construction, Testing, and Commissioning phases.

The process chemicals that will be used during SWPF operations are listed in Table 10-1. The EPC will review this list periodically as new data are obtained and update this section as appropriate.

Table 10-1. SWPF Bulk Chemicals

Chemicals	CAS* Number
NaOH – 50% by weight	1310-73-2
HNO_3 – 20% by weight	7697-37-2
$H_2C_2O_4$ - Received in solid form/mixed to 0.5M aqueous solution in CCA	144-62-7
BOBCalixC6[1]	To-Be-Assigned
MST	60704-88-3
Cs-7SB[2]	308362-88-1
Diesel Fuel (Number 2)	68476-34-6
TOA	1116-76-3
Isopar®L[3]	64742-48-9
Propylene Glycol	57-55-6

Notes:

*CAS: Chemical Abstracting Service

1. BOBCalixC6 - calix[4]arene-bis-(tert-octylbenzo-crown-6)
2. Cs-7SB - 1-(4-tert-octylphenoxy)-3-(1,1,2,2-tetrafluorethoxy)-2-proponal
3. Isopar®L - Commercial hydrocarbon - S.G. 0.765 to 0.772 (specification available)

10.3 Reportable Quantities

The release into the environment in any quantity of a hazardous substance with a reportable quantity (RQ) in 40 CFR 117 (*Determination of Reportable Quantities for Hazardous Substances*[78]) or 40 CFR 302 (*Designation, reportable quantities, and notification*[79]) will be reported to the SRSOC by the person in charge of the facility, as soon as he or she has knowledge of the release (40 CFR 302.6: *Notification requirements*). This quantity will be tracked with other site spills to ensure that a 24-hour RQ is identified and reported as required. If an RQ or courtesy notification level is reached, SRSOC and the SEPC will notify the National Response Center. NaOH and HNO_3 are the only SWPF process chemicals with RQs listed in Table 10-1. The RQ is 1,000 lbs for both substances. Although not specifically listed in 40 CFR 302, Table 302.4 (*List of Hazardous Substances and Reportable Quantities*), the salt waste feed has a pH of approximately 14. An accidental release of waste exceeding 100 lbs would require reporting under Paragraph 302.4(b) of 40 CFR 302.

The EPC will develop a Reporting and Notification procedure during the Construction phase. This procedure will define responsibilities for spill response actions and reporting. The EPC's program will enable information to be transmitted through DOE for inclusion in the SRS Site Chemical Inventory.

10.4 Emergency Planning and Notification for Highly Hazardous Substances

The SWPF will store approximately 2,000 gallons of 20% by weight HNO_3 in the CCA. The Threshold Planning Quantity (TPQ) in 40 CFR 355 (*Emergency planning and notification*[80]) is 1,000 pounds. A 2,000-gallon solution of 20% by weight HNO_3 (9.3 lbs/gallon) weighs approximately 19,000 lbs. Corrected for the percentage of highly hazardous substances present in the solution, there will be approximately 4,000 lbs of HNO_3 stored in the Nitric Acid Receipt Tank (TK-304). The SWPF must, therefore, comply with the emergency planning and notification requirements in 40 CFR 355.

Prior to Cold Commissioning, the EPC will notify the SEPC that the SWPF is subject to emergency planning and notification requirements under 40 CFR 355[80]. The SEPC will be responsible for notifying the State Emergency Response Commission and Local Emergency Response Commission. During Construction, the EPC will:

- Provide notification to the SEPC that the SWPF is subject to the emergency planning requirements of 40 CFR 355[80],
- Designate a Facility Emergency Coordinator (FEC) to participate in the local emergency planning process,
- Notify the SEPC of the Facility representative's name and contact information, and
- Provide to the SEPC any information necessary for development or implementation of the local emergency plan.

The EPC will develop procedures and training programs during the Construction phase to implement notification requirements of 40 CFR 355[80]. The EPC FEC will notify SRSOC when spill response measures exceed the SWPF's ability to control and mitigate the release.

10.5 EPCRA Inventory Reporting

The EPC will submit Material Safety Data Sheet (MSDSs) and Tier I or II forms (whichever is requested) for all chemical materials stored or used by the SWPF to the Chemical Commodity Management Center by October 31 in the first year after the SWPF becomes subject to the reporting requirement. MSDSs and Tier I/II forms will cover all chemicals present at the Facility during the preceding calendar year. The EPC will update the chemical inventory within 30 days of any changes. The SWPF will receive operating inventories of hazardous (NaOH, $H_2C_2O_4$, simulant) and highly hazardous substances (HNO_3) at the start of Cold Commissioning. The simulant will have a high pH (14) and is consequently classified as a HazMat in 40 CFR 302[79].

10.6 EPCRA Toxic Chemical Release Reporting

The EPC will report all usage and releases of a toxic chemical in a calendar year to the EPCRA[74] Form R Coordinator per the Site's forms and program deadlines.

The triggering thresholds for Form R submittals are calculated on a Site-wide basis. Potential EPCRA[74] toxic chemicals associated with SWPF activities include HNO_3, Hg, and Hg compounds. The SWPF will process waste material that contains Hg and Hg compounds; these are identified as toxic chemicals of special concern, with a 10-lb annual reporting threshold. The EPC will provide all data to the EPCRA Form R Coordinator for inclusion in the Form R report. The EPC will supply this information to the EPCRA Form R Coordinator per program requirements each year.

10.7 Schedule

The EPC views any reportable release of a CERCLA[75] hazardous substance or an EPCRA[74] extremely hazardous substance in excess of the applicable RQ or TPQ to be an "emergency" incident that cannot be anticipated or scheduled. If, as a result of an actual release occurring, any modifications to the Site Emergency Response plan are required, the EPC will prepare and submit the modifications to DOE and the Site M&O.

Any changes relevant to emergency planning, as well as the presence of new or additional processes or chemicals, will be reported by the EPC to SEPC. The EPC will submit information to SRSOC within three months of the chemical coming onsite or of the discovery of significant new information concerning the chemical. The EPC will prepare, by March 1 of each year, the required information and transmit this information to SEPC so the Form R reports can be submitted to EPA and SCDHEC by July 1 of each year. Routine EPCRA[74] reporting requirements are likely to be applicable during the Construction and Commissioning phases of the SWPF Project.

11.0 PUBLIC INVOLVEMENT

This section describes the EPC's approach to managing public involvement requirements associated with NEPA[71] and permitting activities.

11.1 Regulatory Requirements and Compliance

The EPC will support DOE with implementation of NEPA[71] regulations under 40 CFR 1506.6 (*Other requirements of NEPA*[81]), if required. The EPC will review design documentation periodically throughout SWPF Construction, Testing, Commissioning, and Operation to ensure that the Facility is in compliance with DOE/EIS-0082-S2[4] and the *ROD*[5].

The EPC will provide necessary technical support to DOE for public involvement activities during regulatory permitting activities.

The EPC will provide assistance (as requested) in the areas of recommendations and responses, implementation planning, safety issues, correspondence management, meetings, site interfaces, visitor coordination, reporting requirements, and training.

11.2 The EPC's Policy and Goals

The EPC's policy regarding public involvement is one that is committed to an open process that involves all concerned stakeholders throughout SWPF Design, Construction, Testing, and Commissioning. The EPC's overall goal with the SWPF participation program is to provide environmental information to DOE that can be shared with public officials and citizens before decisions are made and actions taken. This early data gathering and information sharing will ensure that all concerns have been adequately evaluated, addressed, and meet regulatory objectives, while adhering to approved schedules.

11.3 Support to DOE

Through Permit Condition A.3.b, found in the Modified Permit for the Savannah River Site (SRS) Z-Area Saltstone Disposal Facility, Facility ID No. 025500-1603 in Aiken County, dated January 23, 2007[82], the EPC supports DOE by submitting a quarterly report to SCDHEC identifying the progress in SWPF Design, Construction, and/or Start-up, as appropriate. These quarterly reports include a review of technical, cost, and schedule performance, as well as a discussion of the status of all documented risks and risk mitigation activities (DOE SWPF-07-228: "Contract No. DE-AC09-02SR22210, Salt Waste Processing Facility Project: Initiation of SWPF Quarterly Report for SCDHEC"[83]).

12.0 REFERENCES

[1] WSRC-TR-94-0608, *Savannah River Site Approved Site Treatment Plan, 2006 Update (U)*, Revision 14. Washington Savannah River Company LLC Aiken, South Carolina. November 2006.

[2] WSRC-OS-94-92, *Federal Facility Agreement for the Savannah River Site*. Administrative Docket No. 89-05-FF. Westinghouse Savannah River Company, Aiken, South Carolina. Effective date August 16, 1993.

[3] DE-AC09-02SR22210, *Design, Construction, and Commissioning of a Salt Waste Processing Facility (SWPF)*. U. S. Department of Energy. 2002.

[4] DOE/EIS-0082-S2, *Savannah River Site Salt Processing Alternatives Final Supplemental Environmental Impact Statement*. U.S. Department of Energy, Savannah River Operations Office, Aiken, South Carolina. June 2001.

[5] *Record of Decision: Savannah River Site Salt Processing Alternatives*. U.S. Department of Energy, Washington, D.C. Published in the Federal Register: October 17, 2001 (Volume 66, Number 201).

[6] Amended *Record of Decision: Savannah River Site Salt Processing Alternatives*. U.S. Department of Energy, Washington, D.C. January 24, 2006.

[7] 40 CFR 61, Protection of Environment: Chapter 1: Environmental Protection Agency: *National Emission Standards for Hazardous Air Pollutants (NESHAPs)*. Revised July 1, 2005.

[8] SCR 61-62, *Air Pollution Control Regulations and Standards*. Bureau of Air Quality, South Carolina Department of Health and Environmental Control, Columbia, South Carolina. Effective June 27, 2003.

[9] Permit No. SCR000000, *NPDES General Permit for Storm Water Discharges Associated with Industrial Activity (except construction activity)*. South Carolina Department of Health and Environmental Control, Bureau of Water, Columbia, South Carolina. Issued July 22, 2004; effective July 1, 2005; expires August 31, 2008.

[10] SCR 61-67, *South Carolina Standards for Wastewater Facility Permitting*. South Carolina Department of Health and Environmental Control, Columbia, South Carolina. May 24, 2002.

[11] V-ESR-J-00003, *Salt Waste Processing Facility Radioactive Solid Waste, Mixed Waste, and Hazardous Waste Interface Control Document (ICD-03)*, Revision 1 Parsons, Aiken, South Carolina.

[12] V-ESR-J-00005, *Salt Waste Processing Facility Radioactive Liquid Effluents Interface Control Document (ICD-05)*, Revision 1, Parsons, Aiken, South Carolina.

[13] V-ESR-J-00010, *Salt Waste Processing Facility Waste Transfer Interface Control Document (ICD-10)*, Revision 0. Parsons, Aiken, South Carolina.

[14] V-ESR-J-00021, *Salt Waste Processing Facility Non-Radioactive Solid Waste Interface Control Document (ICD-21)*, Revision 1. Parsons, Aiken, South Carolina.

[15] *Salt Waste Processing Facility Project Procedures Manual*. Parsons, Aiken, South Carolina.

[16] P-CRT-J-0101, *Salt Waste Processing Facility Project Environmental Management System Policy*, Revision 0. Parsons, Aiken, South Carolina. March 30, 2006.

[17] *Savannah River Site (SRS) Environmental Management System Policy*. Washington Savannah River Company, Aiken, South Carolina. August 2006.

[18] DOE O 450.1, *Environmental Protection Program*. U.S. Department of Energy, Washington, D.C. January 15, 2003; Change 1: January 24, 2005; Change 2: December 7, 2005.

[19] DOE O 5400.5, *Radiation Protection of the Public and the Environment*. U.S. Department of Energy, Washington, D.C. February 8, 1990; Change No. 2: January 7, 1993.

[20] DOE O 435.1, *Radioactive Waste Management*. U.S. Department of Energy, Washington, D.C. Change 1: August 28, 2001.

[21] DOE M 435.1-1, *Radioactive Waste Management Manual*. U.S. Department of Energy, Washington, D.C. Approved July 9, 1999. Change 1: June 19, 2001.

[22] DOE O 413.3A, *Program and Project Management for the Acquisition of Capital Assets*. U.S. Department of Energy, Washington, D.C. July 28, 2006.

[23] S-CRT-J-0048, *Salt Waste Processing Facility Project (SWPF) Standards/Requirements Identification Document Compliance Plans*, Revision 0. Parsons, Aiken, South Carolina. April 24, 2003.

[24] P-CRT-J-0012.1, *Salt Waste Processing Facility Project Design Criteria Database*, Revision A. Parsons, Aiken, South Carolina.

[25] P-SPC-J-00002, *Salt Waste Processing Facility Functional Specification*, Revision 0. Parsons, Aiken, South Carolina. January 11, 2005.

[26] Q-PER-J-00002, *Draft Preliminary Engineering Report for an Industrial Wastewater Treatment Facility*, Revision 1. U.S. Department of Energy – Salt Waste Processing Facility, Savannah River Site, Aiken, South Carolina. (Prepared by Parsons, Aiken, South Carolina). July 5, 2005.

[27] ESH-EPG-2004-00292: "Salt Waste Processing Facility Project Radionuclide NESHAP Evaluation" with Addendum: "SWPF radionuclide emissions during normal operations of vented process vessels: source term derivation, air dispersion and total effective dose rate calculations performed pursuant to 40 cfr 61.96(b) (Q-CLC-J-00001)". Dated November 11, 2004.

[28] ESH-EPG-2005-00050: "Exemption Approval: Salt Waste Processing Facility Project, Savannah River Site" with Addendum: "SWPF Air Quality Permit Exemption Request for Toxic Air and Criteria Pollutant Emissions: Engineering Report (Q-PER-J-00001)". Dated February 11, 2005.

[29] Q-PER-J-00001, *Salt Waste Processing Facility Project: Air Quality Permit Exemption Request for Toxic Air and Criteria Pollutant Emissions: Engineering Report*, Revision 0. Parsons, Aiken, South Carolina.

[30] P-ERP-J-00001, Draft *Salt Waste Processing Facility Project (SWPF) Storm Water Management and Sediment Control Plan/Stormwater Pollution Prevention Plan.* Parsons, Aiken, South Carolina.

[31] SCR100000, *South Carolina NPDES General Permit For Storm Water Discharges From Large and Small Construction Activities.* South Carolina Department of Health and Environmental Control, Bureau of Water, Columbia, South Carolina. Effective September 1, 2006.

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