LUCIP for the
T Area Operable Unit
(consists of Neutralization Sump, 678-T; X-001 Outfall Delta, NBN; Lower Discharge Gully, and Swamp, NBN; and TNX-Area Process Sewer Lines and Tile Fields as Abandoned, NBN)

Land Use Control Implementation Plan for T Area Operable Unit
(WSRC-RP-2005-4029, Revision 1, July 2006)

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United States Department of Energy

Savannah River Site

Land Use Control Implementation Plan (LUCIP) for T Area Operable Unit (U)

CERCLIS NUMBER: 96

WSRC–RP–2005-4029

Revision 1

July 2006

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ac	acre
BRA	baseline risk assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CM	contaminant migration
CMIR	Corrective Measures Implementation Report
COC	constituent of concern
ECA	Environmental Compliance Authority
FFA	Federal Facility Agreement
FRR	Final Remediation Report
GMZA	Groundwater Mixing Zone Application
ha	hectare
HAZWOPER	Hazardous Waste Operations and Emergency Response
HH	Human Health
IC	institutional control
IS	Inner Swamp
LUC	Land Use Control
LUCIP	Land Use Control Implementation Plan
LUCAP	Land Use Control Assurance Plan
OD	Outfall Delta
OTSB	Old TNX Seepage Basin
OU	Operable Unit
PCM	Post-Closure Manager
PCR	Post-Construction Report
QA	Quality Assurance
RA	remedial action
RCRA	Resource Conservation and Recovery Act
RFI/RI	RCRA Facility Investigation/ Remedial Investigation
RG	remedial goal
RGO	remedial goal option
ROD	Record of Decision
SA	soil amendment

SEA	Site Evaluation Area
SCDHEC	South Carolina Department of Health and Environmental Control
SGCP	Soil and Groundwater Closure Projects
SRS	Savannah River Site
TAOU	T Area Operable Unit
TBG	TNX Burying Ground
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
WSRC	Washington Savannah River Company, LLC

1.0 INTRODUCTION

This Land Use Control Implementation Plan (LUCIP) has been prepared for T Area Operable Unit (TAOU) at the Savannah River Site (SRS). The TAOU was subdivided into five geographic regions (Figure 2). The anticipated future land use for most of the TAOU is industrial. The Inner Swamp and Outfall Delta regions are considered to be industrial buffer area and support a recreational land use category. However, the portions of the operable unit closest to the river (Swamp High Ground and Outer Swamp) will support residential land use and do not require land use restrictions. The purpose of the LUCIP is to describe how the land use controls (LUCs) selected in the T Area Operable Unit (TAOU) Record of Decision (ROD) will be implemented and maintained. The following LUCs have been selected for this OU:

- Providing access controls for on-site workers via the Site Use Program, Site Clearance Program, work control, worker training, worker briefing of health and safety requirements, and identification signs located in T Area.

- Notifying the United States Environmental Protection Agency (USEPA) and the South Carolina Department of Health and Environmental Control (SCDHEC) in advance of any changes in land use or excavation.

- Providing access controls against trespassers as described in the 2000 Resource Conservation and Recovery Act (RCRA) Part B Permit Renewal Application, Volume I, Section F.1, which describes the security procedures and equipment, 24-hour surveillance system, artificial or natural barriers, control entry systems, and warning signs in place at the SRS boundary. Signs would be posted and maintained at T Area to indicate that the contamination remains buried at depth. At the Outfall Delta (OD) and Inner Swamp (IS), signs would be installed and maintained to prevent trespassers from inadvertently accessing these areas.

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions until the concentrations of hazardous substances in the soil and

groundwater are at such levels to allow for unrestricted use. As agreed on March 30, 2000, among the United States Department of Energy (USDOE), the USEPA, and SCDHEC, SRS is implementing a Land Use Control Action Plan (LUCAP) to ensure that the LUCs required by numerous remedial decisions at SRS are properly maintained and periodically verified. The requirements of that LUCAP also apply to the LUCs that were selected as part of the remedial action for TAOU. This additional document, the TAOU LUCIP, contains the detailed and specific measures required to implement and maintain the LUCs selected as part of this particular remedial decision. The LUCs shall be maintained until the Operable Unit is suitable for unlimited exposure and unrestricted use. Approval by USEPA and SCDHEC is required for any modification or termination of the Institutional controls (ICs).

USDOE is responsible for implementing, maintaining, monitoring, reporting, and enforcing the LUCs in accordance with the approved LUCIP. Upon final approval, the LUCIP will be appended to the LUCAP and should be considered incorporated by reference into the TAOU ROD, establishing implementation and maintenance requirements for the LUCs under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the SRS Federal Facility Agreement. The LUCIP will remain in effect unless and until modifications are approved by USEPA and SCDHEC as necessary for protection of human health and the environment. This LUCIP will be evaluated for accuracy during the five-year remedy review and any approved LUCIP modification will be appropriately documented for incorporation by reference into the TAOU ROD.

1.1 Format of LUCIP

The format of this LUCIP is consistent with the FFA protocol format approved by the USEPA and SCDHEC in March 2004.

2.0 OVERVIEW OF TAOU REMEDIAL ACTION

2.1 General Description and History of the Unit

T Area is one of several industrial areas at SRS (Figure 1). T Area was used in the development and testing of processes, facilities, and equipment for various SRS programs. Until 1978, T Area included three main buildings constructed in 1950 (Buildings 677-T, 678-T, and 679-T). After 1978, the area was expanded to include over 30 buildings (Figure 2) comprising office administrative buildings, process buildings for large-scale experimental demonstrations, laboratories for research and analytical purposes, pilot-scale facilities, bulk tank storage, industrial wastewater processing facilities, and warehouse storage for a wide range of chemicals and specialty equipment. All of the facilities in T Area have been dismantled and removed (Figure 3) with the following exceptions: the 678-5T pump test facility and ancillary structures, the 702-T telecommunications building, the 906-T air stripper, and a soil vapor extraction system.

The TNX Swamp was not used in T-Area industrial processes; however, it is used routinely to manage surface runoff and stormwater. The TNX Swamp was divided into four subunits: the Outfall Delta (OD), the Inner Swamp (IS), the High Ground Swamp, and the Outer Swamp. The TNX Swamp, and the Lower Discharge Gully and Swamp Operable Unit (OU), are included as part of the TAOU.

The TAOU is an area-based OU that incorporates most of the T-Area footprint and the TNX Swamp (Figure 2). As such, it includes all of the applicable OUs, Site Evaluation Areas (SEAs), and the dismantled facilities listed in the TAOU ROD (WSRC 2005c). The TAOU is approximately 26.8 hectares (66 acres). Before an area-based remedial strategy was implemented, remedial actions and removal actions for some of the waste units now identified under the TAOU were included in previous Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) documentation (WSRC 2005c). Remedial decisions for the T-Area waste units and facilities addressed by this document do not affect the RAs of other TAOU subunits previously addressed. These actions include the ongoing soil vapor extraction (SVE), which is associated with the TNX Burying Ground, and operation of the

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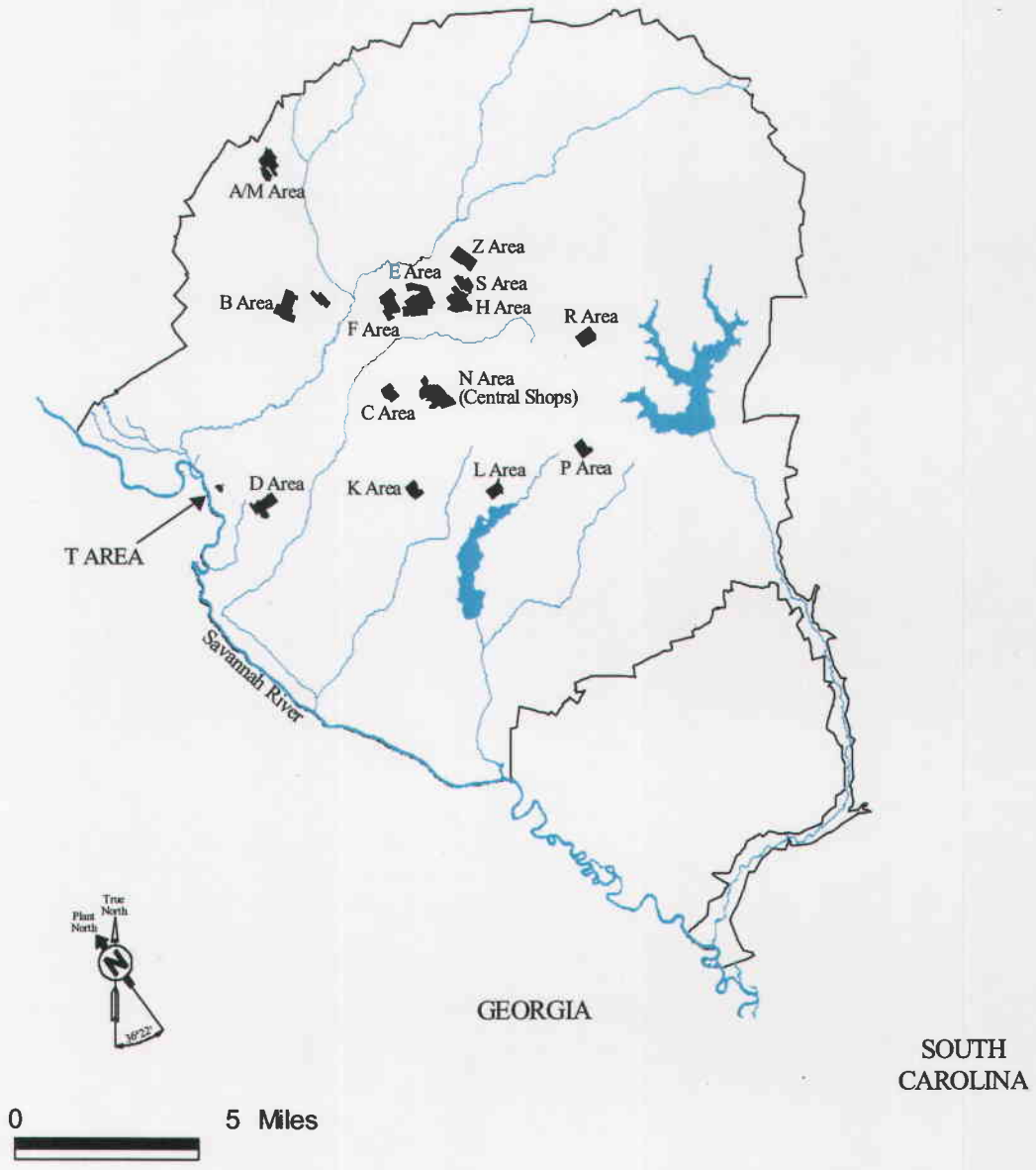

Figure 1. Location of T Area within SRS

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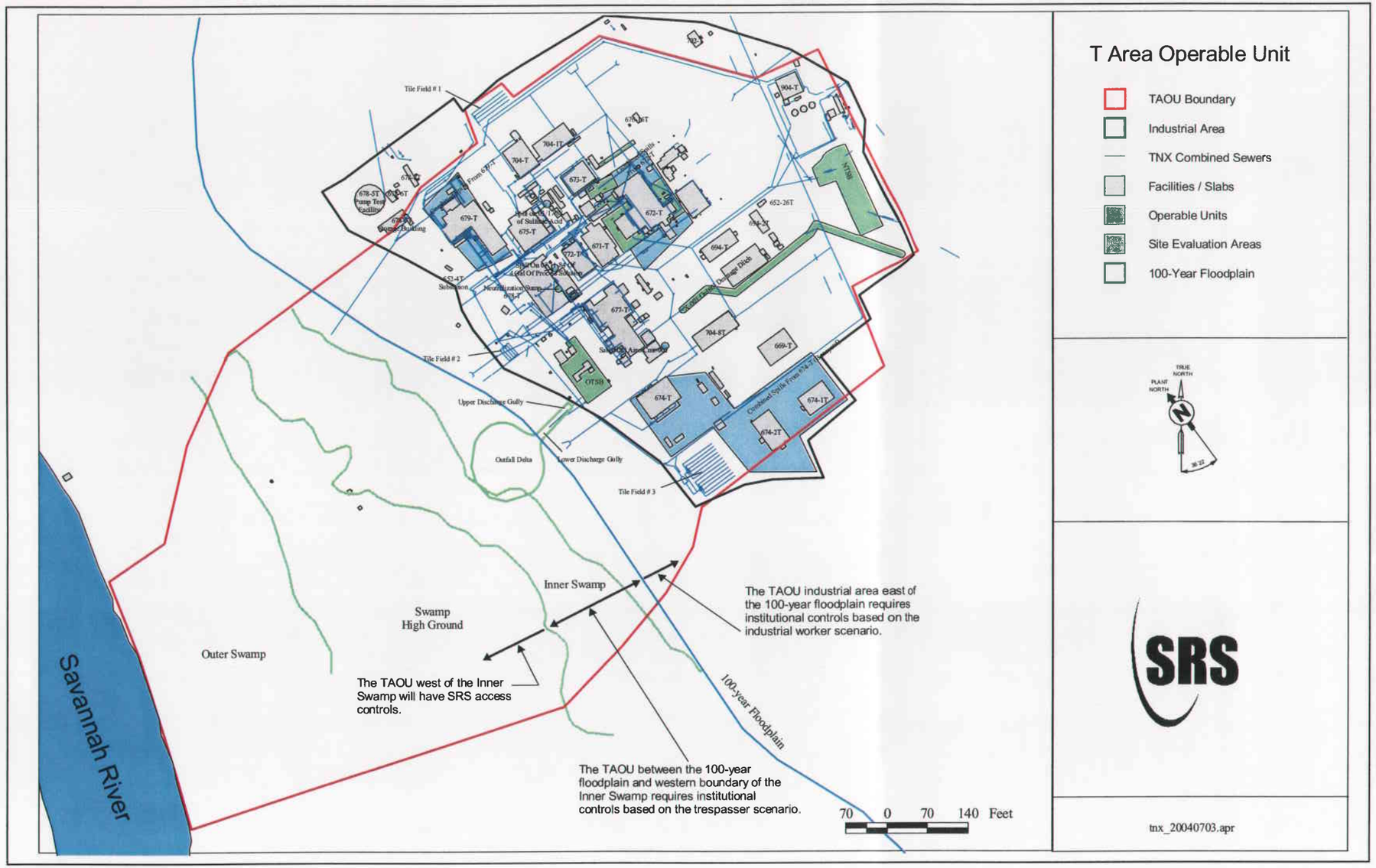

Figure 2. T-Area Operable Unit

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Figure 3. Aerial Photograph of T Area (facing southwest)

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air stripper, which is associated with the TNX-Area Groundwater. These remedies will continue as proposed by the TNX Area OU ROD (WSRC, 2003c). Progress will continue to be documented in the annual groundwater and effectiveness monitoring strategy report.

2.2 Nature and Extent of Contamination

The contamination requiring action at the TAOU is a result of T-Area industrial processes, waste management practices, and an industrial accident during facility operations. Within the industrial area, the contamination is related to leaks from industrial processes and from disposal facilities such as tile fields, burying grounds, and seepage basins. In the TNX Swamp, the contamination resulted from a release of process water and entrained sediment from the Old TNX Seepage Basin (OTSB) down the topographic slope and into the swamp. The OD was formed by these releases. The existing OUs and facilities remaining following dismantling activities in T Area are shown in Figure 2.

Sampling and evaluation was previously performed at the TAOU and the findings are contained in previous documents (WSRC 1999, WSRC 2002, WSRC 2005a). COCs in exceedance of the remedial goal (RG) were found in various locations within the TAOU and are listed by subunit in Table 1. The areas determined to warrant action based on exceedances of the RG are the TNX Burying Ground (TBG) (previously inaccessible areas), TNX OD, and TNX IS. The contamination found in the industrial portion of T Area exceeds human health, and contaminant migration RGs for uranium-238 in several locations (Figure 4). Soil from removal actions at the X-001 Drainage Ditch and Tile Field #2 has also been stockpiled within the footprint of the industrial portion of T Area in the vicinity of the slabs of Buildings 671-T, 672-T and 772-T (see Figure 2). These soils exceeded the remedial goal options (RGOs) listed on Table 1.

Soils in the TNX OD and IS exceed the established RGO for several radionuclides including actinium-228, lead-212, radium-228, thorium-228, uranium-233/234, uranium-235, and uranium-238. Radioisotopes in the thorium-232 decay-series are major risk contributors for human receptors. Of these, thorium-228 is the primary risk driver in the OD and IS. The highest activities of thorium-228 are in the IS southwest and south of the OD (Figure 5). Contaminant

fate and transport calculations in the Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) with Baseline Risk Assessment (BRA) for the TNXOD OU (WSRC 2002) indicated that uranium-233/234, uranium-235, and uranium-238 at the OD and IS may present a potential leachability threat to groundwater (Figures 6 and 7).

Table 1. Remedial Goals for TAOU

Refined Constituent of Concerns (RCOCs)	Units	Type of Constituent of Concern (COC)	RGO from RFI/BRA	Remedial Action
Outfall Delta (soil)				
Actinium-228	pCi/g	HH	3.34	IC
Lead-212	pCi/g	HH	35.34	IC
Radium-228	pCi/g	HH	3.21	IC
Thorium-228	pCi/g	HH	1.73	IC
Uranium-233/234	pCi/g	CM	6.54	SA
Uranium-235	pCi/g	CM	0.31	SA
Uranium-238	pCi/g	CM	6.58	SA
Inner Swamp (Sediment)				
Actinium-228	pCi/g	HH	3.34	IC
Radium-228	pCi/g	HH	3.21	IC
Thorium-228	pCi/g	HH	1.73	IC
Uranium-233/234	pCi/g	CM	5.75	SA
Uranium-235	pCi/g	CM	0.27	SA
Uranium-238	pCi/g	CM	5.75	SA
TNX Burying Ground (TBG) (Previously Inaccessible Areas) (Soil)				
Uranium-238	pCi/g	CM, HH	1.79	Cover
Stockpiled Soils from X-001 Outfall (Soil)				
PCB-1260	mg/kg	ARAR	10	Cover
Uranium-238	pCi/g	HH	1.79	Cover
Stockpiled Soils from Tile Field #2				
Mercury	mg/kg	CM	0.078	Cover

IC= Institutional Control, SA= Soil Amendment, Cover = Geosynthetic Cover System

Most of the facilities in T Area have been dismantled and removed. The only exceptions are the 675-T pump test facility and ancillary structures, the 702-T telecommunications building, the 906-T air stripper, and an SVE system. Process sewer lines have been plugged and exterior sumps have been backfilled with dirt and gravel. Building slabs remain, but slabs with identified contamination have been scabbled such that residual contamination is below $1X10^{-3}$ industrial risk level. Information on sampling, analysis, and data quality under the Site Deactivation and

Decommissioning (SDD) program is provided in the TAOU Remedial Investigation/Focused Feasibility Study/Risk Assessment (RI/FFS/RA) (WSRC, 2005a). Analytical data for these units are presented in Decommissioning Project Final Reports (DPFRs) which are referenced in the CMI/RAIP (WSRC, 2005c) and are summarized in the ROD (WSRC 2005b). A listing of the buildings and associated final decommissioning date is provided in Table 2.

Table 2. Buildings Subject to Deactivation and Decommissioning

Building Number	Building Name	Date of Final Decommissioning
607-40T	TNX Sanitary Treatment Facility	July 2003
607-46T	Organic Removal Facility	April 2003
652-13T	TNX Secondary Transformer Substation #3	July 2003
671-T	Tank Gallery	April 2003
672-1T	Cooling Tower	April 2003
672-T	DWPF Semi-Works Building	March 2004
673-T	Containerization Equipment Development Facility	April 2003
675-T	Melter Demonstration and Multiple Process Facilities	January 2003
677-T	Pilot Plant	February 2004
678-T	Chemical Semi-Works Building	September 2004
679-7T	TNX Water Services Chemical Addition Building	May 2003
679-8T	Fire Pump House	May 2003
679-T	Administrative and Laboratory Building	May 2003
681-4T	TNX River Pump House	October 2003
682-T	Precipitate Hydrolysis Experimental Facility	July 2003
684-T	TNX Solvent Storage Building	September 2002
692-T	TNX Control Room	July 2003
694-2T	TNX Carpenter Shop	October 2002
694-T	TNX Warehouse Building	July 2003
704-1T	TNX Administrative Building Annex	October 2002
704-T	TNX Administrative Building	October 2002
711-T	TNX Electrical Maintenance Building	November 2002
772-T	Analytical Laboratory Building	September 2003
904-T	Effluent Treatment Plant	September 2003

The selected remedy for the TAOU leaves hazardous substances in place that pose a potential future risk and will require land use restrictions until the concentrations of hazardous substances in the soil and groundwater are at such levels to allow for unrestricted use and exposure.

2.3 Remedial Action Selected

As described in the ROD (WSRC 2005c), the selected RA for the T-Area OU included the following elements:

- Low permeability cover: The TAOU low permeability cap will cover disseminated residual contamination in soil, contaminated debris and building slabs left in place, and contaminated soils excavated from T-Area facilities under previous removal actions and staged for placement beneath the cover. The cover will prevent exposure to human and ecological receptors and restrict leaching of contaminants to groundwater. The TAOU cap will cover approximately 3.3 hectare (ha) (8.2 acre [ac]) and will be integrated with the TNX OU cap (WSRC 2003c). The combined caps will encompass approximately 3.8 ha (9.4 ac).

- Soil amendments: Soil amendments will be placed in the OD and IS to attenuate the leachability of radiological contaminants in soils. Soil amendments will be reapplied if long-term monitoring indicates that they are losing their effectiveness. Application of soil amendments will be within the area of Figure 2 between the 100 year flood plain and the western border of the Inner Swamp.

- Site maintenance: Site maintenance will consist of inspections of the OU and the low permeability cover, and maintenance of drainage features to minimize the formation of large gullies. Minor earthwork will be performed as needed to repair any erosion damage that may occur. Site maintenance will also include mowing.

- Access controls: Access controls will include security measures such as posting and maintenance of access control warning signs. Signs will be posted around the OU with a legend warning of the hazard. The signs will be posted at appropriate locations in sufficient numbers to be seen from any approach. Administrative controls (land use restrictions) will be implemented to restrict human exposure to contaminants remaining at the unit.

- CERCLA ROD Remedial Action reviews: The ROD RA will be reviewed every five years to ensure that the selected remedy remains protective of human health and the environment.

RGs are target cleanup criteria. RGs for subunits of the TAOU with COCs are provided in Table 1.

The remedial action for the industrial portion of the TAOU is construction of a geosynthetic cap system. The cap system is approximately 10 acres in size.

The remedial action for the swamp portion of the TAOU is the application of apatite over the area where exceedances of the CM RG occur.

For TAOU including the industrial and swamp areas, institutional controls will be instituted as part of the Remedial Action.

The post-remedial action conceptual site model (see Appendix C-1 to this LUCIP) shows the broken pathways and the remaining residual risk to the future industrial worker.

According to the *Savannah River Site Future Use Project Report* (USDOE 1996), residential use of SRS land is prohibited.

3.0 LAND-USE CONTROL OBJECTIVES

Considering the residual risk, the LUC objectives are to:

- Prohibit the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds.
- Prevent unauthorized access to the closed CERCLA unit as long as the waste remains a threat to human health or the environment in order to protect the industrial worker.
- Land use controls (LUCs): The LUC component of the remedy will 1) prevent access or use of the groundwater, except for remedial/monitoring purposes until cleanup levels are met; 2)

maintain the integrity of any current or future remedial or monitoring system such as monitoring wells; 3) prevent inadvertent human contact with contaminated soil in the OD and IS; 4) prohibit the development and use of property for residential housing, elementary and secondary schools, child care facilities, and playgrounds; and 5) ensure no construction on, excavation, or breaching of the low permeability cover system. The requirements described in the ROD (WSRC, 2005c) for the LUC are provided in the Land Use Control Implementation Plan (LUCIP) (WSRC 2005d).

- Maintain the integrity of any current or future remedial or monitoring system.

4.0 IMPLEMENTATION OF LAND-USE CONTROLS

This section describes the LUCs selected in the ROD to achieve the objectives stated in Section 3.0. DOE is responsible for implementing, maintaining, reporting on and enforcing the land use controls required for the TAOU. A summary of the types of controls is provided in Table 2. USDOE will implement and maintain the LUCs required for the TAOU. The LUCIP will become enforceable and will be implemented when approved by EPA and SCDHEC and following the completion of the remedial actions prescribed by the TAOU ROD. DOE shall notify US EPA and SCDHEC 60 days in advance of any proposed land use changes that are inconsistent with land use control objectives or the selected remedy.

The industrial portion of the TAOU will be maintained as an industrial use area by implementation of the property record notices (Section 4.1) and restrictions (Section 4.2), and the use of a certified LUC survey plat (Section 4.3).

The Site Use Program (Section 4.4) will be implemented to prevent onsite worker exposure to contamination left in place at the TAOU. Other existing measures (i.e., Site Clearance Program, worker training, health and safety requirements, work controls) will also be used to ensure worker safety at the TAOU.

Physical access controls (Section 4.5) are implemented at the SRS boundary to control and restrict public and trespasser access to the TAOU.

Signs at the TAOU will be maintained to alert onsite workers that the area is used to manage hazardous substances. The signs will also convey the restrictions of unauthorized personnel.

4.1 Property Record Notices

In the long term, if the property is ever transferred to non-federal ownership, the U.S. Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as remedial actions taken on the site. The contract for sale and the deed will contain the notification required by CERCLA Section 120(h).

The deed notification shall, in perpetuity, notify any potential purchaser that the property has been used to manage and dispose of waste. This requirement is consistent with the intent of RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

4.2 Property Record Restrictions

The deed shall also include restrictions precluding residential use of the property and/or any other property record restrictions necessary to achieve the LUC objectives. The deed shall contain provisions to ensure that appropriate land use controls remain with the affected area upon any and all transfers. USDOE shall provide a copy of the executed deeds to the regulatory agencies as soon as practicable after the transfer of fee title, but no later than 30 days. However, the need for these deed restrictions may be re-evaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any re-evaluation of the need for the deed restrictions will be done though an amended ROD.

Table 3. Land Use Controls for the T Area Operable Unit

Type of Control	Purpose of Control	Duration	Implementation	Affected Areas[a]
Property Record Notices[b]	Provide notice to anyone searching records about the existence and location of contaminated areas.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Notice recorded by DOE in accordance with state laws at County Register of Deeds office if the property or any portion thereof is ever transferred to non-federal ownership.	All waste management areas and other areas where hazardous substances are left in place at levels requiring land use and/or groundwater restrictions.
Property record restrictions[c]: A. Land Use B. Groundwater	Restrict use of property by imposing limitations. Prohibit the use of groundwater.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Drafted and implemented by DOE upon transfer of affected areas. Recorded by DOE in accordance with state law at County Register of Deeds office.	All waste management areas and other areas where hazardous substances are left in place at levels requiring land use and/or groundwater restrictions.
Other Notices[d]	Provide notice to county/city about the existence and location of waste disposal and residual contamination areas for zoning/planning purposes.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Notice recorded by DOE in accordance with state laws at County Register of Deeds office if the property or any portion thereof is ever transferred to non-federal ownership.	All waste management areas and other areas where hazardous substances are left in place at levels requiring land use and/or groundwater restrictions.
Site Use Program[e]	Provide notice to worker/developer) i.e., permit requestor) on extent of contamination and prohibit or limit excavation/penetration activity.	As long as property remains under DOE control.	Implemented by DOE and site contractors Initiated by permit request	Remediation systems, all waste management areas. And areas where levels requiring land use and / or groundwater restrictions.

Table 3. Land Use Controls for the T Area Operable Unit (Continued)

Type of Control	Purpose of Control	Duration	Implementation	Affected Areas[a]
5. Physical Access Controls[f] (e.g., fences, gates, portals)	Control and restrict access to workers and the public to prevent unauthorized.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Controls maintained by DOE	At select locations throughout CSRA.
6. Warning Signs[g]	Provide notice or warning to prevent unauthorized uses	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Signage maintained by DOE	At select locations throughout SRS.
7. Security Surveillance Measures	Control and monitor access by workers/public	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Established and maintained by DOE Necessity of patrols evaluated upon completion of remedial actions.	Patrol of selected area throughout SRS, as necessary.

[a]Affected areas – Specific locations identified in the SRS LUCIP or subsequent post-ROD documents.

[b]Property Record Notices – Refers to any non-enforceable, purely informational document recorded along with the original property acquisition records of DOE and its predecessor agencies that alerts anyone searching property records to important information about residual contamination; waste disposal areas in the property.

[c]Property Record Restrictions – Includes conditions and/or covenants that restrict or prohibit certain uses of real property and are recoded along with original property acquisition records of Doe and its predecessor agencies.

[d]Other Notices – Includes information on the location of waste disposal areas and residual contamination depicted on as survey plat, which is provided to a zoning authority (i.e., city planning commission) for consideration in appropriate zoning decisions for non-DOE property.

[e]Site Use Program – Refers to the internal DOE/DOE contractor administrative program(s) that requires the permit requestor to obtain authorization, usually in the form of a permit, before beginning any excavation/penetration activity (e.g., well drilling) for the purpose of ensuring that the proposed activity will not affect underground utilities/structures, or in the case contaminated soil or groundwater, will not disturb the affected areas without the appropriate precautions and safeguards.

[f]Physical Access Controls – Physical barriers or restrictions to entry.

[g]Signs – Posted command, warning or direction.

USDOE shall provide USEPA and SCDHEC 6 months notice prior to transfer to ensure that USEPA and SCDHEC can be involved in discussions to ensure that appropriate provisions are included in the transfer terms or conveyance documents to maintain effective ICs. If it is not possible for the facility to notify USEPA and SCDHEC at least six months prior to any transfer or sale, then the facility will notify USEPA and SCDHEC as soon as possible but no later than 60 days prior to the transfer or sale of any property subject to ICs. In addition to the land transfer notice and discussion provisions above, DOE further agrees to provide USEPA and SCDHEC with similar notice, within the same time frames, as to federal to federal transfer of property.

4.3 Other Public Notices

The LUCIP identifies the proposed area under land use restrictions via Figure 2 for the TAOU and the final Survey Plat (when available) located in Appendix A. After construction completion, a final survey plat will be prepared to document the as-built arrangement of the institutional controls and area subject to LUCs. The drawing will present a polygon of the T-Area Operable Unit subject to land use controls, including the bench marks, the location of warning signs, access control points and other information for land use controls. This post construction survey plat will be certified by a professional land surveyor and will be submitted to USEPA and SCDHEC concurrently with the Post-Construction Report (PCR).

In addition, if the site is ever transferred to non-federal ownership, a professional land surveyor-certified survey plat of the OU will be prepared at or near the time of conveyance to support the LUCIP required restrictive covenants on land use and will be recorded with the appropriate county recording agency.

4.4 Site Use Program

Under DOE Order 430.1A, *Life Cycle Management* (USDOE 1998), SRS is required, to implement an asset management program for the use, maintenance, and disposal of physical assets, including real estate. SRS complies with this Order through its Site Use Program, which is conducted in accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control" (WSRC 2003a). All employees, contractors,

and visitors at SRS are required to adhere to the Site Use Program. This program ensures authorization of any work performed at SRS if the work adds, modifies, or removes features portrayed on the SRS development maps. No land use (e.g., excavation) shall be undertaken without prior approval documented by a Site Use Permit. To obtain this authorization, a Site Clearance Request Form must be completed. In accordance with WSRC 1D, Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before any activities are conducted. All Site Clearance Requests will be reviewed to verify that either an approved Site Use Permit has been obtained or that the request is sanctioned by an existing Site Use Permit. All land use requirements applicable for the OU will be provided to the Site Use Program for use in determining issuance of Site Clearance permits. In addition, the Site Use permit must be amended when the geographic configuration or buffer zone used to establish the permit boundary changes or there is a change to the permitted land use.

SRS is responsible for updating, maintaining, and reviewing site maps, including Federal Facility Agreement (FFA) (FFA 1993) OU identifications. If a Site Clearance Request potentially impacts an FFA OU, the Site Clearance Request Form is sent to the appropriate FFA OU reviewer for approval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02. Before a Site Clearance Permit is issued, verification of USDOE approval for intended land use must be obtained. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors). The USEPA and SCDHEC will be notified within 30 days of any changes to the Site Use Program that impacts actual land use requirements by USDOE via a revision to the LUCAP. The processes are controlled within the SRS Quality Assurance (QA) Program in accordance with WSRC 1Q Manual, *Quality Assurance* (WSRC 2003b). The SRS QA program governs all SRS activities.

SRS identifies all buildings and facilities on maps used in the Site Use Program. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled, and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for

maintenance. No change in land use or excavation at the TAOU OU shall be undertaken without USEPA and SCDHEC approval. Approval by USEPA and SCDHEC is required for any modification or termination of the institutional controls and implementation actions, and USDOE must obtain approval from USEPA and SCDHEC that a proposed new land use is sufficiently protective.

4.5 Physical Access Controls

There are no physical access controls required at TAOU; however, physical access controls are provided at the SRS boundary as mentioned in Table 3, item 5.

4.6 Warning Signs

To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while the unit is under ownership of the government, access control warning signs will be posted at the unit. The signs will be legible for a distance of at least 25 feet. The signs will read as follows:

"T Area Operable Unit

Danger – Unauthorized Personnel Keep Out. This unit contains radiological or mixed hazardous substances. Do not dig or excavate. Do not enter without contacting the waste unit custodian.

Custodian: Manager, Post-Closure - Remediation Maintenance

Phone: (803) 725-7243 (1-9192)"

Custodial responsibilities for maintenance and inspection of the TAOU will be maintained by the Post-Closure Maintenance Group within Soil and Groundwater Closure Projects (SGCP).

4.7 Other Access Controls and Security/Surveillance Measures

While under the ownership of USDOE, access control of the entire SRS will be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(I)), control entry systems (R.61-79.264.14(b)(2)(ii)), and access control warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

4.8 Field Inspection and Maintenance for Institutional Controls

After remediation of the TAOU, only inspection and maintenance activities will be required by the RA at the TAOU.

The TAOU will be inspected per the Field Inspection Checklist in Appendix B. Field inspections will be performed annually. Additional inspections may be necessary in the event of unusual weather or any other condition warranting inspection. For TAOU, inspections will be performed to ensure that signs are in place and TAOU cover system is developing self-sustaining vegetation. Inspection records will be kept in the operations record file for future access.

Maintenance (including site inspections, mowing, general housekeeping, and repair of erosion damage) will be performed as needed at TAOU in perpetuity. Necessary repairs for erosion control damage will be performed for the geosynthetic cover system, including vegetation, the drainage system, and cover slopes. Necessary upkeep of the access control signs for TAOU will be performed.

USEPA and SCDHEC will be notified within 30 days of identification by USDOE of any events and/or actions that indicate potential compromise of the institutional controls including any activity that is inconsistent with the IC objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs and the proposed action to address the potential compromise. The FFA Annual Progress Report, submitted to the regulatory agencies by the USDOE, will provide the status of the ICs and how any institutional control deficiencies or

inconsistent uses have been addressed. In the event of property transfer or lease, the Annual Report will cite findings on the following: whether the use restrictions and controls referenced above were communicated in the deed(s) or lease restrictions; whether property use conforms with the deed or lease restrictions and controls; and whether the owners and state/local agencies have been notified regarding the deed or lease restrictions and controls.

All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDEHC review and audit. A copy of the completed inspection form is maintained in the SGCP Document Control. The LUCs shall be maintained until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.

The waste unit inspectors are to be trained in Hazardous Waste Operations and Emergency Response (HAZWOPER), RCRA Well Inspections (SGCP-specific training), SGCP RCRA Waste Unit Inspections, Radiological Worker Training, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years, different personnel may conduct the inspections and grass cutting operations.

This unit-specific LUCIP, including the checklist (Appendix B), will be appended to the SRS LUCAP upon final regulatory approval. After completion of the PCR, the preliminary checklist in the LUCAP will be replaced with the final, approved checklist.

5.0 REFERENCES

FFA, 1993. *Federal Facility Agreement for the Savannah River Site*, Administrative Docket No. 89-05-FF (Effective Date: August 16, 1993)

USDOE, 1996. *Savannah River Site Future Use Project Report*, Stakeholder-Preferred Recommendations for SRS Land and Facilities, USDOE Savannah River Operations Office, January

USDOE, 1998. DOE Order 430.1A, *Life Cycle Management* (Approved October 14, 1998)

WSRC, 1999. *RCRA Facility Investigation/Remedial Investigation Report with Baseline Risk Assessment for the TNX Area Operable Unit* (U), WSRC-TR-96-00808, Rev. 1.2, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2002. *RCRA Facility Investigation/ Remedial Investigation Report with Baseline Risk Assessment for the TNX Outfall Delta, Lower Discharge Gully, and Swamp Operable Unit (U)*, WSRC-RP-98-4158, Rev. 1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2003a. WSRC Procedure Manual 1D, *Site Infrastructure and Services Manual (U)*, Procedure 3.02, "Site Real Property Configuration Control," Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2003b. WSRC Procedure Manual 1Q, *Quality Assurance (U)*, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2003c. *Record of Decision Remedial Alternative Selection for the TNX Area Operable Unit (U)*, WSRC-RP-2003-4017, Rev. 1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2005a. *Remedial Investigation/Focused Feasibility Study/Risk Assessment for the T Area Operable Unit*, WSRC-RP-2004-4050, Redline Rev. 1.1, Westinghouse Savannah River Company, Savannah River Site, Aiken, South Carolina (January).

WSRC, 2005b. *Record of Decision Alternative Selection for the T Area Operable Unit*, Revision 0, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2005c. *Corrective Measures Implementation/ Remedial Action Implementation Plan (CMI/RAIP) for the T-Area Operable Unit (U)*, WSRC-RP-2005-4003, Revision 1, December 2005.

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APPENDIX A

AS-BUILT DRAWINGS

LAND USE CONTROL IMPLEMENTATION PLAN

(Drawing to be provided at a later date.)

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APPENDIX B

FIELD INSPECTION CHECKLIST

for T Area Operable Unit (TAOU)

FIELD INSPECTION CHECKLIST

FOR TAOU WASTE UNIT

❑ **SCHEDULED** ❑ **UNSCHEDULED**

A= Satisfactory X= Unsatisfactory (Explanation required)	A or X	Observation of Corrective Action Taken
1. Verify that the roads are accessible.		
2. Verify that the waste unit signs (20) are in acceptable condition, have the correct information, and are legible from a distance of 25 feet.		
3. Verify that there are no excavation, digging, or construction activities on the soil cover.		
4. Verify that the integrity of any drainage ditches, and required land grading for proper drainage is maintained and they are free of excessive erosion, sediment buildup, and any debris restricting water flow.		
5. Verify that no woody vegetation is growing on the soil cover. Remove or identify as needed.		
6. Verify that the grass density has no bare spots more than 3 by 3 feet in area. The height of the vegetative cover should not impair the visual inspection of the soil cover.		
7. Verify that the soil cover has no signs of unacceptable erosion or depressions (subsidence).		
8. Verify that signs of burrowing or mounding animals are not present.		

Inspected by:

_____ / _____ Date:_____
(Print Name) (Signature)

Post-Closure Manager:

_____ / _____ Date:_____
(Print Name) (Signature)

CAUTION: The inspector shall notify the Post-Closure Manager (PCM) and Environmental Compliance Authority (ECA) **IMMEDIATELY** if there has been a breach or compromise of the institutional controls of this waste unit. The notification shall be in accordance with SRS post-closure inspection procedures.

NOTE: Monitoring wells associated with this waste unit are maintained in accordance with SGCP Monitoring Well Procedures.

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APPENDIX C

POST-REMEDIAL ACTION CONCEPTUAL SITE MODEL

FOR THE T AREA OPERABLE UNIT POST-REMEDIAL ACTION

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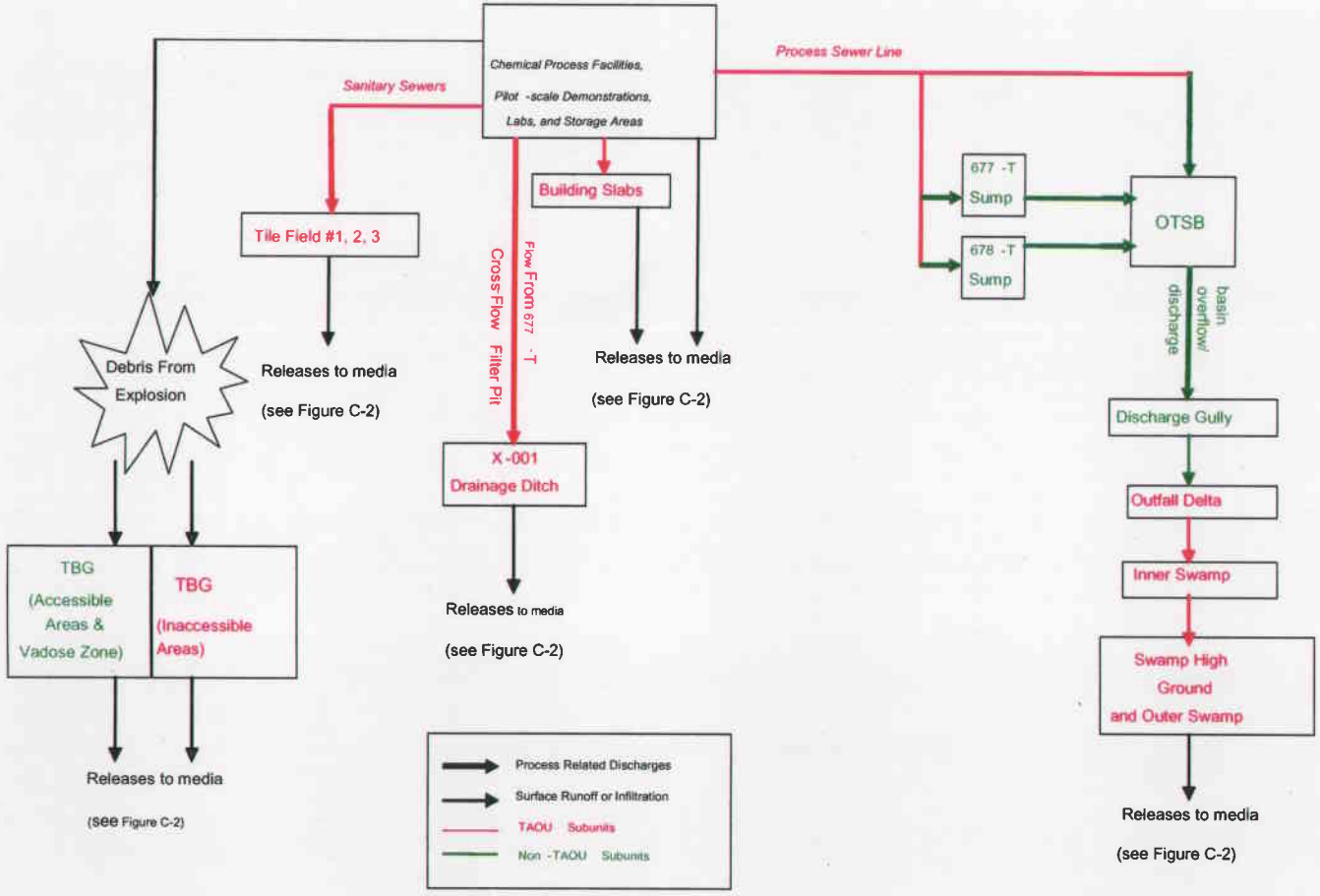

Figure C-1. CSM: Overview of the TAOU

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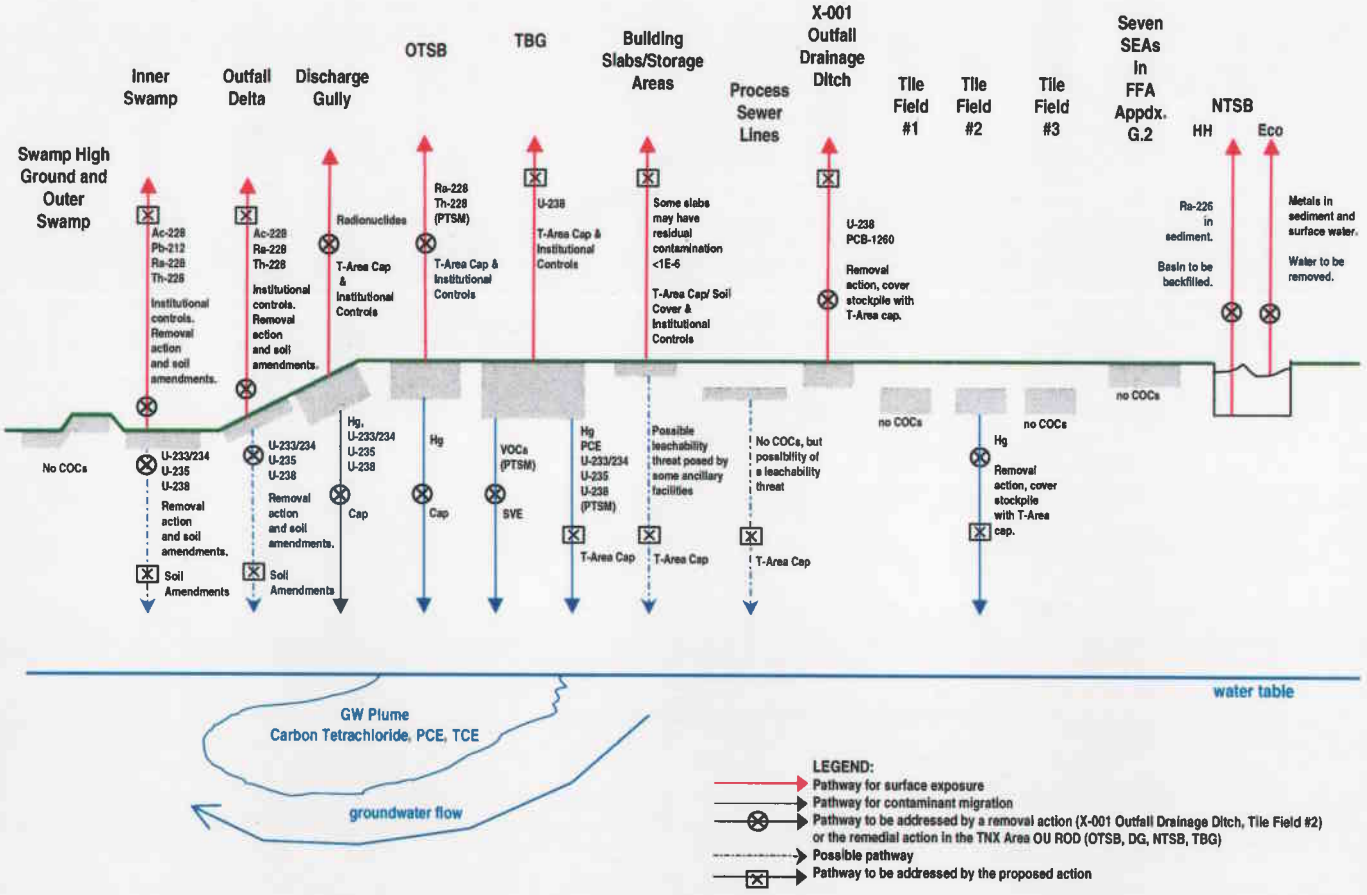

Figure C-2. Post Remedial Action CSM for the TAOU

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APPENDIX D

ACCESS CONTROL WARNING SIGNS

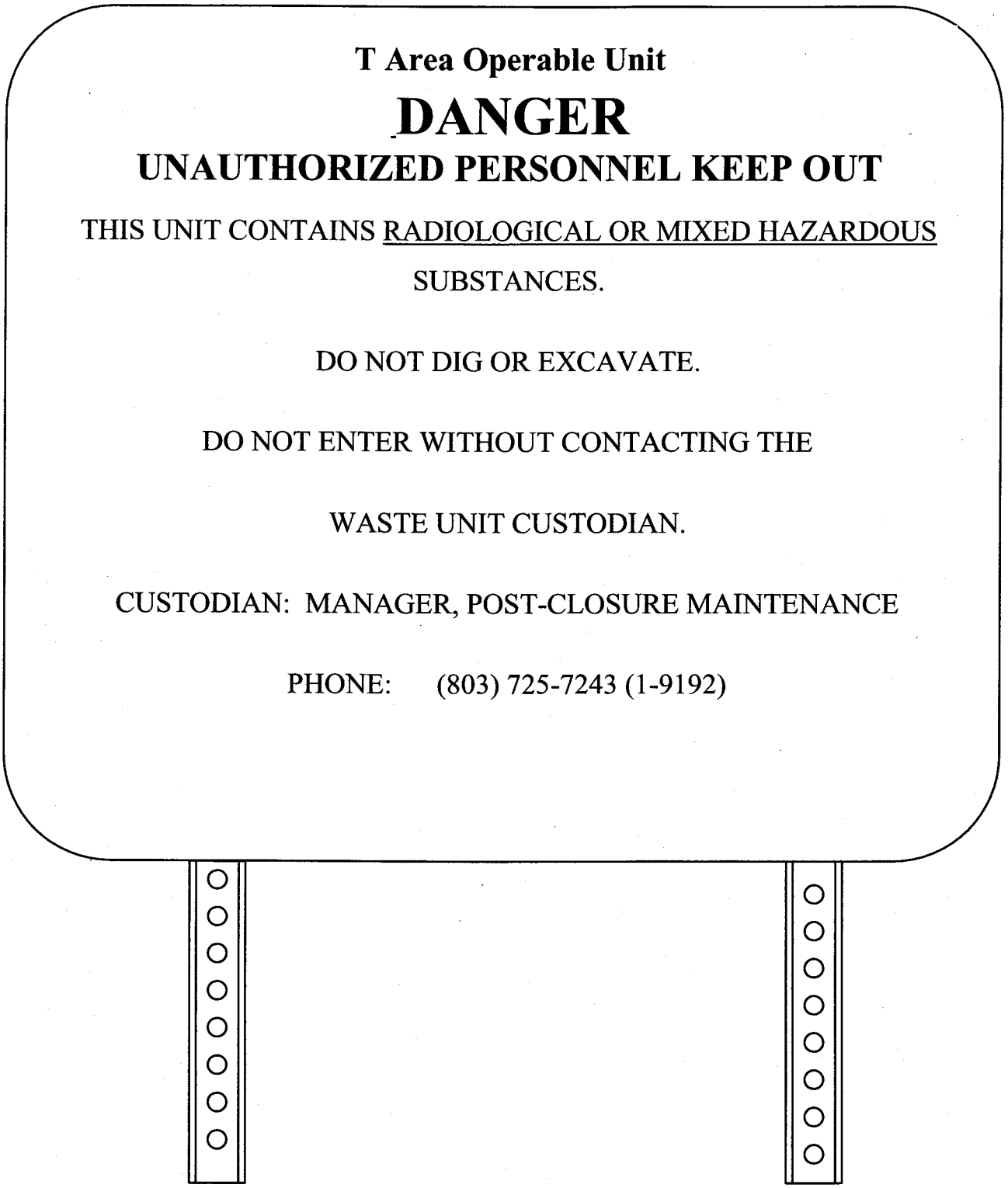

Figure D-1. Access Control Warning Sign