Matthew L. Adkins
Sr. Manager Environmental Remediation

1590 Marietta Blvd NW
Atlanta, GA 30318
(404)350-5135
Matt_Adkins@csx.com

17 December 2020

Waycross, Georgia
Y: Part-B Permit RCRA
CSXT No. 9415589

Mr. Jim McNamara
Unit Coordinator
Hazardous Waste Management Branch
Georgia Department of Natural Resources
2 Martin Luther King, Jr. Drive, Suite 1054 East
Atlanta, Georgia 30334-9000

Subject: Revision 1 Part B Post-Closure Care Permit Renewal Application
Hazardous Waste Facility Permit No. HW-049(D), Waycross, GA

Dear Mr. McNamara:

Please find enclosed two (2) hard copies and one (1) electronic copy of the *Part B Post-Closure Care Permit Renewal Application* prepared for *Hazardous Waste Facility Permit Number HW-049(D).* The submitted document was prepared in accordance with the requirements set forth in 40 CFR§270.28 and the information specified in §§270.14, and incorporates revisions specified in the approved response to GA EPD comments submitted on June 17 and October 23, 2020. To aid your review, we are providing a cross reference of the information requirements and their location within the permit renewal application.

In accordance with 40 CFR§270.11:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

We appreciate your consideration on this matter. If you have any questions please feel welcome to call me at (404)350-5135 or ARCADIS, Jeff Beckner at (706)828-4421. Also, please note my new office mailing address as follows:

Sincerely,
CSX Transportation, Inc.

Matthew L. Adkins
Manager Environmental Remediation

Enclosures: Part B Post-Closure Care Permit Renewal Application (2 copies, 1 electronic)

cc: Facility File – (w/1 copy report)
ARCADIS, Augusta, GA

Cross Reference
40 CFR 270.28 "Part B Information Requirements for Post-Closure Permits"

Title	Part	Section				Information Requirements	Location of Required Information in Application
40	270	.14	(b)	(1)		A general description of the facility.	Section 1.3.1
				(4)		A description of the security procedures and equipment required by § 264.14, or a justification demonstrating the reasons for requesting a waiver of this requirement.	Section 1.7.1
				(5)		A copy of the general inspection schedule required by § 264.15(b) of this part. Include where applicable, as part of the inspection schedule, specific requirements in §§264.174, 264.193(i), 264.195, 264.226, 264.254, 264.273, 264.303, 264.602, 264.1033, 264.1052, 264.1053, 264.1058, 264.1084, 264.1085, 264.1086, and 264.1088 of this part.	Section 1.7.2
				(6)		A justification of any request for a waiver(s) of the preparedness and prevention requirements of part 264, subpart C.	A waiver is not being requested. (Section 1.7.3, Section 1.7.4)
				(11)		Facility location information;	Section 1.3
					(i)	In order to determine the applicability of the seismic standard [§ 264.18(a)] the owner or operator of a new facility must identify the political jurisdiction (e.g., county, township, or election district) in which the facility is proposed to be located. [Comment: If the county or election district is not listed in appendix VI of part 264, no further information is required to demonstrate compliance with § 264.18(a).]	Section 1.3.5
					(iii)	Owners and operators of all facilities shall provide an identification of whether the facility is located within a 100-year floodplain. This identification must indicate the source of data for such determination and include a copy of the relevant Federal Insurance Administration (FIA) flood map, if used, or the calculations and maps used where an FIA map is not available. Information shall also be provided identifying the 100-year flood level and any other special flooding factors (e.g., wave action) which must be considered in designing, constructing, operating, or maintaining the facility to withstand washout from a 100-year flood.	Section 1.3.6

Title	Part	Section			Information Requirements	Location of Required Information in Application
40	270	.14	(13)		A copy of the closure plan and, where applicable, the post-closure plan required by §§ 264.112, 264.118, and 264.197. Include, where applicable, as part of the plans, specific requirements in §§ 264.178, 264.197, 264.228, 264.258, 264.280, 264.310, 264.351, 264.601, and 264.603.	Appendix C
			(16)		Where applicable, the most recent post-closure cost estimate for the facility prepared in accordance with § 264.144 plus a copy of the documentation required to demonstrate financial assurance under § 264.145. For a new facility, a copy of the required documentation may be submitted 60 days prior to the initial receipt of hazardous wastes, if that is later than the submission of the part B.	Appendix D
			(18)		Where appropriate, proof of coverage by a State financial mechanism in compliance with § 264.149 or § 264.150.	Appendix D
			(19)		A topographic map showing a distance of 1,000 feet around the facility at a scale of 2.5 centimeters (1 inch) equal to not more than 61.0 meters (200 feet). Contours must be shown on the map. The contour interval must be sufficient to clearly show the pattern of surface water flow in the vicinity of and from each operational unit of the facility. For example, contours with an interval of 1.5 meters (5 feet), if relief is greater than 6.1 meters (20 feet), or an interval of 0.6 meters (2 feet), if relief is less than 6.1 meters (20 feet). Owners and operators of HWM facilities located in mountainous areas should use large contour intervals to adequately show topographic profiles of facilities. The map shall clearly show the following:	Due to the large size of the facility, CSXT requests a waiver for the use of an alternate scale
				(i)	Map scale and date.	Figure 1-3
				(ii)	100-year floodplain area.	Figure 1-6

Cross Reference
40 CFR 270.28 "Part B Information Requirements for Post-Closure Permits"

Title	Part	Section	Information Requirements	Location of Required Information in Application
40	270	.14	(iii) Surface waters including intermittent streams.	Figures 1-1, 1-2, 1-3
			(iv) Surrounding land uses (residential, commercial, agricultural, recreational).	Figures 1-1, 1-2, 1-3
			(v) A wind rose (i.e., prevailing windspeed and direction).	Figure 1-4
			(vi) Orientation of the map (north arrow).	Included on Figures
			(vii) Legal boundaries of the HWM facility site.	Figure 1-1
			(viii) Access control (fences, gates).	Section 1.7.1
			(ix) Injection and withdrawal wells both on-site and off-site.	Figures 1-3, 2-1, 2-4, 2-5
			(x) Buildings; treatment, storage, or disposal operations; or other structure (recreation areas, runoff control systems, access and internal roads, storm, sanitary, and process sewerage systems, loading and unloading areas, fire control facilities, etc.)	Figure 1-5
			(xi) Barriers for drainage or flood control.	Section 1.3.3
			(xii) Location of operational units within the HWM facility site, where hazardous waste is (or will be) treated, stored, or disposed (include equipment cleanup areas). NOTE: For large HWM facilities the Agency will allow the use of other scales on a case by-case basis.	Figure 1-3
		(22)	(c) Additional information requirements. The following additional information regarding protection of groundwater is required from owners or operators of hazardous waste facilities containing a regulated unit except as provided in § 264.90(b) of this chapter:	
			(1) A summary of the ground-water monitoring data obtained during the interim status period under §§ 265.90 through 265.94, where applicable.	Section 1.4

Cross Reference
40 CFR 270.28 "Part B Information Requirements for Post-Closure Permits"

Title	Part	Section			Information Requirements	Location of Required Information in Application
40	270	.14	(2)		Identification of the uppermost aquifer and aquifers hydraulically interconnected beneath the facility property, including ground-water flow direction and rate, and the basis for such identification (i.e., the information obtained from hydrogeologic investigations of the facility area).	Section 2.3, Appendix G
			(3)		On the topographic map required under paragraph (b)(19) of this section, a delineation of the waste management area, the property boundary, the proposed "point of compliance" as defined under § 264.95, the proposed location of ground-water monitoring wells as required under § 264.97, and, to the extent possible, the information required in paragraph (c)(2) of this section.	Figure 1-3
			(4)		A description of any plume of contamination that has entered the ground water from a regulated unit at the time that the application was submitted that:	
				(i)	Delineates the extent of the plume on the topographic map required under paragraph (b)(19) of this section;	Figures 3-1, 3-2, 3-3, 3-4, 3-5, 3-6
				(ii)	Identifies the concentration of each appendix IX, of part 264 of this chapter, constituent throughout the plume or identifies the maximum concentrations of each appendix IX constituent in the plume.	Tables 1-2 and 1-3
			(5)		Detailed plans and an engineering report describing the proposed ground water monitoring program to be implemented to meet the requirements of § 264.97.	Sections 3.1.4, 3.2.4, 7.0 Table 3-4
			(6)		If the presence of hazardous constituents has not been detected in the ground water at the time of permit application, the owner or operator must submit sufficient information, supporting data, and analyses to establish a detection monitoring program which meets the requirements of § 264.98. This submission must address the following items specified under § 264.98.	Not Applicable

Cross Reference
40 CFR 270.28 "Part B Information Requirements for Post-Closure Permits"

Title Part Section			Information Requirements	Location of Required Information in Application
40 270	.14		(i) A proposed list of indicator parameters, waste constituents, or reaction products that can provide a reliable indication of the presence of hazardous constituents in the ground water;	Table 3-3
			(ii) A proposed ground-water monitoring system;	Section 3.4.2, Section 4.5.2
			(i) Background values for each proposed monitoring parameter or constituent, or procedures to calculate such values; and	Table 3-3
			(iv) A description of proposed sampling, analysis and statistical comparison procedures to be utilized in evaluating ground-water monitoring data.	Sections 3.1.4.2, 3.1.4.3, 3.2.4.2, 3.2.4.3, 3.3, 7.0
		(7)	If the presence of hazardous constituents has been detected in the ground water at the point of compliance at the time of the permit application, the owner or operator must submit sufficient information, supporting data, and analyses to establish a compliance monitoring program which meets the requirements of § 264.99. Except as provided in § 264.98(h)(5), the owner or operator must also submit an engineering feasibility plan for a corrective action program necessary to meet the requirements of § 264.100, unless the owner or operator obtains written authorization in advance from the Regional Administrator to submit a proposed permit schedule for submittal of such a plan. To demonstrate compliance with § 264.99, the owner or operator must address the following items:	Table 3-3, Figure 1-3, Sections 1.6, 3.1, 3.2, Appendices C, D, E
			(i) A description of the wastes previously handled at the facility;	Sections 1.4 and 1.5
			(ii) A characterization of the contaminated ground water, including concentrations of hazardous constituents;	Section 3.0, Tables 3-1 3-2, Figures 3-1, 3-2, 3-3, 3-4, 3-5, and 3-6

Title	Part	Section		Information Requirements	Location of Required Information in Application
40	270	.14	(iii)	A list of hazardous constituents for which compliance monitoring will be undertaken in accordance with §§ 264.97 and 264.99;	Table 3-3
			(iv)	Proposed concentration limits for each hazardous constituent, based on the criteria set forth in § 264.94(a), including a justification for establishing any alternate concentration limits;	Sections 3.1.4.1 and 3.2.4.1, Table 3-3
			(v)	Detailed plans and an engineering report describing the proposed groundwater monitoring system, in accordance with the requirements of § 264.97; and	Section 3.1.4, Section 3.2.4, Section 6.0
			(vi)	A description of proposed sampling, analysis and statistical comparison procedures to be utilized in evaluating ground-water monitoring data.	Section 7.0
			(8)	If hazardous constituents have been measured in the ground water which exceed the concentration limits established under § 264.94 Table 1, or if ground water monitoring conducted at the time of permit application under §§ 265.90 through 265.94 at the waste boundary indicates the presence of hazardous constituents from the facility in ground water over background concentrations, the owner or operator must submit sufficient formation, supporting data, and analyses to establish a corrective action program which meets the requirements of § 264.100. However, an owner or operator is not required to submit information to establish a corrective action program if he demonstrates to the Regional Administrator that alternate concentration limits will protect human health and the environment after considering the criteria listed in § 264.94(b). An owner or operator who is not required to establish a corrective action program for this reason must instead submit sufficient information to establish a compliance monitoring program which meets the requirements of § 264.99 and paragraph (c)(6) of this section. To demonstrate compliance with § 264.100, the owner or operator must address, at a minimum, the following items:	Table 3-3, Figure 1-3, Section 3.1.3, Section 3.2.3, Section 7.0

Cross Reference
40 CFR 270.28 "Part B Information Requirements for Post-Closure Permits"

Title	Part	Section			Information Requirements	Location of Required Information in Application
40	270	.14			(i) A characterization of the contaminated ground water, including concentrations of hazardous constituents;	Table 3-1, Table 3-2, Table 3-3
					(ii) The concentration limit for each hazardous constituent found in the ground water as set forth in § 264.94.	Table 3-3
					(iii) Detailed plans and an engineering report describing the corrective action to be taken; and	Sections 3.1.3 and 3.2.3, Appendix E
					(iv) A description of how the groundwater monitoring program will demonstrate the adequacy of the corrective action.	Sections 3.1.4 and 3.2.4
					(v) The permit may contain a schedule for submittal of the information required in paragraphs (c)(8) (iii) and (iv) provided the owner or operator obtains written authorization from the Regional Administrator prior to submittal of the complete permit application.	Section 7.10
			(d)		*Information requirements for solid waste management units*	
				(1)	The following information is required for each solid waste management unit at a facility seeking a permit:	
					(i) The location of the unit on the topographic map required under paragraph (b)(19) of this section.	Figure 1-3
					(ii) Designation of type of unit.	Table 1-1

Cross Reference
40 CFR 270.28 "Part B Information Requirements for Post-Closure Permits"

Title	Part	Section		Information Requirements	Location of Required Information in Application
40	270	.14		(iii) General dimensions and structural description (supply any available drawings).	Section 1.4, Figure 1-3, Section 4.1.1, Section 4.2.1, Section 4.3.1, Section 5.2.1, Section 5.2.2, Section 5.2.3
				(iv) When the unit was operated	Sections 1.4, 4.2, 4.3, 4.4, 5.0, and 6.0
				(v) Specification of all wastes that have been managed at the unit, to the extent available	Sections 1.4, 4.2, 4.3, 4.4, 5.0, and 6.0
				(iii)	
			(2)	The owner or operator of any facility containing one or more solid waste management units must submit all available information pertaining to any release of hazardous wastes or hazardous constituents from such unit or units.	Sections 1.3.2, 1.4, 4.1, 4.2, 4.3, 4.4, 5.0, and 6.0
			(7)	The owner/operator must conduct and provide the results of sampling and analysis of groundwater, land surface, and subsurface strata, surface water, or air, which may include the installation of wells, where the Director ascertains it is necessary to complete a RCRA Facility Assessment that will determine if a more complete investigation is necessary.	Not Applicable

PART B POST-CLOSURE PERMIT HW-049(D) RENEWAL APPLICATION REVISION 1

CSXT Rice Yard EPA ID # GAD991275900

Waycross, Georgia

December 2020

PART B POST-CLOSURE PERMIT HW-049(D) RENEWAL APPLICATION REVISION 1

CSXT Rice Yard
EPA ID # GAD991275900
Waycross, Georgia

Prepared for:

CSX Transportation, Inc.

Prepared by:

Arcadis U.S., Inc.

1450 Greene Street

Suite 220

Augusta

Georgia 30901-5201

Tel 706 828 4421

Fax 706 828 4722

Our Ref.:

30027978

Date:

December 2020

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Matthew L. Adkins
CSXT- Senior Manager Environmental Remediation

This report was prepared and reviewed in accordance with the guidelines established by the Georgia Environmental Protection Division, by or under the direct supervision of the Georgia Registered Professional Geologist whose certification, signature, and affixed seal appear below.

"I certify that I am a qualified ground-water scientist who has received a baccalaureate or post-graduate degree in the natural sciences or engineering, and have sufficient training and experience in ground-water hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound professional judgments regarding ground-water monitoring and contaminant fate and transport. I further certify that this report was prepared by myself or by a subordinate working under my direction."

Jeff S. Beckner, P.G. #744
Principal Scientist

JEFF S BECKNER REGISTERED No. 865 SOUTH CAROLINA PROFESSIONAL GEOLOGIST

CONTENTS

TABLES

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

ALSA	Alum-Lime Sludge Area
AOC	Area of Concern
ASB	Alum Sludge Basin
ASP	Acid Sludge Pond
AST	Above ground storage tanks
BCLs	Background Concentration Limits
CAER	Corrective Action Effectiveness Report
cis-1,2-DCE	cis-1,2-Dichloroethene
CSXT	CSX Transportation
CVOCs	Chlorinated Volatile Organic Compounds
DNAPL	Dense Non-Aqueous Liquids
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FRE	Fiberglass Reinforced Epoxy
ft bls	feet below land surface
GA EPD	Georgia Environmental Protection Division
gpm	gallons per minute
GWCCs	Groundwater Contaminant Constituents
GWPS	Groundwater Protection Standards
HDPE	high-density polyethylene
HHRA/ERA	Human Health Risk Assessment/Ecological Risk Assessment
HSRA	Hazardous Site Response Act
HWMU	Hazardous Waste Management Units
LBPA	Locomotive Breakdown Pad Area
LPABS	Locomotive Paint and Air Brake Shop
LSA	Locomotive Shop Area
NPDES	National Pollution Discharge Elimination System
NTUs	Nephelometric Turbidity Units
OCVSP	Old Cleaning Vat Sludge Pits

ODSA	Old Drum Storage Area
OEH	Old Engine House
ORA-2/ORPA	Old Refuse Area Number 2 and Old Runoff Pond Area
PAH	Polynuclear Aromatic Hydrocarbons
PVC	Polyvinyl Chloride
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SCADA	Supervisory Control and Data Acquisition
SSLs	Specific Soil Screening Levels
SWMU	Solid Waste Management Unit
TCE	Trichloroethene
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VC	Vinyl Chloride
VOA	Volatile Organic Analysis
WWTF	Wastewater Treatment Facility
WWTPA	Wastewater Treatment Plant/Grit Collection Area

1 INTRODUCTION

1.1 PURPOSE

Pursuant to 40 CFR § 270.28 "Part B Information Requirements for Post-Closure Permits," the enclosed is a Resource Conservation and Recovery Act (RCRA) Part B Post-Closure Permit Renewal Application. The application is for the renewal of RCRA Part B-Post Closure Permit No. HW-049(D) by the Georgia Environmental Protection Division (GAEPD) for the CSX Transportation, Inc.'s (CSXT's) Rice Yard in Waycross, Georgia.

The enclosed permit renewal application updates the corrective action and monitoring programs for the facility. The background, features, and current status of the waste management areas have also been updated.

1.2 PART A PERMIT APPLICATION

The original Part A Permit Application was submitted to the GAEPD on August 29, 1986 and was finalized in December 1986. In accordance with 40 CFR §270.13, the Part A Permit Application is provided in Appendix A.

1.3 FACILITY DESCRIPTION

1.3.1 Site Location

The Rice Yard is a rail yard owned and operated by CSXT. The facility is located in the southwestern portion of the City of Waycross in Ware County, Georgia. The Rice Yard is situated in the southeastern part of the lower Coastal Plain and extends approximately five miles along U.S. Highway 84. Figure 1-1 illustrates the location and boundary of the facility as shown on United States Geological Survey (USGS) topographic maps with approximate locations of surface drainage features and waste management units.

As shown in Figure 1-1, the facility is surrounded by wooded land, wetlands, and residential/commercial development. In addition, a 2019 aerial photograph of the Rice Yard illustrates development to the west and south and industrial, commercial, and residential use to the north and east (Figure 1-2).

Waste management units included in this permit renewal application are the Old Drum Storage Area (ODSA), Alum Sludge Basin (ASB), Acid-Lime Sludge Area (ALSA), Locomotive Shop Area (LSA), Locomotive Paint and Air Brake Shop and Old Engine House (LPABS & OEH), Old Refuse Area Number 2 and Runoff Pond Area (ORA-2/ORPA), and Old Cleaning Vat Sludge Pits (OCVSP). A list of waste management units identified at the facility is included in Table 1-1. Figure 1-1 shows the locations of all waste management units listed in Appendix A of Permit HW-049(D) and Figure 1-3 shows more specific locations of the waste management units located in the east end of the Rice Yard that are currently under corrective action or require further action.

1.3.2 Regulatory Background

In accordance with a June 30, 1986, consent order, CSXT performed an environmental assessment of the Waycross facility to characterize solid and hazardous waste streams generated by the current operations and to identify where land disposal or spills of solid or hazardous materials had occurred. This assessment was documented in the report "Waste Identification Survey - Waycross, Georgia Facility - August 1986."

Three locations [ODSA, ASB, and Wastewater Treatment Plant/Grit Collection Area (WWTPA)] were identified where land disposal of hazardous wastes had occurred after 1980. The use of these three hazardous waste management units (HWMUs) ceased in 1985.

Since the three hazardous waste management units were subject to regulation under the RCRA, a Part A Permit Application was submitted to the GAEPD on August 29, 1986, for their proper closure. The permit was finalized in December 1986.

CSXT submitted a revised Part B - Post-Closure Permit Application in August 1987. On September 28, 1987, the GAEPD issued Hazardous Waste Facility Permit No. HW-049(D) for the post-closure care of the ODSA and ASB. The ODSA and ASB were closed in accordance with the 1987 closure plan by ERT, which involved capping the unit and restricting access to the area. The WWTPA was clean closed and reclassified as a solid waste management unit (SWMU) in 1989.

In October 1993, CSXT submitted the "Revised Part B - Post-Closure Permit Modification Application, Waycross, Georgia, Facility, Volume I, Section 9.0 [Adding the ALSA SWMU]." The Hazardous Waste Facility Permit No. HW-049(D) was amended on January 7, 1994, to incorporate the corrective action plan for remediating the ALSA solid waste management unit.

In June 1995, CSXT submitted the “Part B - Post-Closure Permit Modification Application [Volume I, Section 10.0, Adding the LSA], Waycross, Georgia.” The Hazardous Waste Facility Permit No. HW-049(D) was amended on September 29, 1995, to incorporate the corrective action plan for remediating the LSA SWMU.

On April 29, 1997, CSXT submitted the 10-year permit renewal application, which included revised corrective action plans for addressing the groundwater impacts at the ODSA and ASB. In response to the GAEPD’s June 4, 1997 comments, the permit renewal application was modified and resubmitted on July 25, 1997. Final modifications to the permit renewal application were submitted on August 6, 1997. The RCRA Part B Permit No. HW-049(D) was reissued to CSXT on September 30, 1997.

Based on the findings reported in the March 9, 1999 Corrective Action Assessment for the ASB and Verification Investigation Reports for the ORA-2/ORPA, the corrective action plan for the impacted groundwater east of the ASB was modified and a permit modification application with the revised corrective action plan was submitted to the GAEPD on October 29, 1999.

In response to the GAEPD’s December 16, 1999, comments on the permit modification application, CSXT submitted a revised permit modification application and “Groundwater and Surface Water Hydraulic Interaction Report and Pilot Test Work Plan” on February 28, 2000.

On May 2, 2000, the GAEPD approved the permit modification application. In accordance with Class 3 permit modification requirements, the public notice for the permit modification application was issued on June 20, 2000. On October 19, 2000, the amended permit became effective.

In January 2003, updates to the corrective action and monitoring program were submitted in a Class 3 Permit Modification of the Part B - Post Closure Permit. Post-Closure Permit No. HW-049(D) Amendment was issued by GAEPD on May 7, 2003.

On March 30, 2007, CSXT submitted a 10-year permit renewal application which provided updated groundwater recovery system specifics and proposed revisions to the corrective measures monitoring system and protocol. On March 14, 2008, CSXT submitted Revision 1 of the 10-year permit renewal application. On July 7, 2010, the GAEPD issued final RCRA Part B Permit No. HW0-049(D), renewal.

On January 31, 2014, CSXT submitted final Revision 3 RCRA Facility Investigation (RFI) Report for the Old Refuse Area 2/Old Runoff Pond Area (ORA-2/ORPA), LPABS, Old Engine House (OEH), and Old Cleaning Vat Sludge Pit (OCVSP) SWMUs. On March 28, 2014, the GAEPD issued approval of final Revision 3 RFI Report.

On June 24, 2014, CSXT submitted the Temporary Authorization Request -Groundwater Recovery and Monitoring System Upgrades for LSA, LPABS, and ODSA Waste Management Units. On November 14, 2014, GAEPD granted Temporary Authorization for the specified activities to be conducted during December 1, 2014 to June 1, 2015. On May 5, 2015, CSXT submitted Class 2 Permit Modification Request for modifications to the LSA corrective action program and modifications to the LSA, LPABS, and ODSA corrective action effectiveness monitoring programs. On May 13, 2015, CSXT issued public notice and hosted public meeting per Class III permit modification. On November 14, 2015, GAEPD issues public notice and hosts public hearing per intent to issue Class III permit modification. On April 14, 2016, GAEPD issued amended permit HW-049(D).

On August 7, 2015, CSXT submitted the Revision 3 Human Health Risk Assessment/Ecological Risk Assessment (HHRA/ERA) report. Following receipt of additional GAEPD comments on November 10, 2015, CSXT submitted change pages to Revision 3 HHRA/ERA report on January 25, 2016. GAEPD issued approval of final Revision 3 HHRA/ERA Report on February 18, 2016.

At the request of GAEPD in March 24, 2015 comments pertaining to the Revision 2 Human Health and Ecological Risk Assessment (CSXT, August 2014), CSXT implemented a vapor intrusion (VI) investigation of the Rice Yard Shop area in accordance with a GAEPD approved work plan and addendum dated August 19, 2015 and May 16, 2016, respectively. On May 25, 2018 CSXT submitted Revision 1 Vapor Intrusion Summary – CSXT Rice Yard Shop Area report, and on October 25, 2018 GAEPD issued approval of the Revision 1 report.

On August 11, 2017, CSXT submitted Temporary Authorization Request -Groundwater Recovery and System Upgrades for ODSA Waste Management Unit. On August 28, 2017, GAEPD granted Temporary Authorization for the installation of horizontal groundwater recovery well HWW-4, installation of replacement conveyance piping, and the abandonment of existing recovery wells WW-43, WW-44, WW-45, WW-46, WW-47, and WW-48. On February 23, 2018, CSXT submitted Class II Permit Modification Request for the operation of horizontal recovery well HWW-4 and the permanent abandonment of the existing ODSA recovery wells. On February 24, 2018 CSXT issued public notice of the Permit Modification Request, and on April 12, 2018 hosted a public meeting for same. On August 20, 2018, GAEPD issued Class II Permit Modification of Hazardous Waste Permit HW-049(D).

On September 14, 2017, in accordance with Section 391-3-11-.10, GAEPD issued an extension to the 30-year post-closure care period at the CSX Waycross Facility.

1.3.3 Topographic and Drainage Information

Based on United States Geological Survey (USGS) Waycross West, GA and Waycross East, GA topographic maps (1988), the range in elevation at the Rice Yard facility is approximately 135 to 150 feet above mean sea level (ft msl) (see Figure 1-1). Surface topography in the vicinity generally slopes northeast towards the Satilla River.

Surface topography within the area of the waste management units gently slopes in a south-southeast direction toward the adjacent Waycross and City Drainage Canals that border the facility boundary. Figure 1-4 illustrates surface topography in relation to waste management units, site monitor/recovery/point of compliance wells, and site structures in the east end of Rice Yard.

The topography of the facility allows drainage to be primarily dispersed by overland sheet flow and infiltration through the yard ballast. Approximately two percent of the facility consists of impervious surfaces such as buildings and pavement. Stormwater and surface water at the facility can also be managed by an engineered system of storm grates, storm sewers, and drainage canals.

Drainage canals provide surface water control and run along the entire length of both the northwest and southeast property boundaries. The facility stormwater system also discharges into these drainage canals, which ultimately connect to tributaries of the Satilla River. Figure 1-4 illustrates the location of the drainage canals that convey stormwater runoff in the vicinity of the waste management units. The Shop Area Ditch begins along the ALSA and flows southward toward the ASB, where it joins the easterly flowing Waycross Canal. The Waycross Canal is the primary drainage feature along the south eastern facility boundary.

Stormwater drainage in the vicinity of the waste management units is managed by two separate conveyance systems as shown in Figure 1-5. Runoff from the area north of the Shop Area and the parking lot and rain gutters east of the Locomotive Shop is conveyed (identified as blue on Figure 1-5) to a 60-inch diameter stormwater pipe that discharges into the Shop Area Ditch. The stormwater pipe is located approximately 40 ft upstream of surface water sample location W-10. Stormwater from the Shop Area, to include above ground storage tanks (ASTs), paved surfaces, buildings, and equipment storage, is conveyed by pipes (identified as red on Figure 1-5) to Pollution Ponds No. 1, No. 2, and No. 3. Discharge from Pollution Pond No. 3 is via Outfall SW03 into the Waycross Canal. Stormwater from the Shop Area is discharged through Outfall SW03, Facility ID #00778, under National Pollution Discharge Elimination System (NPDES) General Permit GAR000000.

In the event of a spill near the waste management units, a stormwater shutoff valve is located at Outfall 3, and stormwater collected in Pollution Ponds No. 1, No. 2, and No.3 can be diverted to Wastewater Treatment Facility (WWTF) No. 3 for treatment. There is also a drainage control dam in the Shop Area Ditch approximately 150 ft upstream of the confluence with the Waycross Canal. The dam was installed as a safeguard to prevent petroleum constituents from entering the Waycross Canal.

Process wastewater from operations in the Shop Area is routed through an industrial sewer system (identified as yellow on Figure 1-5) to WWTF No. 3. Treated process wastewater from WWTP No. 3 is conveyed (identified as green on Figure 1-5) to a metered sanitary sewage discharge into the city of Waycross Sewer Collection System at on the southeast corner of the Yard, adjacent to the Waycross Canal. Sanitary sewer from the Shop Area is conveyed (identified as green on Figure 1-5) to a second metered sanitary sewage discharge on the northeast corner of the Yard, near Nichols Street.

1.3.4 Traffic Information

The ODSA, ASB, ALSA, LSA, LPABS & OEH, ORA-2/ORPA, and OCVSP are closed waste management units which no longer receive wastes for disposal. Consequently, no hazardous or solid wastes are being transported to these waste management units via roads, rail, or other means of transport.

1.3.5 Seismic Considerations

The CSXT Rice Yard is located in Waycross, Ware County, Georgia. The facility location does not appear among the cities, counties, and political jurisdictions listed in Appendix VI of Part 264.

1.3.6 Floodplain Standard

Figure 1-6 illustrates the location of the waste management units in relation to the 100-year flood zone. Flood zone data are based on the most recent Federal Emergency Management Agency (FEMA) 2009 Flood Insurance Rate Map (FIRM) for the City of Waycross, Georgia.

Based on the 2009 FEMA flood zone data, the HWMUs and most of the SWMUs are located above the 100-year flood zone. Although portions of the Alum Sludge Pond, and ORA-2/ORPA SWMUs appear within the 100-year flood zone, it must be noted that no hazardous waste is currently managed at these SWMUs and there is no known risk associated with flooding. Further, the 2008 Post Closure Care Facility Permit Number HW-049(D) Amendment listed the Alum Sludge Pond as requiring no further action at this time.

Based on the 2009 FEMA flood zone data, WWTP No. 3, to include a 1,000-gallon recovered oil tank, is located at the periphery of the 100-year flood zone. The recovered oil tank is double walled, sealed, and anchored, and would not pose a threat of release if the area were flooded.

1.4 WASTE CHARACTERISTICS

In 1986, a waste identification survey was conducted at the Waycross facility to characterize the solid and hazardous wastes generated by the facility operations and to identify areas of the facility where land disposal or spills of solid and hazardous materials had occurred. The results of the survey were described in ERT's August 1986 "Waste Identification Survey, Waycross, Georgia, Facility."

Based on the results of the waste identification survey and subsequent investigations, the four waste management areas covered by this permit renewal application were identified. The following describes the characteristics of the wastes in each of the four waste management units covered by this permit.

ODSA

Before 1985, as many as 4,000 empty drums were temporarily stored at the ODSA awaiting sale to off-site drum recovery vendors. The empty drums, some of which contained residual hazardous materials, had stored various solvents used in railroad equipment maintenance operations. Drum handling activities resulted in spills that impacted surface and subsurface soils.

In 1985, composite surficial soil samples were collected at the ODSA. The analytical results were provided to the GAEPD on December 8, 1985, in an environmental audit report. Since 1985, various field investigations have been conducted at the ODSA. Based on these investigations, the wastes disposed of at the ODSA have been identified as USEPA Waste Codes F001 and U051.

In accordance with the Final Groundwater Detection Monitoring Plan for Hazardous Waste and Land Disposal Units, Waycross, Georgia (CSXT, October 1986) a groundwater monitoring system was installed March – May 1987. Based on the 40 CFR Appendix IX analytical results, the following compounds have been identified as the Groundwater Contaminant Constituents (GWCCs) at the ODSA.

Volatile Organic Compounds (VOCs)	Semi-volatile Organic Compounds (SVOCs)	Metals
trichloroethylene	acenaphthene	lead
cis-1,2-dichloroethylene	acenaphthylene	zinc
trans-1,2-dichloroethylene	fluoranthene	
1,1-dichloroethylene	fluorene	
methylene chloride	2-methylnaphthalene	
vinyl chloride	naphthalene	
tetrachloroethylene	phenanthrene	
	pyrene	
	dibenzofuran	

ASB

The ASB is a former surface impoundment which was used through January 1985 to deposit sludges from the wastewater treatment plant operations. The ASB was approximately 250 ft long by 200 ft wide by six ft deep and had a maximum waste storage capacity of approximately 7,500 cubic yards.

Field investigations of the ASB included detailed soil sampling and groundwater monitoring. In late 1986, a soil impact study was done. The results were submitted to the GAEPD in ERT's January 1987 report "Contaminated Soils Investigation Report for Hazardous Waste Land Disposal Units - Waycross, Georgia Facility." Based on these investigations, the waste disposed of at the ASB has been identified as USEPA Waste Code F001.

In accordance with the Final Groundwater Detection Monitoring Plan for Hazardous Waste Land Disposal Units, Waycross, Georgia (CSXT, October 1986) a groundwater monitoring system was installed March – May 1987. Based on the 40 CFR Appendix IX analytical results, the following compounds have been identified as the GWCCs at the ASB:

VOCs	Metals
trichloroethylene	chromium
cis-1,2-dichloroethylene	vanadium
trans-1,2-dichloroethylene	
1,1-dichloroethylene	
methylene chloride	

VOCs	Metals
vinyl chloride	
chlorobenzene	
1,1-dichloroethane	
1,2-dichlorobenzene	
tetrachloroethylene	

ORA-2/ORPA

The ORA-2 is an approximate 6-acre undeveloped area that was used before February 1985 to dispose of concrete debris and other solid waste material from the Waycross facility. Located just south and adjacent to the ORA-2 is the ORPA that is an approximate 4-acre undeveloped area. Prior to 1960, oily wastewater from maintenance operations reportedly flowed to a separation basin and wastewater runoff pond in the ORPA. Remains of the separation basin are still present in the southeast corner of the ORPA SWMU.

Investigation of soil and groundwater was performed during multiple phases of the RFI to define the source and extent of hazardous materials at the ORA-2/ORPA SWMU. Multiple organic and inorganic compounds were detected above site-specific background in surface and subsurface soil at the ORA-2/ORPA SWMU. TCE and related compounds and chromium were the most prevalent organic and inorganic compounds detected in shallow groundwater at and downgradient of the ORA-2/ORPA SWMU. Based on the distribution of TCE and related compounds in ASB and ORA-2/ORPA soil and groundwater, the GWCCs for the ORA-2/ORPA are the same as those identified for ASB above.

ALSA

The ALSA consists of the Refined Oil Acid Pit (Acid Sludge Pit) and the Acetylene-Lime Sludge Pit. For an unknown period up to 1969, a lubrication oil purification facility was operated by CSXT in the LSA of the Waycross facility. Spent lubrication oil was refined using a stripper compound that incorporated sulfuric acid. This process generated a sludge that was deposited in the Acid Sludge Pit.

Since 1985, various field investigations have been conducted at the ALSA to define the nature and extent of the impact in this area. In October 1985, the contents of the Acid Sludge Pit were sampled and analyzed. It was found to contain detectable concentrations of trichloroethylene (TCE). The results of this investigation were submitted to the GAEPD in the December 1985 "Environmental Audit Report."

Additional data from the Acid Sludge Pit was submitted in ENSR's February 1988 report "Biodegradation Feasibility Study of Organic Contaminants in Acid and Lime Pits." Five composite soil/sludge samples were collected from the Acid Sludge Pit and submitted for analysis. TCE was detected in the soil/sludge at a concentration of 570 milligrams per kilogram (mg/kg). The pH of the soil/sludge was measured at 2.0.

These investigations concluded that the Acid Sludge Pit was the source of TCE found in the groundwater downgradient of the ALSA. Consequently, the ALSA was identified as a SWMU.

Based on the past investigations at the ALSA, and subsequent Appendix IX analytical results, the following compounds have been identified as the GWCCs at the ALSA:

VOCs	Metals
trichloroethylene	vanadium
cis-1,2-dichloroethylene	
trans-1,2-dichloroethylene	
tetrachloroethylene	
vinyl chloride	

LSA

The Locomotive Shop building is used for the maintenance and repair of locomotives. The shop once contained a parts cleaning vat, approximately eight-ft by eight-ft, in which TCE was used as a cleaning and degreasing agent. A portion of the vat was five to six ft below grade. Before the parts cleaning vat was removed, the contents of the vat may have leaked or been spilled resulting in a release. The use of the parts cleaning vat is suspected of being the primary source for the TCE and related constituents found in downgradient groundwater and surface water.

During the RCRA Facility Investigation (RFI) performed at the ALSA, groundwater containing TCE was identified to the northeast and southeast of the Locomotive Shop building. A separate soil, surface water, and groundwater remedial investigation was performed to define the source and extent of the TCE. Five separate soil investigation phases were conducted to delineate the lateral and vertical extent of impacted soil underlying the Locomotive Shop building in the area of the former parts cleaning vat. These investigations concluded that the former parts cleaning vat was the source of the TCE found in the groundwater to the northeast and southeast of the Locomotive Shop building. Consequently, the LSA was identified as a SWMU.

Based on the past soil investigations at the LSA, and subsequent Appendix IX analytical results, the following compounds have been identified as the GWCCs at the LSA:

VOCs
trichloroethylene
cis-1,2-dichloroethylene
trans-1,2-dichloroethylene
vinyl chloride
Tetrachloroethylene
1,1,2-trichloroethane

OCVSP

As summarized in the 1986 survey report, the OCVSP SWMU incorporates two former waste pits, which were used a single time in 1985 to dispose of approximately 28 cubic yards of sludge generated from the parts cleaning vats. The 1986 survey indicated no soil impacts at the OCVSP; however, monitor well MW-104, located adjacent to one of the old cleaning-vat sludge pits indicated the presence of chlorinated TCE and associated degradation compounds in shallow groundwater. Investigation of soil and groundwater was performed during multiple investigation phases of the RFI to attempt identification of the source and define the extent of the TCE. Reported TCE and related compounds in surface and subsurface soil at the OCVSP SWMU were either at or below site-specific background concentrations and no evidence of residual waste was identified. TCE and related compounds in shallow groundwater upgradient, at, and downgradient of the OCVSP SWMU were detected above background concentrations and are attributed to the upgradient LSA SWMU. As such, the GWCCs for the OCVSP are the same as those identified for LSA above.

LPABS/OEH

Locomotive preparation and painting were conducted in the Locomotive Paint Shop. No evidence of a hazardous waste release associated with the Locomotive Paint Shop operation was noted during the waste identification survey. The former Locomotive Paint Shop was demolished in 2015 and replaced with a new structure. The old Air Brake Shop was located in the southern portion of the LPABS building, but this operation was terminated in the 1960s. The former Air Brake Shop area is currently occupied by General Electric Corporation and is used for customer inventory. The OEH, located approximately 100 ft south-southwest and downgradient of the LPABS, was used for painting freight cars and minor locomotive repairs. The OEH building was demolished over 10 years ago and only the foundation slab remains. The LPABS and OEH SWMUs are effectively grouped together given their proximity and similar operations.

The 1986 waste identification survey documented a potential release from reported frequent small quantity solvent spills in the southern portion of the locomotive transfer pit, outside of the old Air Brake Shop. Part of the old Air Brake Shop operation included a parts-cleaning vat in which TCE was used as a cleaning and degreasing agent. In addition, small amounts of TCE may have been used for parts degreasing or drying at the OEH. During the RCRA Facility Investigation (RFI) performed at the LPABS/OEH, investigation of soil, groundwater, and surface water was performed to define the source and extent of the TCE. Multiple investigation phases were conducted to delineate the lateral and vertical extent of impacted soil and groundwater at and downgradient of the old Air Brake Shop in the area of the former parts cleaning vat. These investigations concluded that the former parts cleaning vat was the source of the TCE and degradation compounds found in the groundwater to the south-southeast of the old Air Brake Shop building.

Based on the LPABS/OEH RFI, and Appendix IX analytical results, the following compounds have been identified as the GWCCs at the LPABS/OEH:

VOCs
trichloroethylene
cis-1,2-dichloroethylene
trans-1,2-dichloroethylene
vinyl chloride
tetrachloroethylene
1,1,2-trichloroethane

1.5 PROCESS INFORMATION

The ODSA hazardous waste management unit was closed as a landfill in accordance with the interim status regulations prescribed in 40 CFR, Part 265. The site closure involved capping the unit and restricting access to the area. The ODSA is presently a vacant field west of the LPABS (see Figure 1-3) and is approximately 550 ft long by 95 ft wide. Before 1985, as many as 4,000 empty drums were temporarily stored at the site awaiting sale to off-site drum recovery vendors. Drum handling activities resulted in spills that impacted surface and subsurface soils, and an estimated 1,112 cubic yards of waste were disposed of at the ODSA.

The ASB hazardous waste management unit was a surface impoundment that was closed as a landfill in accordance with the interim status regulations prescribed in 40 CFR, Part 265. The site closure involved capping the unit and restricting access to the area. The ASB is east-southeast of the LSA, as shown on Figure 1-3. The former surface impoundment was approximately 250 ft long by 200 ft wide and was used through January 1985 to deposit sludge from the wastewater treatment plant operations. The ASB was approximately six ft deep and had a maximum waste storage capacity of approximately 7,500 cubic yards.

1.6 CLOSURE AND POST-CLOSURE

1.6.1 Closure Plans

The ODSA and ASB units were closed as landfills in accordance with the interim status regulations prescribed in 40 CFR, Part 265. The closure plans are described in ERT's August 1987 report "Revised Closure Plan for the Old Drum Storage Area - Waycross, Georgia, Facility" and ERT's August 1987 report "Revised Closure Plan for the Alum Sludge Basin - Waycross, Georgia Facility" (see Appendix C). The site closures involved capping the units with a low-permeability soil cover and restricting access to the areas. The construction design for the final covers and site control structures are provided in the aforementioned reports.

Copies of the Closure Notices, survey plats indicating the locations and dimensions of the ODSA and ASB with respect to permanently surveyed benchmarks, and the closure plans for the ODSA and ASB are provided in Appendix C.

1.6.2 Post-Closure Plans

The ODSA and ASB post-closure plans consist of completing the groundwater corrective action and maintaining the final cover and site control measures. The final covers consist of compacted, sloped soil caps covered with vegetation to retard erosion. Site control measures include barricades to restrict access to the areas and surface water run-off control systems around the units. Benchmarks are located at the corners of the units to mark the boundaries. The integrity and effectiveness of the final cover are inspected regularly, maintained, and repaired as necessary to correct the effects of settling, subsidence, erosion, or other disturbances.

The post-closure inspection, monitoring, and maintenance plans for the ODSA, ASB, ALSA, and LSA are described in Sections 3.1, 3.2, 4.1, and 4.2, respectively. Post-closure security measures are described in Section 1.7.1. The post-closure schedules for the ODSA and ASB are provided in Section 3.4. The post-closure schedules for the ALSA and LSA are provided in Section 4.5.

The post-closure contact is:

Mr. Matt Adkins
Senior Manager – Environmental Remediation
CSX Transportation, Inc.
1590 Marietta Blvd NW
Atlanta, GA 30318
Phone: (404) 350-5135
Fax: (904) 245-2273

Within 60 days of completion of 1) the established post-closure care period, and 2) completion of the Groundwater Corrective Action Program in accordance with Section 3.4 for the ODSA and the ASB and Section 4.6 for the ALSA, LSA, OCVSP, LPABS/OEH, and ORA-2/ORPA, documentation will be submitted to the GAEPD that post-closure care was performed in accordance with the specifications of the approved post-closure plans. Certification of the completion of post-closure care may be made separately for each unit and will be signed by a responsible corporate officer of CSXT and by an independent professional engineer registered in the State of Georgia.

1.6.3 Post-Closure Costs and Financial Assurance Requirements

In accordance with 40 CFR §264.144, the post-closure cost estimates are provided in Appendix D. In accordance with 40 CFR §264.145, financial assurance for the post-closure care of the Waycross facility is also provided in Appendix D.

1.7 PROCEDURES TO PREVENT HAZARDS

1.7.1 Security

In accordance with 40 CFR §264.14, the Waycross facility has security measures in place to prevent the unknowing entry and minimize the possibility of unauthorized entry of persons or livestock into the areas of the hazardous and solid waste management units. Barricades and warning signage visible within 25 feet are located around the periphery of the ASB and ODSA hazardous waste management units. In addition, the hazardous and solid waste management units are located within areas that are operated 24-hours a day.

The Waycross facility covers a large area which extends approximately five miles. Signs prohibiting unauthorized entry onto CSXT's property are posted at the entrances to the facility, and security gates have been installed at the main entrances to prevent unauthorized entry. In addition, the railroad tracks and nearby internal roads are well travelled by CSXT employees who are instructed to report the presence of unauthorized persons on the facility property. Security personnel make regular inspections of the CSXT property to monitor and control unauthorized entry. For these reasons, the potential for public contact with the hazardous waste management units is minimal, and the potential threat to the public or domestic livestock during the post-closure period is minimal.

Chain link fencing has been installed along the southern boundary of the facility, along Hamilton Avenue, and adjacent the Waycross Canal along the south eastern portion of the facility to restrict access to CSXT property. In addition, the Waycross and City Drainage Canals provide an artificial barrier along the northwest and southeast property boundaries. Further, site control measures for the ODSA and ASB include cable fencing that surrounds each unit to restrict vehicle access. Benchmarks are located at the corners of both units to mark the boundaries. These features minimize the potential for physical contact with the wastes, structures, or equipment within the HWMUs and the potential for injury to unknowing or unauthorized persons or livestock that may enter these areas.

All components of the groundwater recovery system are located within the secured facility boundaries. Additional security control measures of the groundwater recovery and monitoring system include locked monitor wells and secured recovery wells. All components of the recovered groundwater treatment system are housed and secured within a locked, metal building.

1.7.2 Inspections

In accordance with 40 CFR §264.15, the Waycross facility is routinely inspected for malfunctions, deterioration, operator errors, and discharges which may cause or lead to the release of hazardous waste constituents to the environment or may threaten human health. Facility equipment, systems, and devices are inspected or tested routinely to prevent failures that may cause spills or releases and are regularly maintained, cleaned, and adjusted. Defective equipment found during inspections and/or tests are promptly repaired or replaced. Scheduled test and inspection results are documented on inspection forms (Appendix H) and maintained along with follow-up corrective actions. A schedule of inspection/testing of facility systems is as follows:

SYSTEM	INSPECTION TYPE	INSPECTION FREQUENCY	INSPECTED BY
Hazardous Waste Storage Area	visual	weekly	Environmental Field Services personnel
Hazardous Waste Satellite Storage	visual	weekly	Environmental Field Services personnel
Final cover - Hazardous Waste Management Units	visual	monthly and following significant rainfall event	Environmental Field Services personnel and environmental contractor
Groundwater Recovery/Treatment Systems	visual	3 times/week	Environmental Field Services personnel and environmental contractor
Groundwater Monitoring System	visual/physical	semiannually	Environmental contractor
Wastewater Treatment Facilities	visual/physical	monthly	Environmental Field Services personnel

SYSTEM	INSPECTION TYPE	INSPECTION FREQUENCY	INSPECTED BY
Dikes/Sumps/Valves in Chemical Storage Areas	visual/physical	monthly SPCC inspection	Environmental Field Services personnel
Stormwater Control Systems	visual/physical	quarterly (following rain event); annual (dry event)	Environmental Field Services personnel

The post-closure inspection and maintenance procedures and schedules for the ODSA and ASB are described in Section 3.3. Those for ALSA, LSA, LPABS/OEH, OCVSP, and ORA-2/ORPA are described in Section 4.4. Procedures and schedules are provided in these sections for inspecting and maintaining the groundwater recovery and treatment systems, the groundwater monitoring system, and the final cover and site control measures.

CSXT has other environmental plans and programs in place at the facility [e.g., Oil Spill Prevention Control and Countermeasures Plans, a Storm Water Pollution Prevention Plan, the Hazard Communication Program, the Hazardous Materials Emergency Response Guide, and the Environmental Awareness Training Program] that describe inspection and maintenance procedures to prevent and detect malfunctions, deterioration, operator errors, and discharges which may cause or lead to the release of hazardous waste constituents or may threaten human health.

1.7.3 Preparedness and Prevention

In accordance with 40 CFR, Part 264, Subpart C, the Waycross facility is designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or an unplanned release of hazardous waste constituents into the air, soil, or surface water, which could threaten human health or the environment.

In accordance with 40 CFR §264.50, the RCRA Contingency Plan (CSXT, 2018) was developed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water. The content of the Contingency Plan describes actions facility personnel must take, as well as arrangements made by local police, fire departments, hospitals, contractors, and emergency response teams. The RCRA Contingency Plan also lists all emergency equipment, including emergency response systems and communications.

1.7.4 Preventive Procedures, Structures, and Equipment

With respect to the groundwater recovery and treatment system, various devices are in place to prevent the release of untreated groundwater into the environment. The groundwater recovery and treatment systems include safety shutdowns and interlocks designed to prevent an inadvertent discharge of untreated groundwater from the treatment system. The safety features of the groundwater recovery and treatment system are shown on the system drawings and described in the corrective action system operations and maintenance manual that is kept on site. The Site Layout (Drawing 1), ODSA (HWW-4), LPABS (HWW-1), and LSA (HWW-3) Piping Runs (Drawing 2), and ASB (HWW-2) and ALSA (HWW-5) Layout and Piping Runs (Drawing 3) are included in Appendix E.

In addition, caps are in place at the ODSA and ASB to prevent exposure by dermal, inhalation, or oral routes, and to prevent stormwater from coming in contact with the underlying waste materials.

1.8 CONTINGENCY PLAN AND EMERGENCY PROCEDURES

In accordance with 40 CFR §264.50, the RCRA Contingency Plan was developed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water. The content of the RCRA Contingency Plan describes actions facility personnel must take, as well as arrangements made by local police, fire departments, hospitals, contractors, and emergency response teams. The RCRA Contingency Plan (CSXT, 2018) also lists all emergency equipment, including emergency response systems and communications.

1.9 PERSONNEL TRAINING

In accordance with 40 CFR §264.16, appropriate facility personnel receive training that teaches them to perform their duties in a way that ensures compliance with 40 CFR, Part 264. CSXT stresses incident prevention and pollution control in its personnel training. In accordance with 40 CFR §264.16(c), appropriate personnel receive training within six months after being hired or assigned to a new position and annually thereafter. Spill control and hazardous waste management procedures are an integral part of this training. When assigned to areas where the possibility of spills exists and hazardous wastes are handled, spill prevention and control procedures are thoroughly explained throughout the on-the-job training program.

Hazardous waste management is covered in the personnel training program and training records are kept at the facility. The training program is available in the Environmental Field Services office and a copy is kept in the shop superintendent’s office.

Facility employees who generate and manage hazardous waste receive the following training:

- Hazardous Waste Generator Training (video available)
- Environmental Certification Training (manual and video available)

Employees who manifest hazardous materials also receive DOT hazardous materials training. American Red Cross first aid training is also available to facility personnel.

Groundwater and surface water monitoring activities are typically performed by contractors or consultants hired by CSXT to perform these duties. These personnel receive training in performing groundwater and surface water monitoring in accordance with United States Environmental Protection Agency (USEPA) and GAEPD requirements and procedures, and the procedures described in Section 7.0. Training documentation for individuals that conduct environmental monitoring are maintained in personnel files with the subcontracted companies.

1.10 EXPOSURE INFORMATION

In accordance with 40 CFR §270.10 (j), the following information is provided on the potential for the public to be exposed to hazardous wastes or hazardous constituents through releases related to the hazardous waste management units. This information addresses:

- reasonably foreseeable potential releases from both normal operations and accidents at the units, including releases associated with transportation to or from the units.
- the potential pathways of human exposure to hazardous wastes or constituents resulting from the releases described above.
- the potential magnitude and nature of the human exposure resulting from such releases.

1.10.1 Foreseeable Potential Releases

The use of the two hazardous waste management units, the ODSA and the ASB, ended in 1985. Both the ODSA and the ASB were closed by capping the units and restricting access to the areas. The ODSA and ASB post-closure plans consist of completing the groundwater corrective action and maintaining the final cover and site control measures. The final covers consist of compacted, sloped soil caps covered with vegetation to retard erosion. Site control measures include a barricade to restrict access to the areas and a surface water run-off control system around the units. Benchmarks are located at the corners of the units to mark the boundaries.

Potential releases of hazardous waste constituents from normal operations, accidents, or transportation at the ODSA and ASB are minimal for the following reasons:

- the ODSA and ASB are no longer in use;
- hazardous wastes are not being transported to or from the ODSA or ASB;
- the wastes at the ODSA and ASB are covered with a protective soil cap to prevent exposure by dermal, inhalation, or oral routes;
- the final cover at the ODSA and ASB consists of compacted, sloped soil caps covered with vegetation to retard erosion which could expose the covered waste;
- security measures are in place as described in Section 1.7.1 to minimize the potential for exposure to the wastes at the ODSA and ASB;
- the groundwater recovery and treatment systems at the ODSA and ASB are equipped with fail-safe devices to prevent overflows and releases of untreated groundwater; and
- the groundwater recovery and treatment systems at the ODSA and ASB are inspected regularly to ensure proper operation and to detect leaks or other failures.

1.10.2 Potential Pathways of Human Exposure

Human exposure to hazardous wastes or constituents requires the following:

- a release of hazardous wastes or constituents from the hazardous waste management units.

- a human exposure pathway.
- the presence of a population to be exposed to the hazardous wastes or constituents.

The potential pathways of human exposure resulting from a release of hazardous wastes or constituents from the ODSA or ASB follows.

Groundwater

The potential for human exposure via groundwater is unlikely for the following reasons:

- there are no water supply wells screened within the affected area or the impacted aquifer;
- domestic water for the city of Waycross is supplied by three permitted wells drawing water from 750 ft below land surface in the Floridan Aquifer;
- the closest reported water supply wells to the ASB and ODSA are located at 401 Hamilton Avenue (S-22) and 1600 Wardlaw St (I-32), respectively. Locations of water supply wells are further discussed in Section 2.2; and
- there is no evidence of faults or other connections between the impacted aquifer and the Floridan Aquifer.

Surface Water

Surface water drainage from the ODSA and ASB is via the Shop Area Ditch and the Waycross Canal, as shown on Figure 1-3. The Waycross Canal eventually flows into the Satilla River. The potential for human exposure via surface water is minimal for the following reasons:

- the wastes at the ODSA and ASB are covered with a protective soil cap, which consists of compacted, sloped soil covered with vegetation to retard erosion and prevent stormwater from coming in contact with the waste;
- the current corrective action program for the site is effectively preventing the infiltration of GWCCs into the Waycross Canal;
- the levels of constituents detected in the Shop Area Ditch are low and dissipate rapidly; and
- impacted surface water is not being used as a water supply.

Air

The potential for human exposure via the air route is unlikely for the following reasons:

- the wastes at the ODSA and ASB are covered with a protective soil cap which consists of compacted, sloped soil covered with vegetation to retard erosion and prevent windblown particulate dispersal; and
- the groundwater treatment system is equipped with a vapor-phase carbon adsorption system to prevent off-gas emissions.

Subsurface Gas

The potential for human exposure via subsurface gas is unlikely for the following reasons:

- the ODSA and ASB are not near conduits or buildings that might enable the migration and collection of subsurface gas; and

- the wastes disposed at the ODSA and ASB do not typically generate subsurface gases.

Soil

The potential for human exposure via soil contact is unlikely for the following reasons:

- the wastes at the ODSA and ASB are covered with a protective soil cap, which consists of compacted, sloped soil covered with vegetation to retard erosion and prevent accidental contact with the impacted soil; and
- security measures are in place as described in Section 1.7.1 to prevent accidental contact with the impacted soil.

1.10.3 Potential Magnitude and Nature of Human Exposure

Table 1-2 lists the highest GWCC concentrations detected in the groundwater from individual monitor wells at the ODSA, ASB, ALSA, LPABS/OEH, LSA, and ORA-2/ORPA. Table 1-3 lists the highest GWCC concentrations detected in the surface water of the Waycross Canal and the Shop Area Ditch. Appendix B contains material safety data sheets for the GWCCs which provide information on the chemical, physical, and toxicological properties of these constituents to help evaluate the nature of the human exposure potential and the associated risks.

1.11 OTHER FEDERAL LAWS

In accordance with 40 CFR §270.3, the following federal laws have been reviewed, reported, and do not apply to the issuance of this permit:

- The Wild and Scenic Rivers Act (16 U.S.C. 1273 et seq.)
- The National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.)
- The Endangered Species Act (16 U.S.C. 1531 et seq.)
- The Coastal Zone Management Act (16 U.S.C. 1451 et seq.)
- The Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.)

2 GEOLOGY AND HYDROGEOLOGY

2.1 REGIONAL GEOLOGY AND HYDROGEOLOGY

The City of Waycross is located in the lower region of the Coastal Plain physiographic province. The surficial geology in the area consists of unconsolidated sand, silt, and clay to a depth of approximately 60 ft below land surface (ft bls). Groundwater is generally found in the surficial geology at depths shallower than 10 ft bls, and unconfined to confined conditions are common.

Beneath the surficial geology is the Miocene Hawthorn Formation, which is approximately 440 ft thick in the Waycross area. The Hawthorn Formation has several low permeable layers and confines and protects the underlying Floridan Aquifer. Some water supply wells are screened in the more permeable confined layers of the Hawthorn Formation. These wells are usually completed in marl. The marls were deposited as sandy carbonate muds and were subsequently dolomitized. The wells that are installed in and above the water producing layers of the Hawthorn Formation may be referred to as shallow wells or sand wells.

The Floridan Aquifer approaches approximately 1,700 ft in thickness in Ware County and consists of limestone and dolomite ranging in age from Middle Eocene to Oligocene. The Floridan Aquifer is the primary water supply resource in the Waycross area. Wells installed into the Floridan Aquifer may be referred to as lime rock or rock wells. Most water in the aquifer is produced from fractures and cavities and artesian conditions are common.

2.2 WATER SUPPLY WELLS

Table 2-1 summarizes available water well information on file with the City of Waycross, Ware County Health Department, and Satilla Water and Sewer Authority of the water supply wells located within a one-mile radius of the facility boundary. In the Waycross area, wells are completed in the Floridan Aquifer, the permeable layers above and within the Hawthorn Formation (Intermediate), and upper surficial groundwater (Surficial). The Floridan Aquifer wells are used for potable and industrial water supply and are generally cased to a depth of at least 400 ft bls. Wells completed above and within the permeable layers of the Hawthorne Formation are used for industrial and irrigation purposes and are generally cased to a depth of at least 170 ft bls. In general, wells screened within the upper 30 ft of upper surficial groundwater are used for irrigation purposes.

2.2.1 Floridian Aquifer Wells

The potable water supply in the City of Waycross and vicinity is provided by municipal and county water wells drilled into the Floridan Aquifer. Figure 2-1 shows the Floridan Aquifer wells at and in the vicinity of the facility. The City of Waycross obtains potable water from Floridan Aquifer wells including F-1, F-2, and F-3 as also shown on Figure 2-1. These wells are located approximately 3,000 ft northeast of the facility boundary. There is one industrial water supply well on the facility property. Well F-6 is located approximately 80 ft south of the ALSA. Floridan Aquifer well F-7 is reported to be used for industrial purposes (Coca Cola Bottling Co.) and the primary use of F-8 is unknown. Other potable water supply wells were reported to be located at Emerson Park (F-4), over one mile southwest of the ODSA, and at Gilchrist Park (F-5), approximately one mile southeast of the ASB area.

2.2.2 Intermediate Aquifer Wells

Figure 2-2 shows the Intermediate Aquifer water supply wells reported in the vicinity of the facility. The majority of the Intermediate Aquifer wells are used for irrigation; however, two wells on Waycross Recycling (Locomotive Specialist and Progressive Rail Services) identified as I-2 and I-3 on Figure 2-2, are used for industrial purposes. In addition, the City of Waycross confirmed the locations of the reported wells have municipal water connections.

2.2.3 Surficial Wells

Figure 2-3 shows the surficial water supply wells reported within a one-mile radius of the facility boundaries. A majority of the locations of the surficial water supply wells identified on Figure 2-3 and

Table 2-1 were confirmed by City of Waycross and Satilla Water and Sewer Authority to have municipal water connections.

2.3 SITE GEOLOGY AND HYDROGEOLOGY

The site-specific surficial geology was evaluated in 1986 as part of the facility permitting process. The September 1986 “Geology and Hydrogeology Report” summarized the findings of the initial evaluation. Representative boring and well logs from the initial investigation, subsequent investigations, and corrective action, are included in Appendix F. Geologic cross-sections for the ODSA, ASB, ALSA, LSA, LPABS, OEH, and ORA-2/ORPA are provided in Appendix G. Well construction details for site monitoring and recovery wells are summarized in Table 2-2.

The initial geologic evaluation defined five surficial stratigraphic layers to a depth of approximately 60 ft bls. The following summarizes the initial interpretation of the typical site geology with a broad description of each zone:

- Zone I, surface to 7 ft bls; sand, silty sand, clayey sand
- Zone II, 7 to 20 ft bls; clay, silty clay, sandy clay
- Zone III, 20 to 27 ft bls; sand, silty sand, clayey sand (upper surficial groundwater)
- Zone IV, 27 to 39 ft bls; clay, silty clay, sandy clay
- Zone V, 39 to 59 ft bls; sand, silty sand, clayey sand (lower permeable layer)
- Hawthorn Formation, 59 ft bls; blue-green clay, sandy clay

In general, Zone 1 and Zone II strata represent layers of less than 20 ft bls with a range of grain sizes and low transmissivity. Relative permeability appears to increase in Zone III with the layer increasing in sand content and extending to 27 ft. The transitions between the three layers are gradual with no apparent geologic contacts.

Zone IV strata begin at approximately 27 ft bls and are characterized by an increase in clay and a decrease in permeability. The underlying Zone V strata begin at approximately 39 ft bls and extend to approximately 59 ft bls. Zone V strata are primarily comprised of silty fine to medium sand with an increase in relative permeability. At approximately 59 ft bls, the blue-green clay of the low permeable Hawthorn Formation is encountered.

The corrective action withdrawal wells and many site monitoring were installed to investigate, monitor, and remediate the upper surficial groundwater from Zone III strata. Four wells (MW-46, MW-47, MW-52, MW-67) were initially installed to monitor groundwater from the lower permeable layer of Zone V in the ASB, ODSA, ALSA, and LSA SWMUs. Subsequently, multiple Zone V monitor wells were installed at and downgradient of the LPABS/OEH SWMUs as part of the RFI and at and downgradient of the ALSA SWMU in 2016-2018 as part of a supplemental remedial investigation. As part of the supplemental ALSA remedial investigation, a groundwater flow model of the eastern portion of the CSXT Rice Yard and surrounding areas was constructed using MODFLOW code to simulate base flow conditions and current and potential remedial actions. Model generated illustrations of simulated base (non-pumping) and current groundwater recovery (pumping) conditions are included in Appendix G.

The general flow direction of shallow groundwater at the facility is southeast towards the Waycross Canal. Figures 2-4 and 2-5 illustrate the potentiometric surface of Zone III and Zone V groundwater, respectively, under pumping conditions. The configuration of Zone III and Zone V potentiometric surfaces as measured in October 2019 are consistent with the model simulations. Specific geology and hydrogeology for the ODSA, ASB, ALSA, LSA, LPABS & OEH, and ORA-2/ORPA are discussed below.

2.3.1 Old Drum Storage Area (ODSA)

Zone III strata at the ODSA range in thickness from 5 to 15 ft at depths from 9 to 18 ft bls. The top of Zone IV strata are present at depths of approximately 20 to 30 ft bls. Monitor well MW-47 is screened to monitor the lower permeable layer of Zone V strata. The low permeable clay of the Hawthorn Formation was identified in the boring for MW-47 at a depth of approximately 50 ft bls. A supplemental remedial investigation was conducted at the ODSA during 2013 consisting of direct sensing analysis of Zone I-IV strata, depth discrete groundwater quality sampling/analysis, and a hydraulic pumping test of Zone III strata. Geologic cross sections for the ODSA are included in Appendix G.

Hydraulic testing (slug test) of Zone III strata at ODSA was performed in 1987. The estimated hydraulic conductivity and groundwater seepage velocity from this evaluation was approximately 6.5 ft/day and 30 ft/yr, respectively. The 2013 pumping test evaluation indicated the mean hydraulic conductivity of Zone III strata at the ODSA is an estimated 1.5 ft/day. Using October 2019 water elevation measurements from wells MW-13 (129.72 ft msl) and MW-36 (126.99 ft msl), a distance between the wells of approximately 250 ft, hydraulic conductivity of 1.5 ft/day, and an effective porosity of 0.3, the groundwater seepage velocity at the ODSA is estimated to be approximately 20 ft/yr, comparable to the 1987 analysis. The 2013 pumping test analysis is included in Appendix G.

2.3.2 Alum Sludge Basin (ASB)

Zone III strata at the ASB range in thickness from 7 to 25 ft at depths from 8 to 18 ft bls. The top of Zone IV strata was identified at depths of approximately 21 to 35 ft bls. Monitor wells MW-46 was screened to monitor the lower permeable Zone V strata. The low permeable clay of the Hawthorn Formation was identified in the boring for MW-46 at a depth of approximately 60 ft bls. Geologic cross sections for the ASB are included in Appendix G.

Hydraulic testing (slug and pumping test) of Zone III strata at ASB was performed in 1987. The estimated hydraulic conductivity and groundwater seepage velocity from this evaluation was approximately 8.6 ft/day. In addition, the pump test performed at the ASB indicated a transmissivity of 265 ft^2/day, hydraulic conductivity of 17.7 ft/day (assuming a 15-foot thick aquifer), and a storage coefficient of 2.2 x10-3. Using October 2019 water elevation measurements from wells MW-17 (125.32 ft msl) and MW-30 (120.83 ft msl), a distance between the wells of approximately 498 ft, hydraulic conductivities of 8.6 and 17.7 ft/day, and an effective porosity of 0.3, the groundwater seepage velocity at the ASB is estimated to range from approximately 94 to 140 ft/yr under pumping conditions. Slug test and pump test data and analyses are included in Appendix G.

2.3.3 Acid-Lime Sludge Area (ALSA)

Zone III strata at the ALSA range in thickness from 5 to 18 ft at depths from 11 to 20 ft bls. The top of Zone IV strata was identified at depths of approximately 20 to 37 ft bls. Due to the presence of TCE and related compounds in Zone V strata emanating from the ALSA SWMU, supplemental remedial investigations at and downgradient of the ALSA SWMU, performed in 2009-2010 and 2016-2017, refined the hydrogeologic understanding of Zone III, IV, and V strata. Multiple monitor wells (MW-18D, MW-21D, MW-22D, MW-51D, MW-52, MW-120D, MW-122D, MW-134D, MW-135D, MW-136D, MW-137D, MW-138D, and MW-139D) were screened in Zone V strata at and downgradient of the SWMU to monitor the lower permeable Zone V strata. The low permeable clay of the underlying Hawthorn Formation was identified in the borings at depths of approximately 50 to 60 ft bls. Geologic cross sections of the ALSA are included in Appendix G.

In March 1990, slug tests performed at monitor wells MW-40 and MW-50 indicated a hydraulic conductivity of approximately 3.6 ft/day for Zone III strata. In 2016 and 2017, slug tests were performed on several existing and new Zone III monitor wells (MW-6, MW-21, MW-22, MW-56, and MW-135S) and Zone V monitoring wells (MW-18D, MW-21D, MW-51D, MW-52D, MW-116D, MW-122D, MW-134D, MW-135D, MW-136D, and MW-137D). These analyses indicate average hydraulic conductivities of Zone III and V strata at and downgradient of the ALSA SWMU are 4.7 ft/day and 4.9 ft/day, respectively. Using October 2019 water elevation measurements from Zone III wells MW-40 (131.20 ft msl) and MW-116 (128.1 ft msl), a distance between the wells of approximately 855 ft, a hydraulic conductivity of 4.9 ft/day, and an effective porosity of 0.3, the groundwater seepage velocity for Zone III stratum is estimated to be approximately 21 ft/yr. Using October 2019 water elevation measurements from well MW-21D (118.32 ft msl) and MW-134D (124.41 ft msl), a distance between the wells of approximately 1550 ft, a hydraulic conductivity of 4.0 ft/day, and an effective porosity of 0.3, the groundwater seepage velocity for Zone V stratum is estimated to be approximately 23 ft/yr under pumping conditions. Slug test data and analyses are included in Appendix G.

2.3.4 Locomotive Shop Area (LSA)

Zone III strata at the LSA range in thickness from 9 to 18 ft at depths from 12 to 20 ft bls. The top of Zone IV strata was identified at depths of approximately 22 to 37 ft bls. Monitor wells MW-67 and MW-138D were screened in Zone V strata to monitor the lower permeable layer of Zone V strata at and downgradient of the LSA SWMU, respectively. The low permeable clay of the underlying Hawthorn Formation was identified in boring MW-67 at a depth of approximately 67 ft bls. Geologic cross sections for the LSA are included in Appendix G.

In April 1994, a 48-hour pump test performed at the north end of the Locomotive Shop Building indicated a transmissivity of 122 ft2/day and a storage coefficient of 1.49 x 10-3 for Zone III strata. Based on an average Zone III thickness of 15 ft, the hydraulic conductivity for the LSA is 8.1 ft/day. Using October 2019 water elevation measurements from wells MW-66 (131.44 ft msl) and MW-62 (130.13 ft msl), a distance between the wells of approximately 630 ft, a hydraulic conductivity of 8.1 ft/day, and an effective porosity of 0.3, the groundwater seepage velocity for Zone III stratum at the LSA is estimated to be approximately 20 ft/yr. Pump test data and analyses are included in Appendix G.

In 2017, slug test analysis of monitor well MW-138D indicated a hydraulic conductivity of 2 ft/day for Zone V strata downgradient of the LSA SWMU and adjacent the Waycross Canal. Using October 2019 water elevation measurements from wells MW-67 (128.21 ft msl) and MW-138D (122.14 ft msl), a distance between the wells of approximately 1540 ft, a hydraulic conductivity of 2 ft/y, and an effective porosity of 0.3, the groundwater seepage velocity for Zone V strata is estimated to be approximately 10 ft/yr. Slug test data and analyses are included in Appendix G.

2.3.5 Locomotive Paint and Air Brake Shop (LPABS) & Old Engine House (OEH)

Zone III strata at the LPABS/OEH SWMUs range in thickness from 4 to 18 ft at depths from 17 to 37 ft bls. Portions of Zone IV strata are present at depths of approximately 12 to 35 ft bls but are discontinuous, indicating erosion and removal by one or more fluvial channels. Consequently, hydrogeologic connection of Zone III and IV strata in the vicinity of LPABS/OEH SWMUs is increased and they effectively behave as one hydrogeologic unit. Monitor well clusters MW-107, MW-108, MW-111, and MW-112 were screened to monitor the underlying Zone V strata. The low permeable clay of the Hawthorn Formation was identified in borings MW-107, MW-108, and MW-112 at depths of approximately 75 ft bls. Geologic cross sections for the LPABS/OEH SWMUs are included in Appendix G.

In April 1994, a 48-hour pump test performed at the north end of the Locomotive Shop Building indicated a transmissivity of 122 ft2/day and a storage coefficient of 1.49 x 10 -3 for Zone III strata. Using a Zone III thickness of 15 ft, the hydraulic conductivity for the LPABS is 8.1 ft/day. Using October 2019 water elevation measurements from wells MW-89 (130.81 ft msl) and MW-101 (118.08 ft msl), a distance between the wells of approximately 1,025 ft, a hydraulic conductivity 8.1 ft/day (from LSA pump test), and an effective porosity of 0.3, the groundwater seepage velocity at the LPABS area is estimated to be approximately 122 ft/yr under pumping conditions. Pump test data and analyses are included in Appendix G.

2.3.6 Old Refuse Area Number 2 and Old Runoff Pond Area (ORA-2/ORPA)

Zone III strata at the ORA-2/ORPA range in thickness from 1 to 15 ft at depths from 8 to 32 ft bls. The top of Zone IV strata was identified at depths of approximately 33 ft bls. Monitor wells MW-21D, MW-81D, MW-83D, and MW-139D were screened to monitor ORA-2/ORPA Zone V strata. The low permeable clay of the Hawthorn Formation was identified in the borings for MW-21D, MW-81D, MW-83D, and MW-139D at a depth of approximately 60 ft bls. Geologic cross sections for the ORA-2/ORPA are included in Appendix G.

As described for the ASB, a slug test performed at MW-31, (located on southwest side of the ORA-2/ORPA, indicated a hydraulic conductivity (K) value of 8.6 ft/day for Zone III. During supplemental remedial investigation of the ALSA, slug test analysis of wells MW-21 and MW-21D indicated hydraulic conductivities of Zone III and Zone V strata to be 1.7 ft/day and 0.4 ft/day, respectively. Using October 2019 water elevation measurements from wells MW-19 (124.68 ft msl) and MW-9 (120.71 ft msl), a distance between the wells of approximately 920 ft, hydraulic conductivities of 1.7-8.6 ft/day, and an effective porosity of 0.3, the groundwater seepage velocity of ORA-2/ORPA Zone III strata is estimated to be approximately 10-45 ft/yr under pumping conditions. Using October 2019 water elevation measurements from wells MW-139D (118.55 ft msl) and MW-83D (120.72 ft msl), a distance between the wells of approximately 700 ft, hydraulic conductivities of 0.4 ft/day, and an effective porosity of 0.3, the groundwater seepage velocity of ORA-2/ORPA Zone V strata is estimated to be approximately 1.5 ft/yr under pumping conditions. It must be noted that the hydraulic gradient is reversed (southeast to northwest) under the pumping conditions from operating horizontal recovery well HWW-5. Slug test data and analyses are included in Appendix G.

2.3.7 Old Cleaning Vat Sludge Pits (OCVSP)

Zone III strata at the OCVSP range in thickness from 9 to 12 ft at depths of approximately 22 ft bls. The top of Zone IV was identified at depths of approximately 32 to 37 ft bls. Monitor wells MW-138D was screened in Zone V strata to monitor the lower permeable layer of Zone V strata downgradient of the LSA and OCVSP SWMUs, respectively at and downgradient of the SWMU to monitor the lower permeable Zone V strata. The low permeable clay of the underlying Hawthorn Formation was identified in boring MW-111 (located approximately 600 ft west-southwest of OCVSP SWMU) at a depth of approximately 58 ft bls. Geologic cross sections for the OCVSP are included in Appendix G.

In March 1990, slug tests performed at monitor wells MW-40 and MW-50 indicated a hydraulic conductivity of 3.6 ft/day for Zone III stratum. Using October 2019 water elevation measurements from wells MW-45 (126.01 ft msl) and MW-70 (122.62 ft msl), a distance between the wells of approximately 406 ft, a hydraulic conductivity of 3.6 ft/day, and an effective porosity of 0.3, the groundwater seepage velocity at the OCVSP is estimated to be approximately 37 ft/yr. Slug test data and analyses are included in Appendix G.

3 CORRECTIVE ACTION PROGRAM FOR HAZARDOUS WASTE MANAGEMENT UNITS

Based on HWMU process knowledge and soil, surface water, and groundwater quality data collected at the facility since 1986, the primary constituents of concern at the HWMUs are CVOCs, and to a lesser extent metals and polynuclear aromatic hydrocarbons (PAHs). The historic use of TCE in parts cleaning/degreasing processes has resulted in residual concentrations of TCE and its degradation products in HWMU soil and groundwater. The current distribution of TCE, cis-1,2-dichloroethylene (cis-1,2-DCE), and vinyl chloride (VC) concentrations in facility Zone III and V groundwater are illustrated in Figures 3-1 and 3-2, 3-3 and 3-4, and 3-5 and 3-6, respectively. Historic ODSA and ASB groundwater quality data are summarized Tables 3-1 and 3-2, respectively. The corrective actions described in the following have resulted in reducing the overall mass and aerial extent and controlled the migration of chlorinated CVOCs in facility groundwater.

3.1 OLD DRUM STORAGE AREA

3.1.1 Unit Description

The ODSA is one of two HWMUs at the facility that was closed in accordance with RCRA requirements. Post-closure care is currently being administered in accordance with Hazardous Waste Facility Permit Number HW-049(D).

The ODSA is presently a vacant field west of the Locomotive Paint and Air Brake Shop. The site is approximately 550 ft long by 95 ft wide. The ODSA layout and current monitor and recovery well networks are included on Figure 1-3 and in Appendix E, respectively. ODSA well construction details are summarized in Table 2-2.

3.1.2 Corrective Action Background

The ODSA was closed in accordance with the interim status regulations prescribed in 40 CFR Part 265 as described in Section 1.6.1. In accordance with 40 CFR §264.100, a groundwater corrective action program was implemented at the ODSA in 1987. The initial groundwater corrective action program consisted of three groundwater withdrawal wells (WW-7 through WW-9) and an air stripper treatment system.

In response to the GAEPD's request for further delineation of the ODSA GWCCs, CSXT installed eight additional monitor wells at the ODSA (MW-71 through MW-78) in October 1995. These wells were first sampled in November 1995 and were added to the ODSA groundwater monitoring program in March 1996.

In accordance with Condition III.I.1 of Hazardous Waste Facility Permit Number HW-049(D), the GAEPD requested a permit modification in their June 17, 1996 letter to address the groundwater impacts at the ODSA. On April 29, 1997, CSXT submitted a permit renewal application with a revised corrective action plan to enhance the capture of groundwater impacts at the ODSA. Final modifications to the permit renewal application were submitted on August 6, 1997, and the RCRA Part B Permit No. HW-049(D) was reissued to CSXT on September 30, 1997.

In accordance with the RCRA Part B-Post-Closure Permit Application submitted in 1997, six additional withdrawal wells (WW-43 through WW-48) were installed at the ODSA (see Figure 1-3) in August and September 1998 to capture the impacted groundwater downgradient of withdrawal wells WW-7 through WW-9. These withdrawal wells were designed to pump simultaneously to create overlapping cones of depression to contain and recover the ODSA GWCCs. After withdrawal wells WW-43 through WW-48 became operational, withdrawal wells WW-7, WW-8, and WW-9 were shut down in accordance with the 1997 permit renewal application.

Due to performance and operation/maintenance requirements of the vertical well recovery system, on August 11, 2017, CSXT submitted Temporary Authorization Request -Groundwater Recovery and System Upgrades for ODSA Waste Management Unit. On August 28, 2017, GAEPD granted Temporary Authorization for the installation of horizontal groundwater recovery well HWW-4, installation of replacement conveyance piping, and the abandonment of existing recovery wells WW-43, WW-44, WW-45, WW-46, WW-47, and WW-48. Following well abandonments and construction/start-up of new recovery well HWW-4, CSXT submitted a Class II Permit Modification Request on February 23, 2018 for same, and on August 20, 2018, GAEPD issued Class II Permit Modification of Hazardous Waste Permit HW-049(D).

Based on the groundwater analytical results from Zone V monitor well MW-47, no evidence of impacts to groundwater quality below Zone III has been observed at the ODSA, and HWW-4 is effectively recovering CVOC mass and precluding off-site migration.

3.1.3 Groundwater Corrective Action Program

The groundwater corrective action program at the ODSA is designed to control the migration and reduce the mass of GWCCs. The current groundwater recovery system at the ODSA consists of horizontal well HWW-4. The total horizontal length of well HWW-4 is approximately 680 ft with a vertical depth of ranging from 23 ft bls at east end of screen to 14 ft bls at west end of screen. The well is constructed with approximately 350 ft of 4-inch stainless steel pipe-based wire-wrap screen, with 6-inch diameter stainless steel and high-density polyethylene (HDPE) riser pipe to land surface. Groundwater is recovered with a single submersible recovery pump that operates on a continual basis. Well construction records are included in Appendix E.

Recovered groundwater from HWW-4 is pumped directly to the consolidated groundwater treatment system (see figure 1-3) via approximately 2000 ft of 2-inch HDPE pipe. Recovered groundwater enters a common influent header of the treatment system, and then undergoes pH adjustment, initial aeration and clarification, filtered through multi-media filters, and transferred to a shallow tray low profile air stripper for final treatment.

Treated groundwater is discharged to the Shop Area Ditch under NPDES Permit No. GA0046680. CSXT maintains the as-built drawings and the corrective action system operations and maintenance manual on-site at all times. These documents describe the current groundwater corrective action system design details and operation and are updated as modifications are made to the system.

The groundwater recovery and treatment systems include a supervisory control and data acquisition (SCADA) system that has automated alarms, system shutdown, and emergency notification systems in the event of system upset and/or failure. The SCADA system is equipped with a telemetry system that allows remote system access, adjustment, and monitoring. These systems will be maintained and upgraded as necessary for the duration of the corrective action program.

The average volume of groundwater recovered from the ODSA is approximately 400,000 gallons a month, which represents an average continuous withdrawal of approximately 9 gallons per minute (gpm). Measured groundwater elevation data under pumping conditions indicate 3-4 ft drawdown observed over an area of approximately 700 ft by 400 ft. A defined cone of depression is maintained by the operation of the ODSA recovery well HWW-4 (see Figure 2-4). The effectiveness of the groundwater corrective action program in controlling GWCC migration and reducing constituent concentrations is evaluated in each Corrective Action Effectiveness Report, and adjustments are made as necessary.

3.1.4 Corrective Action Effectiveness Monitoring Program

A corrective action effectiveness monitoring program was initiated at the ODSA in June 1987 and continues to present. The monitoring program is designed to determine the overall effectiveness and performance of groundwater corrective actions and provide early detection of off-site migration of GWCCs and will continue for the duration of the corrective action program.

The corrective action effectiveness monitoring program is comprised of the following elements:

- identifying groundwater protection standards for each GWCC at the unit;
- collection and analysis of groundwater from monitor wells and the collection of surface water samples from the Waycross Canal;
- collection of groundwater from the groundwater recovery system;
- post-closure inspections and maintenance;
- data evaluation of GWCC concentration trends and discussion of same in Corrective Action Effectiveness Reports (CAERs);

- discussion of corrective action modifications made or recommended in CAERs; and
- submittal of semiannual CAERs.

If these monitoring methods indicate that the GWCCs are not being effectively controlled, the corrective action program will be modified as necessary to achieve the required control and prevent off-site migration of the GWCCs.

3.1.4.1 Groundwater Protection Standards/Background Concentration Limits

The groundwater protection standards (GWPS) for ODSA GWCCs are those listed in Table 1 of 40CFR264.94. For those constituents not listed in the 40CFR264.94, ODSA background concentration limits (BCLs) were established using groundwater data from upgradient facility background monitor well MW-3. Analytical data from four sampling events were used to calculate the mean and variance values to establish the BCL for each GWCC. The ODSA GWPS/BCL values are listed in Table 3-3.

3.1.4.2 Groundwater Monitoring

The effectiveness of the groundwater corrective action program at the ODSA will be evaluated by monitoring water elevations of the upper surficial groundwater on a semiannual basis during January-December and sampling for groundwater quality on an annual basis during January-June. Groundwater elevation measurements will be conducted on a semiannual basis at ODSA monitor wells MW-11, MW-12, MW-13, MW-32, MW-34, MW-35, MW-36, MW-47, MW-71, MW-72, MW-73, MW-74, MW-75, MW-76, MW-77, and MW-133. Groundwater quality monitoring for ODSA GWCCs will be performed on a biennial basis at upgradient monitor well MW-32 and an annual basis at monitor wells MW-12, MW-13, MW-34, MW-35, MW-36, MW-72, MW-73, MW-74, MW-76, and MW-133. The samples collected during groundwater monitoring events will be analyzed for the GAEPD-approved GWCC list (see Table 3-3). In addition, groundwater samples collected from monitor wells MW-12 and MW-34 will be analyzed for select polynuclear aromatic hydrocarbons (PAHs). A summary of ODSA groundwater monitoring is provided in Table 3-4.

In accordance with 40 CFR Part 264, annual Appendix IX sampling/analysis will be performed on one of the compliance wells (MW-11, MW-12, and MW-13). The Appendix IX sampling will be rotated annually among the three compliance wells so that each well is sampled every three years. If the Appendix IX sampling indicates that constituents are present in unit groundwater that are not already identified in the permit as monitoring constituents, groundwater from the well will be re-sampled and submitted for reanalysis within one month of receiving the laboratory analytical report to confirm its presence. If the second analysis confirms the presence of the new constituent, the GAEPD will be notified within 7 days of receiving the laboratory analytical report to determine if the new constituent needs to be added to the GWCC list.

In addition to groundwater monitor well sampling, a sample of the ODSA recovered groundwater influent will be collected on a semiannual basis to evaluate the effectiveness of the treatment system. This sample will be collected from the dedicated sample port of the ODSA recovery system influent located inside the treatment building and will be analyzed for the ODSA GWCCs listed in Table 3-3.

ODSA groundwater samples and ODSA recovered groundwater influent samples will be preserved, shipped, and analyzed in accordance with the procedures described in Section 6.0. Upon receipt of the laboratory analytical reports, the results from the groundwater monitoring will be evaluated and reported to the GAEPD in a semiannual Corrective Action Effectiveness Report.

The groundwater monitoring program is based on historic distributions of GWCCs, flow conditions of the upper surficial groundwater, and current ODSA groundwater corrective actions. If changes in GWCC concentrations suggest that the schedule needs to be revised, GAEPD will be notified to determine if a request for a permit modification is necessary.

3.1.4.3 Surface Water Monitoring

To further monitor the effectiveness of the groundwater corrective action program at the ODSA, one surface water grab sample (W-28) will be collected downgradient from the ODSA (see Figure 1-3) on a semiannual basis during January-December. The surface water sample will be preserved, shipped, and analyzed in accordance with the procedures described in Section 6.0. A summary of ODSA surface water monitoring is included in Table 3-4. Upon receipt of the laboratory analytical reports, the monitoring results will be evaluated and reported to the GAEPD in a semiannual Corrective Action Effectiveness Report.

3.2 ALUM SLUDGE BASIN

3.2.1 Unit Description

The ASB is one of two HWMUs at the facility and was closed in accordance with RCRA requirements. Post-closure care is currently being administered in accordance with Hazardous Waste Facility Permit Number HW-049(D).

The ASB is presently a vacant field east-southeast of the Maintenance Shop Area. This former surface impoundment was approximately 250 ft long by 200 ft wide and was used through January 1985 to deposit sludges from the wastewater treatment plant operations. The ASB was approximately six ft deep and had a maximum waste storage capacity of approximately 7,500 cubic yards.

The ASB layout and current monitoring and recovery well network are included on Figure 1-3 and in Appendix E, respectively. ASB well construction details are summarized in Table 2-2.

3.2.2 Corrective Action Background

The ASB was closed in accordance with the interim status regulations prescribed in 40 CFR Part 265 as described in Section 1.6.1. In accordance with 40 CFR §264.100, a groundwater corrective action program was implemented at the ASB in 1987. The groundwater corrective action program consisted of withdrawal wells WW-1, WW-2, WW-3, WW-4, WW-5, WW-6, WW-10, WW-11, WW-12, and WW-13.

In response to the GAEPD's request for further delineation of the ASB GWCCs, CSXT installed nine additional monitor wells (MW-79, through MW-87) in October 1995. These wells were first sampled in November 1995 and were added to the ASB groundwater monitoring program in March 1996.

In accordance with Condition III.I.1 of Hazardous Waste Facility Permit Number HW-049(D), the GAEPD requested a permit modification in their June 17, 1996 letter to address the groundwater impacts at the ASB. On April 29, 1997, CSXT submitted a permit renewal application with a revised corrective action plan to capture the groundwater impacts at the ASB. In response to the GAEPD's June 4, 1997 comments, the permit renewal application was modified and resubmitted on July 25, 1997. Final modifications to the permit renewal application were submitted on August 6, 1997. The RCRA Part B Permit No. HW-049(D) was reissued to CSXT on September 30, 1997.

Based on the findings reported in the March 9, 1999, Corrective Action Assessment for the ASB and Verification Investigation Reports for the ORA-2/ORPA, the corrective action plan for the GWCCs east of the ASB was modified and a permit modification application with the revised corrective action plan was submitted to the GAEPD on October 29, 1999.

In response to the GAEPD's December 16, 1999 comments on the permit modification application, CSXT submitted a revised permit modification application and "Groundwater and Surface Water Hydraulic Interaction Report and Pilot Test Work Plan" on February 28, 2000. On May 2, 2000, the GAEPD approved the permit modification application to modify the existing groundwater corrective actions and to add a hydraulic barrier system along a portion of the southern property boundary adjacent to the Waycross Canal. On October 19, 2000, the amended permit became effective.

In accordance with the amended permit, horizontal recovery well HWW-2 was constructed at and east of the ASB (see Figure 1-3) in June 2002. The system controls GWCC migration, reduces GWCC concentrations, operates with minimal operator attention and maintenance, and is intrinsically safe. Upon final completion of HWW-2, withdrawal wells WW-1 through WW-6 and WW-10 through WW-13 were abandoned in accordance with the amended permit.

With the exception of two low reported concentrations of TCE near the method detection limit for monitor well MW-46, no evidence of impacts to groundwater quality below Zone III has been observed at the ASB, and HWW-2 is effectively recovering CVOC mass and precluding off-site migration.

3.2.3 Groundwater Corrective Action Program

The groundwater corrective action program at the ASB is designed to control the migration and reduce the mass of GWCCs. The current groundwater recovery system at the ASB consists of horizontal well HWW-2. The total horizontal length of the well is approximately 1,151 ft with a vertical depth of approximately 27 ft bls. The well is constructed with approximately 844 ft of 4-inch stainless steel pipe-based wire-wrap screen, with 6-inch (west end) and 4-inch (east end) diameter stainless steel riser pipe to land surface. Groundwater is recovered with a single submersible recovery pump that operates on a continual basis. Well construction records are included in Appendix E.

Recovered groundwater from HWW-2 is pumped directly to the consolidated groundwater treatment system (see figure 1-3) via approximately 1375 ft of 2-inch polyvinyl chloride (PVC) pipe. Recovered groundwater enters a common influent header of the treatment system, and then undergoes pH adjustment, initial aeration and clarification, filtered through multi-media filters, and transferred to a shallow tray low profile air stripper for final treatment.

Treated groundwater is discharged to the Shop Area Ditch under NPDES Permit No. GA0046680. CSXT maintains the as-built drawings and the corrective action system operations and maintenance manual on-site at all times. These documents describe the current groundwater corrective action system design details and operation and are updated as modifications are made to the system.

The groundwater recovery and treatment systems include a supervisory control and data acquisition (SCADA) system that has automated alarms, system shutdown, and emergency notification systems in the event of system upset and/or failure. The SCADA system is equipped with a telemetry system that allows remote system access, adjustment, and monitoring. These systems will be maintained and upgraded as necessary for the duration of the corrective action program.

The average volume of groundwater recovered from the ASB is approximately 432,000 gallons per month, which represents an average continuous withdrawal of approximately 10 gpm. Measured groundwater elevation data under pumping conditions indicate 3-5 ft drawdown observed over an area of approximately 1200 ft by 500 ft. A defined cone of depression is maintained by the operation of the ASB recovery well HWW-2 (see Figure 2-4). The effectiveness of the groundwater corrective action program in controlling GWCC migration and reducing constituent concentrations is evaluated in each Corrective Action Effectiveness Report and adjustments made as necessary.

3.2.4 Corrective Action Effectiveness Monitoring Program

A corrective action effectiveness monitoring program was initiated at the ASB in June 1987 and continues to present. The current monitoring program is designed to determine the overall effectiveness and performance of groundwater corrective actions and provide early detection of off-site migration of GWCC and will continue for the duration of the corrective action program.

The corrective action effectiveness monitoring program is comprised of the following elements:

- identifying groundwater protection standards for each GWCC at the unit;
- collection and analysis of groundwater from monitor wells and surface water samples;
- collection of groundwater from the groundwater recovery system;
- post-closure inspections and maintenance;
- data evaluation of GWCC concentration trends and discussion of same in CAERs;
- discussion of corrective action modifications made or recommended in CAERs; and
- submittal of semiannual CAERs.

If these monitoring methods indicate that the GWCCs are not being effectively controlled, the corrective action program will be modified as necessary to achieve the required control and prevent off-site migration of the GWCCs.

3.2.4.1 Background Concentration Limits

The groundwater protection standards (GWPS) for ASB GWCCs are those listed in Table 1 of 40CFR264.94. For those constituents not listed in the 40CFR264.94, ODSA background concentration limits (BCLs) were established using groundwater data from upgradient facility background monitor well MW-3. Analytical data from four sampling events were used to calculate the mean and variance values to establish the BCL for each GWCC. The ASB GWPS/BCL values are listed in Table 3-3.

3.2.4.2 Groundwater Monitoring

The effectiveness of the groundwater corrective action program at the ASB will be evaluated by monitoring water elevations of the upper surficial groundwater on a semiannual basis during January-December and sampling for groundwater quality on an annual basis during July-December. Groundwater measurements will be conducted on a semiannual basis at the ASB monitor wells MW-14, MW-15, MW-16, MW-17, MW-26, MW-28, MW-29(18-28), MW-30, MW-46, MW-48, MW-79. Groundwater quality monitoring for ASB GWCCs will be performed on a biennial basis at upgradient monitor well MW-113 and an annual basis at ASB monitor wells MW-14, MW-15, MW-16, MW-17, MW-28, MW-29(18-28), MW-46, MW-48, and MW-79. The samples collected during groundwater monitoring events will be analyzed for the GAEPD-approved GWCC list presented in Table 3-3. A summary of ASB groundwater monitoring is included in Table 3-4.

In accordance with 40 CFR Part 264, annual Appendix IX sampling/analysis will be performed on one of the compliance wells (MW-14, MW-15, and MW-16). The Appendix IX sampling will be rotated annually among the three compliance wells so that each well in sampled every three years. If the Appendix IX sampling indicates that constituents are present in unit groundwater that are not already identified in the permit as monitoring constituents, groundwater from the well will be re-sampled and submitted for reanalysis within one month of receiving the laboratory analytical report to confirm its presence. If the second analysis confirms the presence of the new constituent, the GAEPD will be notified within 7 days of receiving the laboratory analytical report to determine if the new constituent needs to be added to the GWCC list.

In addition to groundwater monitor well sampling, a sample of the ASB recovered groundwater influent will be collected on a semiannual basis to evaluate the effectiveness of the treatment system. This sample will be collected from the dedicated sample port of the ASB recovery system influent located inside the treatment building and will be analyzed for the ASB GWCCs listed in Table 3-3.

ASB groundwater samples and ASB recovered groundwater will be preserved, shipped, and analyzed in accordance with the procedures described in Section 6.0. Upon receipt of the laboratory analytical reports, the results from the groundwater monitoring will be evaluated and reported to the GAEPD in an annual corrective action effectiveness report.

The groundwater monitoring program is based on historic distributions of GWCCs, flow conditions of the upper surficial groundwater, and current ASB groundwater corrective actions. If changes in GWCC concentrations suggest that the schedule needs to be revised, GAEPD will be notified to determine if a request for a permit modification is necessary.

3.2.4.3 Surface Water Monitoring

To further monitor the effectiveness of the groundwater corrective action program at the ASB, two surface water samples (CW-1, CW-2) downgradient from the ASB (see Figure 1-3) will be collected on a semiannual basis during January-December. The surface water samples will be preserved, shipped, and analyzed in accordance with the procedures described in Section 6.0. A summary of ASB surface water monitoring is provided in Table 3-4. Upon receipt of the laboratory analytical reports, the monitoring results will be evaluated and reported to the GAEPD in a semiannual Corrective Action Effectiveness Report.

3.3 POST-CLOSURE INSPECTIONS AND MAINTENANCE

3.3.1 Groundwater Recovery/Treatment System

Operation of the groundwater recovery/treatment systems will be checked daily via the automated SCADA system. The groundwater recovery/treatment systems will be physically inspected up to three days per week, and routine/necessary maintenance will be performed monthly. The SCADA system transmits alarms to system operators via email and text immediately upon detected equipment failures, upsets, and safety shutdowns. Upon receipt of alarms, CSXT and its subcontractors will promptly identify the issue(s) and coordinate necessary system repairs and maintenance activities.

Inspections and maintenance activities will be documented and recorded on inspection forms and maintenance record logs, provided in Appendix H. A copy of inspection and maintenance reports and a record of the date and type of repairs will be kept on file at the Waycross facility for a period of three years. The inspection data will be evaluated monthly to determine the effectiveness of the corrective action system, and copies of the inspection logs and summary of repairs/maintenance performed will be provided in the semiannual CAERs.

3.3.2 Groundwater Monitoring System

The ODSA and ASB groundwater monitoring systems will be inspected on a semiannual basis to identify conditions that could potentially affect the integrity of groundwater samples. The well inspection form provided in Appendix H will be used for the post-closure inspection and maintenance of the groundwater monitoring system. The groundwater monitoring system will be inspected for the following items:

- well casing broken, bent, or damaged;
- well cap locked;
- well casing clear of obstructions;
- concrete pads;
- well number legible; and
- other conditions of wells that would affect integrity.

Monitor wells will be routinely maintained by CSXT and subcontractor personnel, and will be kept locked except during sampling, inspection, maintenance, or repair activities. Necessary repair or maintenance work and repairs will be promptly scheduled and completed.

3.3.3 Final Cover and Site Control Measures

As part of post-closure care, inspections of the ODSA and ASB final cover and site control measures will be conducted monthly to identify and correct conditions that have the potential to release hazardous constituents or cause risk to human health and the environment. The form provided in the corrective action system operations and maintenance manual will be used for the post-closure inspection and maintenance of the final cover and site control measures. The following items will be inspected and maintained as needed:

- vegetative cover sufficient to minimize erosion;
- surface sloped properly to effectively drain surface water;
- integrity of the cap sufficient (holes, cracks, etc.);
- barrier present to effectively restrict access;
- benchmark visible to clearly mark the unit boundaries; and
- drainage collection system free of obstructions and functioning properly.

ODSA and ASB final cover and site control measures will be maintained by CSXT and subcontract personnel. Necessary repair or maintenance work and repairs will be promptly scheduled and completed.

3.4 POST-CLOSURE SCHEDULE

The corrective action program will continue until groundwater monitoring indicates that the GWCC concentrations no longer exceed the established BCLs. Once the GWCC have been reduced to the GWPS or established BCLs, the corrective action program will cease and monitoring will continue for three consecutive years to ensure that the GWCCs remain below the GWPS/BCLs. If, during the three-year period, statistical analysis of the GWCC data indicates an exceedance of the GWPS/BCLs, the corrective action program will be reinstated until concentrations have been reduced to the GWPS/BCLs, at which time, a new three-year monitoring program will begin to ensure that the GWCCs remain below the GWPS/BCLs. If the three-year period ends with no GWCCs having exceeded the GWPS/BCLs, a revised groundwater monitoring program will be proposed to the GAEPD in the form of a permit modification application.

A review of the ODSA and ASB groundwater recovery/treatment and monitoring systems effectiveness will be conducted on an annual basis to evaluate overall performance and areas of possible improvement. In the event CSXT identifies modifications to the systems that would affect achievement of the GWPS/BCLs and the overall Post-Closure schedule, CSXT will notify GAEPD to determine the need for a permit modification.

3.5 POST-CLOSURE COST ESTIMATE

Current estimated costs for the corrective action and groundwater monitoring programs at the ODSA and ASB HWMUs are included in Appendix D. The cost estimates are inclusive of the following:

- groundwater recovery system operations and maintenance;
- groundwater treatment system operations and maintenance;
- groundwater and surface water monitoring;
- groundwater monitoring system inspection and maintenance; and
- reporting.

In addition, Appendix D provides documentation on CSXT's financial assurance for post-closure care activities.

4 CORRECTIVE ACTION PROGRAM FOR SOLID WASTE MANAGEMENT UNITS

Based on SWMU process knowledge and soil, surface water, and groundwater quality data collected at the facility since 1986, the primary constituents of concern at the SWMUs are CVOCS and to a lesser extent metals and PAHs. The historic use of TCE in parts cleaning/degreasing processes has resulted in residual concentrations of TCE and its degradation products in SWMU soil and groundwater. Historic ALSA, LSA/OCVSP, and LPABS/OEH groundwater quality data are summarized in Tables 4-1, 4-2, and 4-3, respectively. Historic ORA-2/ORPA groundwater quality data are summarized with ASB data in Table 3.2. The corrective actions described in the following have resulted in reducing the overall mass and aerial extent and controlled the migration of chlorinated CVOCs in facility groundwater.

4.1 ACID-LIME SLUDGE AREA

4.1.1 Unit Description

The ALSA is a SWMU located northeast of the LSA at the facility. The unit consists of the Refined Oil Acid Pit (Acid Sludge Pit) and the Acetylene-Lime Sludge Pit. The ALSA layout and current monitoring and recovery well network are included on Figure 1-3 and in Appendix E, respectively. ALSA well construction details are summarized in Table 2-2.

4.1.2 Corrective Action Background

Several investigations indicated that the Refined Oil Acid Pit (Acid Sludge Pit) was a source of the TCE found in the groundwater downgradient of the ALSA. Consequently, the ALSA was identified as a SWMU in Section IV.A of the Hazardous Waste Facility Permit Number HW-049(D) issued to CSXT on September 28, 1987.

CSXT evaluated several options to remediate the Acid Sludge Pit, including biodegradation and in situ soil stabilization. CSXT concluded that the most effective method of removing the TCE source was to excavate and dispose of the impacted soil/sludge off site. Since previous investigations had concluded that the Acetylene Lime Sludge Pit does not contain hazardous constituents and does not impact groundwater, remedial activities were confined to the Acid Sludge Pit.

In June 1993, CSXT submitted the revised corrective measures implementation plan for the Acid Sludge Pit. After receiving GAEPD's approval of the work plan, corrective measures were initiated in November 1993. Approximately 1,900 tons of soil/sludge were excavated and removed from the site for disposal at a USEPA-approved hazardous waste landfill in Pinewood, South Carolina.

On January 7, 1994, GAEPD issued an amended Hazardous Waste Facility Permit Number HW-049(D) for the Waycross facility that incorporated a corrective action plan for remediating ALSA groundwater. In accordance with the amended permit, a groundwater corrective action program was implemented at the ALSA in April 1994. The groundwater corrective action program consisted of groundwater withdrawal wells WW-14, WW-15, WW-16, WW-17, and WW-18 and an air stripper treatment system. These withdrawal wells were pumped simultaneously to create overlapping cones of depression to contain and recover the ALSA GWCCs. Due to ineffectiveness and in accordance with the October 19, 2000 amended permit, the ALSA groundwater withdrawal system was shut down, equipment removed, and withdrawal wells WW-14, WW-15, WW-16, WW-17, and WW-18 were abandoned.

Subsequent groundwater monitoring at the ALSA showed increased levels of GWCCs in previously unaffected well MW-56 located east of the ALSA (see Figure 1-3). Subsequent assessment activity in 2002 and 2003 identified soil exhibiting elevated concentrations of GWCCs south and north of the 1993 excavation area, as well as residual concentrations in groundwater approximately 1,600 ft east of the ALSA. In 2003, CSXT submitted a Removal Action Plan and Monitoring Natural Attenuation CAP to the GAEPD to address residual GWCCs in ALSA soil and groundwater, respectively. In 2004, approximately 5,900 tons of soil and debris were removed from the Acid Sludge Pit and properly disposed at an offsite permitted facility. Soil sampling of the excavation sidewalls and floor confirmed that the remaining soil was below site specific soil screening levels (SSLs).

In June 2008, CSXT conducted a review of existing ALSA monitoring data from 2004 to 2007 to determine the effectiveness of natural attenuation of CVOCs as a viable remedial strategy to address CVOCs in ALSA groundwater. Although biodegradation of CVOCs were documented to be ongoing in ALSA groundwater with natural conditions being favorable for reductive dechlorination under anaerobic conditions, increasing CVOC concentrations in monitor wells MW-41 and MW-115 prompted further investigation and interim remedial actions to address residual CVOCs immediately downgradient of the SWMU. A remedial/treatability investigation and pilot in-situ chemical oxidation (ISCO) test were conducted in 2009-2010, followed by focused ISCO treatment conducted September through November of 2011. A total of approximately 50,750 gallons of persulfate reagent were injected into Zone III and V strata during the treatment. Significant reductions in CVOC concentrations were observed during and after the ISCO application, with an average 40% reduction of CVOC concentrations in the treatment area just east and downgradient of the SWMU.

Subsequent compliance monitoring indicated increases in detectable concentrations of CVOCs in downgradient monitor wells MW-56 and MW-121 (see Figure 1-3). As such, CSXT initiated a multi-phase remedial investigation at and downgradient of the ALSA waste unit to determine the lateral and vertical distribution of CVOCs and site-specific hydrogeologic features that may be influencing their distribution and migration. The investigation consisted of collecting lithologic data across the area via direct sensing technology and core analysis, collection/analysis of depth-discrete groundwater samples from the most permeable zones and installing shallow and deep monitor wells. The investigation identified the extent of TCE and degradation compounds in Zone III and V groundwater at and downgradient of the ALSA SWMU (see Figures 3-1 through 3-6). A focused remedial alternatives evaluation was performed to include a geotechnical investigation and bench scale testing of potential treatment alternatives.

On August 6, 2018, CSXT submitted Interim Measure Work Plan – Acid Lime Sludge Area SWMU for the installation/operation of a Zone V horizontal recovery well (HWW-5) and potential subsurface Zone III groundwater barrier/treatment structure. On September 7, 2018 GAEPD issued approval of the interim measures (IM). Horizontal recovery well HWW-5 and conveyance piping construction were performed March-April 2019, and well startup-testing began July 25, 2019, following completion of the replacement groundwater treatment facility.

4.1.3 Groundwater Corrective Action Program

The groundwater corrective action program at the ALSA is designed to control the migration and reduce the mass of GWCCs. The current groundwater recovery system at the ALSA consists of recovery well HWW-5. The total horizontal length of the well is approximately 1,020 ft with a vertical depth of approximately 45 ft bls. The well is constructed with 500 ft of 4-inch stainless steel pipe-based wire-wrap screen, with 6-inch stainless steel and 6-inch HDPE riser to land surface. Groundwater is recovered with a submersible recovery pump that operates on a continual basis. Well construction records are included in Appendix E.

Recovered groundwater from HWW-5 is pumped directly to the consolidated groundwater treatment system (see figure 1-3) via approximately 575 ft of 2-inch HDPE pipe. Recovered groundwater enters a common influent header of the treatment system, and then undergoes pH adjustment, initial aeration and clarification, filtered through multi-media filters, and transferred to a shallow tray low profile air stripper for final treatment.

Treated groundwater is discharged to the Shop Area Ditch under NPDES Permit No. GA0046680. CSXT maintains the as-built drawings and the corrective action system operations and maintenance manual on-site at all times. These documents describe the current groundwater corrective action system design details and operation and are updated as modifications are made to the system.

The groundwater recovery and treatment systems include a supervisory control and data acquisition (SCADA) system that has automated alarms, system shutdown, and emergency notification systems in the event of system upset and/or failure. The SCADA system is equipped with a telemetry system that allows remote system access, adjustment, and monitoring. These systems will be maintained and upgraded as necessary for the duration of the corrective action program.

The average volume of groundwater recovered from the ALSA is approximately 350,000 gallons per month, which represents an average continuous withdrawal of approximately 8 gpm. Measured groundwater elevations under pumping conditions indicate 5 to 9 ft drawdown observed over an area of approximately 1500 ft by 1000 ft. A defined cone of depression is maintained by the operation of the ASB recovery well HWW-5 (see Figure 2-5). Based on performance monitoring of HWW-5 to date, the recovery well does not appear to have hydraulic control of Zone III groundwater downgradient of the ALSA SWMU, and a subsurface Zone III groundwater barrier/treatment structure will likely be constructed in accordance with the GAEPD approved IM Workplan described in Section 4.1.2. The effectiveness of the groundwater corrective action program in controlling GWCC migration and reducing constituent concentrations is evaluated in each Corrective Action Effectiveness Report and adjustments made as necessary.

4.1.4 Corrective Action Effectiveness Monitoring Program

A corrective action effectiveness monitoring program was initiated at the ALSA in June 1994 and discontinued in February 2000. Additional assessment was conducted in April 2002, at which time the monitoring program resumed and continues to present. The current monitoring program is designed to determine the overall effectiveness and performance of groundwater corrective actions and provide early detection of off-site migration of GWCCs and will continue for the duration of the corrective action program.

The corrective action effectiveness monitoring program is comprised of the following elements:

- collection and analysis of groundwater from monitor wells and surface water samples;
- collection of groundwater from the groundwater recovery system;
- post-closure inspections and maintenance;
- data evaluation of GWCC concentration trends and discussion of same in CAERs;
- discussion of corrective action modifications made or recommended in CAERs; and
- submittal of semiannual CAERs.

If these monitoring methods indicate that the GWCCs are not being effectively controlled, the corrective action program will be modified as necessary to achieve the required control and prevent off-site migration of the GWCCs.

If the system modifications do not alter the basic objective of controlling the GWCCs to prevent off-site migration, a permit modification application is not anticipated; however, GAEPD will be notified in writing of planned modifications to make this determination. Significant system modifications will be incorporated into the comprehensive corrective action system operations and maintenance manual that is kept on site.

4.1.4.1 Groundwater Monitoring

The effectiveness of the groundwater corrective action program at the ALSA will be evaluated by monitoring water elevations of Zone III and Zone V groundwater on a semiannual basis during January-December and sampling for groundwater quality on an annual basis during July-December. Groundwater measurements will be conducted on a semiannual basis at ALSA monitor wells MW-6, MW-18, MW-18D, MW-19, MW-21, MW-21D, MW-22, MW-22D, MW-38, MW-39, MW-40, MW-41, MW-42, MW-49, MW-50, MW-51, MW-51D, MW-52, MW-56, MW-113, MW-114, MW-115, MW-116, MW-116D, MW-117, MW-118, MW-119, MW-120, MW-120D, MW-121, MW-121D, MW-122, MW-122D, MW-134S, MW-134D, MW-135, MW-135D, MW-136, MW-136D, MW-137, MW-137D, and MW-139D. Groundwater quality monitoring will be performed on an annual basis at ALSA monitor wells MW-6, MW-18, MW-18D, MW-21, MW-21D, MW-22, MW-22D, MW-40, MW-41, MW-49, MW-51D, MW-52, MW-56, MW-114, MW-115, MW-116, MW-116D, MW-117, MW-120D, MW-121,MW-122, MW-122D, MW-134D, MW-135, MW-135D, MW-136, MW-136D, MW-137, MW-137D, and MW-139D. A summary of ALSA groundwater monitoring is provided in Table 3-4.

In addition to groundwater monitor well sampling, a sample of the ALSA recovered groundwater influent will be collected on a semiannual basis to evaluate the effectiveness of the treatment system. This sample will be collected from the dedicated sample port of the ALSA recovery system influent, located inside the treatment building, and will be analyzed for the ALSA GWCCs listed in Table 3-4.

ALSA groundwater samples and ALSA recovered groundwater influent will be preserved, shipped, and analyzed in accordance with the procedures described in Section 6.0. Upon receipt of the laboratory analytical reports, the results from the groundwater monitoring will be evaluated and reported to the GAEPD in an annual Corrective Action Effectiveness Report.

The groundwater monitoring schedule is based on historic distributions of GWCCs, flow conditions of Zone III and Zone V groundwater, and current ALSA groundwater corrective actions. If changes in

GWCC concentrations suggest that the schedule needs to be revised, GAEPD will be notified to determine if a request for a permit modification is necessary.

4.1.4.2 Surface Water Monitoring

To further monitor the effectiveness of the groundwater corrective action program at the ALSA, one surface water sample (W-48) downgradient from the ALSA (see Figure 1-3) will be collected on a semiannual basis. The surface water samples will be preserved, shipped, and analyzed in accordance with the procedures described in Section 6.0. A summary of ALSA surface water monitoring is included in Table 3-4. Upon receipt of the laboratory analytical reports, the monitoring results will be evaluated and reported to the GAEPD in a semiannual Corrective Action Effectiveness Report.

4.2 LOCOMOTIVE SHOP AREA/OLD CLEANING VAT SLUDGE PITS

4.2.1 Unit Description

The LSA is a SWMU located northwest of the ASB and southwest of the ALSA. The Locomotive Shop building was used for the maintenance and repair of locomotives and is currently shutdown. The LSA shop once contained a parts-cleaning vat, approximately 8 ft. by 8 ft., in which TCE was used as a cleaning and degreasing agent. A portion of the vat was 5 to 6 ft. below grade. Before the parts-cleaning vat was removed, the vat may have leaked, or the contents may have been spilled resulting in a release. The use of the parts-cleaning vat is suspected of being a primary source for the TCE and related constituents found in downgradient groundwater.

As described in Section 1.4, the OCVSP is located downgradient of the LSA and the TCE and related compounds in shallow groundwater upgradient, at, and downgradient of the OCVSP SWMU are attributed to the upgradient LSA SWMU. As such, the groundwater recovery and monitoring systems for OCVSP are functionally included with those of the LSA.

The LSA/OCVSP layout and current monitoring and recovery well network are included on Figure 1-3 and in Appendix E, respectively. The well construction details for the LSA/OCVSP wells are summarized in Table 2-2.

4.2.2 Corrective Action Background

Following several phases of investigation, the GAEPD requested (12/17/91) that CSXT submit a groundwater corrective action plan for the LSA. In May 1992, CSXT submitted "Part B - Post-Closure Permit Modification Application, Waycross, Georgia Facility" that added the LSA SWMU and included a conceptual plan to remediate groundwater impacted by TCE and related constituents.

Subsequently on September 8, 1992, GAEPD requested CSXT define the lateral extent of impacted soil underlying the LSA so that source control measures could be evaluated. Three soil investigation phases were conducted to delineate the horizontal extent of impacted soil in the area of the former parts cleaning vat. The GAEPD also required CSXT to investigate surface water impact in the drainage ditch east of the Locomotive Shop and address it as part of the overall corrective action plan for the LSA.

Based on the soil, surface water, and groundwater investigations, CSXT submitted the November 1993 "Corrective Measures and Corrective Action Plans for the Locomotive Shop Area, Waycross, Georgia." This plan proposed field tests to better define the horizontal and vertical extent of impacted soil in the former parts cleaning vat area, determine if dense non-aqueous phase liquids (DNAPL) are present, define more specifically the soil lithology and characteristics, evaluate the feasibility of using a soil vapor extraction/groundwater withdrawal remediation system, and study the applicability of air sparging to remediate the GWCCs. The analytical results from these investigations indicated that the highest TCE concentration in the soil (LS-1 at 410 mg/kg) was directly beneath the former parts cleaning vat. TCE concentrations significantly diminished with radial distance from the former cleaning vat and extended in decreasing concentrations approximately 90 ft hydraulically downgradient from the former vat.

Due to the limited extent of soil impacts in the vicinity of the former vat, the shallow groundwater depth, and the unlikelihood that the unsaturated soil is acting as a significant source of further groundwater impact, the corrective action plan for the soil at the LSA involves using an aggressive groundwater withdrawal system immediately downgradient of the Locomotive Shop building.

A final permit modification application was submitted to GAEPD on August 14, 1995 that incorporated the final groundwater corrective action plan. On September 28, 1995, the GAEPD issued the amended Hazardous Waste Facility Permit Number HW-049(D) for the Waycross facility.

The permitted groundwater corrective action program was implemented at the LSA in September 1996 and consisted of 17 groundwater withdrawal wells (WW-19 through WW-35) and groundwater treatment via the shallow tray air stripper system. The withdrawal wells were designed to pump simultaneously to create overlapping cones of depression to contain and recover the LSA GWCCs. Upon final construction of ASB recovery well HWW-2 in 2002, recovery wells WW-33 and WW-34 were removed from the LSA groundwater corrective action program and abandoned.

Following performance review of the existing LSA recovery system, CSXT submitted Temporary Authorization Request - Groundwater Recovery and Monitoring System Upgrades for LSA, LPABS, and ODSA Waste Management Units on June 24, 2014 for the installation of new horizontal recovery well HWW-3 (located directly under OCVSP SWMU) and several additional monitoring wells along adjacent Waycross Canal. On November 14, 2014, GAEPD granted Temporary Authorization for the specified activities. Following completion/startup of HWW-3 and the installation of the additional monitoring wells, CSXT submitted Class II Permit Modification Request on May 5, 2015 for recovery and monitoring system modifications. Following review and public comment, on April 14, 2016 GAEPD issued a Class III permit modification the operation of HWW-3 and monitoring of new wells MW-130 and MW-131.

4.2.3 Groundwater Corrective Action Program

The groundwater corrective action program at the LSA/OCVSP is designed to control the migration and reduce the mass of GWCCs. The current groundwater recovery system at the LSA/OCVSP consists of operating Zone III horizontal recovery well HWW-3 and vertical recovery wells WW-19, WW-20, WW-21, WW-22, WW-23, WW-24, WW-25, WW-26, WW-28, WW-29, WW-30, WW-31, WW-32, and WW-35. Due to ineffectiveness and the lack of dissolved CVOCs in shallow groundwater in certain areas (see Figures 3-1, 3-2, and 3-3) recovery wells WW-24, WW-25, WW-27, and WW-35 will be abandoned in accordance with Georgia water Well Standards Act and applicable sections of EPA Region 4 SESDGUID-101-R1.The total horizontal length of the well (HWW-3) is approximately 960 ft with a vertical depth of approximately 28 ft bls. The well is constructed with 600 ft of 6-inch Fiberglass Reinforced Epoxy (FRE) pipe, with 6-inch FRE riser to land surface. Well construction records are included in Appendix E and summarized in Table 2-2. Groundwater is recovered from HWW-3 with a submersible recovery pump that operates on a continual basis. The vertical recovery wells are each constructed with 10 ft of 4-inch wire-wrap PVC screen, with 4-inch PVC riser to land surface, and completed to total depths of 25-30 ft bls. Well construction records are included in Appendix F and summarized in Table 2-2. Groundwater is recovered from the vertical recovery wells via dedicated pneumatic recovery pumps that operate on a continual basis.

Recovered groundwater from HWW-3 and the pneumatic wells is pumped directly to the consolidated groundwater treatment system (see figure 1-3) via 2-inch HDPE (HWW-3) and 2-inch polyvinyl chloride (PVC) pipe. Recovered groundwater enters a common influent header of the treatment system, and then undergoes pH adjustment, initial aeration and clarification, filtered through multi-media filters, and transferred to a shallow tray low profile air stripper for final treatment.

Treated groundwater is discharged to the Shop Area Ditch under NPDES Permit No. GA0046680. CSXT maintains the as-built drawings and the corrective action system operations and maintenance manual on-site at all times. These documents describe the current groundwater corrective action system design details and operation and are updated as modifications are made to the system.

The groundwater recovery and treatment systems include a supervisory control and data acquisition (SCADA) system that has automated alarms, system shutdown, and emergency notification systems in the event of system upset and/or failure. The SCADA system is equipped with a telemetry system that allows remote system access, adjustment, and monitoring. These systems will be maintained and upgraded as necessary for the duration of the corrective action program.

The average volume of groundwater recovered from the LSA pneumatic recovery wells and HWW-3 is approximately 432,000 gallons a month, which represents an average continuous withdrawal of approximately 10 gpm. The influence of groundwater recovery from horizontal well HWW-3, coupled with existing vertical recovery wells WW-30, WW-31, WW-32, and WW-33 adjacent Waycross Canal, has enhanced groundwater capture between the areas of hydraulic influence of HWW-1 and HHW-2, with observed drawdowns of approximately 4 ft. The drawdown resulting from groundwater recovery at HWW-3 and existing vertical recovery wells adjacent Waycross Canal, is observed over an area of approximately 900 ft. by 450 ft (see Figure 2-4). Groundwater recovery operations around the Heavy Shop via the pneumatic wells are observed to result in localized drawdowns of approximately 1-2 ft. The effectiveness of the groundwater corrective action program in controlling GWCC migration and reducing constituent concentrations is evaluated in each semiannual Corrective Action Effectiveness Report, and adjustments are made as necessary.

4.2.4 Corrective Action Effectiveness Monitoring Program

A corrective action effectiveness monitoring program was initiated at the LSA in December 1995 and continues to present. The monitoring program is designed to determine the overall effectiveness and performance of groundwater corrective actions and provide early detection of off-site migration of GWCCs and will continue for the duration of the corrective action program.

The corrective action effectiveness monitoring program is comprised of the following elements:

- collection and analysis of groundwater from monitor wells and surface water samples;
- collection of groundwater from the groundwater recovery system;
- post-closure inspections and maintenance;
- data evaluation of GWCC concentration trends and discussion of same in CAERs;
- discussion of corrective action modifications made or recommended in CAERs; and
- submittal of semiannual CAERs.

If these monitoring methods indicate that the GWCCs are not being effectively controlled, the corrective action program will be modified as necessary to achieve the required control and prevent off-site migration of the GWCCs.

4.2.4.1 Groundwater Monitoring

The effectiveness of the groundwater corrective action program at the LSA/OCVSP will be evaluated by monitoring water elevations of the upper surficial groundwater on a semiannual basis during January-December and sampling for groundwater quality on an annual basis during July-December. Groundwater elevation measurements will be conducted on a semiannual basis at LSA/OCVSP monitor wells MW-7, MW-26, MW-39, MW-44, MW-45, MW-53, MW-54, MW-55, MW-58, MW-59, MW-61, MW-62, MW-63, MW-64, MW-66, MW-68, MW-69, MW-70, MW-88, MW-104, MW-130, MW-131, and MW-138D. Groundwater quality monitoring will be performed on an annual basis at LSA/OCVSP monitor wells MW-7, MW-26, MW-44, MW-45, MW-54, MW-55, MW-59, MW-61, MW-62, MW-63, MW-64, MW-68, MW-69, MW-70, MW-88, MW-104, MW-130, MW-131, and MW-138D. A summary of LSA/OCVSP groundwater monitoring is provided in Table 3-4.

In addition to groundwater monitor well sampling, a sample of the LSA/OCVSP recovered groundwater influent will be collected on a semiannual basis to evaluate the effectiveness of the treatment system. This sample will be collected from the dedicated sample port of the LSA/OCVSP recovery system influent, located inside the treatment building, and will be analyzed for the LSA/OCVSP GWCCs listed in Table 3-4.

LSA/OCVSP groundwater monitoring and recovered groundwater influent will be preserved, shipped, and analyzed in accordance with the procedures described in Section 6.0. Upon receipt of the laboratory analytical reports, the results from the groundwater monitoring will be evaluated and reported to the GAEPD in an annual Corrective Action Effectiveness Report.

The groundwater monitoring program is based on historic distribution of GWCCs, flow conditions of the upper surficial groundwater, and current LSA/OCVSP groundwater corrective actions. If changes in GWCC concentrations suggest that the schedule needs to be revised, GAEPD will be notified to determine if a request for a permit modification is necessary.

4.2.4.2 Surface Water Monitoring

To further monitor the effectiveness of the groundwater corrective action program at the LSA/OCVSP, six surface water samples (W-6, W-10, W-12, W-15, W-25, and W-26) downgradient from the LSA/OCVSP will be collected on a semiannual basis during January-December (see Figure 1-3). The surface water samples collected will be preserved, shipped, and analyzed in accordance with the procedures described in Section 6.0. A summary of surface water monitoring is included in Table 3-4. Upon receipt of the laboratory analytical reports, the monitoring results will be evaluated and reported to the GAEPD in a semiannual Corrective Action Effectiveness Report.

4.3 LOCOMOTIVE PAINT AND AIR BRAKE SHOP/OLD ENGINE HOUSE

4.3.1 Unit Description

The LPABS is a SWMU located southwest of the LSA and north of the OEH at the facility. The LPABS building is approximately 330 ft long by 165 ft wide with a northwest to southeast orientation. The old Air Brake Shop was located in the southern portion of the LPABS building, and the operation was terminated in the 1960s. The area is currently occupied by General Electric Corporation and is used for customer inventory.

As described in Section 1.4, the OEH is located approximately 100 ft south-southwest and downgradient of the LPABS and was used for painting freight cars and minor locomotive repairs. Although TCE may have been used for parts cleaning and degreasing at the OEH, TCE and related compounds in shallow groundwater upgradient, at, and downgradient of the OEH SWMU are primarily attributed to the upgradient LPABS SWMU. As such, the groundwater recovery and monitoring systems for OEH are functionally included with those of the LPABS.

The LPABS/OEH layout and current monitoring and recovery well network are included on Figure 1-3 and in Appendix E, respectively. The well construction details for the LPABS/OEH wells are summarized in Table 2-2.

4.3.2 Corrective Action Background

In 1986, an assessment was conducted and documented a potential hazardous waste release. Further investigations revealed a patched concrete floor area, approximately five ft by five ft, near the southeast end of the LPABS building where a parts cleaning vat was formerly located in which TCE was used as a cleaning and degreasing agent during former Air Brake Shop operations.

In accordance with the GAEPD’s October 19, 1998 letter, a RFI was initiated at the LPABS. The findings of the initial RFI indicated that the groundwater migrates from the vicinity of the LPABS building toward the Waycross Canal with a downward vertical component that has resulted in TCE and associated constituents to depths of approximately 75 ft bls.

In response to the GAEPD’s December 16, 1999 comments on the permit modification application, CSXT submitted a revised permit modification application and “Groundwater and Surface Water Hydraulic Interaction Report and Pilot Test Work Plan” on February 28, 2000. On May 2, 2000, the GAEPD approved the permit modification application to modify the existing groundwater corrective actions and to add a hydraulic barrier system along a portion of the southern property boundary adjacent to the Waycross Canal. On October 19, 2000, the amended permit became effective.

In accordance with the October 19, 2000 amended permit, horizontal well HWW-1 was constructed downgradient of the LPABS in December 2001 (see Figure 1-3). The system has operated continuously since start-up in 2001 and controls GWCC migration, reduces GWCC concentrations, operates with minimal operator attention and maintenance, and is intrinsically safe.

The multi-phase RFI and HHRA/ERA of the LPABS/OEH SWMUs were completed and approved by GAEPD on March 28, 2014 and February 18, 2016, respectively. Additional source area investigation of the was performed December 2018 – January 2019 to further refine the distribution of CVOCs at and downgradient of the LPABS/OEH SWMUs. Since groundwater recovery began with HWW-1, LPABS/OEH groundwater data from these investigations and compliance monitoring indicate one-three orders of magnitude reductions in CVOCs in Zones I, III, and V groundwater between LPABS/OEH SWMUs and HWW-1. In addition, reported CVOCs in monitoring wells MW-9 through MW-12, located downgradient of recovery well HWW-1, showed rapid declines in CVOC concentrations following start-up of HWW-1, and reported CVOC concentrations have been at or below detection for at least 5 years. Based on these data, it appears that groundwater impacts at and downgradient of the LPABS/OEH SWMUs are limited to surficial groundwater, above the low permeability clays of the Hawthorn Formation, and the operation of HWW-1 is precluding offsite migration of CVOCs.

4.3.3 Groundwater Corrective Action Program

The groundwater corrective action program at the LPABS/OEH is designed to control the migration and reduce the mass of GWCCs in Zones I, III, and V groundwater. The current groundwater recovery system at the LPABS consists of horizontal well HWW-1. The total horizontal length of the well (HWW-1) is approximately 988 ft with a vertical depth of approximately 38 ft bls. The well is constructed with 462 ft of 4-inch stainless steel pipe-based wire wound screen, with 6-inch stainless steel riser pipe to land surface on both ends of the screen. Well construction records are included in Appendix E and summarized in Table 2-2. Groundwater is recovered from HWW-1 with a submersible recovery pump that operates on a continual basis.

Recovered groundwater from HWW-1 is pumped directly to the consolidated groundwater treatment system (see figure 1-3) via approximately 1,400 ft of 4-inch HDPE pipe. Recovered groundwater enters a common influent header of the treatment system, and then undergoes pH adjustment, initial aeration and clarification, filtered through multi-media filters, and transferred to a shallow tray low profile air stripper for final treatment.

Treated groundwater is discharged to the Shop Area Ditch under NPDES Permit No. GA0046680. CSXT maintains the as-built drawings and the corrective action system operations and maintenance manual on-site at all times. These documents describe the current groundwater corrective action system design details and operation and are updated as modifications are made to the system.

The groundwater recovery and treatment systems include a supervisory control and data acquisition (SCADA) system that has automated alarms, system shutdown, and emergency notification systems in the event of system upset and/or failure. The SCADA system is equipped with a telemetry system that allows remote system access, adjustment, and monitoring. These systems will be maintained and upgraded as necessary for the duration of the corrective action program.

The average volume of groundwater recovered from the LPABS/OEH is approximately 1,300,000 gallons per month, which represents an average continuous withdrawal of approximately 30 gpm. Measured groundwater elevations under pumping conditions indicate drawdowns ranging approximately 7 to 9 ft drawdown observed over an area of approximately 1,000 ft by 700 ft. A defined cone of depression is maintained by the operation of the LPABS recovery well HWW-1 (see Figures 2-4 and 2-5). The effectiveness of the groundwater corrective action program in controlling GWCC migration and reducing constituent concentrations is evaluated in each semiannual Corrective Action Effectiveness Report, and adjustments are made as necessary.

4.3.4 Corrective Action Effectiveness Monitoring Program

A corrective action effectiveness monitoring program was initiated at the LPABS/OEH in 2000 and continues to present. The current monitoring program is designed to determine the overall effectiveness and performance of groundwater corrective actions and provide early detection of off-site migration of GWCCs and will continue for the duration of the corrective action program.

The corrective action effectiveness monitoring program is comprised of the following elements:

- collection and analysis of groundwater from monitor wells and surface water samples;
- collection and analysis of groundwater from the groundwater recovery system;
- post-closure inspections and maintenance;
- data evaluation of GWCC concentration trends and discussion of same in CAERs;
- discussion of corrective action modifications made or recommended in CAERs; and
- submittal of semiannual CAERs.

If these monitoring methods indicate that the GWCCs are not being effectively controlled, the corrective action program will be modified as necessary to achieve the required control and prevent off-site migration of the GWCCs.

4.3.4.1 Groundwater Monitoring

The effectiveness of the groundwater corrective action program at the LPABS/OEH will be evaluated by monitoring water elevations of the Zone III and Zone V I groundwater on a semiannual basis during January-December and sampling for groundwater quality on an annual basis during January-June. Groundwater measurements will be conducted on a semiannual basis at the LPABS monitor wells MW-89, MW-90, MW-92, MW-93, MW-94(26-36), MW-95, MW-96(48-58), MW-97, MW-98, MW-99 (18-28), MW-99 (40-50), MW-100, MW-101, MW-102, MW-103, MW-105(12-22), MW-105 (22-32), MW-107(48-58), MW-107 (70-80), MW-108(10-20), MW-108(35-45), MW-108(46-56), MW-108(70-75), MW-109, MW-110, MW-111(10-20), MW-111(30-50), MW-111(70-80), MW-112(10-20), MW-112(30-50), MW-112(70-80), and MW-132. Groundwater quality monitoring will be performed on an annual basis at LPABS monitor wells MW-90, MW-92, MW-93, MW-94(26-36), MW-95, MW-96(48-58), MW-97, MW-98, MW-99(40-50), MW-102, MW-105(12-22), MW-105(22-32), MW-107(48-58), MW-107(70-80), MW-108(35-45), MW-108(46-56), MW-108(70-75), MW-110, MW-111(30-50), MW-111(70-80), MW-112(30-50), MW-112(70-80), and MW-132. Groundwater quality monitoring of monitoring well MW-109 will be performed on a biennial basis. A summary of LPABS/OEH groundwater monitoring is provided in Table 3-4.

In addition to groundwater monitor well sampling, a sample of the LPABS/OEH recovered groundwater influent will be collected on a semiannual basis to evaluate the effectiveness of the treatment system. This sample will be collected from the dedicated sample port of the LPABS/OEH recovery system influent, located inside the treatment building, and will be analyzed for the LPABS/OEH GWCCs listed in Table 3-4.

LPABS groundwater samples and LPABS recovered groundwater influent samples will be preserved, shipped, and analyzed in accordance with the procedures described in Section 6.0. Upon receipt of the laboratory analytical reports, the results from the groundwater monitoring will be evaluated and reported to the GAEPD in a semiannual Corrective Action Effectiveness Report.

The groundwater monitoring program is based on historic distributions of GWCCs, flow conditions of Zone III and Zone V groundwater, and current LPABS groundwater corrective actions. If changes in GWCC concentrations suggest that the schedule needs to be revised, GAEPD will be notified to determine if a request for a permit modification is necessary.

4.3.4.2 Surface Water Monitoring

To further monitor the effectiveness of the groundwater corrective action program at the LPABS/OEH, two surface water samples (W-33 and W-36) downgradient from the LPABS/OEH (see Figure 1-3) will be collected on a semiannual basis during January-December. The surface water samples will be preserved, shipped, and analyzed in accordance with the procedures described in Section 6.0. A summary of surface water monitoring is included in Table 3-4. Upon receipt of the laboratory analytical reports, the monitoring results will be evaluated and reported to the GAEPD in a semiannual Corrective Action Effectiveness Report.

4.4 OLD REFUSE AREA 2/OLD RUNOFF POND AREA

4.4.1 Unit Description

The ORA-2 is an approximate 6-acre undeveloped area that was used before February 1985 to dispose of concrete debris and other solid waste material from the Waycross facility. Located just south and adjacent to the ORA-2 is the ORPA that is an approximate 4-acre undeveloped area. Prior to 1960, oily wastewater from maintenance operations reportedly flowed to a separation basin and wastewater runoff pond in the ORPA. Remains of the separation basin are still present in the southeast corner of the ORPA SWMU. The ORA-2/ORPA layout and current monitoring and recovery well network are included on Figure 1-3 and in Appendix E, respectively. The well construction details for the ORA-2/ORPA wells are summarized in Table 2-2.

4.4.2 Corrective Action Background

As described in Section 3.2.2, horizontal recovery well HWW-2 was constructed at and east of the ASB (see Figure 1-3) and began operation in June 2002. A portion of the well screen of HWW-2 underlies ORA-2/ORPA SWMU and effectively recovers impacted groundwater from the SWMU.

The multi-phase RFI and HHRA/ERA of the ORA-2/ORPA SWMU were completed and approved by GAEPD on March 28, 2014 and February 18, 2016, respectively. Additional source area investigation of the was performed December 2018-January 2019 to further refine the distribution of CVOCs at the ORA-2/ORPA SWMU. Based on data from these investigations and compliance monitoring associated with the adjacent ASB HWMU, TCE and related compounds and chromium are the most prevalent organic and inorganic compounds detected in shallow groundwater at and downgradient of the ORA-2/ORPA SWMU. Notable dissolved CVOCs in ORA-2/ORPA Zone I and III groundwater are observed in monitoring wells MW-86 and MW-87, located on the west side of the SWMU, and concentrations have decreased an order of magnitude since groundwater recovery began via HWW-2.

4.4.3 Groundwater Corrective Action Program

The groundwater corrective action program at the ORA-2/ORPA is the same as that described for ASB in Section 3.2.3. Existing recovery well HWW-2 is designed to control the migration and reduce the mass of GWCCs and is effectively recovery and containing CVOC mass in ORA-2/ORPA groundwater (see Figure 2-4).

4.4.4 Corrective Action Effectiveness Monitoring Program

A corrective action effectiveness monitoring program was initiated at the ASB in in June 1987, and those components of the ASB monitoring program that are physically located within and downgradient of the operational footprint of the ORA-2/ORPA will transferred to the ORA-2/ORPA. The current monitoring program is designed to determine the overall effectiveness and performance of groundwater corrective actions and provide early detection of off-site migration of GWCCs and will continue for the duration of the corrective action program.

The corrective action effectiveness monitoring program is comprised of the following elements:

- collection and analysis of groundwater from monitor wells and surface water samples;
- post-closure inspections and maintenance;
- data evaluation of GWCC concentration trends and discussion of same in CAERs;
- discussion of corrective action modifications made or recommended in CAERs; and
- submittal of semiannual CAERs.

If these monitoring methods indicate that the GWCCs are not being effectively controlled, the corrective action program will be modified as necessary to achieve the required control and prevent off-site migration of the GWCCs.

4.4.4.1 Groundwater Monitoring

The effectiveness of the groundwater corrective action program at the ORA-2/ORPA will be evaluated by monitoring water elevations of Zone III and Zone V groundwater on a semiannual basis during January-December and sampling for groundwater quality on an annual basis during July-December. Groundwater elevation gauging will be conducted on a semiannual basis at ORA-2/ORPA monitor wells MW-9 (2-12), MW-9 (17-27), MW-80, MW-81(13-23), MW-81(37-47), MW-82, MW-83, MW-83 (47-57), MW-85, MW-86, MW-87(13-23), MW-125 (13-18), and MW-125(20-25). Groundwater quality monitoring will be performed on an annual basis at ORA-2/ORPA monitor wells , MW-80, MW-81(13-23), MW-81(37-47), MW-83(13-23), MW-83(47-57), MW-86, and MW-87(13-23). Groundwater quality monitoring of monitoring wells MW-9 (2-12), MW-9 (17-27) will be performed on a biennial basis. A summary of ORA-2/ORPA groundwater monitoring is provided in Table 3-4.

ORA-2/ORPA groundwater samples will be preserved, shipped, and analyzed in accordance with the procedures described in Section 6.0. Upon receipt of the laboratory analytical reports, the results from the groundwater monitoring will be evaluated and reported to the GAEPD in a semiannual Corrective Action Effectiveness Report.

The groundwater monitoring program is based on historic distributions of GWCCs, flow conditions of Zone III and Zone V groundwater, and current ORA-2/ORPA groundwater corrective actions. If changes in GWCC concentrations suggest that the schedule needs to be revised, GAEPD will be notified to determine if a request for a permit modification is necessary.

4.4.4.2 Surface Water Monitoring

To further monitor the effectiveness of the groundwater corrective action program at the ORA-2/ORPA, two surface water samples (CW-3 and W-45) downgradient from the ORA-2/ORPA (see Figure 1-3) will be collected on a semiannual basis during January-December. The surface water samples will be preserved, shipped, and analyzed in accordance with the procedures described in Section 6.0. A summary of surface water monitoring is included in Table 3-4. Upon receipt of the laboratory analytical reports, the monitoring results will be evaluated and reported to the GAEPD in a semiannual Corrective Action Effectiveness Report.

4.5 POST-CLOSURE INSPECTIONS AND MAINTENANCE

4.5.1 Groundwater Recover/Treatment System

Operation of the groundwater recovery/treatment systems will be checked daily via the automated SCADA system. The groundwater recovery/treatment systems will be physically inspected up to three days per week, and routine/necessary maintenance will be performed monthly. The SCADA system transmits alarms to system operators via email and text immediately upon detected equipment failures, upsets, and safety shutdowns. Upon receipt of alarms, CSXT and its subcontractors will promptly identify the issue(s) and coordinate necessary system repairs and maintenance activities.

Inspection and maintenance activities will be documented and recorded on inspection forms and maintenance record logs, provided in Appendix H. A copy of inspection and maintenance reports and a record of the date and type of repairs will be kept on file at the Waycross facility for a period of three years. The inspection data will be evaluated monthly to determine the effectiveness of the corrective action system, and copies of the inspection logs and summary of repairs/maintenance performed will be provided in the semiannual CAERs.

4.5.2 Groundwater Monitoring System

The ALSA, LSA/OCVSP, LPABS/OEH, and ORA-2/ORPA groundwater monitoring systems will be inspected on a semiannual basis to identify conditions that could potentially affect the integrity of groundwater samples. The well inspection form provided in Appendix H will be used for the post-closure inspection and maintenance of the groundwater monitoring system. The groundwater monitoring system will be inspected for the following items:

- well casing broken, bent, or damaged;
- well cap locked;
- well casing clear of obstructions;
- concrete pads;
- well number legible; and
- other conditions of wells that would affect integrity.

Monitor wells will be routinely maintained by CSXT and subcontractor personnel, and will be kept locked except during sampling, inspection, maintenance, or repair activities. Necessary repair or maintenance work and repairs will be promptly scheduled and completed.

4.6 POST-CLOSURE SCHEDULE

The corrective action program will continue until groundwater monitoring indicates that the GWCC concentrations no longer exceed GWPS/BCLs or alternate risk-based clean-up goals. Once the GWCC have been reduced to the established clean-up goals, the corrective action program will cease, and monitoring will continue for three consecutive years to ensure that the GWCCs remain below the clean-up goals. If, during the three-year period, statistical analysis of the GWCC data indicates an exceedance of the clean-up goals, the corrective action program will be reinstated until concentrations have been reduced to the clean-up goals, at which time, a new three-year monitoring program will begin to ensure that the GWCCs remain below the clean-up goals. If the three-year period ends with no GWCCs having exceeded the clean-up goals, a revised groundwater monitoring program will be proposed to the GAEPD in the form of a permit modification application.

A review of the groundwater recovery/treatment and monitoring systems effectiveness will be conducted on a semiannual basis to evaluate overall performance and areas of possible improvement. In the event CSXT identifies modifications to the systems that would affect achievement of the clean-up goals and the overall Post-Closure schedule, CSXT will notify GAEPD to determine the need for a permit modification.

4.7 POST-CLOSURE COST ESTIMATE

The current estimated costs for the corrective action and groundwater monitoring programs at the ALSA, LSA/OCVSP, LPABS/OEH, and ORA-2/ORPA are included in Appendix D. The cost estimates inclusive of the following:

- groundwater recovery system operations and maintenance.
- groundwater treatment system operations and maintenance.
- groundwater and surface water monitoring.
- groundwater monitoring system inspection and maintenance; and
- reporting.

In addition, Appendix D provides documentation on CSXT's financial assurance for post-closure care activities.

5 SWMUS REQUIRING NO FURTHER ACTION

The Alum Sludge Pond (ASP), located adjacent to the ASB (see Figure 1-3), consisted of a pond enclosed in an earthen dike measuring approximately 200 ft long by 250 ft wide by 2 ft deep. The ASP was designed to receive water from the ASB via three pipes. The final elevation of the interconnecting pipes was such that they would only drain surface rainwater from the top of the basin. Water received in the pond was removed via evaporation. The pond was used through January 1985 when it was removed from service. Due to its proximity to the ASB, The ASP was listed as a SWMU requiring no further action at this time in Post-Closure Care Facility Permit HW-049(D) Amendment (5/7/03).

The Caustic Cleaning Vat Sludge Pile, located approximately 350 ft northwest of the ASB (see Figure 1-3), was a small area used to dispose of sludge generated from parts cleaning vats. The 1986 Waste Identification Survey reported no soil impacts and recommended no further assessment of soil quality. The Caustic Cleaning Vat Sludge Pile was eliminated from the 1997 permit renewal application and the facility permit HW-049(D) reissued to CSXT on September 30, 1997.

Pollution Pond Numbers 1 and 2 are located immediately southeast of the LSA (see Figure 1-3). Both ponds were constructed as settling basins to receive oily wastewater from the Shop Area and were part of the Wastewater Treatment Plant 1 & 2 system. Residues were removed from both Ponds during 1996 and placed in the Temporary Sludge Stabilization Area, located within a bermed area northeast of Pond 2 (see Figure 1-3). The Ponds were subsequently lined and were listed as SWMUs requiring No Further Action in the 2003 Post-Closure Care Facility Permit HW-049(D) Amendment. Both Ponds currently receive stormwater runoff from the Shop area and discharge to Pollution Pond 3, located just south towards Waycross Canal.

Residues from a third Pollution Pond (No. 5), located north of the engine repair and diesel service shops (see Figure 1-1), were also placed in the Temporary Sludge Stabilization Area in early 1997. Pond No 5 was an approximate 2-acre surface impoundment that received effluent from two oil/water separators and a wastewater lift station located north of the engine repair shop. Pollution Pond No 5 was subsequently lined and was listed as a SWMU requiring No Further Action in the 2003 Post-Closure Care Facility Permit HW-049(D) Amendment. Pollution Pond 5 currently receives stormwater runoff from the diesel service center following oil/water separation.

The residues placed in the Temporary Sludge Stabilization Area in 1996-1997 were dewatered/stabilized and manifested as non-hazardous waste to an offsite thermal treatment facility. Following residue removal, the underlying soils were excavated, confirmed clean, and the Temporary Sludge Stabilization Area was listed as a SWMU requiring No Further Action in the 2003 Post-Closure Care Facility Permit HW-049(D) Amendment.

The Loop Track Area is located in the southwest end of the Classification Yard (see Figure 1-1). The 1986 Waste Identification Survey reported no soil impacts and recommended no further assessment of soil quality. The Loop Track Area was eliminated from the 1997 permit renewal application and the facility permit HW-049(D) reissued to CSXT on September 30, 1997.

Car Cleaning Drainage Ditch, located approximately 1800 ft southwest of the ODSA (see Figure 1-1), was a surface water ditch that received wastewater from car cleaning operations. The 1986 Waste Identification Survey reported no soil impacts and recommended no further assessment of soil quality. The Car Cleaning Drainage Ditch was eliminated from the 1997 permit renewal application and the facility permit HW-049(D) reissued to CSXT on September 30, 1997.

The Old Refuge Area No 1 was an approximate 150ft x 400ft open area, situated between the Old Cleaning Vat Sludge Pits and the Waycross Canal (see Figure 1-3), that presumably received various forms of non-hazardous solid wastes. No waste disposal records exist for the area; however, the 1986 Waste Identification Survey reported no soil impacts and recommended no further assessment of soil quality. The Old Refuge Area No 1 was eliminated from the 1997 permit renewal application and the facility permit HW-049(D) reissued to CSXT on September 30, 1997.

The Wastewater Treatment Plant Grit Sludge Area was an approximate 400ft x 400ft open area, situated just north of the ORA-2/ORPA (see Figure 1-3), that received residual sludge from the facility wastewater treatment plants. No waste disposal records exist for the area; however, the 1986 Waste Identification Survey reported no soil impacts and recommended no further assessment of soil quality. The Wastewater Treatment Plan Grit Sludge Area was reportedly clean closed and reclassified as a SWMU requiring no further action in 1989.

A list of waste management units with reported classification and status is included as Table 1-1. The location of the waste management units are provided in Figures 1-1 and 1-3.

6 AREAS OF CONCERN REQUIRING VERIFICATION INVESTIGATION

During the annual 2009 RCRA compliance inspection in March 2009, CSXT environmental and GAEPD personnel inspected a portion of the CSXT property bordering the Waycross Recycling Company (see Steel Processors Property on Figure 1-3) where contract personnel were decommissioning locomotives for salvage. During the inspection, CSXT and GAEPD personnel noted the presence of used batteries, domestic trash, a 55-gallon drum of waste oil, an aerosol-can puncturing device, a flammable storage cabinet, and a pallet of oil and water-based paints.

Upon observation of the housekeeping and waste management practices observed in the locomotive decommissioning area, CSXT immediately identified the responsible party and expedited measures to address the housekeeping concerns. All wastes were removed from the area and transported to the Atkinson County SWMA for proper disposal, and CSXT property was returned to previous conditions by March 17, 2009.

GAEPD designated the area as the Locomotive Breakdown Pad Area (LBPA) of Concern (AOC) in Hazardous Waste Facility Permit HW-049(D) and requested CSXT implement a Verification Investigation (VI) Work Plan for the area in accordance with Permit Conditions IV.D.3. The initial VI documented low concentrations of polycycle aromatic hydrocarbons (PAHs) and several metals, indicative of the observed coal/cinder and treated wood debris in the surface soils samples. GAEPD requested the collection of additional surface and subsurface soil samples and CSXT reported the results in Verification Investigation

Addendum – LBPA (CSXT 8/17/18). Although reported PAH and metal concentrations in all but two samples were below GAEPD Hazardous Site Response Act (HSRA) notification concentrations, GAEPD requested that reported constituent concentrations be evaluated using similar risk screening methodology as utilized in the GAEPD approved HHRA/ERA.

Risk screening of the soil data from the VI indicates that under current site conditions, the potential risks to on-site receptors, including the outdoor worker, construction worker, and adolescent trespasser, are within the USEPA risk management range and the hazards are less than the target of 1. The potential risk of a hypothetical future resident is within the USEPA risk management range, and the noncancer HI equals the target HI of 1. Based on these findings, further evaluation of potential human exposure to LBPA soils is not required and no corrective actions are necessary. In addition, The LBPA was evaluated for potential ecological risk, and the assessment indicates there is adequate information to conclude that any ecological risks are negligible and further ecological assessment of the LBPA is not warranted. The risk screening summary and results were submitted in the *Human Health and Screening Level Ecological Risk Assessment - Locomotive Breakdown Pad Area of Concern* (CSXT, January 2020).

7 GROUNDWATER AND SURFACE WATER SAMPLING, QA/QC PROGRAM, DATA ANALYSES, AND ANNUAL REPORTING

Groundwater elevation, surface water quality, and recovered groundwater influent quality monitoring will be conducted during the second and fourth quarters of each year. Groundwater quality monitoring of the HWMUs and SWMUs will be conducted on an annual basis with ODSA and LPABS/OEH being sampled during second quarter and ASB, ALSA, LSA/OCVSP, and ORA-2/ORPA being sampled during the fourth quarter. Groundwater and surface monitoring will be conducted in accordance with USEPA Field Branches Quality System and Technical Procedures. Groundwater/Surface water sampling procedures are identified as Groundwater Sampling No. SESDPR OC-301-R4 (April 26, 2017 and future updates) and Surface Water Sampling No. SESDPR OC-201-R3 (December 16, 2016 and future updates). Departures from the protocols described in the referenced methods will be discussed in the respective CAERs) and are described below.

7.1 SAMPLING PROCEDURES

7.1.1 Groundwater Sampling Procedures

Procedures will be employed to ensure that representative groundwater samples are collected and include the following:

1. Low flow sampling procedures will be utilized; water level measurements will be measured during low flow sampling; and field parameters will be measured.
2. Groundwater samples will be free of suspended solids to the extent practical by attempting to collect groundwater with less than 10 nephelometric turbidity units (NTUs).

3. Contamination from external sources (bailers, other sampling devices, the atmosphere, sample containers, or other sources) will be avoided.
4. Groundwater samples will be collected and containerized in the order of the volatilization potential of the parameters (i.e., samples to be analyzed for the most volatile parameters will be collected and containerized first).
5. Groundwater samples will be collected from monitor wells in order of lowest anticipated GWCC concentrations to highest anticipated GWCC concentrations.

7.1.1.1 Water Level Measurements

Before purging or sampling a well, the static water level in the well will be measured to the nearest 0.01 foot and recorded, using an electric water level indicator. Water levels will be measured from the top of the well casing. In addition, the total depth of each well will be measured annually to the nearest 0.01 foot.

7.1.1.2 Well Purging

After the water level is measured, the end of the tubing or submersible pump will be lowered to the mid-section of the well screen. Field readings will be collected every 10 to 15 minutes until three consecutive readings have been recorded. During field readings, water level measurements will be measured to ensure the water level remains stable. Purged groundwater from the monitor wells will be containerized and disposed of using the on-site treatment system.

Field pH, temperature, turbidity, and specific conductance will be measured during purging until three consecutive readings have been recorded. Stabilization of pH will be within 0.1 units, specific conductance will be 5%, and turbidity shall be 10 NTU or lower until field indicator parameters have stabilized in accordance with USEPA Field Branches Quality System and Technical Procedures Region IV, Athens, Georgia. If the well is purged dry, the well will be sampled following recovery. When purging is complete, final pH, temperature, turbidity, and specific conductance will be measured. Field measurements and observations collected during the purge will be recorded on the Groundwater Sampling Form.

Equipment used for field measurements (pH, temperature, turbidity, and specific conductance meter) will be calibrated before field use and recalibrated in the field as necessary. In addition, a post-calibration verification will be performed at the end of the day. Calibration and verification data will be recorded on the Field Instrument Calibration Form (Appendix I). Copies of the completed Field Instrument Calibration Forms will be maintained at the facility with the Groundwater Sampling Data Sheets in each semiannual Corrective Action Effectiveness Report.

7.1.1.3 Sample Collection

The well may be sampled using either a bailer or peristaltic pump/tubing. Bailers are commonly used for purging when other equipment is not available or has failed as described in Groundwater Sampling No. SESDPROC-301-R4, Section 3.7.3. If a bailer is used, new monofilament line will be attached to a disposable Teflon® lined bailer and gently immersed in the top of the water column until just filled. The bailer will then be carefully removed, and the contents emptied into the appropriate sample containers. If a peristaltic pump/tubing is used, the tubing will be momentarily attached to the peristaltic pump to fill the tube with groundwater water. The Teflon® tubing will then be removed from the well and the groundwater will be allowed to either gravity drain or be reversed, by the pump, into the sample vials.

The sample aliquot collection sequence will be metals first, followed by semi-volatiles, other Appendix IX analytes, and VOCs. To minimize volatilization of organic constituents, no headspace or air bubbles will be allowed in the volatile organic analysis (VOA) sample containers (40-milliliter glass vials).

7.1.2 Surface Water Sampling Procedures

The following procedures will be used to ensure that representative surface water samples are collected.

1. The samples will be free of suspended solids to the extent practical and the sampler will avoid wading into the surface water to minimize turbulence.
2. If it is necessary to wade into the surface water for sample collection, the sampler will stand downstream of the sample collection point and will don new non-powdered latex or nitrile gloves just prior to sample collection.
3. Samples will be collected from the farthest downstream location proceeding in the upstream direction.
4. A grab sample will be collected at mid-depth near the center of the channel.
5. Whenever possible, samples will be collected directly into the sample container which will be oriented with the open end pointed upstream.
6. Cross-contamination from external sources (sampling devices, sample containers, the atmosphere, or other sources) will be avoided.
7. Field parameters will be measured at each location upon completion of surface water sample collection.
8. If surface water samples cannot be collected directly into the sample container, a peristaltic pump with new tubing will be utilized as described in Surface Water Sampling No. SESDPROC-201-R4 (December 16, 2016 and future updates).

Equipment used for field measurements (pH, temperature, turbidity, and specific conductance meter) will be calibrated before field use and recalibrated in the field as necessary. In addition, a post-calibration verification will be performed at the end of the day. Calibration and verification data will be recorded on the Field Instrument Calibration Form (Appendix I). Copies of the completed Field Instrument Calibration Forms will be maintained at the facility with the Groundwater Sampling Data Sheets in each semiannual Corrective Action Effectiveness Report.

7.2 DECONTAMINATION AND STANDARD FIELD CLEANING PROCEDURES

To prevent cross-contamination, new nitrile gloves will be worn by sampling personnel during well gauging/groundwater elevation measurements, purging and sampling of groundwater monitor wells, and sampling of surface water. In addition, new disposable Teflon® lined well bailers, if used, and new monofilament line will be used during groundwater sample collection.

The general decontamination procedure may include the use of laboratory detergent solution wash, de-ionized water rinse, pesticide-grade isopropanol, and de-ionized water rinse. The methods and procedures used for cleaning of sampling and field equipment will be in accordance with Appendix B of USEPA Field Branches Quality System and Technical Procedures and Field Equipment Cleaning and Decontamination No. SESDPROC-205-R3 (December 18, 2015 and future updates).

7.3 SAMPLE IDENTIFICATION

Each sample will be labeled to include the unique sample number keyed to the sampling log, sampler's name, sample location, date and time of sample collection, volume of sample, and type of preservative used. Data will be written on the label using a waterproof marker.

7.4 SAMPLE PRESERVATION METHOD

Sample preservation methods are intended to prevent volatilization, retard biological action, retard hydrolysis, and reduce sorption effects. These methods include pH control, chemical addition, refrigeration, and freezing.

To prevent volatilization and retard biological action, samples will be stored on ice and maintained at a maximum temperature of 4 degrees Celsius. The sample preservatives and holding times for the various parameters are summarized in Tables 7-1 and 7-2.

7.5 SAMPLE HANDLING

Thermally insulated coolers with ice packs for preservation purposes will be used for sample transport. Individual sample containers will be carefully packed within the transport cooler to prevent damage in transit. The samples will be shipped by overnight courier to the analytical laboratory.

7.6 RECORD KEEPING AND CHAIN OF CUSTODY PROCEDURES

Field sampling data sheets, chain-of-custody sheets, and laboratory analytical activities will be documented as follows. Monitoring information included on field sampling records will include date and time samples collected, sampler’s name, well number, sample location, and other information required by 40 CFR 270.30(j). Field data collected during sampling and calibration logs of field equipment will be maintained in the facility’s records.

7.6.1 Field Data Sheets

Pertinent field sampling information and measurements will be recorded on the Groundwater Sampling Log. A copy of the Groundwater Sampling Form is included in Appendix I.

7.6.2 Chain-of-Custody Records

Each sample transported off site for analysis will be accompanied by a chain-of-custody form to document sample custody from the time of collection until receipt by the analytical laboratory. An example chain-of-custody form is included in Appendix I.

7.6.3 Laboratory Logbook

The laboratory performing the analyses will maintain a logbook recording the person delivering the sample, the person receiving the sample, date and time received, source of sample, sample number, manner of transport to the lab, and a number assigned to each sample by the laboratory. A standardized format will be used for logbook entries. The laboratory sample custodian will ensure that heat-sensitive or light-sensitive samples, or sample materials having other unusual physical characteristics requiring special handling, are properly stored and maintained. The sample custodian will distribute samples to laboratory personnel for analyses. The sample custodian will enter in the logbook the laboratory sample number, time, date, and the signature or initials of the person to whom the samples were given.

7.7 FIELD AND LABORATORY QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

This program is designed to ensure the precision and accuracy of field and laboratory analytical data developed during the groundwater monitoring program.

7.7.1 Field QA/QC Program

Two types of quality control (QC) blanks (trip blanks and equipment blanks) will be collected during each sampling event. Trip blanks will be used to determine if samples have been contaminated during storage or transportation. Equipment blanks will be used to determine if contamination has been introduced by the sample collection equipment. A description of each blank type follows:

- Trip Blank – The laboratory will provide bottles filled with de-ionized water for VOC analysis. The bottles will be transported to and from the site with the facility sample containers and returned to the laboratory for VOC analyses. One trip blank will be collected per sample cooler.
- Equipment Blank – To ensure that the sampling device has been effectively cleaned, field sampling equipment rinse water (deionized) will be collected in laboratory provided sample bottles and returned to the laboratory for the appropriate analyses. One equipment blank will be collected and analyzed for each sampling event.
- Blind Duplicates – One-two per twenty samples
- Matrix Spike/Matrix Spike Duplicates – One per twenty samples

QC blanks and the samples will be handled, transported to the laboratory, and analyzed. The analytical results from the blanks will not be used to correct the groundwater data. If contamination is identified, corrective action (which may include re-sampling) will be initiated.

7.7.2 Laboratory QA/QC Program

Laboratory analyses will be performed in accordance with USEPA requirements. The laboratory will use standards, laboratory blanks, duplicates, and spiked samples for calibrating and maintaining analytical integrity. Data from the QC samples (e.g., blanks, spiked samples) will be used by the laboratory to measure performance or identify potential sources of cross-contamination, but the data will not be used to alter or correct the analytical data. The analytical data reported by the laboratory will include QA/QC data for each sampling event.

7.8 SAMPLING AND ANALYTICAL METHODS

To monitor the effectiveness of the groundwater corrective action program, the monitor wells and surface water locations of the ODSA, ASB, ALSA, LSA/OCVSP, LPABS/OEH, and ORA-2/ORPA will be sampled annually for the respective GWCCs in each area. Table 7-1 lists the analytical methods, parameters, sample containers, preservatives, and holding times to be used for the GWCC and surface water sampling and analyses.

For each HWMU, one POC monitor well will be sampled annually for the 40 CFR Appendix IX analyses. Table 7-2 lists the analytical methods, parameters, sample containers, preservatives, and holding times to be used for the Appendix IX sampling and analyses.

7.9 STATISTICAL ANALYSIS OF GROUNDWATER MONITORING DATA

In accordance with the RCRA Part B Permit No. HW-049(D), which was reissued to CSXT on July 7, 2010, the statistical analysis of the groundwater monitoring data will not be performed until the GWCCs in wells have been reduced to the GWPS/BCLs established for the ODSA and ASB HWMUs and the clean-up goals for the ALSA, LSA/OCVSP, LPABS/OEH, and ORA-2/ORPA SWMUs. In the interim, CSXT will provide time versus concentration plots for select GWCCs and an evaluation of the changes in GWCC concentrations over time in each Corrective Action Effectiveness Report. Once the reported GWCC in wells have been reduced to the clean-up goals, the statistical analysis program will then be reinstated to statistically confirm that the clean-up goals have been achieved. The statistical program will be consistent with 40 CFR 264.97(h) and the results will be reported to the GAEPD in the Corrective Action Effectiveness Report.

7.10 SEMIANNUAL REPORTING

Corrective Action Effectiveness Reports will be prepared and submitted to the GAEPD on a semiannual basis following the reporting period. The report will include at a minimum the following elements:

- work performed and methods used;
- groundwater flow direction and rate;
- surface water quality;
- groundwater quality;
- summary of groundwater recovery/treatment system maintenance and modifications; and
- groundwater recovery and treatment system effectiveness

TABLES