DEPARTMENT OF THE ARMY
Holston Army Ammunition Plant
4509 West Stone Drive
Kingsport, TN 37660

October 15, 2019

REPLY TO
ATTENTION OF

Mr. Roger Donovan
Tennessee Department of Environment and Conservation
Division of Solid Waste Management
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Ave, 14th Floor
Nashville, TN 37243

Dear Mr. Donovan,

Holston Army Ammunition Plant (HSAAP) has completed pre-modification activities associated with the Corrective Action Order (CAO) modification request for Case Number 03-HCA003. The purpose of the modification will be to move Solid Waste Management Units (SWMUs) to their appropriate management table, amend groundwater sampling requirements, and make language clarifications as needed. The fee associated with this request was mailed on October 15, 2019 to the address listed on form CN-1261. A copy of the form is enclosed for your convenience.

HSAAP began the pre-modification process by publishing a public notice in the Rogersville Review and Kingsport Times News. The notices were originally published on August 7 and August 4, 2019 respectively. A revised notice was published in each paper on August 10 and August 8 respectively. The revised notice was also posted on the HSAAP Facebook page. The publication affidavits are enclosed for your convenience. The notice provided the information associated with the modification, the public meeting, and the comment period. The comment period ran from August 5 until October 11, 2019. No written comments were received.

The public meeting was held on August 22, 2019. Two individuals from the community participated along with three Army personnel and one Army Contractor. The sign-in sheet and meeting minutes are also attached to this letter for your convenience.

HSAAP looks forward to working with you on this modification. If you have any questions please contact Laura Peters, HSAAP Environmental Engineer, at phone: (423) 578-6193 or email: laura.l.peters15.civ@mail.mil.

Sincerely,

FOR THE COMMANDERS REPRESENTATIVE:

H. S. Shelton
Chemical Engineer

NOTICE OF REQUEST TO MODIFY HOLSTON ARMY AMMUNITION PLANT CORRECTIVE ACTION ORDER

The Holston Army Ammunition Plant (HSAAP) is requesting a modification to the HSAAP Hazardous Waste Corrective Action Order, Case Number 03-HCA003. HSAAP (EPA ID TN5210020421) is located at 4509 West Stone Drive, Kingsport, Tennessee 37660. The Class 3 Modification will add final remedies for facility solid waste management units (SWMUs) and areas of concern (AOCs) and modify groundwater and surface water monitoring requirements.

A public meeting is scheduled for 6:00 pm to 8:00 pm, on August 22, 2019, and will be held at the East Tennessee State University (ETSU) Allandale Campus, Room 236, located at 1501 University Boulevard, Kinsgport, TN. This meeting will be hosted by representatives from Holston Army Ammunition Plant. The purpose of this meeting is to inform the community of the proposed changes to facilitate meaningful input. Please note that only comments associated with the Corrective Action Program at HSAAP will be addressed. If you may need special access to participate in this meeting, please call 423-578-6285 at least 72 hours in advance.

Copies of proposed modifications and the fact sheet are available for public inspection at the Church Hill Public Library, 412 East Main Blvd., Church Hill, TN 37600 (423357-4591) and at the Kingsport Public Library, 400 Broad St., Kingsport, TN 37600 (423-229-9489).

Any interested person may submit written comments on the proposed modification by contacting: Kathy Cole, HSAAP Staff Action Specialist, 4509 W. Stone Drive, Kingsport, Tennessee 37660 (423-578-6285) or e-mail to kathy.o.cole.civ@mail.mil . **The comments,** under Rule 0400-12-01-.07(7)(f), **must be received by 4:30 p.m., Friday, October 11, 2019**, to assure consideration. Note: This notice was originally posted on August 5, 2019 and revised on August 6th. To ensure adequate time to complete a review, the comment period was extended from October 4th to October 11, 2019.

NOTICE ISSUED: August 5, 2019
REVISED: August 6, 2019

FACT SHEET

REQUEST TO MODIFY HOLSTON ARMY AMMUNITION PLANT'S ORDER

Facility Name: Holston Army Ammunition Plant (HSAAP)

Location: 4509 West Stone Drive, Kingsport, Tennessee 37660

Order Number: 03-HCA003

EPA ID Number: TN5 21 002 0421

Respondent: HSAAP

Owner: United States Department of Defense
Department of Army

Regulated Units: The corrective action order addresses remedial action at facility solid waste management units (SWMUs) and areas of concern (AOCs). This order does not address operating requirements for the Burning Pans (SWMU 45) which are regulated by the Hazardous Waste Management Open Burn Permit, TNHW-148, issued March 31, 2011.

Facility Contact: Laura Peters, Restoration Program Manager
Holston Army Ammunition Plant
4509 West Stone Drive
Kingsport, Tennessee 37660
Phone: 423-578-6193
E-mail: laura.l.peters15.civ@mail.mil

Comment Period: **Begins: August 5, 2019**
Ends: 4:30 p.m., Friday, October 11, 2019

PURPOSE

This fact sheet is prepared pursuant to Tennessee Rule 0400-12-01-.07(7)(d) for the draft order modification. The purpose of this process is to afford any interested persons the opportunity to review and comment on the selected final remedies and other modifications to the applicable hazardous waste management (corrective action) requirements. The proposal is for an order modification to be issued under the authority of the Tennessee Hazardous Waste Management Act of 1977, as amended, Tennessee Code Annotated, Section 68-212-101 et seq., and Rule Chapter 0400-12-01, Hazardous Waste Management. The proposed order modification is prepared in accordance with the provisions of Rule 0400-12-01-.07.

NOTICE OF REQUEST TO MODIFY HOLSTON ARMY AMMUNITION PLANT CORRECTIVE ACTION ORDER

The Holston Army Ammunition Plant (HSAAP) is requesting a modification to the HSAAP Hazardous Waste Corrective Action Order, Case Number 03-HCA003. HSAAP (EPA ID TN5210020421) is located at 4509 West Stone Drive, Kingsport, Tennessee 37660. The Class 3 Modification will add final remedies for facility solid waste management units (SWMUs) and areas of concern (AOCs) and modify groundwater and surface water monitoring requirements.

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REVISED: August 6, 2019

FACT SHEET

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Order Number: 03-HCA003

EPA ID Number: TN5 21 002 0421

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Owner: United States Department of Defense
Department of Army

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4509 West Stone Drive
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FACILITY DESCRIPTION

HSAAP is located at 4509 West Stone Drive, Kingsport, Tennessee (Figure 1). HSAAP consists of two plant areas referred to as Area A and Area B (Figure 2). Area A is located within the City of Kingsport in Sullivan County, Tennessee, on State Route 93. Area B is located in Hawkins County about 4 miles west of downtown Kingsport, on U.S. Route 11W. Area A and Area B are linked by a fenced interplant railroad that is approximately 3.7 miles long (Figure 2).

Area A, the smaller of the two areas, is approximately 60 acres and is located within a heavily industrialized area of Kingsport adjacent to several private sector commercial industrial facilities. Area B is approximately 5,913 acres and contains the explosives production area, where explosive manufacturing and packaging takes place. During most of the history of HSAAP, the region around Area B has been residential and agricultural, along with limited commercial activities. Since the early 1980s, residential and commercial developments have increased significantly around Area B, particularly around West Stone Drive. Residential developments abut the northeast and northwest plant boundaries of Area B. Highway 11W separates Area B from the majority of residential and commercial areas to the north and northwest. Residential areas to the south are separated from Area B by sections of Holston River Mountain, Bays Mountain, and Bays Mountain Park.

ORDER HISTORY

Under the authority of the Tennessee Hazardous Waste Management Program, the post-closure and corrective action regulatory history for Holston Army Ammunition Plant is chronologically summarized as follows:

1. The Former Solvent Burn Tank Unit (Unit) was operated from the early 1960s to 1983. The Unit, also identified as Solid Waste Management Unit (SWMU) 50, was comprised of two open tanks used for burning explosive-contaminated, nonhalogenated spent solvents and waste propyl formate solution from the azeotropic distillation of acetic acid. Batches of spent solvents were placed in the open tanks, ignited, and allowed to completely burn.

2. In 1982, the first tank in the Unit was excavated and the resulting pit was backfilled. In 1984, the second tank in the Unit was excavated and the resulting pit was backfilled. In 1984, the Division of Solid Waste Management (DSWM) approved the Closure Plan for clean closure of the Unit.

3. In 1991, USEPA notified HSAAP that they were subject to clean closure equivalency standards.

4. In 1993, a study was conducted by HSAAP to satisfy the clean closure equivalency requirements. The study indicated groundwater contamination at the Unit.

5. From late 1995 to early 1997, HSAAP conducted soil and groundwater assessments at the Unit. A groundwater monitoring system was installed to evaluate the extent of groundwater contamination.

6. In September 1997, HSAAP submitted a closure certification and a report outlining the results of its soil investigation. As a result of the investigation HSAAP was not required to remove any additional soils.

7. On March 31, 1999, the DSWM issued HSAAP a Post-Closure Corrective Action Order that required a Corrective Action Plan (CAP) for the Unit. The DSWM did not approve the CAP submitted by the Respondent.

8. On March 26, 2002, HSAAP requested a modification from the DSWM to deviate from the corrective action process as described in Section II of the Attachment to the Order by participating in the Facility Action Plan (FAP) process. The DSWM approved HSAAP's request.

9. On January 27, 2003, HSAAP requested a modification to the Post-Closure Corrective Action Order to address groundwater monitoring and any required corrective action at the Unit under the Order's site-wide groundwater corrective action program. The Unit, which has no contaminated soils, would have any groundwater monitoring or groundwater corrective action addressed under the corrective action requirements for the entire facility. The DSWM approved HSAAP's request.

10. Based on HSAAP's modification requests and the DSWM's approvals noted in items 8 and 9 above, the Post-Closure Corrective Action Order issued to the Respondent on March 31, 1999 was replaced in its entirety by a new order.

11. On May 16, 2003, the State of Tennessee Department of Environment and Conservation (TDEC) issued Corrective Action Order (Order) Case No. 03-HCA002 to HSAAP. The Order listed Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) that required Confirmatory Sampling (CS) or Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFIs).

12. In compliance with the conditions of the new Corrective Action Order, HSAAP completed CSs, RFIs, and Interim Measures (IMs) at the facility SWMUs and AOCs. The result of those activities is reflected in the proposed status for each SWMU and AOC as listed in the tables in this fact sheet.

13. To finalize the remedies for the SWMUs and AOCs and in accordance with the procedures specified in the current order, HSAAP requested that the Corrective Action Order be modified to reflect the current status of the SWMUs and AOCs. The request followed a public meeting conducted by the facility on April 12, 2010, at Holston Business Development Center, 2005 Venture Park, Kingsport, TN. The purpose of the meeting was to inform the community of HSAAP's planned modification request to incorporate the proposed final remedies of various SWMUs and AOCs into their order. The public notice of the meeting included the establishment of a 60-day comment period (March 12 through May 14, 2010). At the meeting, HSAAP performed a slide presentation about the facility's corrective action order and remedial actions to date and answered a few questions. No comments were received at the meeting or during the 60-day comment period.

14. To complete the modification request, the DSWM public noticed the request, including drafting the modification with the necessary supporting data and documentation, enabling the public to have the opportunity to review and comment on the remedies. The current Order was approved by TDEC on January 24, 2013.

PROPOSED ORDER MODIFICATION

The purpose of the proposed Class 3 Order Modification is to define the final correction action requirements for HSAAP solid waste management units (SWMUs) and areas of concern (AOCs), clarify language in the CAO, reclassify SWMUs 1 and 3, consolidate two tables in the CAO to eliminate redundancy, and modify groundwater and surface water monitoring parameters and frequencies based on historical monitoring data.

The tables in this Fact Sheet provide the requirements for all the SWMUs and AOCs at HSAAP. Figures 3 through 6 depict the locations of these units. Specifically, there are **143** SWMUs and AOCs that require no further action under this order at this time **(Table A-1(a))**. There are no SWMUs or AOCs that require confirmatory sampling **(Table A-2)**, a RCRA facility investigation **(Table A-3)**, interim measures **(Table A-4)**, or a corrective measures study **(Table A-5)**. The **81** SWMUs/AOCs requiring implementation of a corrective action remedy are listed in Tables A-6 and A-7. Additional investigation and other possible remedial actions may be necessary for the **46** operationally active units listed in Table A-7. Those actions shall be addressed during unit or plant closure.

At present, there are no SWMUs or AOCs that require confirmatory sampling, a RCRA facility investigation, interim measures or a corrective measures study under the corrective action requirements of the draft order modification.

CORRECTIVE ACTION REQUIREMENTS

The draft order modification describes how Holston Army Ammunition Plant (HSAAP) shall implement the selected corrective action remedies at their facility.

As contaminants remain in soil and groundwater, the proposed order modification requires HSAAP to maintain site controls. Included are site security measures, institutional controls, groundwater monitoring and inspections. Controls are necessary to protect human health and the environment by preventing exposure to the materials contaminated with hazardous constituents. This will be accomplished through site access controls and enforcement of other administrative measures. Inspections will verify that these controls are maintained and that the installed cap/cover systems remain intact. Groundwater monitoring will identify changes in groundwater quality at or near prior release locations and to ensure that migration of contaminants will not impact the water quality of the Holston River. Required surface water monitoring will verify that the river is not being impacted by releases from HSAAP.

COMMENTS

Copies of draft modification and fact sheet are available for public inspection at the Church Hill Public Library, 412 East Main Blvd., Church Hill, TN 37600 (423-357-4591) and at the Kingsport Public Library, 400 Broad St., Kingsport, TN 37600 (423-229-9489).

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FACT SHEET TABLES

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
1A	Industrial Sewer	Unit consists of sumps, drains and underground/aboveground pipes located throughout Area A.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
1B	Industrial Sewer	This unit consists of sumps, drains and underground/aboveground pipes located throughout Area B.	1942– Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
1C	Industrial Sewer	This unit consists of sumps, drains and underground/aboveground pipes located throughout the interplant rail corridor.	1942– Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
2	Surface Drainage Ditches	Unit consists of unlined drainage ditches throughout Areas A and B that discharge surface runoff to the Holston River.	1942 – Present	Confirmatory Sampling determined no releases; NFA approval DSWM – 8/13/04
3B5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3B11	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3D3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3D6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3D7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3D9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3E8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3G1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3G2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3H1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 07/2012, prior to RFI. RFI did not confirm CS results; NFA approval DSWM–4/06/15

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
3H10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 12/2011, prior to RFI. RFI did not confirm CS results; NFA approval DSWM–4/06/15
3I1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 08/2011. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 11/2012. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
3J8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 08/2012. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3K1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3K7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 10/2012. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3K9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3K10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	CS completed as part of RFI; NFA approval DSWM–4/06/15
3L2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3L7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3L9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3L10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 08/2011. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
3M8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
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3M10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3N1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3N2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3N9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3N10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3O1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3O5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3O7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3O9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
5	Acetic Anhydride Sludge Tanks	The tanks store sludge generated by base heater that refines acetic anhydride in Building 6.	1943 – Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
6	Ball Mill Solids Pit and Dumpster	Unit receives wash-down water from acetic anhydride operations. Solids settle to bottom, liquid is discharged to Industrial Wastewater Treatment Plant (IWTP).	1942 – Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
7	Propyl Formate Tanks	Unit consists of three banded steel tanks with capacities of 2,000 to 2,500 gallons.	1972 – 1995	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
8	Area A Industrial Boilers	Unit consists of 8 boilers that burn coal, coal tar, and propyl formate wastes (D001) for heat recovery.	1940s – Present	Clean Closed; Confirmation of clean closure DSWM – 7/16/99
9	Area A Fly Ash Loading Station	Unit consists of one uncurbed concrete pad and one smaller pad beneath the fly ash hoppers of Building 8 in Area A.	1942 – 1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
10	Rail Car Loading Area	Unit is part of the facility railroad that links Areas A and B.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
11	Area A Parts Cleaners	Unit consists of covered metal containers which hold solvents for cleaning metal parts.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
12	Area A Spill Pond	Unit was once part of the Area A Aeration Basin. The unit has managed acetic acid and acetic anhydride waste waters.	1983 – 1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM– 2/14/00
13	Area A Aeration Basin	This clay-lined basin is also referred to as the Area A Industrial Waste Water/ Equalization Lagoon or Treatment Lagoon. The unit managed acetic acid and acetic anhydride waste waters.	1975 – 1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
15	Coal Tar Landfill 2	Unit is a ¼-acre unlined landfill that managed coal tar and fly ash.	Unknown	Interim Measures Report; NFA Approval DSWM – 10/23/07
16	Coal Tar Container Storage Area	Unit is an interior storage area in Building 13 (Area A) used to store coal tar drums.	Unknown – 1990s	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
25	Area B Tar Burial Site	Unit managed coal tar and fly ash	1978-1980	Interim Measures Report; NFA Approval DSWM – 10/31/13
30	Former Nitric Acid Equalization Basin	This unlined unit managed industrial wastewaters from processes conducted in the Nitric Acid Manufacturing Area.	1978 – 1984	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
31	Existing Nitric Acid Equalization Basin	Unit receives industrial wastewater from the Nitric Acid Manufacturing Area and the Nitric Acid Spill Pond. The waste is neutralized and discharged to the IWTP.	1985 – Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
32	Explosive Settling Basins	Unit acted as settling basins for wastewater particulate matter coming from the manufacturing area.	1983 – 1989	NFA per EPA RFA Report (A. T. Kearny) 8/30/91

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
33	Neutralization Basins	These below-grade basins manage industrial wastewaters generated from processes in the Nitric Acid Manufacturing Area.	1978 – Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
34	Area B Industrial Boilers	Unit consists of nine boilers which generate fly ash.	1942 – Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
35	Unlined Spill Pond	Unit managed industrial wastewater from the Industrial Sewer (SWMU 1).	1983 – 1986	Additional Confirm. Sampling Report determined no releases; NFA approval DSWM – 6/5/08
36	Lined Spill Pond	Unit received industrial wastewaters from acetic acid recovery processes conducted in Area B.	1987 – 1988	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
40	Sodium Nitrate Pond 3	This unlined unit received waste waters from the B-Line Production Areas.	1970 – 1987	No indication of release of RCRA hazardous waste/constituent. Closed by TDEC Division of Water Pollution Control in 1980s.
41	Sodium Nitrate Pond 4	This unlined unit received waste waters from the B-Line Production Areas.	1973 – 1987	Did not contain hazardous constituents. Closed by TDEC Division of Water Pollution Control in 1980s.
42	A – 1 Equalization Basin	Unit managed wastewaters containing ammonia and dimethylamines.	1979 – 1994	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
43	Burning Ground	Unit regulated by Hazardous Waste Management Permit TNHW-148. Unit receives explosive-contaminated wastes.	1940s – Present	RFI Report; NFA approval DSWM – 12/18/08
46	Burning Cages (2)	These two cages are located in the Burning Ground Area (SWMU 43).	1940s – Present	RFI Report; NFA approval DSWM – 12/18/08
48	Sludge Dewatering Station	Unit is located in the Burning Ground Area (SWMU 43). It received explosive contaminated wastes for dewatering.	Mid 1940s – 1981	RFI Report; NFA approval DSWM – 12/18/08
49	Vehicle Wash Pad at Burning Ground	Unit is located in the Burning Ground. Area (SWMU 43). This unit managed wash water that may have contained oil, grease, gasoline and explosives. The pad drains to IWTP.	About 1983 – Present	RFI Report; NFA approval DSWM – 12/18/08
50	Former Solvent Burn Tank	Unit is located in the Burning Ground Area (SWMU 43). It was utilized for the open burning of explosive contaminated, spent non-halogenated solvents and oils.	1980 – 1984	RCRA unit NFA under PCCAO dated 3/31/99. Groundwater included in AOC-GW.

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
51	Vehicle Wash Pad Outside Bldg. 105	Unit manages wash water that may have contained oil, grease, gasoline and explosive residues.	1980 – Present	Confirmatory sampling determined no releases; NFA approval DSWM – 10/10/05
52	Vehicle Wash Pad inside Bldg. 105	Unit manages wash water that may have contained oil, grease, gasoline and explosive residues.	1942 – Present	Confirmatory sampling determined no releases; NFA approval DSWM – 10/10/05
53	WWII Vehicle Wash Pad	Unit managed wash water that may have contained oil, grease, gasoline, fly ash, metal glass and explosive residues.	1940s – 1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
54	Vehicle Wash Pad at Bldg. 556	Unit manages wash water that may contain oil, grease, gasoline, and explosive residues.	App. 1960 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
55	Steam Cleaning Pad at Bldg. 556	Unit is used for steam cleaning heavy equipment. The unit manages wash water that may contain oil, grease, gasoline and explosive residues.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
57	Oily Rag Satellite Accumulation Areas (SAAs)	These SAAs manage oily rags that contain petroleum hydrocarbons.	1940s – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
58	Waste Oil SAAs	These SAAs manage waste oils that contain petroleum hydrocarbons.	1940s – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
59	Used Tire SAA	Unit is used to store tires prior to their disposal.	Unknown	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
60	Waste Oil Drainage Pad	Unit manages waste oils and oil contaminated materials.	1960 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
61	Oil/Water Separator	Unit manages oily wastewaters.	1960 - Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
62	Area B Parts Cleaners	Unit manages waste oil, grease removed from machine parts, spent Stoddard solvent, mineral spirits and varsol.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
63	Laboratory Explosives SAA	Unit manages waste explosives and explosive-contaminated material collected in the catch basin behind the laboratory building (Building 8).	Unknown	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
64	Paint Sludges SAA	Unit managed paint sludges or still bottoms resulting from the recovery of thinners in a distillation unit at the Paint Shop.	1988 – 1990s	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
65	Respirator Cartridge SAA	Unit manages spent respirator filters that had failed TCLP testing for cadmium.	1989 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
66	Former Paint Waste SAA	Unit managed paint wastes from Area B paint shop.	1988 – 1989	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
67	Used Battery SAAs	Unit manages used batteries generated by vehicles and equipment.	Unknown	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
68	Sulfuric Acid SAA	Unit is used to collect spent sulfuric acid from used batteries that are drained prior to disposal.	Unknown	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
69	Scrap Metal Yard	Unit managed scrap metal and equipment.	Mid 1940s – 1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
70	Production Yards	These units are located throughout the facility. The units managed potentially contaminated equipment, scrap metal, decontaminated materials, and materials waiting reuse.	1942 – 1990s	*Yards 1-5, 8-11* – Confirmatory Sampling (CS) Report determined no releases; NFA approval DSWM – 6/19/00. *Yards 6-7* – CS Report determined no releases; NFA approval DSWM – 6/5/08. *Yard 12* – Interim Measures Report; NFA approval DSWM – 10/11/05.
71	PCB Storage Area	The unit manages the storage of PCB transformers and PCB-contaminated materials.	1981– Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
72	Former Battery Storage Area	The unit managed the storage of used vehicle batteries prior to disposal.	1960s– 1988	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
73	Waste Fuel Oil Drum Storage Area	The unit managed waste fuel oil from Sanitary Wastewater Treatment Facility.	1991	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
74	Ball Field Staging Area	This unit managed soil contaminated with petroleum hydrocarbons.	1989– 1990s	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
75	T–1 Bldg. Staging Area	This unit managed coal tar/soil mixture, a PCB-oil transformer, and calcium chloride.	1990s	Confirmatory Sampling Report determined no releases; NFA approval DSWM–6/5/08
76	Dumpster	The unit received various non-hazardous waste and general refuse such as paper, glass, metal, incinerator ash, and fly ash prior to disposal.	1942– 1990s	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
79	Waste Oil Underground Storage Tank (UST) at Bldg. 105	This unit is a 2,000-gallon carbon steel tank that was used to store waste motor oil, lubricating oil, and non-PCB transformer oil.	1968–1994	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
80	Waste Oil UST at Bldg. 556	This unit consists of a 2,500-gallon steel UST that stored spent mineral spirits, Stoddard chemical and varsol from parts cleaners.	1983–1994	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
81	Waste Oil UST at Bldg. 302	This unit consisted of one 130-gallon UST which received waste oil that had been captured in the oil room sump. The building and UST have been removed.	1970–1994	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
82	Area B Fly Ash Loading Station	This unit consists of a paved loading area for the transfer of fly ash.	App. 1957–Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
83	Decontamina-tion Ovens	These ovens manage metal parts and scrap metal that have been contaminated with explosive residues.	1961–Present	Interim Measures Report; NFA approval DSWM–10/13/05
84	Incinerators	This unit consists of incinerators used to thermally remove non-explosive waste materials from the plant site such as paper, cardboard, wooden boxes, plastic bags, oily rags, rubbish, foliage, and garbage.	1974–Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
85	Incinerator Staging Area	Unit manages the storage of non-hazardous, non-explosive, combustible garbage prior to incineration.	1974 – Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
89	Industrial Waste Water Treatment Facility	Unit treats the wastewater from the facility.	1983 – Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
90	Area A Former Coal Piles	Unit is a grass covered area that stored coal. It also managed ball mill solids.	1942 – 1989	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
91	Sewage Treatment Plant	Unit is a 758,000-gallon per day trickling filter waste-water treatment facility.	1960 – Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
93	Sandblasting Area 1	Unit had been used to perform general sandblasting.	1990 – 1992	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
94	Sandblasting Area 2	Unit had been used to perform general sandblasting.	1980s – 1990	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
95	Sandblasting Area 3	Unit was used to perform general sandblasting. The area is approximately 200 feet long by 200 feet wide. The area was once gravel but is now covered by an asphalt lot.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
97	Coal Tar Contamination Along the Rail Corridor	Unit is a coal tar disposal area along the rail corridor between Areas A and B.	Unknown	Interim Measures Report; NFA approval DSWM – 2/23/06
98	Coal Tar Contamination South of SWMU 17	Unit is a coal tar disposal area in Area B.	Unknown	Interim Measures Report; NFA approval DSWM – 3/14/06
99	Landfill	Unit is a possible landfill north of Building C-6.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
100	Possible Drum Rinsing Area near Bldg. R-6	Unit is a possible drum rinsing area near Building R-6. Area is presently a parking lot. This unit had been used to perform general sandblasting.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
101	Bldg. 105 Oil/ Water Separator and Associated Drain Pad	Unit was reportedly used for temporary storage of new oil drums. Unit had been used to perform general sandblasting.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
102	Former Penn–Dixie Sedimentation Pond	This surface impoundment is a natural low area approximately three acres. Runoff and leachate from a Penn-Dixie cement kiln dust waste pile was managed at this unit. This unit had been used to perform general sandblasting.	Unknown	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
104	Firing Range West of Building 134	Firing range used in the mid-1960s.	1960s	RFI/Interim Measures Report; NFA approval DSWM – 4/28/06
105	Firing Range at the Water Reservoir	Small arms practice range.	1984 – ?	RFI/Interim Measures Report; NFA approval DSWM – 4/28/06
106	Firing Range at Building 234	Area is the site of a former firing range. Range likely destroyed to construct Building 234.	1967 – 1983	RFI/Interim Measures Report; NFA approval DSWM – 4/28/06
107	Diesel UST at Rail Car Building	Diesel/fuel oil tank at in-plant fueling station which was taken out of service and abandoned in place at an unknown date.	Unknown	Interim Measures Report; NFA approval DSWM – 5/29/08
108	Armed Forces Reserve Center and Maintenance Shop	Area used for disposal of fly-ash type material.	Unknown	SWMU Assessment Report determined no releases; NFA approval DSWM – 5/12/09

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
110	Acetic Acid Spill near 3E4	Acetic acid/explosives pipeline expansion joint rupture	July 2013	Interim Measures Report; NFA DSWM approval – Nov 2017
A	Mad Branch Stream	This stream currently receives the facility's non-contact cooling water from Areas A and waters from the AFG Stream (AOC B).	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
B	AFG Stream	This stream receives non-contact cooling water from Area A.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
C	UST Gasoline Leak	Unit consisted of a filling station that contained three USTs that held diesel fuel and gasoline for facility vehicles. The tanks went through a UST closure.	1968 – 1994	RFI Addendum Report; NFA approval DSWM – 9/17/07
D	Existing Product USTs	These nineteen USTs managed products.	1942 – 1994	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
E	Removed Product USTs	These eight USTs no longer exist. They managed product materials.	1942 – 1991	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
F	Manganese Ore Piles	Unit consisted of several former and existing manganese ore piles stored directly on the ground.	1955 – 1987	Interim Measures Report; NFA approval DSWM – 3/14/06
G	Arnot Branch	This stream receives non-contact cooling water and surface drainage from the plant.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
H	Other Possible Fly Ash Sites	This unit consists of four sites in Area B identified as possible fly ash landfill locations.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
I	Explosive Demonstra-tion Ground	This area is located near the laboratory building. It contains a rectangular concrete pad where small quantities of explosives were detonated for training purposes.	1942– Present	Interim Measures Report; NFA approval DSWM–2/23/06
J	Area B Former Coal Pile	Soil and gravel areas that stored coal.	1942– Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–6/5/08
K	PCB Spill Site #2	This is a PCB spill from a transformer that was stored on a concrete pad east of Building 334 in Area B.	1987	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
L	PCB Spill Site #1	This area of contamination was located outside of Building #1 in Area A. The spill was the result of a transformer leak.	1987	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
O	Coal Tar Behind Building 20	This unit is a coal tar site on the west side of Building 20 in Area A.	Unknown	RFI/Interim Measures Report; NFA approval DSWM–9/28/07

Table A-1(b) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time. These Units are Currently Regulated Under Another Program:			
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**
17	Active Sanitary Landfill	Unit is an 8.25-acre unlined landfill that received wastes from throughout the facility. *Regulated by TDEC Johnson City DSWM Field Office - Class II Sanitary Landfill: Permit No. IDL 37-104-0192.*	1983 – 1996
22	Active Fly Ash Landfill	Unit is a 5.5-acre unlined landfill that received fly ash. *Regulated by Regulated by TDEC Johnson City DSWM Field Office - Class II fly Ash Landfill – Permit No. IDL 37-104-0062.*	1983 – 1997
28	Sedimentation Pond for Fly Ash Landfill	Unit manages runoff from the Active Fly Ash Landfill (SWMU 22). *Regulated by TDEC Johnson City DSWM Field Office – Landfill – Permit No. IDL 37-104-0062.*	1983 – Present
45	Burning Pans (4)	Regulated by Hazardous Waste Mgmt Permit TNHW-148. Unit receives explosive-contaminated wastes. (Pans are in Burning Ground Area - SWMU 43)	1984 – Present
92	New Sanitary Landfill	Unit is used to dispose of nonhazardous, nonexplosive, sanitary and inert waste and garbage generated at HSAAP. *Regulated by TDEC Johnson City DSWM Field Office: Permit No. IDL 37-104-0090.*	1997 – Present

Table A-2 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Confirmatory Sampling (CS):
There are no SWMUs or AOCs requiring Confirmatory Sampling.

Table A-3 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring a RCRA Facility Investigation (RFI):
There are no SWMUs or AOCs requiring a RCRA Facility Investigation.

Table A-4 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Interim Measures (IM):
There are no SWMUs or AOCs requiring Interim Measures.

Table A-5 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring a Corrective Measures Study (CMS):
There are no SWMUs or AOCs requiring a Corrective Measures Study.

Table A-6 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
3D1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3D2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3D8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3E1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3E2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3E5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3E9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3G9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3H2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3H3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3H8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3H9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections

Table A-6 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
4	Coal Tar Tanks	Unit consists of two 2,000-gallon aboveground steel tanks that stored coal tar. The tanks have been removed.	1978 –1994	Institutional Controls and Inspections
14	Coal Tar Landfill 1	Unit is a three-acre unlined landfill that managed coal tar and fly ash.	1948 –1978	Institutional Controls and Inspections
18	Former Sanitary Landfill	Unit is a 7-acre unlined clay capped landfill that received domestic refuse, light bulbs, bagged asbestos and empty pesticide containers.	1967 – 1984	Institutional Controls and Inspections
19	Construction Debris Landfill	Unit has managed construction debris as well as runoff from the Active Sanitary Landfill.	1984 – 1990s	Institutional Controls and Inspections
20	Area B Rock Quarry Landfill	Unit managed light metal, cinders, fly ash, fiberglass insulation, concrete, rubber, non-salable metal, automobile batteries and approximately six cubic yards of explosive contaminated concrete.	1940 – 1983	Institutional Controls and Inspections
21	Rock Dam Landfill	Unit managed demolition and excavation wastes, scrap metal, wooden debris and domestic refuse.	1966-1983	Institutional Controls and Inspections
23	Former Fly Ash Landfill	Unit is a 7-acre unlined clay capped landfill that received fly ash.	1977-1984	Institutional Controls and Inspections
26	WWII Coal Tar Site	Unit managed coal tar and fly ash.	Early 1940s	Institutional Controls and Inspections
29	Former Sedimentation Pond for Sanitary Landfill	Unit managed runoff from the Active Sanitary Landfill (SWMU 17).	1983 – 1984	Institutional Controls and Inspections
38	Sodium Nitrate Pond 1	Unlined unit received waste waters from the B-Line Production Areas.	1969 – 1972	Institutional Controls and Inspections
39	Sodium Nitrate Pond 2	Unlined unit received waste waters from the B-Line Production Areas.	1969 – 1972	Institutional Controls and Inspections
44	Former Burning Pads (2)	These two pads are located in the Burning Ground Area (SWMU 43).	Mid 1940s – 1984	Institutional Controls and Inspections

Table A-6 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
47	Burning Piles (5)	These piles are located in the Burning Ground Area (SWMU 43).	Mid 1940s – Present	Institutional Controls and Inspections
77	Pesticide Rinsate UST 148 – 1	Unit consisted of one 500-gallon pre-filter tank (UST) which received pesticide rinsate from pesticide spraying operations. The tank has been removed.	App. 1970s – 2004	Institutional Controls and Inspections
78	Pesticide Rinsate UST 148 – 2	Unit consisted of one 130-gallon septic tank (UST) which received pesticide rinsate from pesticide spraying operations. The tank has been removed.	App. 1970s – 2004	Institutional Controls and Inspections
86	Pesticide Drain Field	Unit managed pesticide rinsate. The drain field has been removed.	1960s – 2004	Institutional Controls and Inspections
87	Active Pesticide Wash-Down Area	Unit consists of a concrete wash pad with a three-foot concrete sump in the center. The unit is curbed on three sides. The unit managed pesticide rinsate.	1960s – 1986	Institutional Controls and Inspections
88	WWII Pesticide Wash-Down Area	Unit managed pesticide rinsate from tractors and spraying equipment.	1942 – 1970s	Institutional Controls and Inspections
96	Gas Producer Coal Tar Storage Tanks	Unit managed coal tar generated during production of coal gas in Building 10. Evidence of coal tar was reported during a pit excavation.	1940s – 1993	Institutional Controls and Inspections
103	Coal Tar Site, Ditch behind Gas Producer Building	Unit managed coal tar generated during production of coal gas in Building 10. Evidence of coal tar was reported during a pit excavation. The SWMU is the end of a ditch that carried discharge from Gas Producer Building.	1942 – 1994	Institutional Controls and Inspections
109	WW II Coal Tar Site 2	Unit managed coal tar	Early 1940s	Institutional Controls and Inspections
N	Hydraulic Fluid Leak, Elevator at Building G-2	This was site of hydraulic fluid leak at the elevator building associated with Building G-2	1940s – 1970s	Institutional Controls and Inspections
GW	Site-Wide Groundwater	Unit addresses groundwater contamination at Areas A & B.	Unknown	Monitoring, Reporting, and Well Inspections
Note: Institutional controls include access restrictions, signage, excavation restrictions, and annual perimeter fence and land use control inspections.				

Table A-7 - List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
3B3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3D5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3D10	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3E3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3E4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3E6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3E7	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3E10	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3G3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3G4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3G5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3G6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3G7	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3G8	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3G10	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections

Table A-7 - List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
3H4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3H5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3H6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3H7	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3I3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3I5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3I6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3J3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3K3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3K5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3L1	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3L3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3L4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3L5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3L6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections

Table A-7 - List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
3L8	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3M3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3M4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3M5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3M6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N7	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N8	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3O3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
24	Bldg. 200 Coal Tar and Fly Ash Landfill	This unit managed fly ash, coal tar and possibly hexamine.	1960s	Institutional Controls and Inspections
27	Sedimentation Pond for Coal Pile	This unit manages runoff from the existing Coal Pile (SWMU 56)	1989 – Present	Institutional Controls and Inspections
37	Nitric Acid Spill Pond	This unlined unit receives overflows from the Nitric Acid Production.	1940s – Present	Institutional Controls and Inspections

Table A-7 - List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
56	Existing Coal Pile	This unit stores coal directly on the ground.	1989 – Present	Institutional Controls and Inspections
Note: Institutional controls include access restrictions, signage, excavation restrictions, and annual perimeter fence and land use control inspections.				

FACT SHEET FIGURES

Figure 1

Site Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Basemap: National Geographic Society, i-cubed

0 5,000 10,000 Feet

0 1,000 2,000 Meters

1 inch = 6,000 feet

Site Boundary

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised:11/7/2018 Project No.J160167

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAOJ160167 FIG 1 HSAAP Site Location.mxd

Figure 2

Site Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Basemap: National Geographic Society, i-cubed

0 2,000 4,000 6,000 8,000 10,000 Feet

0 1,000 2,000 3,000 Meters

Project Site Boundary

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised: 11/7/2018 Project No.J160167

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAO\J160167 FIG 2 Site Map.mxd

Figure 3

HSAAP Rail Corridor and Off-Site Area - SWMU AOC Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Basemap: National Geographic Society, i-cubed

0 2,000 4,000 6,000 8,000 10,000 Feet

0 1,000 2,000 3,000 Meters

- Solid Waste Management Unit (SWMU)
- Project Site Boundary

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised: 11/7/2018 Project No.J160167

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAO\J160167 FIG 3 HSAAP Rail Corridor and Off-Site Area - SWMU_AOC Location Map.mxd

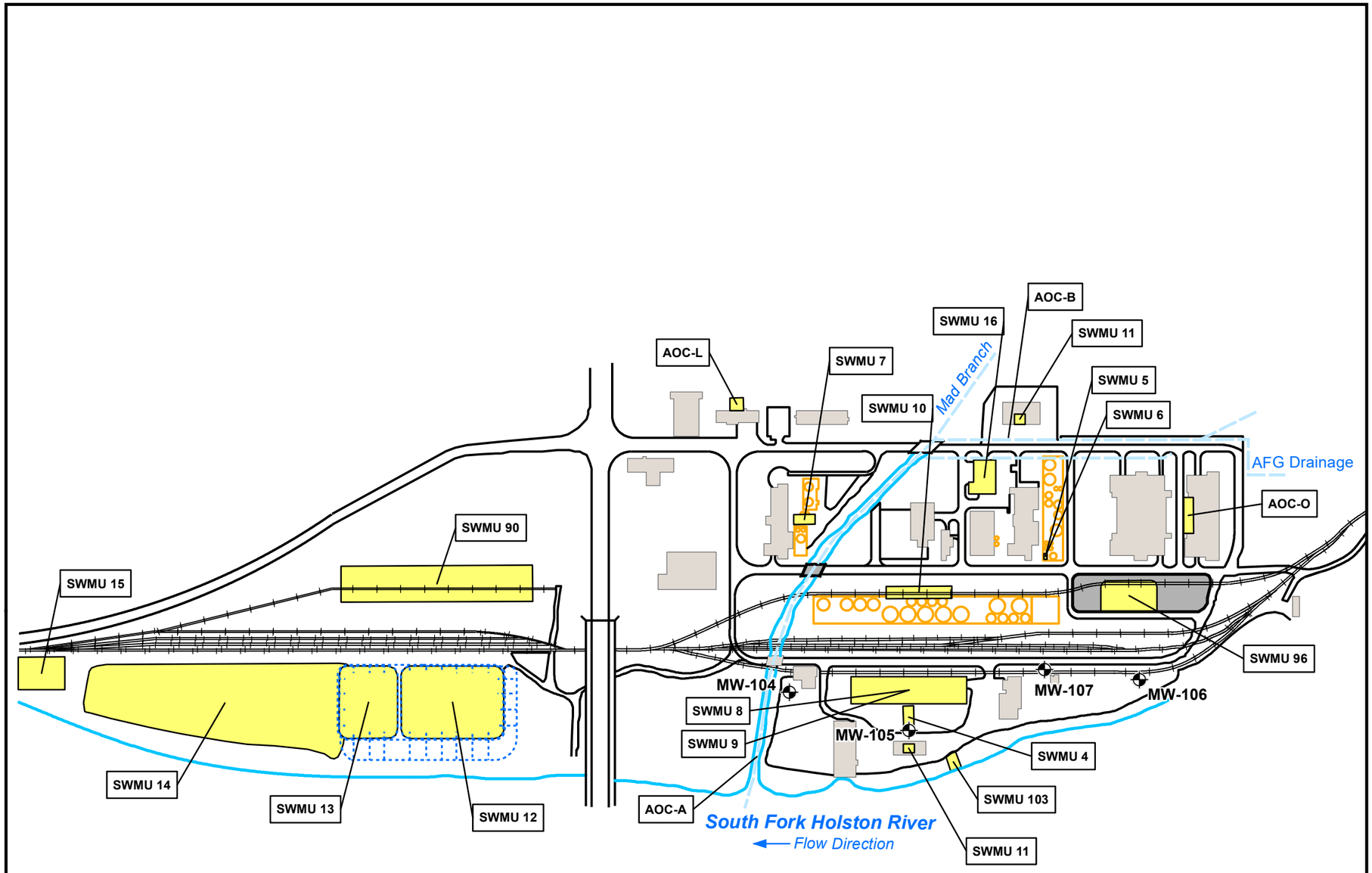

Figure 4

HSAAP Area A SWMU/AOC and Monitoring Well Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet

0 250 500 750 1,000 Feet

0 100 200 300 Meters

- Long Term Monitoring Well Location
- Holding Pond
- Railroad
- Road
- Ditch
- River
- Building
- Bridge
- Solid Waste Management Unit (SWMU) or Area of Concern (AOC)
- Storage Tank
- Project Site Boundary

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised: 11/7/2018 Project No.J160167

Figure 5

HSAAP Area B Production and Shop Areas SWMU/AOC and Monitoring Well Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet

0 1,000 2,000 3,000 4,000 Feet

0 250 500 750 1,000 Meters

- Long Term Monitoring Well Location
- Drainage Ditch
- River
- Road
- Cat-Walk
- Fence
- Property Boundary
- Railroad
- Storage Tank
- Islands
- Bunker
- Building
- Solid Waste Management Unit (SWMU) or Area of Concern (AOC)

Bay West
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Drawn By: N.J. Date Drawn/Revised: 11/7/2018 Project No.J160167

SWMU-17

SWMU-17

SWMU-25

SWMU-21

SWMU-19/29

SWMU-98

SWMU-20

MW-48

MW-116

MW-115

MW-68

HOLSTON RIVER

Figure 6

HSAAP Area B Landfill Area SWMU/AOC and Monitoring Well Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet

NOT TO SCALE

- Long Term Monitoring Well Location
- Railroad
- Road
- River
- Solid Waste Management Unit (SWMU)

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised: 11/29/2018 Project No.J160167

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAO\J160167 FIG 6 HSAAP Area B Landfill Area SWMU_AOC and Monitoring Well Location Map.mxd

DEPARTMENT OF THE ARMY
Holston Army Ammunition Plant
4509 West Stone Drive
Kingsport, TN 37660

October 15, 2019

REPLY TO
ATTENTION OF

Mr. Roger Donovan
Tennessee Department of Environment and Conservation
Division of Solid Waste Management
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Ave, 14th Floor
Nashville, TN 37243

Dear Mr. Donovan,

Holston Army Ammunition Plant (HSAAP) has completed pre-modification activities associated with the Corrective Action Order (CAO) modification request for Case Number 03-HCA003. The purpose of the modification will be to move Solid Waste Management Units (SWMUs) to their appropriate management table, amend groundwater sampling requirements, and make language clarifications as needed. The fee associated with this request was mailed on October 15, 2019 to the address listed on form CN-1261. A copy of the form is enclosed for your convenience.

HSAAP began the pre-modification process by publishing a public notice in the Rogersville Review and Kingsport Times News. The notices were originally published on August 7 and August 4, 2019 respectively. A revised notice was published in each paper on August 10 and August 8 respectively. The revised notice was also posted on the HSAAP Facebook page. The publication affidavits are enclosed for your convenience. The notice provided the information associated with the modification, the public meeting, and the comment period. The comment period ran from August 5 until October 11, 2019. No written comments were received.

The public meeting was held on August 22, 2019. Two individuals from the community participated along with three Army personnel and one Army Contractor. The sign-in sheet and meeting minutes are also attached to this letter for your convenience.

HSAAP looks forward to working with you on this modification. If you have any questions please contact Laura Peters, HSAAP Environmental Engineer, at phone: (423) 578-6193 or email: laura.l.peters15.civ@mail.mil.

Sincerely,

FOR THE COMMANDERS REPRESENTATIVE:

H. S. Shelton
Chemical Engineer

Holston Army Ammunition Plant
Corrective Action Order Modification Request
Community Meeting August 22, 2019

Name	Affiliation, If Applicable
Scott Shelton	HSAAP
David Light	Citizen Neighbor
Ron Schmidt	Neighbor
Rich Kinsella	USACE
Rick Van Allen	Bay West
Laura Peters	Army, HSAAP

Meeting Minutes

HSAAP Corrective Action Order Class III Modification Request

Community Meeting, 22 August 2019

On 22 August 2019, Holston Army Ammunition Plant (HSAAP) held a community meeting to present the requested modifications to the Corrective Action Order (CAO) and gather community input. The meeting began at 1805 and concluded at 1855. A total of six people were present at the meeting, two community members, two Army personnel from HSAAP, one Army representative from the Army Corps of Engineers (USACE), and one representative from Bay West. All personnel are listed on the attendee list (Attachment A). A facility map with all SWMUs was present at the front of the room for attendees to view.

The meeting began with a 29 slide presentation (Attachment B), which covered background information about the CAO and associated management and requested modifications. The slides began with introduction and background information before moving into the requested administrative and technical changes. Laura Peters of HSAAP and Rick Van Allen of Bay West presented. At the conclusion of the slide presentation, the community members were given an opportunity to ask questions or provide comments. A total of four questions/comments were received.

1. Q: In looking at the information, it appears that most of the groundwater sampling programs started in 2005. Is this from a change in the production/operations at the site, or when the majority of sampling began?

   A: 2005 is when the majority of groundwater sampling began at the site. If you recall back to the discussion on the SWMU 21 map, I indicated that the main sampling phase for the identified SWMUs was in 2000. When you take the Army funding cycle and just the time required to complete investigations, you end up in the 2004-2006 timeframe. And of course, the severity of the site and perceived contamination plays into that because we addressed what we thought were the worst sites first. So, that is why you see a lot of sampling starting in that time frame. As new sites are identified, then those sites start sampling later, like SWMU 109, we identified that site in 2014, so management of that site started much later.

2. Comment: Glad to see that you are separating out the sewer site into multiple areas. I believe this will allow you to have better response times and ability to address any issues. You should also consider adding flow directions of the lines to your GIS so that you can know how each line flows and trace any issues based on flow direction and isolate issues.

   A: Thank you, we will consider that. Our sewer lines are part of our GIS system.

3. Q: On the acetic acid spill, you said there were explosives like RDX released to the soil. What is the connection between RDX and the acetic acid? How did the explosives get in the acid?

A: Acetic acid is one of the main chemicals that we use here to make RDX. When RDX is first made, it is in the acetic acid. Once the initial RDX is formed, the acetic acid is taken out and we recycle it. Because the RDX was in the acid, the spent acid that is drained off still contains small amounts of RDX. We use pipelines to transport that spent acid back to the recycle building. Sometimes, as in all manufacturing settings, we have failures and releases, so if we have a release of acetic acid it may contain trace amounts of RDX.

Q: Ok, so RDX isn't a component of the acid, it's just in there in trace amounts until you recycle it?

A: Yes, acetic acid is basically vinegar and the RDX soil screening values are so low, trace amounts can cause us to have an exceedance that requires clean up. We don't see this too much with HMX, but we do for RDX.

4. Q: Is there a cost savings in the reduction of sampling that you are requesting?

A: Yes, but not as much as you might think. In some cases, we're still collecting samples from the wells where we're recommending a reduction in analytes, but the sample itself isn't a significant cost savings. Where we see cost savings is in labor; wells where we plan to extend the frequency to biennial represent the biggest cost savings. Whereas the wells where we're reducing the number of explosives we're looking for, nothing really changes. It's still the same sampling and analytical method, we're just not looking for some of the analytes anymore.

Rachel S. Goulet

From: Rachel S. Goulet
Sent: Friday, August 9, 2019 8:38 AM
Subject: Public Notice: Holston Army Ammunition Plant Requests Modification to Hazardous Waste Corrective Action Order - Kingsport, Sullivan Co.
Attachments: HSAAP CAO public notice_2019_FINAL_Rev 08062019.pdf

Bcc: grisabel169@gmail.com; steven_alexander@fws.gov; william.anderson@testamericainc.com; jerry.archer@woodplc.com; jarmour@wm.com; jbaines@lebanontn.org; asballew@tva.gov; smbanbury@gmail.com; cbarnett@ensafe.com; cbarney@stanford.edu; Bastek.Brian@epa.gov; tbeavers@bristoltn.org; wtbeckham@hotmail.com; iam2hawk@gmail.com; tom_blount@nps.gov; Mbooker@nespower.com; albowen@tva.gov; berlin.boyd@memphistn.gov; Stan Boyd; bradshawdoris@ymail.com; braggd@republicservices.com; robert.braisted@stantec.com; jbrock@johnsoncitytn.org; jbrooks@metalpha.com; jbrown@holliston.com; glbuchanan@cooperstandard.com; Clayton Bullington; rburnette@santekenviro.com; karinburnette@eastman.com; jburns@esclabsciences.com; Jamie Burroughs; mbutler@tnwf.org; rcall@mcminnco.net; ed.callaway@wallerlaw.com; larry.carpenter@logan-aluminum.com; Ed Carter; ocswd@ken-tennwireless.com; Vaughn Cassidy; info@eseng.us; chattanoogawq@chattanooga.gov; jcheely@usit.net; JohnClark@kingsporttn.gov; Jan Compton; pcoop@ensafe.com; repcoop86 @gmail.com; dcopeland@calvertstreet.com; ccraig@ftdd.org; rep.john.crawford@capitol.tn.gov; jwcropp@bakerdonelson.com; jackcunningham@charter.net; tcca.curtiss@tncounties.org; dianed@nirs.org; aletheia.davidson@wasteindustries.com; delonghoust@blomand.net; rdevin@perma-fix.com; Robert Dickinson; lditto@smeinc.com; charlesdixon@dixonservicesinc.com; Jennifer Dodd; a_dyson@msn.com; margeanes@yahoo.com; info@tcwn.org; phembody@spectraenergy.com; eshleman@energysolutions.com; evertcc@aol.com; shelly@southeasterntank.com; mfeierabend@bristoltn.org; fieldsm@y12.doe.gov; Michael A. Finks; magfleenor@gmail.com; Pat Flood; johnf@schoolfm.com; hhoilrecovery@yahoo.com; Albert Frakes; jfrazier@golder.com; dgang@tennessean.com; lgardner@tnwf.org; sidney.garland@ettp.doe.gov; nicolem.gates@gmail.com; elngibson@yahoo.com; rep.brenda.gilmore@capitol.tn.gov; mgnau@agruamerica.com; diane@ectmemphis.com; lgorenflo@gmail.com; sandra@sandrakgoss.com; tgreene@com-ins.com; bgriggs@griggsandmaloney.com; thomas.guleff@plaskolite.com; tom@gunnco.com; jguthrie@brightbridgeinc.org; jim@jimhackworth.com; tharrington@calvertstreetgroup.com; brett.harris@nissan-usa.com; gharvell@velsicol.com; swissman10@hotmail.com; jhastings@republicservices.com; kathy@tcwn.org; khembree@cityofalcoa-tn.gov; keyanahenning@yahoo.com; jim.herron@microcraft.aero; kfhickerson@tva.gov; rep.gary.hicks@capitol.tn.gov; dhigney@gkhpc.com; rep.timothy.hill@capitol.tn.gov; tdhinch@triadenv.com; barbarahinson@hotmail.com; mrjoehoffman@gmail.com; rholland@packagingcorp.com; holland_j@chattanooga.gov; jthorn@tva.gov; angela.hough@delta.com; tapidero@comcast.net; ms_hughes@bellsouth.net; adam@socm.org; rep.bud.hulsey@capitol.tn.gov; delta21@delta-21.com; jinman@wm.com; sjacobs@bonelaw.com; lejeffers@highland.net; zachary.johnson@knoxcounty.org; James Johnston; Chris.Jones@mountcarmeltn.gov; jconinc@frontiernet.net; mkelley@questarusa.com; joseph.r.kennedy3.civ@mail.mil; cindy.kennedy@mcnairycountytn.com; Joe Kennedy; nking@nespower.com; ed.krise@safety-kleen.com; William Krispin; akyle@wm.com;

Bcc: david.laband@teradata.com; Chris Lamb; elathon@fox17.com; vlay@springhilltn.org; Casey Lee; ruben@fibrexgroup.com; guy@usfusion.com; rtemem@bellsouth.net; rancherdon53@yahoo.com; jlukens@lukensengineering.com; sen.jon.lundberg@capitol.tn.gov; jared.lynn@nmm.nissan-usa.com; maddoxd@ornl.gov; mmahery@tml1.org; tinmaness@gmail.com; rmann@ftdd.org; dmarsh@darlenemarsh.com; gregg.w.martin@chemours.com; smayes@ccsliners.com; tmcclanahan@bassberry.com; cmccormack@srtsafety.com; Roger McCoy; mcijoann@gmail.com; wayne.mckinney@ettp.doe.gov; jmckoon@mwhfirm.com; david.mclaughlin@bandpent.com; can@tennlaw.com; mcnamarase@y12.doe.gov; jmcnama1@wm.com; jimmcnaughton@comcast.net; Merizalde.carlos@Epa.gov; namiller@memphis.edu; milton@smaweb.org; minkara_m@chattanooga.gov; wemaybeback2@hotmail.com; samlaw928@yahoo.com; moses3732@bellsouth.net; clintonneal@bellsouth.net; sen.frank.niceley@capitol.tn.gov; vnzengung@munirem.com; kathyoneely@gmail.com; Olparko@aol.com; bpaddock@twlakes.net; pearigen@LunaLawNashville.com; spenn@envstd.com; bpenny@burr.com; peretz@tennessee.edu; yputman@timesfreepress.com; markquarles@comcast.net; jquinton@republicservices.com; kim.raia@tennessee.edu; dartersteel@msn.com; jasonr.rpconsult@bellsouth.net; gregrice@gnmassoc.com; jroach@watsonroach.com; sales@grizzlycranes.com; Mike Robertson; trobin15 @wm.com; bob.rogers@shelbycountytn.gov; rogers_joshua@chattanooga.gov; jrothwell@titanenviron.com; awalkeriii@thewalkercompany.com; jim@aircaretech.com; greg.schaefer@ch2m.com; zces1@cox.net; c7z@ornl.gov; dsheumaker@griggsandmaloney.com; Debra Shults; msieracke@weaverboos.com; jsloan@microbac.com; hcsw@hardincountytn.net; rsteele@bakerdonelson.com; mstooksberry@utk.edu; mstrom@tiogaenv.com; whsummers@comcast.net; bswinford1@yahoo.com; rtant@shieldengineering.com; Chris P. Thompson; markhtoohey@gmail.com; btucker@smeinc.com; ron@santekenviro.com; rvenable@sullivancountytn.gov; michael.w.vestal@us.army.mil; swalker@energylogic.com; Eric Ward; watsoncompany@bellsouth.net; bcmayorirenewells@gmail.com; Steven Westerman; mkwilkins@bellsouth.net; harold.r.williams@chemours.com; jwilliams@tewlawfirm.com; cwilli9180@bellsouth.net; williamrwilson@gmail.com; swinter@ensafe.com; dusty@tana-na.com

NOTICE OF REQUEST TO MODIFY HOLSTON ARMY AMMUNITION PLANT CORRECTIVE ACTION ORDER

The Holston Army Ammunition Plant (HSAAP) is requesting a modification to the HSAAP Hazardous Waste Corrective Action Order, Case Number 03-HCA003. HSAAP (EPA ID TN5210020421) is located at 4509 West Stone Drive, Kingsport, Tennessee 37660. The Class 3 Modification will add final remedies for facility solid waste management units (SWMUs) and areas of concern (AOCs) and modify groundwater and surface water monitoring requirements.

A public meeting is scheduled for 6:00 pm to 8:00 pm, on August 22, 2019, and will be held at the East Tennessee State University (ETSU) Allandale Campus, Room 236, located at 1501 University Boulevard, Kingsport, TN. This meeting will be hosted by representatives from Holston Army Ammunition Plant. The purpose of this meeting is to inform the community of the proposed changes to facilitate meaningful input. Please note that only comments associated with the Corrective Action Program at HSAAP will be addressed. If you may need special access to participate in this meeting, please call 423-578-6285 at least 72 hours in advance.

Copies of proposed modifications and the fact sheet are available for public inspection at the Church Hill Public Library, 412 East Main Blvd., Church Hill, TN 37600 (423357-4591) and at the Kingsport Public Library, 400 Broad St., Kingsport, TN 37600 (423-229-9489).

Any interested person may submit written comments on the proposed modification by contacting: Kathy Cole, HSAAP Staff Action Specialist, 4509 W. Stone Drive, Kingsport, Tennessee 37660 (423-578-6285) or e-mail to kathy.o.cole.civ@mail.mil . **The comments,** under Rule 0400-12-01-.07(7)(f), **must be received by 4:30 p.m., Friday, October 11, 2019**, to assure consideration.

Holston Army Ammunition Plant
Corrective Action Order Modification Request
Community Meeting August 22, 2019

Name	Affiliation, If Applicable
Scott Shelton	HSAAP
David Light	Citizen Neighbor
Ravi Schmidt	Neighbor
Rich Kinsella	USACE
Rick Van Allen	Bay West
Laura Peters	Army, HSAAP

Meeting Minutes

HSAAP Corrective Action Order Class III Modification Request

Community Meeting, 22 August 2019

On 22 August 2019, Holston Army Ammunition Plant (HSAAP) held a community meeting to present the requested modifications to the Corrective Action Order (CAO) and gather community input. The meeting began at 1805 and concluded at 1855. A total of six people were present at the meeting, two community members, two Army personnel from HSAAP, one Army representative from the Army Corps of Engineers (USACE), and one representative from Bay West. All personnel are listed on the attendee list (Attachment A). A facility map with all SWMUs was present at the front of the room for attendees to view.

The meeting began with a 29 slide presentation (Attachment B), which covered background information about the CAO and associated management and requested modifications. The slides began with introduction and background information before moving into the requested administrative and technical changes. Laura Peters of HSAAP and Rick Van Allen of Bay West presented. At the conclusion of the slide presentation, the community members were given an opportunity to ask questions or provide comments. A total of four questions/comments were received.

1. Q: In looking at the information, it appears that most of the groundwater sampling programs started in 2005. Is this from a change in the production/operations at the site, or when the majority of sampling began?

   A: 2005 is when the majority of groundwater sampling began at the site. If you recall back to the discussion on the SWMU 21 map, I indicated that the main sampling phase for the identified SWMUs was in 2000. When you take the Army funding cycle and just the time required to complete investigations, you end up in the 2004-2006 timeframe. And of course, the severity of the site and perceived contamination plays into that because we addressed what we thought were the worst sites first. So, that is why you see a lot of sampling starting in that time frame. As new sites are identified, then those sites start sampling later, like SWMU 109, we identified that site in 2014, so management of that site started much later.

2. Comment: Glad to see that you are separating out the sewer site into multiple areas. I believe this will allow you to have better response times and ability to address any issues. You should also consider adding flow directions of the lines to your GIS so that you can know how each line flows and trace any issues based on flow direction and isolate issues.

   A: Thank you, we will consider that. Our sewer lines are part of our GIS system.

3. Q: On the acetic acid spill, you said there were explosives like RDX released to the soil. What is the connection between RDX and the acetic acid? How did the explosives get in the acid?

A: Acetic acid is one of the main chemicals that we use here to make RDX. When RDX is first made, it is in the acetic acid. Once the initial RDX is formed, the acetic acid is taken out and we recycle it. Because the RDX was in the acid, the spent acid that is drained off still contains small amounts of RDX. We use pipelines to transport that spent acid back to the recycle building. Sometimes, as in all manufacturing settings, we have failures and releases, so if we have a release of acetic acid it may contain trace amounts of RDX.

Q: Ok, so RDX isn't a component of the acid, it's just in there in trace amounts until you recycle it?

A: Yes, acetic acid is basically vinegar and the RDX soil screening values are so low, trace amounts can cause us to have an exceedance that requires clean up. We don't see this too much with HMX, but we do for RDX.

4. Q: Is there a cost savings in the reduction of sampling that you are requesting?

A: Yes, but not as much as you might think. In some cases, we're still collecting samples from the wells where we're recommending a reduction in analytes, but the sample itself isn't a significant cost savings. Where we see cost savings is in labor; wells where we plan to extend the frequency to biennial represent the biggest cost savings. Whereas the wells where we're reducing the number of explosives we're looking for, nothing really changes. It's still the same sampling and analytical method, we're just not looking for some of the analytes anymore.

Rachel S. Goulet

From: Rachel S. Goulet
Sent: Friday, August 9, 2019 8:38 AM
Subject: Public Notice: Holston Army Ammunition Plant Requests Modification to Hazardous Waste Corrective Action Order - Kingsport, Sullivan Co.
Attachments: HSAAP CAO public notice_2019_FINAL_Rev 08062019.pdf

Bcc: grisabel169@gmail.com; steven_alexander@fws.gov; william.anderson@testamericainc.com; jerry.archer@woodplc.com; jarmour@wm.com; jbaines@lebanontn.org; asballew@tva.gov; smbanbury@gmail.com; cbarnett@ensafe.com; cbarney@stanford.edu; Bastek.Brian@epa.gov; tbeavers@bristoltn.org; wtbeckham@hotmail.com; iam2hawk@gmail.com; tom_blount@nps.gov; Mbooker@nespower.com; albowen@tva.gov; berlin.boyd@memphistn.gov; Stan Boyd; bradshawdoris@ymail.com; braggd@republicservices.com; robert.braisted@stantec.com; jbrock@johnsoncitytn.org; jbrooks@metalpha.com; jbrown@holliston.com; glbuchanan@cooperstandard.com; Clayton Bullington; rburnette@santekenviro.com; karinburnette@eastman.com; jburns@esclabsciences.com; Jamie Burroughs; mbutler@tnwf.org; rcall@mcminnco.net; ed.callaway@wallerlaw.com; larry.carpenter@logan-aluminum.com; Ed Carter; ocswd@ken-tennwireless.com; Vaughn Cassidy; info@eseng.us; chattanoogawq@chattanooga.gov; jcheely@usit.net; JohnClark@kingsporttn.gov; Jan Compton; pcoop@ensafe.com; repcoop86 @gmail.com; dcopeland@calvertstreet.com; ccraig@ftdd.org; rep.john.crawford@capitol.tn.gov; jwcropp@bakerdonelson.com; jackcunningham@charter.net; tcca.curtiss@tncounties.org; dianed@nirs.org; aletheia.davidson@wasteindustries.com; delonghoust@blomand.net; rdevin@perma-fix.com; Robert Dickinson; lditto@smeinc.com; charlesdixon@dixonservicesinc.com; Jennifer Dodd; a_dyson@msn.com; margeanes@yahoo.com; info@tcwn.org; phembody@spectraenergy.com; eshleman@energysolutions.com; evertcc@aol.com; shelly@southeasterntank.com; mfeierabend@bristoltn.org; fieldsm@y12.doe.gov; Michael A. Finks; magfleenor@gmail.com; Pat Flood; johnf@schoolfm.com; hhoilrecovery@yahoo.com; Albert Frakes; jfrazier@golder.com; dgang@tennessean.com; lgardner@tnwf.org; sidney.garland@ettp.doe.gov; nicolem.gates@gmail.com; elngibson@yahoo.com; rep.brenda.gilmore@capitol.tn.gov; mgnau@agruamerica.com; diane@ectmemphis.com; lgorenflo@gmail.com; sandra@sandrakgoss.com; tgreene@com-ins.com; bgriggs@griggsandmaloney.com; thomas.guleff@plaskolite.com; tom@gunnco.com; jguthrie@brightbridgeinc.org; jim@jimhackworth.com; tharrington@calvertstreetgroup.com; brett.harris@nissan-usa.com; gharvell@velsicol.com; swissman10@hotmail.com; jhastings@republicservices.com; kathy@tcwn.org; khembree@cityofalcoa-tn.gov; keyanahenning@yahoo.com; jim.herron@microcraft.aero; kfhickerson@tva.gov; rep.gary.hicks@capitol.tn.gov; dhigney@gkhpc.com; rep.timothy.hill@capitol.tn.gov; tdhinch@triadenv.com; barbarahinson@hotmail.com; mrjoehoffman@gmail.com; rholland@packagingcorp.com; holland_j@chattanooga.gov; jthorn@tva.gov; angela.hough@delta.com; tapidero@comcast.net; ms_hughes@bellsouth.net; adam@socm.org; rep.bud.hulsey@capitol.tn.gov; delta21@delta-21.com; jinman@wm.com; sjacobs@bonelaw.com; lejeffers@highland.net; zachary.johnson@knoxcounty.org; James Johnston; Chris.Jones@mountcarmeltn.gov; jconinc@frontiernet.net; mkelley@questarusa.com; joseph.r.kennedy3.civ@mail.mil; cindy.kennedy@mcnairycountytn.com; Joe Kennedy; nking@nespower.com; ed.krise@safety-kleen.com; William Krispin; akyle@wm.com;

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NOTICE OF REQUEST TO MODIFY HOLSTON ARMY AMMUNITION PLANT CORRECTIVE ACTION ORDER

The Holston Army Ammunition Plant (HSAAP) is requesting a modification to the HSAAP Hazardous Waste Corrective Action Order, Case Number 03-HCA003. HSAAP (EPA ID TN5210020421) is located at 4509 West Stone Drive, Kingsport, Tennessee 37660. The Class 3 Modification will add final remedies for facility solid waste management units (SWMUs) and areas of concern (AOCs) and modify groundwater and surface water monitoring requirements.

A public meeting is scheduled for 6:00 pm to 8:00 pm, on August 22, 2019, and will be held at the East Tennessee State University (ETSU) Allandale Campus, Room 236, located at 1501 University Boulevard, Kingsport, TN. This meeting will be hosted by representatives from Holston Army Ammunition Plant. The purpose of this meeting is to inform the community of the proposed changes to facilitate meaningful input. Please note that only comments associated with the Corrective Action Program at HSAAP will be addressed. If you may need special access to participate in this meeting, please call 423-578-6285 at least 72 hours in advance.

Copies of proposed modifications and the fact sheet are available for public inspection at the Church Hill Public Library, 412 East Main Blvd., Church Hill, TN 37600 (423357-4591) and at the Kingsport Public Library, 400 Broad St., Kingsport, TN 37600 (423-229-9489).

Any interested person may submit written comments on the proposed modification by contacting: Kathy Cole, HSAAP Staff Action Specialist, 4509 W. Stone Drive, Kingsport, Tennessee 37660 (423-578-6285) or e-mail to kathy.o.cole.civ@mail.mil . **The comments,** under Rule 0400-12-01-.07(7)(f), **must be received by 4:30 p.m., Friday, October 11, 2019**, to assure consideration.

Technical Memorandum
Corrective Action Order Class 3 Modification
Holston Army Ammunition Plant
Kingsport, TN
EPA ID Number TN5 21 002 0421

HSAAP requests modification of the CAO to incorporate the following changes/corrections. The specific modifications requested are listed below and in the attached redlined copy of the CAO.

A. Appendix A – Table Revisions

(1) Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this time.

- Add SWMU 25 – Area B Tar Burial Site;
- Add SWMU 110 spill site
- Incorporate SWMU 1 reclassification.
- Incorporate SWMU 3 reclassification. These changes to Table A-1(a) are too numerous to show in this technical memorandum, see the revisions to Table A-1(a) in the CAO text.

SWMU/AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	NFA Documentation
25	**Area B Tar Burial Site**	**Unit managed coal tar and fly ash**	**1978-1980**	**Interim Measures Report; NFA approval DSWM – 10/31/13**
110	**Acetic Acid Spill near 3E4**	**Acetic acid/explosives pipeline expansion joint rupture**	**July 2013**	**Interim Measures Report; NFA DSWM approval – Nov 2017**
1A~~1~~	Industrial Sewer	This unit consists of sumps, drains and underground/aboveground pipes located throughout Area~~s~~ A ~~and B~~.	1942–Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
1B	**Industrial Sewer**	**This unit consists of sumps, drains and underground/aboveground pipes located throughout Area B.**	**1942–Present**	**Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00**
1C	**Industrial Sewer**	**This unit consists of sumps, drains and underground/aboveground pipes located throughout the interplant rail corridor.**	**1942–Present**	**Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00**

(2) Table A-1(b) – List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this time. These Units are Currently Regulated Under Another Program:

- Delete SWMUs 21 and 23 from Table A-1(b) and move them to Table A-6. HSAAP previously thought these SWMUs were managed by the Johnson City Field Office. They both need a Statement of Basis.

SWMU/AOC	SWMU/AOC Name	Unit Comment	Dates of Operation
~~21~~	~~Rock Dam Landfill~~	~~Unit managed demolition and excavation wastes, scrap metal, wooden debris and domestic refuse. Regulated by TDEC Johnson City DSWM Field Office. Unit closed – 10/31/83~~	~~1966-1983~~
~~23~~	~~Former Fly Ash Landfill~~	~~Unit is a 7-acre unlined clay capped landfill that received fly ash. Regulated by TDEC Johnson City DSWM Field Office.~~	~~1977-1984~~

(3) Table A-6 – List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Implementation of a Corrective Action Remedy:

- Delete SWMU 25 (moving to Table A-1(a)), granted NFA in the CMI approval letter dated October 31, 2013 with subsequent Statement of Basis Support Document submitted April 6, 2015),
- Add SWMU 109 (CMI complete in October 2017 and subsequent Statement of Basis Support Document submitted April 2, 2018),
- Add SWMUs 21 and 23. HSAAP previously thought these SWMUs were managed by Johnson City Field Office, move from Table A-1(b). Statement of Basis Support Document for SWMU 21 approved by TDEC April 2, 2018, SWMU 23 pending approval by TDEC.,
- Incorporate SWMU 3 reclassification. These changes to Table A-6 are too numerous to show in this technical memorandum, see the revisions to Table A-6 in the CAO text.

SWMU/AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	Remedy
21	**Rock Dam Landfill**	**Unit managed demolition and excavation wastes, scrap metal, wooden debris and domestic refuse. Unit closed – 10/31/83**	**1966-1983**	**Institutional Controls and Inspections**
23	**Former Fly Ash Landfill**	**Unit is a 7-acre unlined clay capped landfill that received fly ash.**	**1977-1984**	**Institutional Controls and Inspections**

~~25~~	~~Area B Tar Burial Site~~	~~Unit managed coal tar and fly ash~~	~~1978-1980~~	~~Institutional Controls and Inspections~~
109	**WW II Coal Tar Site**	**Unit managed coal tar**	**Early 1940s**	**Institutional Controls and Inspections**

(4) Table A-7 – List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Implementation of a Corrective Action Remedy:

- Incorporate SWMU 3 reclassification. These changes to Table A-7 are too numerous to show in this technical memorandum, see the revisions to Table A-7 in the CAO text.

B. Appendix F Revisions

(1) Appendix F, Page 1, Site Description. Revise the text in paragraph 3 to account for SWMU 25 and SWMU 110 receiving NFA, SWMU 3 and SWMU 1 being reclassified (subdivided), and the addition of SWMUs 109, 21 and 23 to Table A-6. The revised paragraph reads as follows:

*The tables in Appendix A provide the requirements for all the solid waste management units (SWMUs) and areas of concern (AOCs) at HSAAP. Figures 3 through 6 depict the locations of these units. Specifically, there are ~~77~~ **143** SWMUs and ~~13~~ AOCs that require no further action under this order at this time **(Table A-1(a)**. There are no SWMUs or AOCs that require confirmatory sampling **(Table A-2)**, a RCRA facility investigation **(Table A-3)**, interim measures **(Table A-4)**, or a corrective measures study **(Table A-5)**. The ~~24~~ **81** SWMUs/~~ and two~~ AOCs requiring implementation of a corrective action remedy are listed in Appendix A, Tables A-6 and A-7. As detailed in paragraph II.I.2, on order attachment page 21, additional investigation and other possible remedial actions, may be necessary for the ~~five~~ **46** operationally active units listed in Table A-7. Those actions shall be addressed during unit or plant closure.*

(2) Appendix F, Page 2, I. D. Revise the following sentence so it is clear that a safety permit is not required for landfill repairs:

> *"The 24-hour requirement ~~may~~ **shall** be waived in the event of **landfill repairs or** an emergency response."*

(3) Appendix F, Page 4, III. B. Change references to Table G-3 to proposed Table G-2.

(4) Figures

Figures 1 - 6 – Updated all CAO figures to new GIS formatting.

Figure 4 – Remove building/area labels per BAE security request.

Figure 5 – Add SWMU 109 and SWMU 110. Removed building/area labels from SWMU 3 per BAE security request and depict SWMU 3 as the entire production area.

Figure 6 – Remove wells MW-55 and MW-114 from the figure, they've been recommended for elimination from the sampling schedule.

C. Appendix G Text Revisions

(1) Appendix G, Page 1, I, second paragraph. This paragraph has been revised to reflect the correct number of wells after the recommended deletion of MW-55 and MW-114. The paragraph now reads:

There are ~~**seven**~~ **five** interior wells at Area B **that** ~~**Six of the interior wells**~~ monitor source trends~~**; the seventh well is an upgradient well which serves as a background well**~~. There are ~~**four**~~ **three** boundary wells at the Area B landfill area downgradient of SWMUs 19/29 and 20. There are twelve boundary wells at the Area B production and shops area including four co-located well pairs to monitor unconsolidated and bedrock intervals, and an additional two unconsolidated and two bedrock wells. There are four boundary monitoring wells at Area A, which are downgradient of legacy sources and upgradient of the South Fork of the Holston River.

(2) Appendix G, Page 1, Section II. Recommend deleting the second paragraph of Section II Target Analytes and Groundwater Protection Standards in its entirety because it's redundant with Appendix F Section II. D.

(3) Appendix G, Page 2, Section III. C. Revise the wording of this paragraph so that this section corresponds with text elsewhere in the CAO where it says to use most recent analytical methods:

> *"C.* ***If not specified in this order, laboratory methods must be those specified in the most recent version of Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846 which can be found at https://www.epa.gov/hw-sw846, or an equivalent method approved by the Commissioner. The most current of the*** *following USEPA analytical methods shall be used:"*

(4) Appendix G, Page 2, Section III. C. 4. Updated item 4 so that the text matches what is in the Table G-2 as follows:

> *4.* ***Explosives including*** *RDX and RDX Degradation Compounds – SW-846 8330*

(5) Appendix G, Page 3, Section III. C.

Remove letter designations following SW846 laboratory analytical methods in bullet 1 (8260~~B~~), bullet 2 (8270~~C~~), bullet 3 (6010~~B~~), bullet 5 (8081~~A~~), and bullet 6 (8141~~A~~).

D. Appendix G Table Revisions

(1) Delete unneeded LTM and analysis in accordance with TDEC Rule 0400-12-01-.06(6)(k)6 (Rule pages 46 and 47) which states that the Army can petition to discontinue analytes after three consecutive years below the MCL (see attached **Table 1** with recommended LTM changes).

We propose to revise the target analyte list for the following monitoring wells: MW-48, -115, -116, -68, -101, -101B, -11, -11B, -102, -102B, -S1A, -91, -91B, STMW-15, GM-12, GM-14, MW-99, -73, -75, and -86.

Eliminate the following wells from the sampling program: MW-55 and MW-114 (these wells will continue to be maintained and inspected for future sampling as necessary).

Change the sampling frequency from semi-annual to biennial at MW-104, -105, -106, and -107 on even-numbered years.

Change the sampling frequency for all Area B boundary wells (MW-101, MW-101B, MW-11, MW-11B, MW-102, MW-102B, MW-S1A, MW-91, MW-91B, STMW-15, GM-12, and GM-14, to biennial on even numbered years.

(2) Table G-2. Combine previous Tables G-2 and G-3 into proposed new Table G-2 to eliminate the conflict and redundancy between the two tables. For example, Table G-2 lists analytical suites and a list of metals in the footnotes, while Table G-3 lists specific target analytes.

(3) Table G-3. Delete table.

TABLE 1 - HSAAP Recommended Future CAO Modifications for LTM (recommended changes are highlighted yellow)

Source Area	Source Unit	Sample Location	Sampling Frequency Recommendation			Chemical Compound Class	Target Analyte	CAO Modification Recommendations
			Semiannual (spring and fall)	Annual (spring)	Biennial (spring of even-numbered years)			
Area A	SWMU 96	MW-104			X	VOCs	Benzene	Revise sampling frequency to biennial because these target analytes have never been detected above standards since monitoring began in 2008 (21 sampling events). Monitoring cannot be eliminated because coal tar source remains in place.
							Methylene chloride	
						SVOCs	Naphthalene	
		MW-105			X	VOCs	Benzene	Revise sampling frequency to biennial because these target analytes have never been detected above standards since monitoring began in 2008 (21 sampling events). Monitoring cannot be eliminated because coal tar source remains in place.
							Methylene chloride	
						SVOCs	Naphthalene	
		MW-106			X	VOCs	Benzene	Revise sampling frequency to biennial because these target analytes have never been detected above standards since monitoring began in 2008 (21 sampling events). Monitoring cannot be eliminated because soil coal tar source remains in place.
							Methylene chloride	
						SVOCs	Naphthalene	
		MW-107			X	VOCs	Benzene	Revise sampling frequency to biennial because these target analytes have never been detected above standards since monitoring began in 2008 (21 sampling events). Monitoring cannot be eliminated because coal tar source remains in place.
							Methylene chloride	
						SVOCs	Naphthalene	
Area B Landfill Areas	Upgradient	MW-55				SVOCs	Bis(2-ethylhexyl)phthalate	Recommend ending active sampling of MW-55. This is an up-gradient well with a history of non-detects. Groundwater analytical for Holston is not compared against background and the data from this well is not providing useful information with respect to groundwater quality. In addition, all SVOCs and metals sampled at this well have been non-detect since 2008.
							Dibenzofuran	
							Fluorene	
							2-Methylnaphthalene	
							Naphthalene	
							n-Nitrosodiphenylamine	
						Metals	Arsenic	
							Chromium (total)	
							Lead	
	SWMUs 19/29	MW-48	X			SVOCs/PAHs	Bis(2-ethylhexyl)phthalate	Continue monitoring as currently described in the CAO because of a recent exceedance (Spring 2016) of criteria in a downgradient well (MW-116)
							Dibenzofuran	Continue monitoring as currently described in the CAO because of historical fluctuations of this analyte above and below the screening criteria (5.8 µg/L).
							Fluorene	Eliminate fluorene monitoring because it has not been detected above standards (220 µg/L) in MW-48 since 2005 (25 sampling events).
							2-Methylnaphthalene	Eliminate 2-methylnaphthalene monitoring because it has not been detected above standards (27 µg/L) in MW-48 since April 2014 (8 sampling events).
							Naphthalene	Continue monitoring as currently described in the CAO due to recent exceedances between 2015 through 2017 in well MW-48
							n-Nitrosodiphenylamine	Continue monitoring as currently described in the CAO due to an exceedance of the standard (10 µg/L) in March 2018.
						Metals	Arsenic	Eliminate arsenic monitoring because it has not been detected above standard (10 µg/L) in MW-48 since May 2015.
							Lead	Continue monitoring as currently described in the CAO due to a recent exceedance in a downgradient well (MW-115) in Fall 2016
		MW-114				SVOCs	Bis(2-ethylhexyl)phthalate	Eliminate monitoring because boundary wells MW-115 and MW-116 are sufficient to monitor the SVOC source area and no target analytes have been detected in this monitoring well above screening criteria since 2005.
							Dibenzofuran	
							Fluorene	
							2-Methylnaphthalene	
							Naphthalene	
							n-Nitrosodiphenylamine	
						Metals	Arsenic	
							Lead	

TABLE 1 - HSAAP Recommended Future CAO Modifications for LTM (continued)

Source Area	Source Unit	Sample Location	Sampling Frequency: Semiannual (spring and fall)	Sampling Frequency: Annual (spring)	Sampling Frequency: Biennial (spring of even-numbered years)	Chemical Compound Class	Target Analyte	CAO Modification Recommendations
Area B Landfill Areas (continued)	SWMUs 19/29 (continued)	MW-115	X		X	SVOCs	Bis(2-ethylhexyl)phthalate	Continue monitoring as currently described in the CAO because of a recent exceedance (Spring 2016) of criteria in a downgradient well (MW-116)
							Dibenzofuran	Eliminate dibenzofuran monitoring because it has not been detected at MW-115 above standards (5.8 ug/L) since 2006 (25 sampling events).
							Fluorene	Eliminate fluorene monitoring because it has not been detected at MW-115 since monitoring began in 2006 (25 sampling events).
							2-Methylnaphthalene	Eliminate 2-methylnaphthalene monitoring because it has not been detected at MW-115 since monitoring began 2006 (25 sampling events.
							Naphthalene	Continue monitoring naphthalene as currently described in the CAO due to recent exceedances between 2015 through 2017 in well MW-48.
							n-Nitrosodiphenylamine	Eliminate n-Nitrosodiphenylamine monitoring because it has not been detected at MW-115 above standards (10 ug/L) since monitoring began in 2006 (25 sampling events).
						Metals	Arsenic	Eliminate arsenic monitoring because it has not been detected at MW-115 exceeding the standard (10 ug/L) since Sep 2009 (17 sampling events).
							Lead	Continue monitoring as currently described in the CAO due to a recent exceedance in a downgradient well (MW-115) in Fall 2016
		MW-116	X		X	SVOCs	Bis(2-ethylhexyl)phthalate	Continue monitoring as currently described in the CAO because of a recent exceedance (Spring 2016) of criteria in a downgradient well (MW-116)
							Dibenzofuran	Eliminate dibenzofuran monitoring because it has not been detected above standards (5.8 ug/L) at MW-116 since monitoring began in 2006 (25 sampling events).
							Fluorene	Eliminate fluorene monitoring because it has not been detected above standards (220 µg/L) at MW-116 since monitoring began in 2006 (25 sampling events).
							2-Methylnaphthalene	Eliminate 2-methylnaphthalene monitoring because it has not been detected above standards (27 µg/L) at MW-116 since monitoring began in 2006 (25 sampling events).
							Naphthalene	Continue monitoring naphthalene as currently described in the CAO due to recent exceedances between 2015 through 2017 in well MW-48
							n-Nitrosodiphenylamine	Eliminate n-Nitrosodiphenylamine monitoring because it has not been detected at MW-116 above standards (10 ug/L) since monitoring began in 2006 (25 sampling events).
						Metals	Arsenic	Eliminate arsenic monitoring because it has not been detected at MW-116 above standards (10 ug/L) since monitoring began in 2006 (25 sampling events).
							Lead	Continue monitoring as currently described in the CAO due to a recent exceedance in a downgradient well (MW-115) in Fall 2016
	SWMU 20	MW-68	X		X	Explosives	RDX	Continue monitoring as currently described in the CAO due to recent exceedances between 2015 through 2017 in well MW-68
						RDX MNA[a]	DNX	None at this time, these constituents provide important information on degradation. Note that these three constituents are not listed in the 2013 CAO, Table G-3. They will be listed in the new combined Table G-2 for the current CAO modification.
							MNX	
							TNX	
						Metals	Arsenic	Eliminate arsenic monitoring because it has not been detected above standards (10 µg/L) in MW-68 since monitoring began in 2005 (27 sampling events).
							Chromium (total)	Eliminate total chromium monitoring because it has not been detected above standards (11 µg/L) in MW-68 since 2013 (18 µg/L), 9 consecutive sampling events.
Area B Explosives Production and Shop Area	Boundary Wells	MW-101			X	Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; and 4-amino-2,6-dinitrotoluene monitoring because there have been no exceedances of screening criteria and no detections above laboratory reporting limits since sampling began in 2005 (11 sampling events).
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring due to a recent exceedance in Spring 2017, reduce sampling to biennial.
							RDX	Continue monitoring to ensure RDX is not migrating to the boundary wells, reduce sampling to biennial.

TABLE 1 - HSAAP Recommended Future CAO Modifications for LTM (continued)

Source Area	Source Unit	Sample Location	Sampling Frequency: Semiannual (spring and fall)	Sampling Frequency: Annual (spring)	Sampling Frequency: Biennial (spring of even-numbered years)	Chemical Compound Class	Target Analyte	CAO Modification Recommendations
Area B Explosives Production and Shop Area (continued)	Boundary Wells (continued)	MW-101B			X	Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; 4-amino-2,6-dinitrotoluene monitoring because they have not been detected above standards for three consecutive sampling events, 2014, 2016, and 2018.
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring as currently described in the CAO due to a recent exceedance in Spring 2017. Keep nitroglycerin for all boundary wells due to detection at MW-101.
							RDX	Continue monitoring as currently described in the CAO to ensure RDX is not migrating to the boundary wells
		MW-11			X	Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; 4-amino-2,6-dinitrotoluene monitoring because there have been at least three rounds of sampling with no screening criteria exceedances, 2014, 2015, 2016, 2017, and 2018.
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring due to a recent exceedance in Spring 2017, reduce sampling to biennial.
							RDX	Continue monitoring to ensure RDX is not migrating to the boundary wells, reduce sampling to biennial.
		MW-11B			X	Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; 4-amino-2,6-dinitrotoluene monitoring because they will have not been detected above standards for three consecutive sampling events, 2014, 2016, and 2018.
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring as currently described in the CAO due to a recent exceedance in Spring 2017
							RDX	Continue monitoring as currently described in the CAO to ensure RDX is not migrating to the boundary wells
		MW-102			X	Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; 4-amino-2,6-dinitrotoluene monitoring because there have been three rounds of sampling with no screening criteria exceedances (11 sampling events since 2005).
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring due to a recent exceedance in Spring 2017, reduce sampling to biennial.
							RDX	Continue monitoring to ensure RDX is not migrating to the boundary wells, reduce sampling to biennial.
		MW-102B			X	Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; 4-amino-2,6-dinitrotoluene monitoring because they will have not been detected above standards for three consecutive sampling events, 2014, 2016, 2018.
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring as currently described in the CAO due to a recent exceedance in Spring 2017
							RDX	Continue monitoring as currently described in the CAO to ensure RDX is not migrating to the boundary wells
		MW-S1A			X	Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; 4-amino-2,6-dinitrotoluene monitoring because there have been at least three rounds of sampling with no screening criteria exceedances beginning in 2005 (11 sampling events).
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring due to a recent exceedance in Spring 2017, reduce sampling to biennial.
							RDX	Continue monitoring to ensure RDX is not migrating to the boundary wells, reduce sampling to biennial.

TABLE 1 - HSAAP Recommended Future CAO Modifications for LTM (continued)

Source Area	Source Unit	Sample Location	Sampling Frequency: Semiannual (spring and fall)	Sampling Frequency: Annual (spring)	Sampling Frequency: Biennial (spring of even-numbered years)	Chemical Compound Class	Target Analyte	CAO Modification Recommendations
Area B Explosives Production and Shop Area (continued)	Boundary Wells (continued)	MW-91			X	Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; 4-amino-2,6-dinitrotoluene monitoring because there have been at least three rounds of sampling with no screening criteria exceedances beginning in 2005 (11 sampling events).
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring due to a recent exceedance in Spring 2017, reduce sampling to biennial.
							RDX	Continue monitoring to ensure RDX is not migrating to the boundary wells, reduce sampling to biennial.
		MW-91B			X	Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; 4-amino-2,6-dinitrotoluene monitoring because they will have not been detected above standards for three consecutive sampling events, 2014, 2016, and 2018.
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring as currently described in the CAO due to a recent exceedance in Spring 2017
							RDX	Continue monitoring as currently described in the CAO to ensure RDX is not migrating to the boundary wells
		STMW-15			X	Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; 4-amino-2,6-dinitrotoluene monitoring because there have been three rounds of sampling with no screening criteria exceedances beginning in 2005 (11 sampling events).
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring due to a recent exceedance in Spring 2017, reduce sampling to biennial.
							RDX	Continue monitoring to ensure RDX is not migrating to the boundary wells, reduce sampling to biennial.
						BTEX	Benzene	These parameters are analyzed at STMW-15 to assess for releases of petroleum-related VOCs associated with the SWMU 50 solvent burn tank unit. Recommend eliminating BTEX monitoring because they have not been detected above laboratory reporting limits for more than 3 years beginning in 2008 (11 sampling events).
							Toluene	
							Ethylbenzene	
							Xylenes	
		GM-12			X	Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; 4-amino-2,6-dinitrotoluene monitoring because they will have not been detected above standards for three consecutive sampling events, 2014, 2016, and 2018.
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring as currently described in the CAO due to a recent exceedance in Spring 2017
							RDX	Continue monitoring as currently described in the CAO to ensure RDX is not migrating to the boundary wells
		GM-14			X	Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; 4-amino-2,6-dinitrotoluene monitoring because they will have not been detected above standards for three consecutive sampling events, beginning in 2005 (9 sampling events).
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring as currently described in the CAO due to a recent exceedance in Spring 2017
							RDX	Continue monitoring as currently described in the CAO to ensure RDX is not migrating to the boundary wells

TABLE 1 - HSAAP Recommended Future CAO Modifications for LTM (continued)

Source Area	Source Unit	Sample Location	Sampling Frequency			Chemical Compound Class	Target Analyte	CAO Modification Recommendations
			Semiannual (spring and fall)	Annual (spring)	Biennial (spring of even-numbered years)			
Area B Explosives Production and Shop Area (continued)	Explosives Production Area	MW-99		X		Explosives	2,4-Dinitrotoluene	Eliminate 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; 2-amino-4,6-dinitrotoluene; 4-amino-2,6-dinitrotoluene monitoring because there have been three rounds of sampling with no screening criteria exceedances, beginning in 2005 (11 sampling events).
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	Continue monitoring as currently described in the CAO due to a recent exceedance in Spring 2017
							RDX	Continue monitoring as currently described in the CAO to monitor the RDX source area
						RDX MNA[a]	DNX	None at this time. Note that these three constituents are not listed in Table G-3 of the CAO Modification; however, these constituents provide important information on degradation.
							MNX	
							TNX	
	SWMU 18	MW-70		X		Metals	Mercury	Continue monitoring as currently described in the CAO due to a recent exceedance in Spring 2016
	SWMUs 77/78/86/87	MW-73		X		Pesticides	alpha-Chlordane	Eliminate chlordane monitoring because it has not been detected above standards for more than 3 years. Chlordane is not a COC at this site and was added during last CAO modification. No chlordane exceedances since 2005, 18 sampling events.
							gamma-Chlordane	
							Dieldrin	Continue monitoring as currently described in the CAO due to recent exceedances of criteria
							Bromacil	Eliminate bromacil monitoring because it has not been detected above standards for more than 3 years (2014, 2015, 2016, 2017). Bromacil is not a COC at this site and was added during last CAO modification. This compound was previously eliminated as a COC for this site.
		MW-75		X		Pesticides	alpha-Chlordane	Eliminate chlordane monitoring because it has not been detected above standards for more than 3 years. Chlordane is not a COC at this site and was added during last CAO modification. No chlordane exceedances since 2005, 18 sampling events.
							gamma-Chlordane	
							Dieldrin	Continue monitoring as currently described in the CAO due to recent exceedances of criteria
							Bromacil	Eliminate bromacil monitoring because it has not been detected above standards for more than 3 years (2014, 2015, 2016, 2017). Bromacil is not a COC at this site and was added during last CAO modification. This compound was previously eliminated as a COC for this site.
	SWMU 88	MW-86		X		Pesticides	alpha-Chlordane	Eliminate chlordane monitoring because it has not been detected above standards for more than 3 years No chlordane exceedances since 2005, 12 sampling events. Chlordane is not a COC at this site and was added during the last CAO mod. This compound was previously eliminated as a COC for this site.
							gamma-Chlordane	
							Dieldrin	Continue monitoring as currently described in the CAO due to the presence soil contaminants (aldrin and dieldrin) exceeding residential PRGs (waste remains in place).
							Bromacil	Eliminate bromacil monitoring because it has not been detected above standards for more than 3 years, the data suggests a stable or decreasing trend, and there is no evidence of a residual source area (i.e. no waste in place). Last detection above the standard (70 µg/L) in Mar 2009, 8 consecutive sampling events below the standard.

TABLE 1 - HSAAP Recommended Future CAO Modifications for LTM (continued)

Source Area	Source Unit	Sample Location	Sampling Frequency: Semiannual (spring and fall)	Sampling Frequency: Annual (spring)	Sampling Frequency: Biennial (spring of even-numbered years)	Chemical Compound Class	Target Analyte	CAO Modification Recommendations
Holston River	Upgradient and downgradient of Area B	Surface Water	X [b]			VOCs	Benzene	Yellow highlighted compounds recommended for removal due to repeated non-detects or low detections below criteria in groundwater on-site and/or lack of mobility in groundwater.
							Methylene chloride	
						SVOCs	Bis(2-ethylhexyl)phthalate	
							Dibenzofuran	
							Fluorene	
							2-Methylnaphthalene	
							Naphthalene	
							n-Nitrosodiphenylamine	
						Metals	Arsenic	
							Chromium (total)	
							Lead	
							Mercury	
						Pesticides	alpha-Chlordane	
							gamma-Chlordane	
							Dieldrin	
							Bromacil	
						Explosives	2,4-Dinitrotoluene	
							2,6-Dinitrotoluene	
							2,4,6-Trinitrotoluene	
							2-Amino-4,6-dinitrotoluene	
							4-Amino-2,6-dinitrotoluene	
							Nitroglycerin	
							RDX	

[a]MNA analysis performed on an annual basis at this well (spring event only).
[b]Surface water samples are collected annually in the fall of odd-numbered years and in the spring of even-numbered years.
BTEX = Benzene, toluene, ethylbenzene, and xylenes.
CAO = Corrective Action Order.
DNX = Hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine.
HSAAP = Holston Army Ammunition Plant.
IWTP = Industrial wastewater treatment plant.
LTM = Long-term monitoring.
MNA = Monitored natural attenuation (RDX degradation intermediates: hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine; hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine; and hexahydro-1,3,5-trinitroso-1,3,5-triazine, annual spring event only).
MNX = Hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine.
RDX = Hexahydro-1,3,5-trinitroso-1,3,5-triazine.
SVOC = Semivolatile organic compound.
SWMU = Solid waste management unit.
TNX = Hexahydro-1,3,5-trinitroso-1,3,5-triazine.
VOC = Volatile organic compound.

STATE OF TENNESSEE

DEPARTMENT OF ENVIRONMENT AND CONSERVATION

IN THE MATTER OF:	)	**DIVISION OF SOLID WASTE MANAGEMENT**
HOLSTON ARMY AMMUNITION PLANT	)	
EPA I.D. NUMBER: TN5 21-002-0421	)	**CASE NO. 03-HCA003**
RESPONDENT	)	

CORRECTIVE ACTION ORDER

PARTIES

I.

David Salyers, P.E. is the duly appointed Commissioner of the Department of Environment and Conservation (hereinafter the "Department"), and among other duties and responsibilities, he is charged with the responsibility for administering and enforcing the *Tennessee Hazardous Waste Management Act* (hereinafter the "Act"), T.C.A. §68 212 101 et seq. Mike Apple is the duly appointed Director of the Division of Solid Waste Management (hereinafter the "Division"). He has received written delegation from the Commissioner to administer and enforce particular aspects of the Act.

II.

Holston Army Ammunition Plant (hereinafter "HSAAP" or "Respondent") is a Department of Defense facility located in Sullivan County and Hawkins County, Tennessee. Process may be served on the Respondent as follows: Commander, Holston Army Ammunition Plant, 4509 West Stone Drive, Kingsport, Tennessee 37660-9982.

JURISDICTION

III.

Pursuant to T.C.A. Section 68-212-111, when the Commissioner finds upon investigation that any provisions of the Act are not being carried out, the Commissioner may issue an Order for correction to the responsible person, and this Order shall be complied with within the time limit specified in the order. Further, whenever the Commissioner finds that any person is engaging in an unauthorized activity which is endangering or causing damage to the public health or environment the Commissioner may, without prior notice, issue an order reciting the existence of such unauthorized activity and requiring that such action be taken as the Commissioner deems necessary.

IV.

The Respondent has allowed or failed to prevent unauthorized releases of materials that are hazardous wastes when they are disposed. As is set out more specifically below, these unauthorized releases are endangering or causing damage to the public health or environment.

V.

The Respondent is a "person" within the meaning of T.C.A. §68-212-104.

DEFINITIONS

VI.

Terms used herein shall have the same meaning as those in the Act, the Tennessee Hazardous Waste Management Regulations and the Attachment to this Order.

FACTS

VII.

1. HSAAP is located in Kingsport, Tennessee at 4509 West Stone Drive. The HSAAP facility has two distinct manufacturing areas, designated as Area A & Area B, located on 6100 acres linked by an interplant railroad. The area surrounding the facility ranges from residential to heavy and light industry. The facility is adjacent to the Holston River. Area A is in Kingsport in Sullivan County, adjacent to Eastman Chemical Company. Area B is located along the Holston River in eastern Hawkins County and is bordered by residential and commercial properties.

2. The former Solvent Burn Tank Unit (hereinafter the "Unit") was operated from the early 1960s to 1983. The Unit, also identified as Solid Waste Management Unit (SWMU) 50, was comprised of two open tanks used for burning explosive contaminated, nonhalogenated spent solvents and waste propyl formate solution from the azeotropic distillation of acetic acid. Batches of spent solvents were placed in the open tanks, ignited, and allowed to completely burn.

3. In 1982, the first tank in the Unit was excavated and the resulting pit was backfilled. In 1984, the second tank in the Unit was excavated and the resulting pit was backfilled. In 1984, the Division approved the Closure Plan for clean closure of the Unit.

4. In 1991, USEPA notified HSAAP that they were subject to clean closure equivalency standards.

5. In 1993, a study was conducted by HSAAP to satisfy the clean closure equivalency requirements. The study indicated groundwater contamination at the Unit.

6. From late 1995 to early 1997, HSAAP conducted soil and groundwater assessments at the Unit. A groundwater monitoring system was installed to evaluate the extent of groundwater contamination.

7. In September 1997, HSAAP submitted a closure certification and a report outlining the results of its soil investigation. As a result of the investigation HSAAP was not required to remove any additional soils.

8. On March 31, 1999, the Division issued HSAAP a Post-Closure Corrective Action Order that required a Corrective Action Plan (CAP) for the Unit. The Division did not approve the CAP submitted by Respondent.

9. On March 26, 2002, HSAAP requested a modification from the Division to deviate from the corrective action process as described in Section II of the Attachment to the Order by participating in the Facility Action Plan (FAP) process. The Division has approved HSAAP's request.

10. On January 27, 2003, HSAAP requested a modification to the Post-Closure Corrective Action Order to address groundwater monitoring and any required corrective action at the Unit under the Order's site-wide groundwater corrective action program. The Unit,

which has no contaminated soils, would have any groundwater monitoring or groundwater corrective action addressed under the corrective action requirements for the entire facility. The DSWM approved HSAAP's request.

11. Based on HSAAP's modification requests and the DSWM's approvals noted in items 9 and 10 above, the Post-Closure Corrective Action Order issued to the Respondent on March 31, 1999 was replaced in its entirety by a new order.

12. On May 16, 2003, the State of Tennessee Department of Environment and Conservation (TDEC) issued Corrective Action Order (Order) Case No. 03-HCA002 to HSAAP. The Order listed Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) that required Confirmatory Sampling (CS) or Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFIs).

13. In compliance with the conditions of the new Corrective Action Order, HSAAP completed CSs, RFIs, and Interim Measures (IMs) at the facility SWMUs and AOCs. The result of those activities is reflected in the proposed status for each SWMU and AOC as listed in the tables in this fact sheet.

14. To finalize the remedies for the SWMUs and AOCs and in accordance with the procedures specified in the current order, HSAAP requested that the Corrective Action Order be modified to reflect the current status of the SWMUs and AOCs. The request followed a public meeting conducted by the facility on April 12, 2010, at Holston Business Development Center, 2005 Venture Park, Kingsport, TN. The purpose of the meeting was to inform the community of HSAAP's planned modification request to incorporate the proposed final remedies of various SWMUs and AOCs into their order. The public notice of the meeting included the establishment of a 60-day comment period

(March 12 through May 14, 2010). At the meeting, HSAAP performed a slide presentation about the facility's corrective action order and remedial actions to date and answered a few questions. No comments were received at the meeting or during the 60-day comment period.

15. To complete the modification request, the DSWM public noticed the request, including drafting the modification with the necessary supporting data and documentation, enabling the public to have the opportunity to review and comment on the remedies. The current Order was approved by TDEC on January 24, 2013.

ORDER

VIII.

WHEREFORE, pursuant to the authority vested by T.C.A. §68-212-111, I, Mike Apple, acting as the authorized representative of the Commissioner, ORDER that:

1. The Respondent shall comply with all the Standard Conditions and Corrective Action Requirements specified in the Attachment to this Order, which includes the option to participate in the Facility Action Plan process described in Attachment Condition II.I.5. The conditions set out in this Order and Attachment may be modified in accordance with Tennessee Hazardous Waste Management Regulations, Rule 0400-12-01.

2. The Respondent shall continue implementation of all corrective action as currently approved by the Division.

3. The Respondent shall, within ninety (90) days of the receipt of this Order, submit to the Division for approval a fact sheet that describes this Order and the status of all corrective

actions at the HSAAP facility. A copy of this fact sheet shall be provided to all persons included on a mailing list that has been approved by the Commissioner.

RESERVATION OF RIGHTS

IX.

The Respondent is hereby advised that in the issuance of this Order, the Commissioner does not implicitly or expressly waive any provisions of the Act or regulations promulgated thereunder or any other law. Nothing in this order is to be construed as waiving or otherwise preventing the assessment of penalties for any violation of the Act or Rules, past or future. However, compliance with this Order will be one factor considered in any decision of whether to assess penalties against the Respondent for any past violations.

The finality of this Order shall not preclude Respondent from requesting a declaratory ruling from the Tennessee Solid Waste Disposal Board pursuant to T.C.A. Section 4-5-223 regarding the application of any portion of this Order or the applicability of any particular Rule to Respondent.

Issued this 8th day of July, 2003 in the Office of the Director of the Division of Solid Waste Management, Tennessee Department of Environment and Conservation.

Mike Apple, Director
Division of Solid Waste Management
Tennessee Department of Environment and Conservation

NOTICE OF RIGHTS

X.

The Respondent is herby advised that in accordance with Tennessee Code Annotated Sections 68-212-113 and 4-5-307, this Order may be appealed by filing a written petition with the Commissioner, setting forth the grounds and reasons for objection and asking for a hearing before the Solid Waste Disposal Control Board. The ORDER shall become FINAL and not subject to review unless such petition is filed (received) within thirty (30) days after the date this ORDER is served. Any hearing will be conducted in accordance with the ***Tennessee Administrative Procedures Act,*** T.C.A. §4-5-301 et seq.

All correspondence pertaining to this Order, should be addressed to Charles Burroughs, Division of Solid Waste Management; Corrective Action Section; 5th Floor, L&C Tower; 401 Church Street; Nashville, Tennessee 37243-1535; PH (615) 532-0863.

Work plans, reports and other documents to be submitted by Respondent pursuant to this Order should be sent to Mike Apple, Director; Division of Solid Waste Management; 5th Floor, L&C Tower; 401 Church Street; Nashville, Tennessee 37243-1535; PH (615)-532-0780.

_____

Charles E. Burroughs
Corrective Action Section
Division of Solid Waste Management

ORDER ATTACHMENT

TABLE OF CONTENTS
HOLSTON ARMY AMMUNITION PLANT
Case No. 03-HCA003

I. STANDARD CONDITIONS

I.A. EFFECT OF ORDER

Respondent is required to conduct corrective action for any releases of hazardous waste or hazardous constituents in accordance with the conditions of this order. Issuance of this order does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of other State or local laws or regulations. This order does not convey any property rights of any sort or any exclusive privilege. Compliance with the terms of this order does not constitute a defense to any order issued or any action brought under Section 3013 or Section 7003 of the Resource Conservation and Recovery Act of 1976 as amended (42 U.S.C. 6901 et seq., commonly referred to as RCRA), Sections 104, 106(a) and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq., commonly known as CERCLA), Sections 68-212-206(a), 207, and 215(c) of the Tennessee Hazardous Waste Management Act of 1983, as amended, or any other law providing for protection of public health or the environment.

I.B. SEVERABILITY

The provisions of this order are severable, and if any provisions of this order or the application of any provision of this order to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this order shall not be affected thereby.

I.C. DEFINITIONS

For the purpose of this order, terms used herein shall have the same meaning as those in the Tennessee Hazardous Waste Regulations, Rules 0400-12-01-.01, .02, .06, .07 and .10, unless this order specifically provides otherwise. Where terms are not defined in the regulations, this order, or U.S. EPA guidelines or publications, the meaning associated with such terms shall be as defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

1. "Area of concern" (AOC) for the purposes of this order includes any area having a probable release of a hazardous waste or hazardous constituent that is not from a solid waste management unit and is determined by the Commissioner to pose a current or potential threat to human health or the environment. Such areas of concern may require investigations and corrective measures as required by this order and to ensure adequate protection of human health and the environment.

2. “Contamination” refers to the presence of any hazardous constituent in a concentration that exceeds the naturally occurring concentration of that constituent in the immediate vicinity of the unit (in areas not affected by the unit).

3. A "Corrective Action Management Unit" (CAMU) for the purposes of this order, means an area within a facility used only for managing remediation wastes for implementing corrective action or cleanup at the facility.

4. "Corrective measures" for the purposes of this order, include all corrective action necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in the unit. Corrective measures may address releases to air, soils, surface water or groundwater.

5. "Extent of contamination" for the purposes of this order is defined as the horizontal and vertical area in which the concentrations of hazardous constituents in the environmental media being investigated are above detection limits or background concentrations indicative of the region, whichever is appropriate as determined by the Commissioner.

6. "Facility" for the purposes of this order includes all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (e.g., one or more landfills, surface impoundments, or combination of them). For the purposes of implementing corrective action under this order, a facility includes all contiguous property under the control of Respondent.

7. "Hazardous constituent(s)" or "hazardous waste constituent(s)" for the purposes of this order are those substances listed in Rule 0400-01-11-.02(5), Appendix VIII and in Rule 0400-01-11-.06(57), Appendix IX, including hazardous constituents released from any waste and hazardous constituents that are reaction by-products.

8. "Interim measures" for the purposes of this order are actions necessary to minimize or prevent the further migration of contaminants and limit actual or potential human and environmental exposure to contaminants while long-term corrective action remedies are evaluated and, if necessary, implemented.

9. "Land disposal" for the purposes of this order and Rule 0400-01-11-.10 means placement in or on the land, except for a "corrective action management unit," and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, underground mine or cave, or concrete vault or bunker intended for disposal purposes.

10. "Landfill" for the purposes of this order includes any disposal facility or part of a facility where hazardous waste is placed in or on the land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.

11. "Point of compliance" refers to the vertical surface located at the hydraulically downgradient limit of the waste management area that extends down into the uppermost aquifer underlying the regulated unit.

12. "Registered engineer" or "registered professional engineer" shall mean a person authorized to perform engineering in Tennessee pursuant to Tennessee Code Annotated, Title 62, Chapter 2.

13. "Release" for the purposes of this order includes any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of any hazardous waste or hazardous constituents.

14. "Remediation waste" for the purposes of this order includes all solid and hazardous wastes, and all media (including ground water, surface water, soils, and sediments) and debris, which contain listed hazardous waste or which themselves exhibit a hazardous waste characteristic, that are managed for the purpose of implementing corrective action requirements of this order. For a given facility, remediation wastes may originate only from within the facility boundary but may include waste managed for releases beyond the facility boundary.

15. "Screening levels" for the purposes of this order are health-based concentrations of hazardous constituents determined to be indicators for the protection of human health and/or the environment.

16. "Solid waste" means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved materials in irrigation return flow or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923).

17. A "solid waste management unit" (SWMU) for the purposes of this order includes any unit that has been used for the treatment, storage, or disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for the management of solid waste. Permitted or interim status hazardous waste management units are also solid waste management units. Solid waste management units include areas that have been contaminated by routine and systematic releases of hazardous waste or hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities (e.g., product or process spills).

18. A "temporary unit" (TU) for the purposes of this order includes any temporary tanks and/or container storage areas used solely for treatment or storage of hazardous

remediation wastes during specific remediation activities. Designated by the Commissioner, such units must conform to specific standards, and may only be in operation for a period of time as specified by the Commissioner.

~~18.~~19. A "unit" for the purposes of this order includes, but is not limited to, any landfill, surface impoundment, waste pile, land treatment unit, incinerator, injection well, tank, container storage area, septic tank, drain field, wastewater treatment unit, elementary neutralization unit, transfer station, or recycling unit.

I.D. GENERAL DUTIES AND REQUIREMENTS

1. Duty to Comply: Respondent shall comply with all conditions of this order, except that Respondent need not comply with the conditions of the order to the extent and for the duration that such noncompliance is authorized in an emergency permit. Any order noncompliance, except under the terms of an emergency permit, constitutes a violation of the Act and is grounds for enforcement action.

2. Need to Halt or Reduce Activity Not a Defense: It shall not be a defense for Respondent in an enforcement action that it would have been necessary to halt or reduce the ordered activity in order to maintain compliance with the conditions of this order.

3. Duty to Mitigate: In the event of noncompliance with the order, Respondent shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.

4. Proper Operation and Maintenance: Respondent shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by Respondent to achieve compliance with the conditions of this order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the order.

5. Duty to Provide Information: Respondent shall furnish to the Commissioner, within a reasonable time, any relevant information which the Commissioner may request to determine whether cause exists for modifying, revoking and reissuing, terminating this order, or to determine compliance with this order. Respondent shall also furnish to the Commissioner, upon request, copies of records required to be kept by this order.

6. Inspection and Entry: Respondent shall allow the Commissioner, or any authorized representative, upon presentation of credentials and other documents as may be required by law, to:

(a) Enter, at reasonable times, upon Respondent's premises where an ordered unit(s) or activity is located or conducted, or where records must be kept under the conditions of this order;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this order;

(c) Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this order;

(d) Sample or monitor, at reasonable times, for the purposes of assuring order compliance or as otherwise authorized by the Act, any substances or parameters at any location; and

(e) Make photographs for the purpose of documenting items of compliance or noncompliance at waste management units. Upon request of the inspector, Respondent will make photographs for that documentation and clear them through security before the photos leave the site.

7. Monitoring and Records:

(a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. Respondent shall perform all monitoring in accordance with the methods described in this Appendix, including the appendices. If not specified in this order, the method used to obtain a representative waste sample to be analyzed must be the appropriate method from Appendix I of Rule 0400-12-01-.02(5); the most recent version of the USEPA, Region 4, Science and Ecosystem Support Division's Field Branches Quality System and Technical Procedures, which can be found at http://www.epa.gov/region4/sesd/fbqstp; or an equivalent method approved by the Commissioner. If not specified in this order, procedures for sampling media must be those identified in the most recent version of the Field Branches Quality System and Technical Procedures or an equivalent method approved by the Commissioner. If not specified in this order, laboratory methods must be those specified in the most recent version of Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846 which can be found at http://www.epa.gov/osw/hazard/testmethods/sw846/online/, or an equivalent method approved by the Commissioner.

(b) Respondent shall retain at the facility, as provided for under Rule 0400-12-01-.06, or other location approved by the Commissioner, records of all monitoring information required under the terms of this order, including all calibration and

maintenance records and all original strip chart recordings for continuous monitoring instrumentation, records of all data used to prepare documents required by this order, copies of all reports, records and inspection forms required by this order, and records of all data used to complete the application for this order, for a period of at least five (5) years from the date of the sample, measurement, report, certification, or application, or until corrective action is completed, whichever date is later. As a generator of hazardous waste, Respondent shall retain a copy of all notices, certifications, demonstrations, waste analysis data, and other documentation produced pursuant to Rule 0400-12-01-.10 for at least five (5) years from the date that the waste which is subject of such documentation was last sent to on-site or off-site treatment storage or disposal, or until corrective action is completed, whichever date is later. Respondent shall maintain records from all groundwater monitoring wells and associated groundwater surface elevations, for the active life of the facility, and, for disposal facilities, for the post-closure care period as well. These periods may be extended by request of the Commissioner at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility.

(c) Records of monitoring information shall specify:

(i) The dates, exact place, and times of sampling, or measurements;

(ii) The individual(s) who performed the sampling or measurements;

(iii) The date(s) analyses were performed;

(iv) The name of the laboratory that performed the analyses;

(v) The analytical techniques or methods used; and

(vi) The results of such analyses.

8. Reporting Requirements:

(a) Planned changes: Respondent shall give notice to the Commissioner as soon as possible of any planned physical alterations or additions which impact any SWMUs, AOCs, or other areas and media contaminated by them, including voluntary corrective measures, i.e., Respondent-initiated Interim Measures per Condition II.F(b). The notice shall include at a minimum, a summary of the planned change, the reason for the planned change, a discussion of the impact(s) the planned change will have on the ability to investigate contamination at or from the SWMU or AOC, and a discussion of the impact(s) the planned change will have on the known or suspected contamination.

(b) Anticipated noncompliance: Respondent shall give advance notice to the Commissioner of any planned changes in the facility or activity which may result in noncompliance with the requirements of this order.

(c) Compliance schedules: Written notification of compliance or noncompli-ance with any item identified in the compliance schedule of this order shall be submitted according to each schedule date. If Respondent does not notify the Commissioner within fourteen (14) calendar days of its compliance or noncompliance with the schedule, Respondent shall be subject to an enforcement action. Submittal of a required item according to the schedule constitutes notification of compliance.

(d) Monitoring and Inspection Reports: Respondent shall submit all required monitoring and inspection data or analyses at the intervals specified elsewhere in this order.

(e) Twenty-four hour reporting:

(i) Respondent shall report any noncompliance which may endanger health or the environment orally within 24 hours from the time Respondent becomes aware of the circumstances, including:

(1) Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies.

(2) Any information of a release or discharge of hazardous waste, or of a fire or explosion from the hazardous waste management facility, which could threaten the environment or human health outside the facility.

(ii) The description of the occurrence and the cause shall include:

(1) Name, address, and telephone number of the owner and/or operator;

(2) Name, address, and telephone number of the facility;

(3) Date, time, and type of incident;

(4) Name and quantity of material(s) involved;

(5) The extent of injuries, if any;

(6) An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and

(7) Estimated quantity and disposition of recovered material that resulted from the incident.

(iii) A written submission shall also be provided within 5 days of the time Respondent becomes aware of the circumstances. The written submission shall contain the information specified under Conditions I.M.4(a) and (b); a description of the imminent hazard and its cause; the periods of the emergency (including exact dates and times); whether the imminent hazard has been corrected; and if not, the anticipated time it is expected to continue; and steps taken to reduce, eliminate, and prevent recurrence of the imminent hazard. The Commissioner may waive the five-day written notice requirement in favor of a written report within fifteen days.

(f) Other information: Where Respondent becomes aware that it failed to submit any relevant facts or submitted incorrect information in any document(s) submitted to the Commissioner, Respondent shall promptly submit such facts or information.

9. Signatory Requirement: All reports or information submitted to the Commissioner shall be signed and certified. All signatures and certifications shall satisfy the requirements of Tennessee Hazardous Waste Management Regulations, Rule 0400-01-11-.07(2)(a).

I.E. ORDER ACTIONS

Respondent's action of submitting a request to modify the order, or filing notice for planned changes, Condition I.D.8(a), or anticipated noncompliance, Condition I.D.8(b), does not stay any existing condition under this order.

I.F. SECURITY

Respondent shall provide appropriate security measures at the facility that minimize the threat of exposure to hazardous waste or hazardous constituents. Respondent shall also implement and maintain any additional security measures described in Appendix F.

I.G. PERSONNEL TRAINING

Respondent shall ensure that facility personnel successfully complete a program of classroom instruction and/or on the job training that teaches them to perform their duties in a way that assures the Respondent's compliance with this order. Respondent shall ensure that the training program is directed by a person(s) trained in hazardous waste management procedures and shall include instruction which teaches facility personnel the hazardous waste management procedures relevant to the positions in which they are employed. As applicable, training will be provided for personnel involved with hazardous waste corrective action investigation and remediation activities, contingency plan implementation, and any additional order-specific training described in Appendix F.

I.H. CONFIDENTIAL INFORMATION

In accordance with Tennessee Hazardous Waste Management Regulations, Rule 0400-01-11-.01(7), Respondent may claim for confidential handling any proprietary information required to be submitted by this order.

II. CORRECTIVE ACTION REQUIREMENTS

II.A. APPLICABILITY

The Conditions of this Part apply to:

1. The solid waste management units (SWMUs) and areas of concern (AOCs) identified in Appendix A, Table A-1(a) and Table A-1(b), which require No Further Action (NFA) under this order at this time;

2. The SWMUs and AOCs identified in Appendix A, Table A-2, which require Confirmatory Sampling (CS);

3. The SWMUs and AOCs identified in Appendix A, Table A-3, which require an RCRA Facility Investigation (RFI);

4. The SWMUs and AOCs identified in Appendix A, Table A-4, which require Interim Measures (IM);

5. The SWMUs and AOCs identified in Appendix A, Table A-5, which require a Corrective Measures Study (CMS);

6. The SWMUs and AOCs identified in Appendix A, Table A-6, which require implementation of a Corrective Action Remedy;

7. The active SWMUs identified in Appendix A, Table A-7, which require implementation of a corrective action remedy. As specified in Condition II.I, Corrective Measures Implementation, these units shall again be addressed in conjunction with unit or plant closure, and as necessary to protect human health and the environment;

8. Any additional SWMUs or AOCs discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means. As used in this order, the terms "discover", "discovery", or "discovered" refer to the date on which Respondent either, (1) visually observes evidence of a new SWMU or AOC, (2) visually observes evidence of a previously unidentified release of hazardous constituents to the environment, or (3) receives information which suggests the presence of a new release of hazardous waste or hazardous constituents to the environment; and

9. Contamination that has migrated beyond the facility boundary, if applicable. Respondent shall implement corrective actions beyond the facility boundary where necessary to protect human health and the environment, unless Respondent demonstrates to the satisfaction of the Commissioner that, despite Respondent's best efforts, as determined by the Commissioner, Respondent was unable to obtain the necessary permission to undertake such actions. Respondent is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases shall be determined on a case-by-case basis.

II.B. NOTIFICATION AND ASSESSMENT REQUIREMENTS FOR NEWLY IDENTIFIED SWMUs AND AOCs

1. Respondent shall notify the Commissioner in writing, within fifteen (15) calendar days of discovery, of any suspected new AOC as discovered under Condition II.A.7. The notification shall include, at a minimum, the location of the AOC and all available information pertaining to the nature of the release (e.g., media affected, hazardous constituents released, magnitude of release, etc.). The Commissioner may conduct, or require Respondent to conduct, further assessment (i.e., Confirmatory Sampling) to determine the status of the suspected AOC. The Commissioner will notify Respondent in writing of the final determination as to the status of the suspected AOC. If the Commissioner determines that further investigation or other corrective action of an AOC is required, Respondent shall modify this order in accordance with Tennessee Hazardous Waste Management Regulations, Rule 0400-01-11-.07(9).

2. Respondent shall notify the Commissioner in writing, within fifteen (15) calendar days of discovery, of any additional SWMU discovered under Condition II.A.7.

3. Respondent shall prepare and submit to the Commissioner, within ninety (90) calendar days of notification, a SWMU Assessment Report (SAR) for each SWMU identified under Condition II.B.2. At a minimum, the SAR shall provide the following information:

   (a) Location of unit(s) on a topographic map of appropriate scale such as required under Tennessee Hazardous Waste Management Regulations, Rule 0400-01-11-.07(5)(a)1(xix).

   (b) Designation of type and function of unit(s).

   (c) General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings).

   (d) Dates that the unit(s) was operated.

   (e) Specification of all wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous constituents in the wastes.

   (f) All available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s) (to include groundwater data, soil analyses, air, and/or surface water data).

4. Based on the results of the SAR, the Commissioner shall determine the need for further investigations at the SWMUs covered in the SAR. If the Commissioner

determines that such investigations are needed, Respondent shall be required to prepare a plan for such investigations as outlined in Condition II.D.1 or II.E.1(a).

II.C. NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES FROM SWMUs or AOCs

1. Respondent shall notify the Commissioner in writing of any newly discovered release(s) of hazardous waste or hazardous constituents discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means, within fifteen (15) calendar days of discovery. Such newly discovered releases may be from SWMUs or AOCs identified in Condition II.A.1 or SWMU or AOCs identified in Condition II.A.7 for which further investigation under Condition II.B.4 was not required.

2. If the Commissioner determines that further investigation of the SWMUs or AOCs is needed, Respondent shall be required to prepare a plan for such investigations as outlined in Condition II.E.1(a).

II.D. CONFIRMATORY SAMPLING (CS)

1. Upon notification by the Commissioner, Respondent shall prepare and submit a Confirmatory Sampling (CS) Work Plan for suspected AOCs per Condition II.B.1 or newly identified SWMUs per Condition II.B.4. The work plan shall be submitted within forty-five (45) calendar days of notification by the Commissioner that a CS Work Plan is required. The CS Work Plan shall include schedules of implementation and completion of specific actions necessary to determine whether or not a release has occurred. It should also address applicable requirements and affected media. In order to partly or wholly satisfy the CS requirement, previously existing data may be submitted with the work plan for the Commissioner's consideration.

2. The CS Work Plan must be approved by the Commissioner, in writing, prior to implementation. The Commissioner shall specify the start date of the CS Work Plan schedule in the letter approving the CS Work Plan. If the Commissioner disapproves the CS Work Plan, the Commissioner shall either (1) notify Respondent in writing of the CS Work Plan's deficiencies and specify a due date for submission of a revised CS Work Plan, (2) revise the CS Work Plan and notify Respondent of the revisions, or (3) conditionally approve the CS Work Plan and notify Respondent of the conditions.

3. Respondent shall implement the confirmatory sampling in accordance with the approved CS Work Plan.

4. Respondent shall prepare and submit to the Commissioner in accordance with the schedule in the approved CS Work Plan, a Confirmatory Sampling (CS) Report identifying all SWMUs or AOCs that have released hazardous waste or hazardous

constituents into the environment. The CS Report shall include all data, including raw data, and a summary and analysis of the data that supports the above determination. If submittal of the CS Report coincides with submittal of the RFI Report, then the CS Report and the RFI Report may be combined into one submittal.

5. Based on the results of the CS Report, the Commissioner shall determine the need for further investigations at the SWMUs or AOCs covered in the CS Report. If the Commissioner determines that such investigations are needed, Respondent shall be required to prepare a plan for such investigations as outlined in Condition II.E.1(a). The Commissioner will notify Respondent of any no further action decision.

II.E. RCRA FACILITY INVESTIGATION (RFI)

1. RFI Work Plan(s)

(a) Respondent shall prepare and submit to the Commissioner, within ninety (90) calendar days of notification by the Commissioner, an RFI Work Plan for those units identified under Condition II.B.4, Condition II.C.2, or Condition II.D.5. The RFI Work Plan(s) shall be developed to meet the requirements of Condition II.E.1(b).

(b) The RFI Work Plan(s) shall meet the requirements of Appendix B. The RFI Work Plan(s) shall include schedules of implementation and completion of specific actions necessary to determine the nature and extent of contamination and the potential pathways of contaminant releases to the air, soil, surface water, and groundwater. Respondent must provide sufficient justification and associated documentation that a release is not probable or has already been characterized if a unit or a media/pathway associated with a unit (ground-water, surface water, soil, subsurface gas, or air) is not included in the RFI Work Plan(s). Such deletions of a unit, media or pathway from the RFI(s) are subject to the approval of the Commissioner. Respondent shall provide sufficient written justification for any omissions or deviations from the minimum requirements of Appendix B. Such omissions or deviations are subject to the approval of the Commissioner. In addition, the scope of the RFI Work Plan(s) shall include all investigations necessary to ensure compliance with Tennessee Hazardous Waste Management Regulations, Rule 0400-01-11- 06(6)(l)3.

(c) The RFI Work Plan(s) must be approved by the Commissioner, in writing, prior to implementation. The Commissioner shall specify the start date of the RFI Work Plan schedule in the letter approving the RFI Work Plan(s). If the Commissioner disapproves the RFI Work Plan(s), the Commissioner shall either (1) notify Respondent in writing of the RFI Work Plan's

deficiencies and specify a due date for submission of a revised RFI Work Plan, (2) revise the RFI Work Plan and notify Respondent of the revisions and the start date of the schedule within the approved RFI Work Plan, or (3) conditionally approve the RFI Work Plan and notify Respondent of the conditions.

2. RFI Implementation

Respondent shall implement the RFI(s) in accordance with the approved RFI Work Plan(s) and Appendix B. Respondent shall notify the Commissioner at least twenty (20) days prior to any sampling activity.

3. RFI Reports

(a) Respondent shall prepare and submit to the Commissioner Draft and Final RCRA Facility Investigation Report(s) for the investigations conducted pursuant to the RFI Work Plan(s) submitted under Condition II.E.1. The Draft RFI Report(s) shall be submitted to the Commissioner for review in accordance with the schedule in the approved RFI Work Plan(s). The Final RFI Report(s) shall be submitted to the Commissioner within thirty (30) calendar days of receipt of the Commissioner's final comments on the Draft RFI Report. The RFI Report(s) shall include an analysis and summary of all required investigations of SWMUs and AOCs and their results. The summary shall describe the type and extent of contamination at the facility, including sources and migration pathways, identify all hazardous constituents present in all media, and describe actual or potential receptors. The RFI Report(s) shall also describe the extent of contamination (qualitative/quantitative) in relation to background levels indicative of the area. If the Draft RFI Report is a summary of the initial phase investigatory work, the report shall include a work plan for the final phase investigatory actions required based on the initial findings. Approval of the final phase work plan shall be carried out in accordance with Condition II.E.1(c). The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support a Corrective Measures Study, if necessary.

(b) Respondent shall prepare and submit to the Commissioner, along with the Draft and Final RFI Report(s), screening levels for each of the hazardous constituents reported in Condition II.E.3(a). Screening levels shall be calculated as specified in Appendix E of this order.

(c) The Commissioner will review the RFI Report(s), including the screening levels described in Condition II.E.3(b). The Commissioner shall notify Respondent of the need for further investigative action if necessary and, if

appropriate at this moment of the investigation, inform Respondent, if not already notified, of the need for a Corrective Measures Study to meet the requirements of Condition II.G and Tennessee Hazardous Waste Management Regulations, Rule 0400-01-11-.06(6)(l). The Commissioner will notify Respondent of any no further action decision. Any further investigative action required by the Commissioner shall be prepared and submitted in accordance with a schedule specified by the Commissioner and approved in accordance with Condition II.E.1(c).

(d) If the time required to conduct the RFI(s) is greater than one hundred eighty (180) calendar days, Respondent shall provide the Commissioner with quarterly RFI Progress Reports (90-day intervals) beginning ninety (90) calendar days from the start date specified by the Commissioner in the RFI Work Plan approval letter. The Progress Reports shall contain the following information at a minimum:

(i) A description of the portion of the RFI completed;

(ii) Summaries of findings;

(iii) Summaries of any deviations from the approved RFI Work Plan during the reporting period;

(iv) Summaries of any significant contacts with local community public interest groups or State government;

(v) Summaries of any problems or potential problems encountered during the reporting period;

(vi) Actions taken to rectify problems;

(vii) Changes in relevant personnel;

(viii) Projected work for the next reporting period; and

(ix) Copies of daily reports, inspection reports, data, etc.

II.F. INTERIM MEASURES (IM)

1. IM Work Plan

(a) Upon notification by the Commissioner, Respondent shall prepare and submit an Interim Measures (IM) Work Plan for any SWMU or AOC that the Commissioner determines is necessary. IM are necessary in order to minimize or prevent the further migration of contaminants and limiting actual or potential human and environmental exposure to contaminants

while long-term corrective action remedies are evaluated and, if necessary, implemented. The IM Work Plan shall be submitted within thirty (30) calendar days of such notification and shall include the elements listed in II.F.1(c). Such interim measures may be conducted concurrently with investigations required under the terms of this order.

(b) Respondent may initiate IM at a SWMU or AOC by submitting the appropriate notification pursuant to Condition I.D.8(a). The Commissioner will process Respondent-initiated IM by either conditionally approving the IM or imposing an IM Work Plan per Condition II.F.1(a). Respondent-initiated IM shall be considered conditionally approved unless the Commissioner specifically imposes an IM Work Plan within thirty (30) calendar days of receipt of notification of Respondent-initiated IM. Respondent-initiated IM must follow the progress and final reporting requirements in Condition II.F.3. The scope and success of Respondent-initiated IM conditionally approved per Condition II.F.1(b) shall be subject to subsequent in-depth review with the Commissioner providing comments and/or an approval letter for the Respondent-initiated IM.

(c) The IM Work Plan shall ensure that the interim measures are designed to mitigate any current or potential threat(s) to human health or the environment and are consistent with and integrated into any long-term solution at the facility. The IM Work Plan shall include the interim measures objectives, procedures for implementation (including any designs, plans, or specifications) and schedules for implementation.

(d) The IM Work Plan imposed under Condition II.F.1(a) must be approved by the Commissioner, in writing, prior to implementation. The Commissioner shall specify the start date of the IM Work Plan schedule in the letter approving the IM Work Plan. If the Commissioner disapproves the IM Work Plan, the Commissioner shall either (1) notify Respondent in writing of the IM Work Plan's deficiencies and specify a due date for submission of a revised IM Work Plan, (2) revise the IM Work Plan and notify Respondent of the revisions and the start date of the schedule within the approved IM Work Plan, or (3) conditionally approve the IM Work Plan and notify Respondent of the conditions.

2. IM Implementation

(a) Respondent shall implement the interim measures imposed under Condition II.F.1(a) in accordance with the approved IM Work Plan.

(b) Respondent shall give notice to the Commissioner as soon as possible of any planned changes, reductions or additions to the IM Work Plan imposed under Condition II.F.1(a) or initiated by Respondent under Condition II.F.1(b).

(c) Final approval of corrective action required under Rule 0400-01-11-.06(6)(I) which is achieved through interim measures shall be in accordance Rule 0400-01-11-.07(9)(c) and subsection VI.H as a permit modification.

3. IM Reports

(a) Respondent shall prepare and submit to the Commissioner, within ninety (90) calendar days of completion of interim measures conducted under Condition II.F, an Interim Measures (IM) Report. The IM Report shall contain the following information at a minimum:

(i) A description of interim measures implemented;

(ii) Summaries of results;

(iii) Summaries of all problems encountered;

(iv) Summaries of accomplishments and/or effectiveness of IM; and

(v) Copies of all relevant laboratory and/or monitoring data, etc. in accordance with Condition I.D.7.

(b) If the time required for completion of interim measures imposed under Condition II.F.1(a) or implemented under Condition II.F.1(b) is greater than one year, Respondent shall provide the Commissioner with progress reports at intervals specified in the approved Work Plan or semi-annually for Respondent initiated interim measures. The Progress Reports shall contain the following information at a minimum:

(i) A description of the portion of the interim measures completed;

(ii) Summaries of findings;

(iii) Summaries of any deviations from the IM Work Plan during the reporting period;

(iv) Summaries of any problems or potential problems encountered during the reporting period; and

(v) Projected work for the next reporting period.

II.G. CORRECTIVE MEASURES STUDY (CMS)

1. Corrective Measures Study (CMS) Work Plan

(a) Respondent shall prepare and submit a CMS Work Plan for those units requiring a CMS within ninety (90) calendar days of notification by the Commissioner that a CMS is required. This CMS Work Plan shall be developed to meet the requirements of Condition II.G.1(b). Respondent may seek approval from the Commissioner for concurrent RFI/CMS. The CMS may be performed concurrent with the RFI process if the Commissioner determines that sufficient investigative details are available to allow concurrent action.

(b) The CMS Work Plan shall meet the requirements of Appendix C at a minimum. The CMS Work Plan shall include schedules of implementation and completion of specific actions necessary to complete a CMS. Respondent must provide sufficient justification and/or documentation for any unit deleted from the CMS Work Plan. Such deletion of a unit is subject to the approval of the Commissioner. The CMS shall be conducted in accordance with the approved CMS Work Plan. Respondent shall provide sufficient written justification for any omissions or deviations from the minimum requirements of Appendix C. Such omissions or deviations are subject to the approval of the Commissioner. The scope of the CMS Work Plan shall include all investigations necessary to ensure compliance with the Act and Tennessee Hazardous Waste Management Regulations, Rules 0400-01-11-.06(6)(l), .06(22)(c), and .07(8)(b)2(ii). Respondent shall implement corrective actions beyond the facility boundary, as set forth in Condition II.A.8.

(c) The Commissioner shall either approve or disapprove, in writing, the CMS Work Plan. If the Commissioner disapproves the CMS Work Plan, the Commissioner shall either (1) notify Respondent in writing of the CMS Work Plan's deficiencies and specify a due date for submittal of a revised CMS Work Plan, (2) revise the CMS Work Plan and notify Respondent of the revisions, or (3) conditionally approve the CMS Work Plan and notify Respondent of the conditions. This modified CMS Work Plan becomes the approved CMS Work Plan.

2. Corrective Measures Study Implementation

Respondent shall begin to implement the Corrective Measures Study according to the schedules specified in the CMS Work Plan, no later than fifteen (15) calendar days after Respondent has received written approval from the Commissioner for the CMS Work Plan. Pursuant to Condition II.G.1(b) the CMS shall be conducted in accordance with the approved CMS Work Plan.

3. CMS Report

(a) Respondent shall prepare and submit to the Commissioner a draft and final CMS Report for the study conducted pursuant to the approved CMS Work Plan and in accordance with Appendix C. The draft CMS Report shall be submitted to the Commissioner in accordance with the schedule in the approved CMS Work Plan. The final CMS Report shall be submitted to the Commissioner within thirty (30) days of receipt of the Commissioner's final comments on the draft CMS Report. The CMS Report shall summarize any bench-scale or pilot tests conducted. The CMS Report must include an evaluation of each remedial alternative. If a remedial alternative requires the use of a CAMU, the CMS report shall include all information necessary to establish and implement the CAMU. The CMS Report shall present all information gathered under the approved CMS Work Plan. The CMS Final Report must contain adequate information to support the Commissioner's decision on the recommended remedy, described under Condition II.H.

(b) If the Commissioner determines that the CMS Final Report does not fully satisfy the information requirements specified under Condition II.G.3(a), the Commissioner may disapprove the CMS Final Report. If the Commissioner disapproves the CMS Final Report, the Commissioner shall notify Respondent in writing of deficiencies in the CMS Final Report and specify a due date for submittal of a revised CMS Final Report. The Commissioner will notify Respondent of any no further action decision.

(c) As specified under Condition II.G.3(b), based on preliminary results and the CMS Final Report, the Commissioner may require Respondent to evaluate additional remedies or particular elements of one or more proposed remedies.

II.H. REMEDY APPROVAL AND ORDER MODIFICATION

1. A remedy shall be selected from the remedial alternatives evaluated in the CMS. It will be based at a minimum on protection of human health and the environment, as per specific site conditions and existing regulations. The selected remedy may include any interim measures implemented to date.

2. Pursuant to Rule 0400-12-01-.07(9)(c), an order modification will be initiated by the Commissioner after recommendation of a remedy under Paragraph II.H.1. This modification will serve to incorporate a final remedy, including a CAMU if necessary, into this order. All modifications to this order will follow Rule 0400-12-01-.07(9)(c) and 0400-12-01-.07(7)(e).

3. As part of the public notification during the modification process all supporting documentation for the proposed remedy, including a Statement of Basis, will be made available for public review and comment. The Statement of Basis will be prepared utilizing EPA's **Guidance on RCRA Corrective Action Decision Documents (EPA/540/G-91/011)** as a reference.

II.I. CORRECTIVE MEASURES IMPLEMENTATION

1. Respondent shall implement corrective action for the SWMUs and AOCs identified in Appendix A, Table A-6 and Table A-7, in accordance with the requirements in Appendix F, Corrective Action Remedies.

2. In conjunction with unit or plant closure, and as necessary to protect human health and the environment from newly discovered or suspected releases from the SWMUs or AOCs identified in Appendix A, Table A-7, Respondent shall submit a corrective action investigation work plan. The investigation work plan shall meet the requirements of Condition II.D, Confirmatory Sampling, or II.E, RCRA Facility Investigation, if a release is known to have occurred.

II.J. WORK PLAN AND REPORT REQUIREMENTS

l. All work plans and schedules shall be subject to approval by the Commissioner prior to implementation to assure that such work plans and schedules are consistent with the requirements of this order and with applicable regulations. Respondent shall revise all submittals and schedules as specified by the Commissioner. Upon approval Respondent shall implement all work plans and schedules as written.

2. All work plans and reports shall be submitted in accordance with the approved schedule. Extensions of the due date for submittals may be granted by the Commissioner based on Respondent's demonstration that sufficient justification for the extension exists.

3. Unless notified by separate letter that additional hard copies are necessary, only two (2) hard copies and one (1) electronic copy of all reports and plans shall be provided by the Respondent to the Commissioner. Submittals shall be addressed in care of the Division Director, as follows:

Director
Division of Solid Waste Management
5th Floor, L & C Tower
401 Church Street
Nashville, TN 37243-1535

The Respondent shall also submit (1) hard copy to the Environmental Field Office at the following address:

Field Office Manager
Division of Solid Waste Management
TDEC Johnson City Environmental Field Office
2305 Silverdale Road
Johnson City, TN 37601-2162

4. If Respondent at any time determines that the SAR information required under Condition II.B, the CS Work Plan under Condition II.D, or the RFI Work Plan(s) required under Condition II.E no longer satisfy the requirements of Tennessee Hazardous Waste Management Regulations, Rule 0400-12-01-.06(6)(l) or this order for prior or continuing releases of hazardous waste or hazardous constituents from solid waste management units and/or areas of concern, Respondent shall submit an amended Work Plan(s) to the Commissioner within ninety (90) calendar days of such determination.

5. The Respondent may deviate from the Conditions of Corrective Action For Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) by participating in the Facility Action Plan (FAP) process, with the permission of the Director. The Respondent shall meet with the Division personnel once a year to develop a Facility Action Plan. During the Facility Action Plan meeting the Respondent must be prepared to discuss work done since the previous FAP meeting or if this is the first FAP meeting all work that has been done prior to the FAP meeting and discuss at a minimum future work to be completed in the following work year. The Facility Action Plan shall include reporting requirements and an implementation schedule. The Respondent must notify the Division prior to any deviation from their FAP. The Respondent must notify the Division and provide the plans for fieldwork at least thirty (30) days prior to the commencement of any field activities. The Respondent must provide for a mid-year meeting, if deemed necessary by the Director. If the Respondent fails to abide by the negotiated conditions and schedules in the FAP plan and as outlined in this condition, or the Respondent no longer wishes to remain in the FAP process, then upon notification, the Respondent shall be required to revert back to the conditions of Corrective Action For Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs).

II.K. APPROVAL/DISAPPROVAL OF SUBMITTALS

The Commissioner will review the work plans, reports, schedules, and other documents (submittals) that require the Commissioner's approval in accordance with the conditions of this order. The Commissioner will notify Respondent in writing of any submittal that is disapproved, and the basis therefore. Condition II.K shall apply only to submittals that have been disapproved and revised by the Commissioner, or that have been disapproved by the Commissioner, then revised and resubmitted by Respondent, and again disapproved by the Commissioner.

II.L. DISPUTE RESOLUTION

The Commissioner and Respondent shall use their best effort to resolve any disputes concerning submissions hereunder and the proper application of statutory or regulatory provisions informally and in good faith. If a disagreement cannot be resolved informally, the parties jointly or individually may pursue the matter formally by requesting a Declaratory Order by the Tennessee Underground Storage Tanks and Solid Waste Disposal Control Board in a contested case hearing under T.C.A. §4-5-223.

APPENDIX A

REQUIREMENTS FOR SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

APPENDIX A

REQUIREMENTS FOR SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
1A~~1~~	Industrial Sewer	Unit consists of sumps, drains and underground/aboveground pipes located throughout Area~~s~~ A ~~and B~~.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
1B	Industrial Sewer	This unit consists of sumps, drains and underground/aboveground pipes located throughout Area B.	1942– Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
1C	Industrial Sewer	This unit consists of sumps, drains and underground/aboveground pipes located throughout the interplant rail corridor.	1942– Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
2	Surface Drainage Ditches	Unit consists of unlined drainage ditches throughout Areas A and B that discharge surface runoff to the Holston River.	1942 – Present	Confirmatory Sampling determined no releases; NFA approval DSWM – 8/13/04
3B5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3B11	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3D3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3D6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3D7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3D9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3E8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3G1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3G2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
3H1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 07/2012, prior to RFI. RFI did not confirm CS results; NFA approval DSWM–4/06/15
3H10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 12/2011, prior to RFI. RFI did not confirm CS results; NFA approval DSWM–4/06/15
3I1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 08/2011. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 11/2012. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
3J7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 08/2012. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3K1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3K7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 10/2012. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3K9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3K10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	CS completed as part of RFI; NFA approval DSWM–4/06/15
3L2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3L7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3L9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3L10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Demolished 08/2011. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
3M7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3N1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3N2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3N9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3N10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3O1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3O5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3O7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3O9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
5	Acetic Anhydride Sludge Tanks	The tanks store sludge generated by base heater that refines acetic anhydride in Building 6.	1943 – Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
6	Ball Mill Solids Pit and Dumpster	Unit receives wash-down water from acetic anhydride operations. Solids settle to bottom, liquid is discharged to Industrial Wastewater Treatment Plant (IWTP).	1942 – Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
7	Propyl Formate Tanks	Unit consists of three banded steel tanks with capacities of 2,000 to 2,500 gallons.	1972 – 1995	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
8	Area A Industrial Boilers	Unit consists of 8 boilers that burn coal, coal tar, and propyl formate wastes (D001) for heat recovery.	1940s – Present	Clean Closed; Confirmation of clean closure DSWM – 7/16/99
9	Area A Fly Ash Loading Station	Unit consists of one uncurbed concrete pad and one smaller pad beneath the fly ash hoppers of Building 8 in Area A.	1942 – 1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
10	Rail Car Loading Area	Unit is part of the facility railroad that links Areas A and B.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
11	Area A Parts Cleaners	Unit consists of covered metal containers which hold solvents for cleaning metal parts.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
12	Area A Spill Pond	Unit was once part of the Area A Aeration Basin. The unit has managed acetic acid and acetic anhydride waste waters.	1983 – 1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM– 2/14/00
13	Area A Aeration Basin	This clay-lined basin is also referred to as the Area A Industrial Waste Water/ Equalization Lagoon or Treatment Lagoon. The unit managed acetic acid and acetic anhydride waste waters.	1975 – 1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
15	Coal Tar Landfill 2	Unit is a ¼-acre unlined landfill that managed coal tar and fly ash.	Unknown	Interim Measures Report; NFA Approval DSWM – 10/23/07
16	Coal Tar Container Storage Area	Unit is an interior storage area in Building 13 (Area A) used to store coal tar drums.	Unknown – 1990s	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
25	Area B Tar Burial Site	Unit managed coal tar and fly ash	1978-1980	Interim Measures Report; NFA Approval DSWM – 10/31/13
30	Former Nitric Acid Equalization Basin	This unlined unit managed industrial wastewaters from processes conducted in the Nitric Acid Manufacturing Area.	1978 – 1984	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
31	Existing Nitric Acid Equalization Basin	Unit receives industrial wastewater from the Nitric Acid Manufacturing Area and the Nitric Acid Spill Pond. The waste is neutralized and discharged to the IWTP.	1985 – Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
32	Explosive Settling Basins	Unit acted as settling basins for wastewater particulate matter coming from the manufacturing area.	1983 – 1989	NFA per EPA RFA Report (A. T. Kearny) 8/30/91

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SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
33	Neutralization Basins	These below-grade basins manage industrial wastewaters generated from processes in the Nitric Acid Manufacturing Area.	1978 – Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
34	Area B Industrial Boilers	Unit consists of nine boilers which generate fly ash.	1942 – Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
35	Unlined Spill Pond	Unit managed industrial wastewater from the Industrial Sewer (SWMU 1).	1983 – 1986	Additional Confirm. Sampling Report determined no releases; NFA approval DSWM – 6/5/08
36	Lined Spill Pond	Unit received industrial wastewaters from acetic acid recovery processes conducted in Area B.	1987 – 1988	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
40	Sodium Nitrate Pond 3	This unlined unit received waste waters from the B-Line Production Areas.	1970 – 1987	No indication of release of RCRA hazardous waste/constituent. Closed by TDEC Division of Water Pollution Control in 1980s.
41	Sodium Nitrate Pond 4	This unlined unit received waste waters from the B-Line Production Areas.	1973 – 1987	Did not contain hazardous constituents. Closed by TDEC Division of Water Pollution Control in 1980s.
42	A – 1 Equalization Basin	Unit managed wastewaters containing ammonia and dimethylamines.	1979 – 1994	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
43	Burning Ground	Unit regulated by Hazardous Waste Management Permit TNHW-148. Unit receives explosive-contaminated wastes.	1940s – Present	RFI Report; NFA approval DSWM – 12/18/08
46	Burning Cages (2)	These two cages are located in the Burning Ground Area (SWMU 43).	1940s – Present	RFI Report; NFA approval DSWM – 12/18/08
48	Sludge Dewatering Station	Unit is located in the Burning Ground Area (SWMU 43). It received explosive contaminated wastes for dewatering.	Mid 1940s – 1981	RFI Report; NFA approval DSWM – 12/18/08
49	Vehicle Wash Pad at Burning Ground	Unit is located in the Burning Ground. Area (SWMU 43). This unit managed wash water that may have contained oil, grease, gasoline and explosives. The pad drains to IWTP.	About 1983 – Present	RFI Report; NFA approval DSWM – 12/18/08
50	Former Solvent Burn Tank	Unit is located in the Burning Ground Area (SWMU 43). It was utilized for the open burning of explosive contaminated, spent non-halogenated solvents and oils.	1980 – 1984	RCRA unit NFA under PCCAO dated 3/31/99. Groundwater included in AOC-GW.

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SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
51	Vehicle Wash Pad Outside Bldg. 105	Unit manages wash water that may have contained oil, grease, gasoline and explosive residues.	1980 – Present	Confirmatory sampling determined no releases; NFA approval DSWM – 10/10/05
52	Vehicle Wash Pad inside Bldg. 105	Unit manages wash water that may have contained oil, grease, gasoline and explosive residues.	1942 – Present	Confirmatory sampling determined no releases; NFA approval DSWM – 10/10/05
53	WWII Vehicle Wash Pad	Unit managed wash water that may have contained oil, grease, gasoline, fly ash, metal glass and explosive residues.	1940s – 1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
54	Vehicle Wash Pad at Bldg. 556	Unit manages wash water that may contain oil, grease, gasoline, and explosive residues.	App. 1960 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
55	Steam Cleaning Pad at Bldg. 556	Unit is used for steam cleaning heavy equipment. The unit manages wash water that may contain oil, grease, gasoline and explosive residues.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
57	Oily Rag Satellite Accumulation Areas (SAAs)	These SAAs manage oily rags that contain petroleum hydrocarbons.	1940s – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
58	Waste Oil SAAs	These SAAs manage waste oils that contain petroleum hydrocarbons.	1940s – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
59	Used Tire SAA	Unit is used to store tires prior to their disposal.	Unknown	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
60	Waste Oil Drainage Pad	Unit manages waste oils and oil contaminated materials.	1960 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
61	Oil/Water Separator	Unit manages oily wastewaters.	1960 - Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
62	Area B Parts Cleaners	Unit manages waste oil, grease removed from machine parts, spent Stoddard solvent, mineral spirits and varsol.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
63	Laboratory Explosives SAA	Unit manages waste explosives and explosive-contaminated material collected in the catch basin behind the laboratory building (Building 8).	Unknown	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
64	Paint Sludges SAA	Unit managed paint sludges or still bottoms resulting from the recovery of thinners in a distillation unit at the Paint Shop.	1988 – 1990s	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
65	Respirator Cartridge SAA	Unit manages spent respirator filters that had failed TCLP testing for cadmium.	1989 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
66	Former Paint Waste SAA	Unit managed paint wastes from Area B paint shop.	1988 – 1989	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
67	Used Battery SAAs	Unit manages used batteries generated by vehicles and equipment.	Unknown	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
68	Sulfuric Acid SAA	Unit is used to collect spent sulfuric acid from used batteries that are drained prior to disposal.	Unknown	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
69	Scrap Metal Yard	Unit managed scrap metal and equipment.	Mid 1940s – 1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
70	Production Yards	These units are located throughout the facility. The units managed potentially contaminated equipment, scrap metal, decontaminated materials, and materials waiting reuse.	1942 – 1990s	*Yards 1-5, 8-11* – Confirmatory Sampling (CS) Report determined no releases; NFA approval DSWM – 6/19/00. *Yards 6-7* – CS Report determined no releases; NFA approval DSWM – 6/5/08. *Yard 12* – Interim Measures Report; NFA approval DSWM – 10/11/05.
71	PCB Storage Area	The unit manages the storage of PCB transformers and PCB-contaminated materials.	1981– Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
72	Former Battery Storage Area	The unit managed the storage of used vehicle batteries prior to disposal.	1960s– 1988	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
73	Waste Fuel Oil Drum Storage Area	The unit managed waste fuel oil from Sanitary Wastewater Treatment Facility.	1991	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
74	Ball Field Staging Area	This unit managed soil contaminated with petroleum hydrocarbons.	1989– 1990s	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
75	T–1 Bldg. Staging Area	This unit managed coal tar/soil mixture, a PCB-oil transformer, and calcium chloride.	1990s	Confirmatory Sampling Report determined no releases; NFA approval DSWM–6/5/08
76	Dumpster	The unit received various non-hazardous waste and general refuse such as paper, glass, metal, incinerator ash, and fly ash prior to disposal.	1942– 1990s	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
79	Waste Oil Underground Storage Tank (UST) at Bldg. 105	This unit is a 2,000-gallon carbon steel tank that was used to store waste motor oil, lubricating oil, and non-PCB transformer oil.	1968–1994	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
80	Waste Oil UST at Bldg. 556	This unit consists of a 2,500-gallon steel UST that stored spent mineral spirits, Stoddard chemical and varsol from parts cleaners.	1983–1994	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
81	Waste Oil UST at Bldg. 302	This unit consisted of one 130-gallon UST which received waste oil that had been captured in the oil room sump. The building and UST have been removed.	1970–1994	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
82	Area B Fly Ash Loading Station	This unit consists of a paved loading area for the transfer of fly ash.	App. 1957–Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
83	Decontamina-tion Ovens	These ovens manage metal parts and scrap metal that have been contaminated with explosive residues.	1961–Present	Interim Measures Report; NFA approval DSWM–10/13/05
84	Incinerators	This unit consists of incinerators used to thermally remove non-explosive waste materials from the plant site such as paper, cardboard, wooden boxes, plastic bags, oily rags, rubbish, foliage, and garbage.	1974–Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
85	Incinerator Staging Area	Unit manages the storage of non-hazardous, non-explosive, combustible garbage prior to incineration.	1974 – Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
89	Industrial Waste Water Treatment Facility	Unit treats the wastewater from the facility.	1983 – Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
90	Area A Former Coal Piles	Unit is a grass covered area that stored coal. It also managed ball mill solids.	1942 – 1989	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
91	Sewage Treatment Plant	Unit is a 758,000-gallon per day trickling filter waste-water treatment facility.	1960 – Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
93	Sandblasting Area 1	Unit had been used to perform general sandblasting.	1990 – 1992	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
94	Sandblasting Area 2	Unit had been used to perform general sandblasting.	1980s – 1990	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
95	Sandblasting Area 3	Unit was used to perform general sandblasting. The area is approximately 200 feet long by 200 feet wide. The area was once gravel but is now covered by an asphalt lot.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
97	Coal Tar Contamination Along the Rail Corridor	Unit is a coal tar disposal area along the rail corridor between Areas A and B.	Unknown	Interim Measures Report; NFA approval DSWM – 2/23/06
98	Coal Tar Contamination South of SWMU 17	Unit is a coal tar disposal area in Area B.	Unknown	Interim Measures Report; NFA approval DSWM – 3/14/06
99	Landfill	Unit is a possible landfill north of Building C-6.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
100	Possible Drum Rinsing Area near Bldg. R-6	Unit is a possible drum rinsing area near Building R-6. Area is presently a parking lot. This unit had been used to perform general sandblasting.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
101	Bldg. 105 Oil/ Water Separator and Associated Drain Pad	Unit was reportedly used for temporary storage of new oil drums. Unit had been used to perform general sandblasting.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
102	Former Penn–Dixie Sedimentation Pond	This surface impoundment is a natural low area approximately three acres. Runoff and leachate from a Penn-Dixie cement kiln dust waste pile was managed at this unit. This unit had been used to perform general sandblasting.	Unknown	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
104	Firing Range West of Building 134	Firing range used in the mid-1960s.	1960s	RFI/Interim Measures Report; NFA approval DSWM – 4/28/06
105	Firing Range at the Water Reservoir	Small arms practice range.	1984 – ?	RFI/Interim Measures Report; NFA approval DSWM – 4/28/06
106	Firing Range at Building 234	Area is the site of a former firing range. Range likely destroyed to construct Building 234.	1967 – 1983	RFI/Interim Measures Report; NFA approval DSWM – 4/28/06
107	Diesel UST at Rail Car Building	Diesel/fuel oil tank at in-plant fueling station which was taken out of service and abandoned in place at an unknown date.	Unknown	Interim Measures Report; NFA approval DSWM – 5/29/08
108	Armed Forces Reserve Center and Maintenance Shop	Area used for disposal of fly-ash type material.	Unknown	SWMU Assessment Report determined no releases; NFA approval DSWM – 5/12/09

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
110	Acetic Acid Spill near 3E4	Acetic acid/explosives pipeline expansion joint rupture	July 2013	Interim Measures Report; NFA DSWM approval – Nov 2017
A	Mad Branch Stream	This stream currently receives the facility's non-contact cooling water from Areas A and waters from the AFG Stream (AOC B).	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
B	AFG Stream	This stream receives non-contact cooling water from Area A.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
C	UST Gasoline Leak	Unit consisted of a filling station that contained three USTs that held diesel fuel and gasoline for facility vehicles. The tanks went through a UST closure.	1968 – 1994	RFI Addendum Report; NFA approval DSWM – 9/17/07
D	Existing Product USTs	These nineteen USTs managed products.	1942 – 1994	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
E	Removed Product USTs	These eight USTs no longer exist. They managed product materials.	1942 – 1991	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
F	Manganese Ore Piles	Unit consisted of several former and existing manganese ore piles stored directly on the ground.	1955 – 1987	Interim Measures Report; NFA approval DSWM – 3/14/06
G	Arnot Branch	This stream receives non-contact cooling water and surface drainage from the plant.	1942 – Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
H	Other Possible Fly Ash Sites	This unit consists of four sites in Area B identified as possible fly ash landfill locations.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
I	Explosive Demonstra-tion Ground	This area is located near the laboratory building. It contains a rectangular concrete pad where small quantities of explosives were detonated for training purposes.	1942– Present	Interim Measures Report; NFA approval DSWM–2/23/06
J	Area B Former Coal Pile	Soil and gravel areas that stored coal.	1942– Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–6/5/08
K	PCB Spill Site #2	This is a PCB spill from a transformer that was stored on a concrete pad east of Building 334 in Area B.	1987	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
L	PCB Spill Site #1	This area of contamination was located outside of Building #1 in Area A. The spill was the result of a transformer leak.	1987	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time:				
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
O	Coal Tar Behind Building 20	This unit is a coal tar site on the west side of Building 20 in Area A.	Unknown	RFI/Interim Measures Report; NFA approval DSWM–9/28/07

Table A-1(b) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) under this Order at this Time. These Units are Currently Regulated Under Another Program:			
SWMU/AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**
17	Active Sanitary Landfill	Unit is an 8.25-acre unlined landfill that received wastes from throughout the facility. *Regulated by TDEC Johnson City DSWM Field Office - Class II Sanitary Landfill: Permit No. IDL 37-104-0192.*	1983 – 1996
~~21~~	~~Rock Dam Landfill~~	~~Unit managed demolition and excavation wastes, scrap metal, wooden debris and domestic refuse. *Regulated by TDEC Johnson City DSWM Field Office. Unit closed – 10/31/83.*~~	~~1966 – 1983~~
22	Active Fly Ash Landfill	Unit is a 5.5-acre unlined landfill that received fly ash. *Regulated by Regulated by TDEC Johnson City DSWM Field Office - Class II fly Ash Landfill – Permit No. IDL 37-104-0062.*	1983 – 1997
~~23~~	~~Former Fly Ash Landfill~~	~~Unit is a 7-acre unlined clay-capped landfill that received fly ash. *Regulated by TDEC Johnson City DSWM Field Office.*~~	~~1977 – 1984~~
28	Sedimentation Pond for Fly Ash Landfill	Unit manages runoff from the Active Fly Ash Landfill (SWMU 22). *Regulated by TDEC Johnson City DSWM Field Office – Landfill –Permit No. IDL 37-104-0062.*	1983 – Present
45	Burning Pans (4)	Regulated by Hazardous Waste Mgmt Permit TNHW-148. Unit receives explosive-contaminated wastes. (Pans are in Burning Ground Area - SWMU 43)	1984 – Present
92	New Sanitary Landfill	Unit is used to dispose of nonhazardous, nonexplosive, sanitary and inert waste and garbage generated at HSAAP. *Regulated by TDEC Johnson City DSWM Field Office: Permit No. IDL 37-104-0090.*	1997 – Present

Table A-2 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Confirmatory Sampling (CS):
There are no SWMUs or AOCs requiring Confirmatory Sampling.

Table A-3 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring a RCRA Facility Investigation (RFI):
There are no SWMUs or AOCs requiring a RCRA Facility Investigation.

Table A-4 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Interim Measures (IM):

There are no SWMUs or AOCs requiring Interim Measures.

Table A-5 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring a Corrective Measures Study (CMS):

There are no SWMUs or AOCs requiring a Corrective Measures Study.

Table A-6 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	Remedy
3D1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3D2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3D8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3E1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3E2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3E5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3E9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3G9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3H2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3H3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3H8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3H9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections

Table A-6 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
4	Coal Tar Tanks	Unit consists of two 2,000-gallon aboveground steel tanks that stored coal tar. The tanks have been removed.	1978 –1994	Institutional Controls and Inspections
14	Coal Tar Landfill 1	Unit is a three-acre unlined landfill that managed coal tar and fly ash.	1948 –1978	Institutional Controls and Inspections
18	Former Sanitary Landfill	Unit is a 7-acre unlined clay capped landfill that received domestic refuse, light bulbs, bagged asbestos and empty pesticide containers.	1967 – 1984	Institutional Controls and Inspections
19	Construction Debris Landfill	Unit has managed construction debris as well as runoff from the Active Sanitary Landfill.	1984 – 1990s	Institutional Controls and Inspections
20	Area B Rock Quarry Landfill	Unit managed light metal, cinders, fly ash, fiberglass insulation, concrete, rubber, non-salable metal, automobile batteries and approximately six cubic yards of explosive contaminated concrete.	1940 – 1983	Institutional Controls and Inspections
21	Rock Dam Landfill	Unit managed demolition and excavation wastes, scrap metal, wooden debris and domestic refuse.	1966-1983	Institutional Controls and Inspections
23	Former Fly Ash Landfill	Unit is a 7-acre unlined clay capped landfill that received fly ash.	1977-1984	Institutional Controls and Inspections
26	WWII Coal Tar Site	Unit managed coal tar and fly ash.	Early 1940s	Institutional Controls and Inspections
29	Former Sedimentation Pond for Sanitary Landfill	Unit managed runoff from the Active Sanitary Landfill (SWMU 17).	1983 – 1984	Institutional Controls and Inspections
38	Sodium Nitrate Pond 1	Unlined unit received waste waters from the B-Line Production Areas.	1969 – 1972	Institutional Controls and Inspections
39	Sodium Nitrate Pond 2	Unlined unit received waste waters from the B-Line Production Areas.	1969 – 1972	Institutional Controls and Inspections
44	Former Burning Pads (2)	These two pads are located in the Burning Ground Area (SWMU 43).	Mid 1940s – 1984	Institutional Controls and Inspections

Table A-6 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
47	Burning Piles (5)	These piles are located in the Burning Ground Area (SWMU 43).	Mid 1940s – Present	Institutional Controls and Inspections
77	Pesticide Rinsate UST 148 – 1	Unit consisted of one 500-gallon pre-filter tank (UST) which received pesticide rinsate from pesticide spraying operations. The tank has been removed.	App. 1970s – 2004	Institutional Controls and Inspections
78	Pesticide Rinsate UST 148 – 2	Unit consisted of one 130-gallon septic tank (UST) which received pesticide rinsate from pesticide spraying operations. The tank has been removed.	App. 1970s – 2004	Institutional Controls and Inspections
86	Pesticide Drain Field	Unit managed pesticide rinsate. The drain field has been removed.	1960s – 2004	Institutional Controls and Inspections
87	Active Pesticide Wash-Down Area	Unit consists of a concrete wash pad with a three-foot concrete sump in the center. The unit is curbed on three sides. The unit managed pesticide rinsate.	1960s – 1986	Institutional Controls and Inspections
88	WWII Pesticide Wash-Down Area	Unit managed pesticide rinsate from tractors and spraying equipment.	1942 – 1970s	Institutional Controls and Inspections
96	Gas Producer Coal Tar Storage Tanks	Unit managed coal tar generated during production of coal gas in Building 10. Evidence of coal tar was reported during a pit excavation.	1940s – 1993	Institutional Controls and Inspections
103	Coal Tar Site, Ditch behind Gas Producer Building	Unit managed coal tar generated during production of coal gas in Building 10. Evidence of coal tar was reported during a pit excavation. The SWMU is the end of a ditch that carried discharge from Gas Producer Building.	1942 – 1994	Institutional Controls and Inspections
109	WW II Coal Tar Site 2	Unit managed coal tar	Early 1940s	Institutional Controls and Inspections
N	Hydraulic Fluid Leak, Elevator at Building G-2	This was site of hydraulic fluid leak at the elevator building associated with Building G-2	1940s – 1970s	Institutional Controls and Inspections
GW	Site-Wide Groundwater	Unit addresses groundwater contamination at Areas A & B.	Unknown	Monitoring, Reporting, and Well Inspections
Note: Institutional controls include access restrictions, signage, excavation restrictions, and annual perimeter fence and land use control inspections. Please see Appendix F, Corrective Action Remedies, for specific details.				

Table A-7 - List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	Remedy
3B33	Catch Basin~~Catch Basins~~	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.~~Catch basins in Areas A and B which collect solids; most associated with explosive manufacturing buildings.~~	1943–Present~~1942 – Present~~	Institutional Controls and Inspections~~Institutional Controls and Inspections~~
3D5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3D10	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3E3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3E4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3E6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3E7	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3E10	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3G3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3G4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3G5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3G6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3G7	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3G8	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3G10	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3H4	Catch Basin	Catch basin in Area B which collect solids; most	1943–	Institutional

Table A-7 - List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
		associated with explosive manufacturing buildings.	Present	Controls and Inspections
3H5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3H6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3H7	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3I3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3I5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3I6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3J3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3K3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3K5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3L1	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3L3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3L4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3L5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3L6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3L8	Catch Basin	Catch basin in Area B which collect solids; most	1943–	Institutional

Table A-7 - List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
		associated with explosive manufacturing buildings.	Present	Controls and Inspections
3M3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3M4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3M5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3M6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N7	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N8	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3O3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
24	Bldg. 200 Coal Tar and Fly Ash Landfill	This unit managed fly ash, coal tar and possibly hexamine.	1960s	Institutional Controls and Inspections
27	Sedimentation Pond for Coal Pile	This unit manages runoff from the existing Coal Pile (SWMU 56)	1989 – Present	Institutional Controls and Inspections
37	Nitric Acid Spill Pond	This unlined unit receives overflows from the Nitric Acid Production.	1940s – Present	Institutional Controls and Inspections
56	Existing Coal Pile	This unit stores coal directly on the ground.	1989 –	Institutional

Table A-7 - List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
			Present	Controls and Inspections
Note: Institutional controls include access restrictions, signage, excavation restrictions, and annual perimeter fence and land use control inspections. Please see Appendix F, Corrective Action Remedies, for specific details.				

APPENDIX E

SCREENING LEVELS

I. DEFINITION

Screening levels are conservative health-based concentrations of hazardous constituents determined to be indicators for the protection of human health or the environment. Screening levels shall be set for all hazardous constituents, a subset of hazardous wastes, identified in the RCRA Facility Investigation (RFI) Report(s) or for those hazardous constituents which the Commissioner has reason to believe may have been released from a Solid Waste Management Unit (SWMU) or an Area of Concern (AOC) at the facility. Should the concentration of a hazardous constituent(s) in an aquifer, surface water, soil or air exceed its screening level for any environmental medium, the Commissioner may require Respondent to conduct a Corrective Measure Study (CMS) to meet the requirements of Condition II.G, Appendix C, and Tennessee Hazardous Waste Management Regulations Rule 0400-12-01-.06(6)(l). If the Commissioner determines that a constituent(s) released from a SWMU or AOC in quantities below its respective screening level(s) may pose a threat to human health or the environment, given site-specific exposure conditions, cumulative effects, ecological concerns, etc., then the Commissioner has the authority to require a CMS to meet the requirements of Condition II.G, Appendix C, and Rule 0400-12-01-.06(6)(l).

A. Screening levels shall be concentration levels that satisfy the following criteria:

1. Are derived in a manner consistent with the U.S. Environmental Protection Agency (EPA) guidelines for assessing human and environmental health risks from hazardous constituents; and

2. Are based on scientifically valid studies conducted in accordance with the Toxic Substances Control Act (TSCA) Good Laboratory Practice Standards, or equivalent; and

3. For human health screening levels to address carcinogens, represents a concentration associated with an excess upper bound lifetime cancer risk of 1×10^{-6} for carcinogens due to continuous constant lifetime exposure; and

4. For human health screening levels to address systemic toxicants, represents a concentration to which the human population (including sensitive subgroups) could be exposed on a daily basis that is likely to be without appreciable risk of deleterious effects during a lifetime.

B. For constituent(s) detected in groundwater, air, surface water or soil, for which a concentration level that meets the criteria specified in paragraphs I.A.1 through I.A.4 of this appendix is not available or possible, the screening level for the constituent(s) shall be the background concentration of the constituent(s).

II. GROUNDWATER

A. Screening levels for groundwater constituents shall be concentrations specified as:

1. Maximum contaminant levels (MCLs) for Drinking Water Standards; or

2. For constituents for which MCLs have not been promulgated, a concentration which satisfies the criteria specified in paragraphs I.A.1 through I.A.4 of this appendix shall be calculated.

B. In deriving human health screening levels for constituents for which MCLs have not been promulgated, the recommended equations/assumptions shall be that followed by EPA's "Regional Screening Levels for Chemical Contaminants at Superfund Sites," most recent version, which can be found on the internet at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm. Because the science of risk assessment is in flux and technical criteria/opinion of today (e.g., content of standardized equations, use of default exposure assumptions, etc.) may change, the Commissioner reserves that right to revise the above recommended equations/assumptions as needed to meet the criteria listed in paragraphs I.A.1 through I.A.4 of this appendix. ~~**For RDX, the Lifetime Health Advisory shall be used as the screening level.**~~

~~**Screening levels for groundwater monitoring performed as part of a corrective action remedy shall be the State of Tennessee Water Quality Criteria – Domestic Water Supply Criteria listed in Table G-2. Boundary wells sampled as part of corrective action remedy shall also be compared to the Groundwater Protection Standards listed in Table G-2.**~~

III. SURFACE WATER

A. Screening levels for surface water constituents shall be concentrations specified as:

~~1.~~ ~~**The lowest State of Tennessee Water Quality Criteria listed in Table G-2 for surface water monitoring performed as part of a corrective action remedy.**~~

~~2~~1. Water Quality Standards established pursuant to the Clean Water Act by the State of Tennessee, where such standards are expressed as numeric values; or

~~3~~2. Numeric interpretations of State narrative water quality standards where water quality standards expressed as numeric values have not been established by the State; or

~~4~~3. MCLs for constituents in surface water designated by the State for drinking water supply, where numeric values or numeric interpretations, described in paragraphs III.A.1 and 2 of this appendix are not available; or

~~5~~4. For constituents in surface waters designated by the State for drinking water supply for which numeric values, numeric interpretations, or MCLs are not available, a concentration which meets the criteria specified in paragraphs I.A.1 through I.A.4 of this appendix shall be calculated assuming exposure through consumption of the water contaminated with the constituent; or

~~6~~5. For constituents in surface waters designated for use or uses other than drinking water supply and for which numeric values or numeric interpretations have not been established, a concentration established by the Commissioner which meets the criteria specified in paragraphs I.A.1 through I.A.4 of this appendix shall be calculated.

B. In deriving human health screening levels for constituents in surface water, the recommended equations/assumptions shall be that followed by EPA's "Regional Screening Levels for Chemical Contaminants at Superfund Sites," most recent version, which can be found at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm. Because the science of risk assessment is in flux and technical criteria/opinion of today (e.g., content of standardized equations, use of default exposure assumptions, etc.) may change, the Commissioner reserves that right to revise the above recommended equations/assumptions as needed to meet the criteria listed in paragraphs I.A.1 through I.A.4 of this appendix.

IV. AIR

A. Screening levels for constituents in air shall be defined as concentrations which meet the criteria specified in paragraphs I.A.1 through I.A.4 of this appendix. The screening levels for air shall be measured or estimated at the facility boundary, or another location closer to the unit if necessary to protect human health and the environment.

B. In deriving human health screening levels for constituents in air, the reference concentration (RfC) should be utilized as the screening level, where available. The RfC includes exposure assumptions, and no calculations are necessary to calculate a screening level. If an RfC is not available, the recommended methodology/ assumptions shall be that followed by EPA's "Regional Screening Levels for Chemical Contaminants at Superfund Sites," most recent version, which can be found on the internet at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm. Because the science of risk assessment is in flux and technical criteria/opinion of today (e.g., content of standardized equations, use of default exposure assumptions, etc.) may change, the Commissioner reserves that right to revise the above recommended equations/assumptions as needed to meet the criteria listed in paragraphs I.A.1 through I.A.4 of this appendix.

V. SOIL

A. Screening levels for constituents in soil shall be concentrations which meet the criteria specified in paragraphs I.A.1 through I.A.4 of this appendix.

B. The calculation of human health screening levels for soil includes several specific exposure routes which must be evaluated individually: 1) ingestion, 2) inhalation and 3) leachability to groundwater. In deriving screening levels to address ingestion, inhalation and leaching, the methodology/assumptions found in the most recent EPA Soil Screening Level Guidance should be reviewed for appropriate equations and assumptions. Because the science of risk assessment is in flux and technical criteria/opinion of today (e.g., content of standardized equations, use of default exposure assumptions, etc.) may change, the Commissioner reserves that right to revise the above recommended equations/assumptions as needed to meet the criteria listed in paragraphs I.A.1 through I.A.4 of this appendix.

VI. SEDIMENT

A. Screening levels for constituents in sediment shall be based on whether human health or ecological health is the major concern. If ecological concerns are deemed to predominate, then screening levels for constituents in sediment shall be concentrations based on the latest sediment screening values as calculated by EPA Region 4. Because the science of risk assessment is in flux and technical criteria/opinion of today (e.g., content of standardized equations, use of default exposure assumptions, etc.) may change, the Commissioner reserves that right to revise the above recommended equations/assumptions as needed to meet the criteria listed in paragraphs I.A.1 through I.A.4 of this appendix.

B. If an ecological sediment screening value for a constituent of concern has not been generated by EPA Region 4 and cannot be generated using the criteria in paragraphs I.A.1 and I.A.2 of this appendix, then the ecological screening level for sediment shall be background. If human health is the prevailing concern, then the human health screening level for sediment shall address all applicable exposures.

APPENDIX F

CORRECTIVE ACTION REMEDIES

This Appendix provides the selected corrective action remedy to be implemented by Holston Army Ammunition Plant (HSAAP or Respondent). It includes a general description of the facility and all the necessary corrective action requirements to minimize exposure risks to contamination associated with the solid waste management units and areas of concern at the operating facility.

SITE DESCRIPTION

HSAAP, located at 4509 West Stone Drive in Kingsport, Tennessee, consists of two plant areas (Figure 1). Area A is located within the City of Kingsport in Sullivan County, Tennessee, on State Route 93. Area B is located on U.S. Route 11W in Hawkins County about 4 miles west of downtown Kingsport. Area A and Area B are linked by a fenced interplant railroad that is approximately 3.7 miles long (Figure 2).

Area A, the smaller of the two areas, is approximately 112 acres and is located within a heavily industrialized area of Kingsport adjacent to several private sector commercial industrial facilities. Area B is approximately 5,913 acres and contains the explosives production area, where explosive manufacturing and packaging takes place. During most of the history of HSAAP, the region around Area B has been residential and agricultural, along with limited commercial activities. Since the early 1980s, residential and commercial developments have increased significantly around Area B, particularly around West Stone Drive. Residential developments abut the northeast and northwest plant boundaries of Area B. Highway 11W separates Area B from the majority of residential and commercial areas to the north and northwest. Residential areas to the south are separated from Area B by sections of Holston River Mountain, Bays Mountain, and Bays Mountain Park.

The tables in Appendix A provide the requirements for all the solid waste management units (SWMUs) and areas of concern (AOCs) at HSAAP. Figures 3 through 6 depict the locations of these units. Specifically, there are ~~77~~ **143** SWMUs and ~~13~~ AOCs that require no further action under this order at this time **(Table A-1(a))**. There are no SWMUs or AOCs that require confirmatory sampling **(Table A-2)**, a RCRA facility investigation **(Table A-3)**, interim measures **(Table A-4)**, or a corrective measures study **(Table A-5)**. The ~~24~~ **81** SWMUs~~ and two~~ AOCs requiring implementation of a corrective action remedy are listed in Appendix A, Tables A-6 and A-7. As detailed in paragraph II.I.2, on order attachment page 21, additional investigation and other possible remedial actions, may be necessary for the ~~five~~ **46** operationally active units listed in Table A-7. Those actions shall be addressed during unit or plant closure.

CORRECTIVE ACTION REQUIREMENTS

The following sections describe how the Respondent shall implement the selected corrective action remedies at HSAAP. The sections are Site Security Measures and Institutional Controls; Groundwater Monitoring; Surface Water Monitoring; and, Inspections. Controls are necessary to protect human health and the environment by preventing exposure to the materials contaminated

with hazardous constituents associated with SWMUs and AOCs. This shall be accomplished through site access controls and enforcement of internal administrative policies. Inspections will verify that these controls are maintained and that the installed cap/cover systems remain intact. Groundwater monitoring will identify changes in groundwater quality at or near prior release locations and along the downgradient facility boundary. The point of compliance (POC) is defined by the boundary wells that monitor groundwater quality prior to discharge to the Holston River. Surface water monitoring will verify that migration of hazardous contaminants from Area B SWMUs and AOCs has not impacted the water quality of the Holston River.

I. SITE SECURITY AND INSTITUTIONAL CONTROLS

This section provides the conditions for site security and the institutional controls that are required to be maintained at HSAAP. Respondent shall provide appropriate security measures at the facility that will mitigate the potential for uncontrolled exposures to remaining hazardous constituents at or from the SWMUs and AOCs listed in Tables A-6 and A-7 of Appendix A. Existing security measures limit public access to the facility, as well as restrict worker access to these areas. The conditions of this section shall apply to the units in Table A-7 for limiting the risk of exposure but shall only be applied to the normal operational procedures of the active SWMUs as necessary to prevent exposures.

A. Respondent shall maintain, in good condition, the existing facility perimeter six-foot chain-link fence in areas where SWMUs and AOCs contain hazardous constituents at concentrations that do not allow for unrestricted use. This fencing system, in conjunction with the river, acts as a barrier to unauthorized foot ingress. The fence shall be regularly inspected as described in Section IV of this Appendix. Access to these areas of the facility is controlled through use of security guards and/or gates.

B. Respondent shall maintain signs or provide other means, as approved by the Division, to readily identify the location of the SWMUs and AOCs that are listed in Appendix A, Tables A-6 and A-7, that require institutional controls (ICs).

C. Respondent shall not allow any digging, drilling, construction, or other activities that disturb the soils, landfill covers or wastes within the SWMUs and AOCs that are listed as requiring ICs in Appendix A, Tables A-6 and A-7, without prior written authorization by the Commissioner and acquiring a HSAAP safety permit approval. ~~**Repairs needed to maintain the integrity of landfill covers do not require the Commissioner's written authorization.**~~

D. Respondent shall ensure that no work is started at a designated site until a Safety Permit has been issued by the HSAAP Safety Manager. All requests for Safety Permits shall be made to the Safety Manager a minimum of 24 hours in advance of the start of the work. The 24-hour requirement ~~may~~ **shall** be waived in the event of **landfill repairs or** an emergency response. The Safety Manager shall ensure all work has been authorized by the HSAAP Environmental Manager. Failure to conform to plant safety rules and the conditions of the Safety Permit will result in revocation of the Safety Permit.

E. To minimize the threat of exposure to hazardous constituents at HSAAP, Respondent must ensure that workers adhere to established safety measures during inspections, maintenance, or any other activities at the SWMUs and AOCs that are listed in Appendix A, Tables A-6 and A-7.

F. To ensure that unauthorized excavation or other disturbances of the landfill caps or soil covers have not taken place, Respondent shall perform semiannual land use control inspections of the SWMUs and AOCs that are listed in Appendix A, Tables A-6 and A-7.

G. Respondent shall notify the Commissioner of the Department of Environment and Conservation within fifteen (15) days of discovery of any significant and/or ongoing noncompliance with the institutional controls or security measures specified in this order.

II. GROUNDWATER MONITORING

This section provides the conditions for groundwater monitoring, which includes the sampling and analysis procedures to be performed by the Respondent at HSAAP.

A. Respondent shall maintain the groundwater monitoring wells for AOC-GW in accordance with the monitoring well construction details in Table G-1, Appendix G, at the locations shown on Figures 4 through 6 of this Appendix.

B. Respondent shall collect groundwater samples as specified in Appendix G, Groundwater Monitoring, and as summarized in Table G-2.

C. Respondent shall analyze the monitoring well samples using the methods listed in Subsection III.C of Appendix G, Groundwater Monitoring.

D. In order to comply with Rule 0400-12-01-.06(6)(l), Respondent shall compare the analytical results from boundary well monitoring to the Groundwater Protection Standards (GWPS) in Table G-~~3~~ 2 of Appendix G. The GWPS, including all the Tennessee General Water Quality Criteria used to develop the risk-based concentrations for the site's Target Analytes are presented in Table G-~~3~~2. Respondent shall notify the Commissioner within fifteen days of discovery that a GWPS has been exceeded at a boundary well. An exceedance may require additional sampling, implementation of corrective measures and/or modification of the remedy. The notification shall include recommendations for further action.

~~**E. Respondent shall compare the analytical results from the monitoring well sampling to the lowest Tennessee General Water Quality Criteria listed in Table G-2.**~~

~~F.~~E. Respondent shall comply with all groundwater reporting requirements of this Order including the submittal of an annual report.

~~G.~~F. At such time that closure is necessary and with prior written approval by the Commissioner, Respondent shall close the monitoring wells listed in Table G-1 according to the procedures specified in the HSAAP Site Well Plugging and Abandonment Plan (Appendix J).

III. SURFACE WATER MONITORING

This section provides the conditions for surface water monitoring, which includes the sampling and analysis procedures to be performed by the Respondent at HSAAP. The monitoring of the Holston River is to verify that any constituent of concern (Target Analyte) in groundwater discharging to the river from the Respondent's facility is not statistically impacting the surface water body.

A. Respondent shall collect appropriate upgradient and downgradient surface water samples to monitor for any impact of groundwater discharging to the Holston River from HSAAP's Area B.

B. Respondent shall annually collect surface water samples for all the Target Analytes listed in Appendix G, Table G-~~3~~2, in accordance with the procedures contained in the HSAAP Site Sampling and Analysis Plan (SAP – Appendix H) dated February 2005, and the Site Quality Assurance Project Plan (QAPP – Appendix I) dated February 2005. The annual sampling shall alternate from a spring event in the years that bi-annual groundwater samples are collected, to a fall event in the years bi-annual groundwater samples are not collected.

C. Respondent shall use the same sample handling techniques, including preservation methods, chain-of-custody procedures and other quality control measures to assure surface water sample integrity, as described for groundwater samples in Section II of this appendix and in Appendix G. Duplicate samples will not be required. The trip blanks used for groundwater sampling events will suffice for the surface water samples if the two events coincide.

D. Respondent shall analyze the surface water samples using the same methods as prescribed for the groundwater samples, which are listed in Subsection III.C of Appendix G, Groundwater Monitoring.

E. Respondent shall statistically compare the analytical results of the upgradient sample(s) to the downgradient sample(s). Respondent shall use the most appropriate statistical method for evaluating the surface water analytical data as selected from EPA's guidance document "Data Quality Assessment:~~—~~ Statistical Methods for Practitioners EPA QA/G-9S," which can be found online at epa.gov/quality/qs-docs/g9s-final.pdf. The statistical analysis must be performed within forty-five (45) calendar days of the receipt of the analytical results.

F. Respondent shall include a map of the surface water monitoring locations, the rational for the sample locations' choices, the analytical results, the statistical test method(s) used, conclusions, and any recommendations as part of their annual report.

G. Respondent shall notify the Commissioner within fifteen (15) calendar days of determining that the groundwater discharge is impacting the Holston River. The notification shall include recommendation(s) and a schedule for further action.

IV. INSPECTIONS

In accordance with the conditions in this section, Respondent shall perform regular inspections at HSAAP. Items included for inspections are the perimeter fence and gates, the landfills/coal tar disposal areas, land use controls, and the groundwater monitoring wells. Inspections shall be performed semiannually for all the SWMUs and AOCs listed in Tables A-6 and A-7 of Appendix A. Respondent shall document all the inspections required by this order and retain in the facility record, copies of all inspection reports and logs in accordance with Attachment Subparagraph I.D.7(b). The inspections shall be performed using the following procedures.

A. Perimeter Fence and Gates: The site perimeter fence shall be inspected to ensure that the chain link, rails, and barbed wire are intact and continuous, and are a deterrent to unauthorized entry. Signs shall be inspected for legibility. Unattended gates shall be inspected to ensure they are chained and locked against unauthorized entry. These inspections shall be documented.

B. Landfill/Coal Tar Area Inspections: Each cap/cover system shall be inspected for signs of deterioration, erosion, settlement, cracks, and stressed vegetation. The physical inspections shall include all items listed below.

1. Drainage ditches shall be inspected to ensure they are free flowing.

2. Interior fencing specific to a landfill area shall be inspected to ensure it is intact and can prevent unauthorized access to the landfill. Gates, if present, shall be inspected to ensure they are locked and secured.

3. Signs shall be inspected to ensure they are visible and legible.

4. The coal tar areas shall be inspected for the presence of surficial coal tar.

The SWMUs to be inspected are indicated on Tables A-6 and A-7. Inspection findings and recommendations for repairs/coal tar removal shall be recorded on the Semiannual Landfill Cap/Cover Inspection Report form in this Appendix. Repairs shall be made in a timely manner and documented on the inspection form. A summary of deficiencies noted during inspections, including completed repairs, shall be included in the Annual Long-Term Monitoring Report.

C. Land Use Control Inspections: To confirm compliance with the Institutional Controls regarding unauthorized excavations, physical site inspections shall be conducted at the SWMUs indicated in Tables A-6 and A-7. Each site shall be examined for signs of soil disturbance. Should it appear that excavation has taken place, the inspector shall work with the HSAAP Environmental Coordinator to review the site operating contractor's safety permits to determine whether the excavation was authorized. If the excavation was not authorized, the inspector shall notify the HSAAP Environmental Coordinator who shall then make all further investigation/notifications of said unauthorized excavation. The findings of the Land Use Control Inspections shall be documented on the Landfill Cap/Cover Inspection Report form and a summary of those findings shall be included in the Annual Long-Term Monitoring Report. Respondent shall also notify the Commissioner within fifteen days as detailed in Subsection II.G of Appendix F.

D. Monitoring Well Inspections: Groundwater monitoring wells sampled as part of Area of Concern – Site-Wide Groundwater (AOC-GW) shall be inspected on a semiannual basis. The wells are listed in Table G-1 and shown on Figures 4 through 6. Monitoring well inspections shall include all items listed below.

1. The identification number of each well shall be examined to ensure it is legible.
2. Wells completed above grade shall be examined to ensure guard posts are present and situated to prevent collision damage to the well.
3. The traffic cover at flush-mount wells shall be examined for signs of crushing or cracking and to confirm that it is bolted to the box.
4. Concrete aprons and pads shall be examined for signs of cracking or other deterioration.
5. The presence of an intact cover and working lock on the protective casing shall be confirmed. Checking the presence of an intact compression cap or sampling system cover (e.g., Well Wizard ™) on the inner casing is only required when each particular well is scheduled for sampling as identified by the sampling frequency columns in Table G-2.
6. Protective casings shall be examined to ensure they are intact, straight and sound and have an unobstructed weep hole.
7. The findings of the well inspections shall be documented on the Holston Army Ammunition Plant Well Inspection Checklist Form in this Appendix. A summary of any deficiencies and repairs made shall be included in the Annual Long-Term Monitoring Report.

Figure 1

Site Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Basemap: National Geographic Society, i-cubed

0 5,000 10,000 Feet

0 1,000 2,000 Meters

1 inch = 6,000 feet

Site Boundary

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised:11/7/2018 Project No.J160167

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAOJ160167 FIG 1 HSAAP Site Location.mxd

Figure 2

Site Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Basemap: National Geographic Society, i-cubed

0 2,000 4,000 6,000 8,000 10,000 Feet

0 1,000 2,000 3,000 Meters

Project Site Boundary

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised: 11/7/2018 Project No.J160167

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAO\J160167 FIG 2 Site Map.mxd

Figure 3

HSAAP Rail Corridor and Off-Site Area - SWMU AOC Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Basemap: National Geographic Society, i-cubed

0 2,000 4,000 6,000 8,000 10,000 Feet

0 1,000 2,000 3,000 Meters

- Solid Waste Management Unit (SWMU)
- Project Site Boundary

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised: 11/7/2018 Project No.J160167

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAO\J160167 FIG 3 HSAAP Rail Corridor and Off-Site Area - SWMU_AOC Location Map.mxd

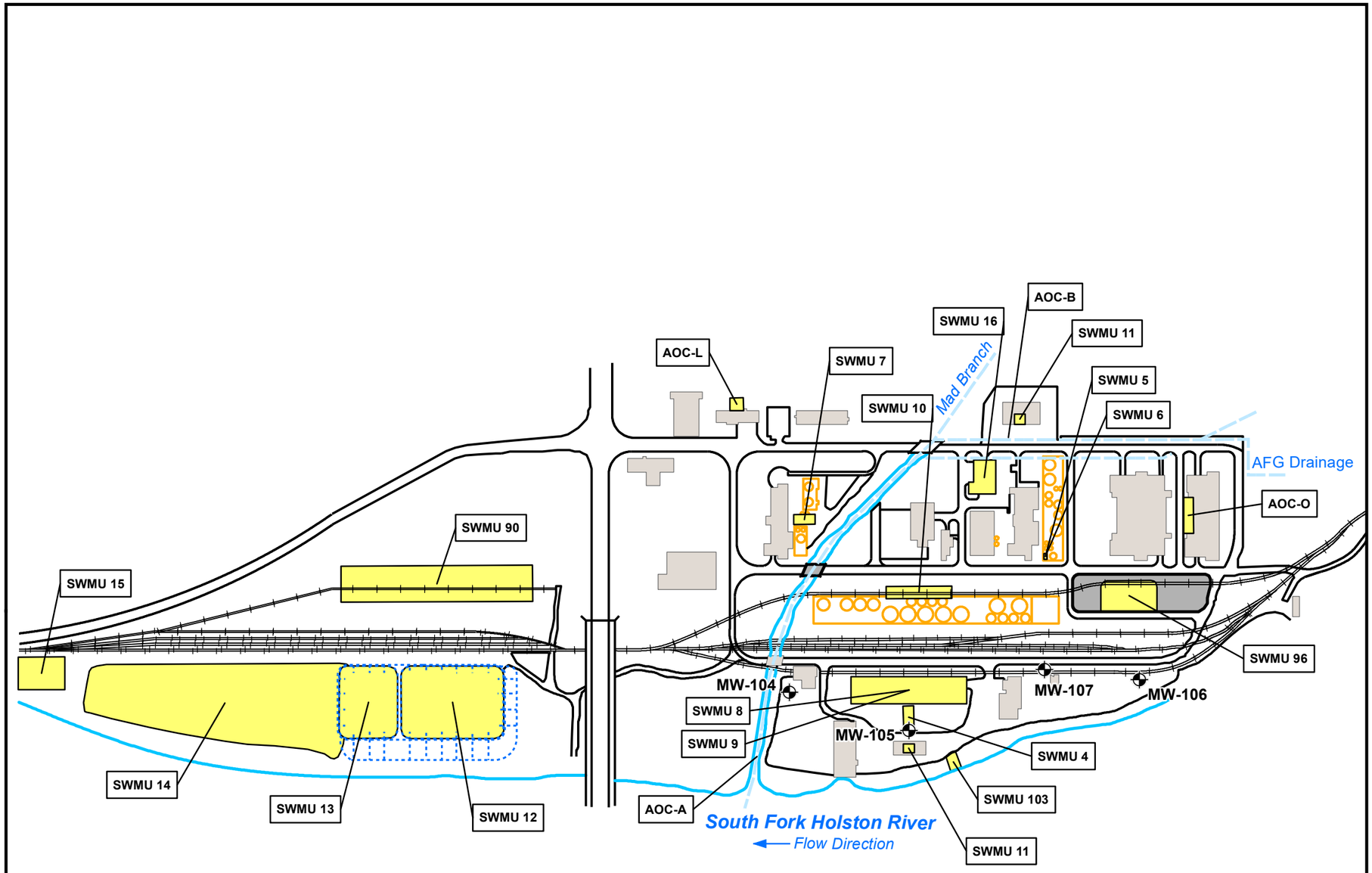
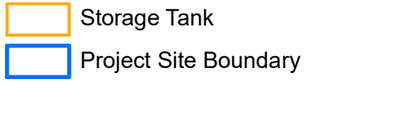


Figure 4

HSAAP Area A SWMU/AOC and Monitoring Well Location Map

Holston AAP

Kingsport, TN 37660



Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet

0 250 500 750 1,000 Feet

0 100 200 300 Meters

- Long Term Monitoring Well Location
- Holding Pond
- Railroad
- Road
- Ditch
- River
- Building
- Bridge
- Solid Waste Management Unit (SWMU) or Area of Concern (AOC)
- Storage Tank
- Project Site Boundary

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Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAOIJ160167 FIG 4 HSAAP Area A SWMU_AOC and Monitoring Well Location Map.mxd

Figure 5

HSAAP Area B Production and Shop Areas SWMU/AOC and Monitoring Well Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet

0 1,000 2,000 3,000 4,000 Feet

0 250 500 750 1,000 Meters

- Long Term Monitoring Well Location
- Drainage Ditch
- River
- Road
- Cat-Walk
- Fence
- Property Boundary
- Railroad
- Storage Tank
- Islands
- Bunker
- Building
- Solid Waste Management Unit (SWMU) or Area of Concern (AOC)

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SWMU-17

SWMU-17

SWMU-25

SWMU-21

SWMU-19/29

SWMU-98

SWMU-20

MW-48

MW-116

MW-115

MW-68

HOLSTON RIVER

Figure 6

HSAAP Area B Landfill Area SWMU/AOC and Monitoring Well Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet

NOT TO SCALE

- Long Term Monitoring Well Location
- Railroad
- Road
- River
- Solid Waste Management Unit (SWMU)

Drawn By: N.J. Date Drawn/Revised: 11/29/2018 Project No.J160167

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAO\J160167 FIG 6 HSAAP Area B Landfill Area SWMU_AOC and Monitoring Well Location Map.mxd

APPENDIX G

GROUNDWATER MONITORING

This Section provides the description of the groundwater monitoring program and includes the Groundwater Protection Standards and sampling and analysis procedures for Holston Army Ammunition Plant (HSAAP).

I. MONITORING WELLS

Construction details and monitoring protocol for the wells included in the AOC-GW monitoring network are listed on Tables G-1 and G-2, respectively. Locations of monitoring wells are shown on Figures 4 through 6 of Appendix F. The wells were selected to identify changes in groundwater quality at or near prior release locations (interior wells), and to verify that migration of contaminants will not impact the water quality of the Holston River (boundary wells).

There are ~~seven~~ **five** interior wells at Area B that ~~. Six of the interior wells~~ monitor source trends~~; the seventh well is an upgradient well which serves as a background well~~. There are ~~four~~ **three** boundary wells at the Area B landfill area downgradient of SWMUs 19/29 and 20. There are twelve boundary wells at the Area B production and shops area including four co-located well pairs to monitor unconsolidated and bedrock intervals, and an additional two unconsolidated and two bedrock wells. There are four boundary monitoring wells at Area A, which are downgradient of legacy sources and upgradient of the South Fork of the Holston River.

II. TARGET ANALYTES AND GROUNDWATER PROTECTION STANDARDS

The target analytes for long-term groundwater monitoring, are shown in Table G-2~~3~~ of this appendix. The selected target analytes are based on process knowledge and characteristics of known releases and wastes managed at solid waste management units (SWMUs). The Groundwater Protection Standards were selected to be protective of groundwater and the water quality of the Holston River. Respondent shall compare all analytical results for each target analyte to the Groundwater Protection Standards in Table G-2~~3~~.

Respondent shall notify the Commissioner within fifteen (15) days of discovery that a Groundwater Protection Standard has been exceeded at any boundary well. An exceedance may require additional sampling, implementation of corrective measures and/or modification of the final remedy. The notification shall include recommendations for further action.

III. GROUNDWATER SAMPLING AND ANALYSIS PROCEDURES

Respondent shall be responsible for performing groundwater monitoring in accordance with the following procedures:

A. Groundwater samples, shall be collected and analyzed in accordance with the frequencies shown on Table G-2.

B. Groundwater samples shall be collected in accordance with the procedures contained in the HSAAP Site Sampling and Analysis Plan (SAP – Appendix H) dated February 2005, and the Site Quality Assurance Project Plan (QAPP – Appendix I) dated February 2005, as summarized below:

1. The low-flow purging method described in the SAP shall be used to collect the samples. In the event low-flow purging cannot be conducted without drawing down the water level in the well, sampling shall be conducted using a pump or bailer and purging the well to dryness per the SAP. Samples shall be collected from the recovered well within a 24-hour period. If all required samples cannot be collected with the initial 24-hour period, samples shall be collected in order of importance within consecutive intervals not to exceed 24-hours each.

2. Field parameters, including pH, temperature, specific conductivity, dissolved oxygen, and oxidation/reduction potential, shall be measured during all groundwater sampling events.

3. Groundwater samples shall be collected in laboratory-prepared sample containers.

C. If not specified in this order, laboratory methods must be those specified in the most recent version of Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846 which can be found at https://www.epa.gov/hw-sw846, or an equivalent method approved by the Commissioner.~~Unless a different method is specified in the most recent version of Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, which can be found online at http://www.epa.gov/osw/hazard/testmethods/sw846/online/,~~ T~~t~~he **most current of the** following USEPA analytical methods shall be used:

1. Volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene and xylenes (BTEX) – SW-846 8260~~B~~

2. Semivolatile organic compounds (SVOCs) – SW-846 8270~~C~~

3. RCRA Metals – SW-846 6010~~B~~, 6020, and 7470 (Mercury only)

4. **Explosives including** RDX and RDX Degradation Compounds – SW-846 8330

5. Pesticides – SW-846 8081~~A~~

6. Bromacil – SW-846 8141~~A~~

D. Groundwater samples shall be placed in coolers on ice or refrigerated immediately following collection while awaiting shipment to the laboratory. Completed chain-of-custody forms shall accompany all shipments to the laboratory.

E. Quality control samples to be collected include:

1. Duplicate samples shall be collected to evaluate the laboratory's ability to reproduce the analytical results. One duplicate groundwater sample shall be collected for every 10 field samples.

2. One trip blank shall accompany each cooler of VOC samples to identify contamination that may have been contributed to the field samples during transport. The trip blank shall be prepared by the laboratory, shipped with the glassware to be used for sample collection, and analyzed for VOCs.

3. Equipment rinsate blanks shall be used to determine the effectiveness of the field decontamination. The blank shall be collected after decontamination of the sampling device by pouring ASTM Type I water (or equivalent) over and into the device and collecting the water directly into sample containers. Rinsate blanks shall be collected at a frequency of 10% or one per day per matrix.

4. Source water blanks shall be collected from each water source (ASTM Type I lot or potable water source) used for decontamination purposes.

F. The results of the sampling events shall be reported annually. The reports shall include summary tables of the analytical results and potentiometric surface maps based on groundwater level measurements collected during each sampling event. The report shall also include an evaluation of long-term trends at interior source wells, as applicable. Field sampling data sheets, laboratory analytical reports, and quality assurance summaries shall be attached to the annual reports.

Table G-1 - Long-Term Monitoring Well Construction Data

Area[a]		Well	Well Depth (ft BGS)	Bottom of Well (ft AMSL)	Ground Surface (ft AMSL)	Top of Casing Elevation (ft AMSL)	Screen Length (ft)	Bottom of Screen (ft AMSL)	Top of Screen (ft AMSL)	Geology of Screened Interval	Construction	Year Constructed
I. Area A		MW-104	19.00	1,180.45	1,199.45	1,199.40	10	1,180.95	1,190.95	Alluvium and shale (screen 2 ft into weathered shale)	2-in. PVC, flush-mount	2001
		MW-105	19.50	1,180.65	1,200.15	1,200.08	10	1,181.15	1,191.15	Alluvium and shale (screen 7 ft into weathered and competent shale)	2-in. PVC, flush-mount	2001
		MW-106	19.60	1,181.46	1,201.06	1,201.00	10	1,181.96	1,191.96	Alluvium and shale (screen 8 ft into weathered and competent shale)	2-in. PVC, flush-mount	2001
		MW-107	19.00	1,181.28	1,200.28	1,200.16	10	1,181.78	1,191.78	Shale – weathered	2-in. PVC, flush-mount	2001
II. Area B - Landfill Area		MW-48	66.90	No data	No data	1,200.52	No data	No data	No data	Limestone – dolostone	2-in. PVC, above-ground	1997
		~~MW-55~~	~~115.20~~	~~1,189.99~~	~~1,305.19~~	~~1,307.71~~	~~10~~	~~1,189.99~~	~~1,199.99~~	~~Limestone – dolostone~~	~~2-in. PVC, above-ground~~	~~1989~~
		MW-68	41.40	1,141.26	1,182.36	1,184.83	20	1,141.76	1,161.76	Limestone – dolostone	2-in. PVC, above-ground	1997
		~~MW-114~~	~~102.90~~	~~1,091.80~~	~~1,194.70~~	~~1,197.67~~	~~10~~	~~1,089.33~~	~~1,099.33~~	~~Limestone – dolostone~~	~~2-in. PVC, above-ground~~	~~2005~~
		MW-115	38.00	1,152.80	1,190.80	1,193.65	10	1,153.40	1,163.40	Limestone – dolostone	2-in. PVC, above-ground	2005
		MW-116	116.80	1,087.70	1,204.50	1,207.50	20	1,087.90	1,107.60	Limestone – dolostone	2-in. PVC, above-ground	2005
III. Area B - Explosives Production and Shop Areas	A. Installation Boundary near Holston River	MW-101	17.41	1,157.56	1,174.97	1,177.17	10	1,158.06	1,168.06	Alluvium and weathered shale (screen into weathered shale 2 ft)	2-in. PVC, above-ground	2001
		MW-101B	61.44	1,113.00 (OB)	1,174.44	1,176.81	37 (OB)	1,113 (OB)	1,150 (OB)	Shale – competent	4-in. PVC, above-ground	2001
		MW-11	14.20	1,150.69	1,164.89	1,168.69	10	1,151.20	1,161.20	Alluvium and weathered shale (screen into weathered shale 5 ft)	2-in. PVC, above-ground	1980
		MW-11B	60.50	1,105.1 (OB)	1,165.60	1,168.57	47 (OB)	1,105.1 (OB)	1,152.1 (OB)	Shale – competent	4-in. PVC, above-ground	2001
		MW-102	16.09	1,151.72	1,167.81	1,169.72	10	1,152.22	1,162.22	Alluvium	2-in. PVC, above-ground	2001
		MW-102B	24.35	1,117.5 (OB)	1,167.35	1,169.49	24.5 (OB)	1,117.5 (OB)	1,142 (OB)	Shale – competent	4-in. PVC, above-ground	2001
		MW-S1A	14.50	1,147.70	1,162.20	1,164.71	5	1,148.20	1,153.20	Alluvium above contact with shale	2-in. PVC, above-ground	1990
		MW-91	14.24	1,155.13	1,169.37	1,171.57	10	1,155.63	1,165.63	Alluvium	2-in. PVC, above-ground	2001
		MW-91B	41.00	1,128.4 (OB)	1,169.40	1,171.55	20 (OB)	1,128.4 (OB)	1,148.4 (OB)	Shale – competent	4-in. PVC, above-ground	2001
		STMW-15	30.21	1,135.99	1,166.20	1,168.39	10	1,136.49	1,146.49	Alluvium and shale	2-in. PVC, above-ground	1999
		GM-12	70.71	1,094.53	1,165.24	1,168.26	20	1,094.53	1,114.53	Shale – competent	4-in. PVC, above-ground	1994
		GM-14	44.29	1,119.06	1,163.35	1,166.37	20	1,119.06	1,139.06	Shale – competent	4-in. PVC, above-ground	1994
	B. Internal Source Area Trending/ Corrective Measures Performance	MW-99	15.56	1,190.82	1,206.38	1,209.22	10	1,191.32	1,201.32	Alluvium	2-in. PVC, above-ground	2001
		MW-70	50.00	1,222.60	1,272.60	1,275.10	10	1,223.10	1,233.10	Alluvium	2-in. PVC, above-ground	1997
		MW-73	15.00	1,214.40	1,227.40	1,228.90	10	1,214.90	1,224.90	Alluvium and weathered shale (screen into weathered shale 2 ft)	2-in. PVC, above-ground	1997
		MW-75	13.00	1,213.08	1,226.08	1,228.58	10	1,213.08	1,223.08	Alluvium and weathered shale (screen into weathered shale 1 ft)	2-in. PVC, above-ground	1997
		MW-86	17.27	1,221.35	1,238.62	1,241.26	10	1,221.85	1,231.85	Alluvium and weathered shale	2-in. PVC, above-ground	1997

[a] Areas selected based on hydrogeologic considerations (bedrock stratigraphy and flow regime) and geographic proximity.
ft AMSL = Ft above mean sea level.
ft BGS = Ft below ground surface.
OB = Open borehole.
PVC = Polyvinyl chloride.

Table G-2. Long-Term Groundwater Monitoring Program and Groundwater Protection Standards at AOC-GW Component Units
Holston Army Ammunition Plant (HSAAP), Kingsport, Tennessee

Source Area	Source Unit	Sample Location	Sampling Frequency			Chemical Compound Class	Target Analyte	Screening Criteria[a]		
			Semiannual (Spring and Fall)	Annual (Spring)	Biennial (Spring of even-numbered years)			MCL or RSL if Unavailable	Lowest Water Quality Criteria	Groundwater Protection Standard[b]
Area A	SWMU 96	MW-104			X	VOCs	Benzene	MCL	5	8,500
							Methylene chloride	MCL	5	8,500
						SVOCs	Naphthalene	RSL	0.17	289
		MW-105			X	VOCs	Benzene	MCL	5	8,500
							Methylene chloride	MCL	5	8,500
						SVOCs	Naphthalene	RSL	0.17	289
		MW-106			X	VOCs	Benzene	MCL	5	8,500
							Methylene chloride	MCL	5	8,500
						SVOCs	Naphthalene	RSL	0.17	289
		MW-107			X	VOCs	Benzene	MCL	5	8,500
							Methylene chloride	MCL	5	8,500
						SVOCs	Naphthalene	RSL	0.17	289
	SWMUs 19/29	MW-48	X			SVOCs, metals	Bis(2-ethylhexyl)phthalate	MCL	6	10,200
							Dibenzofuran	RSL	7.9	13,430
							Naphthalene	RSL	0.17	289
							n-Nitrosodiphenylamine	RSL	12	20,400
							Lead	MCL	15	25,500
		MW-115	X			SVOCs, Metals	Bis(2-ethylhexyl)phthalate	MCL	6	10,200
							Naphthalene	RSL	0.17	289
							Lead	MCL	15	25,500
		MW-116	X			SVOCs, Metals	Bis(2-ethylhexyl)phthalate	MCL	6	10,200
							Naphthalene	RSL	0.17	289
							Lead	MCL	15	25,500
	SWMU 20	MW-68	X			Explosives	RDX	RSL	0.97	1,649
						RDX MNA[c]	DNX	--	NV	NV
							MNX	--	NV	NV
							TNX	--	NV	NV

Table G-2. Long-Term Groundwater Monitoring Program and Groundwater Protection Standards at AOC-GW Component Units
Holston Army Ammunition Plant (HSAAP), Kingsport, Tennessee (continued)

Source Area	Source Unit	Sample Location	Sampling Frequency			Chemical Compound Class	Target Analyte	Screening Criteria[a]		
			Semiannual (Spring and Fall)	Annual (Spring)	Biennial (Spring of even-numbered years)			MCL or RSL if Unavailable	Lowest Water Quality Criteria	Groundwater Protection Standard[b]
Area B Explosives Production and Shop Area (continued)	Boundary Wells	GM-12			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		GM-14			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-11			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-11B			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-91			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-91B			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-101			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-101B			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-102			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-102B			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-S1A			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		STMW-15			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649

Table G-2. Long-Term Groundwater Monitoring Program and Groundwater Protection Standards at AOC-GW Component Units
Holston Army Ammunition Plant (HSAAP), Kingsport, Tennessee (continued)

Source Area	Source Unit	Sample Location	Sampling Frequency			Chemical Compound Class	Target Analyte	Screening Criteria[a]		
			Semiannual (Spring and Fall)	Annual (Spring)	Biennial (Spring of even-numbered years)			MCL or RSL if Unavailable	Lowest Water Quality Criteria	Groundwater Protection Standard[b]
Area B Explosives Production and Shop Area (continued)	Explosives Production Area	MW-99		X		Explosives	RDX	RSL	0.97	1,649
							Nitroglycerin	RSL	2	3,400
						RDX MNA[c]	DNX	--	NV	NV
							MNX	--	NV	NV
							TNX	--	NV	NV
	SWMU 18	MW-70		X		Metals	Mercury	MCL	2	3,400
	SWMUs 77/78/86/87	MW-73		X		Pesticides	Dieldrin	RSL	0.0018	3.06
		MW-75		X		Pesticides	Dieldrin	RSL	0.0018	3.06
	SWMU 88	MW-86		X		Pesticides	Dieldrin	RSL	0.0018	30.6
Holston River	Upgradient and downgradient of Area B	Surface Water	X[d]			Explosives	Nitroglycerin	RSL	2	NA
							RDX	RSL	0.97	NA

[a] Screening Criteria, the U.S. Environmental Protection Agency MCLs by default, RSLs are used for constituents with no established MCL.
[b] Groundwater Protection Standards are the lowest criteria multiplied by the site-specific dilution factor of 17,000, multiplied by 10 percent (%).
[c] MNA analysis performed on an annual basis at this well (spring event only).
[d] Surface water samples are collected annually in the fall of odd-numbered years and in the spring of even-numbered years.
CAO = Corrective Action Order.
DNX = Hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine.
IWTP = Industrial wastewater treatment plant.
MCL = Maximum contaminant level (as of April 2019).
MNA = Monitored natural attenuation (RDX degradation intermediates: hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine; hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine; and hexahydro-1,3,5-trinitroso-1,3,5-triazine, annual spring event only).
MNX = Hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine.
NA = Not applicable.
NV = No value is established by the State of Tennessee.
RDX = Hexahydro-1,3,5-trinitroso-1,3,5-triazine.
RSL = Regional screening level at target hazard quotient (THQ) = 1.0 (updated November 2018).
SVOC = Semivolatile organic compound.
SWMU = Solid waste management unit.
TNX = Hexahydro-1,3,5-trinitroso-1,3,5-triazine.
VOC = Volatile organic compound.
All units are in micrograms per liter (µg/L), which is equivalent to parts per billion (ppb).

COMMENTS INVITED ON PROPOSED MODIFICATION TO HOLSTON ARMY AMMUNITION PLANT'S HAZARDOUS WASTE CORRECTIVE ACTION ORDER

The Tennessee Department of Environment and Conservation's (TDEC) Division of Solid Waste Management (DSWM) proposes to modify Holston Army Ammunition Plant's (Holston) Corrective Action Order, Case Number 03-HCA002. Holston, EPA ID Number TN5210020421, located in Sullivan County at 4509 West Stone Drive, Kingsport, Tennessee 37660. **TDEC invites the public to review and submit comments on those proposals during a 45-day comment period ending on July 27, 2020.**

The current Order (03-HCA002) was issued on May 16, 2003 and was modified to include final remedies on January 24, 2013. Holston conducted a public meeting on August 22, 2019, at the East Tennessee State University Allandale Campus, Room 236, as announced in the August 5, 2019 Rogersville Review. The purpose of the meeting was to inform the communities of Holston's planned modification. Two members of the public attended the meeting. Four comments were received but did not affect the proposed final remedies. No other comments were received during the 60-day comment period which ended on October 11, 2019. Holston submitted this proposed modification request on October 15, 2019.

DSWM has determined the selected final remedies adequately protect human health and the environment at Solid Waste Units (SWMUs) 21, 25, 109, 110, and parts of SWMU 3. As residual contamination remains in soil and groundwater, the proposed order modification requires Holston to maintain controls that prevent exposure to those contaminants and to monitor groundwater to assure that the contaminants in groundwater will not impact the water quality of the Holston River. The remedy includes provisions for long-term care including site security and inspections, restrictions on digging and drilling, groundwater monitoring, and notification of any new release to the environment. Additionally, the modification approves the reclassification of SWMU 1 and 3 and changes to the surface water and groundwater monitoring program.

DSWM has drafted the Class 3 Modification to add final remedies for five of the facilities, reclassify SWMUs 1 (Industrial Sewer) and 3 (Catch Basins), and update the groundwater monitoring and surface water monitoring requirements. DSWM has also prepared a statement of basis which provides justification for selected remedies.

The order is proposed to be modified under the authority of the Tennessee Hazardous Waste Management Act of 1977, as amended, Tennessee Code Annotated, Section 68-212-101 et seq., and Rule Chapter 0400-12-01, Hazardous Waste Management. In accordance with Rule 0400-12-01-.07(9)(c)5(iii)(VII) and .07(7)(e), DSWM is providing a 45-day comment period, beginning on the date of this publication, and the opportunity to request a public hearing. A fact sheet and statement of basis have been prepared to provide additional information about the site and the proposed modification.

DSWM invites the public to review and submit comments on the draft Order modification anytime during the 45-day comment period ending on Monday, July 27, 2020. Electronic copies of the modification application, draft modification, public notice, fact sheet, and Statement of Basis are available to review online at tn.gov/environment/notices/holston on the Solid Waste Management Dataviewer and at the DSWM Central Office, TN Tower, 312 Rosa L. Parks Avenue, 14th Floor, Nashville, TN 37243 (615-532-0780). Due to limited library availability, hard copies of the available documents are available by contacting Kathy O. Cole, 4509 W. Stone Dr., Kingsport, TN 37660 (423-578-6285; kathy.o.cole.civ@mail.mil) or the TDEC Johnson City Environmental Field Office, 2305 Silverdale Road, Johnson City, TN 37601 (423-854-5400).

To comment on the proposed modification or request a public hearing, contact Roger Donovan in the Hazardous Waste Permitting Section of DSWM's Central Office at the TN Tower, 312 Rosa L. Parks Avenue, 14th Floor, Nashville, TN 37243 (615-532-0864), email Roger.Donovan@tn.gov or fax 615-532-0938. **Comments must be received by 4:30 p.m. CDT, Monday, July 27,2020 to assure consideration.** A request for a public hearing requires a significant degree of public interest. The request shall be made in writing, including the contact information of the requestor, and shall state the nature of the issues to be raised at the hearing.

After considering all comments, DSWM will make a final decision to either issue or deny the modification. Notice will be given to the applicant and each person who has submitted written comments or requested notice of the final decision. At the time a final decision is issued, a Response to Comments document addressing all significant input received on the draft modification will be made available to the public. The final decision shall become effective upon signing by the Director of DSWM.

If it is hard for you to read, speak, or understand English, TDEC may be able to provide translation or interpretation services free of charge. Please contact Mary Evans at 615-532-0798 for more information.

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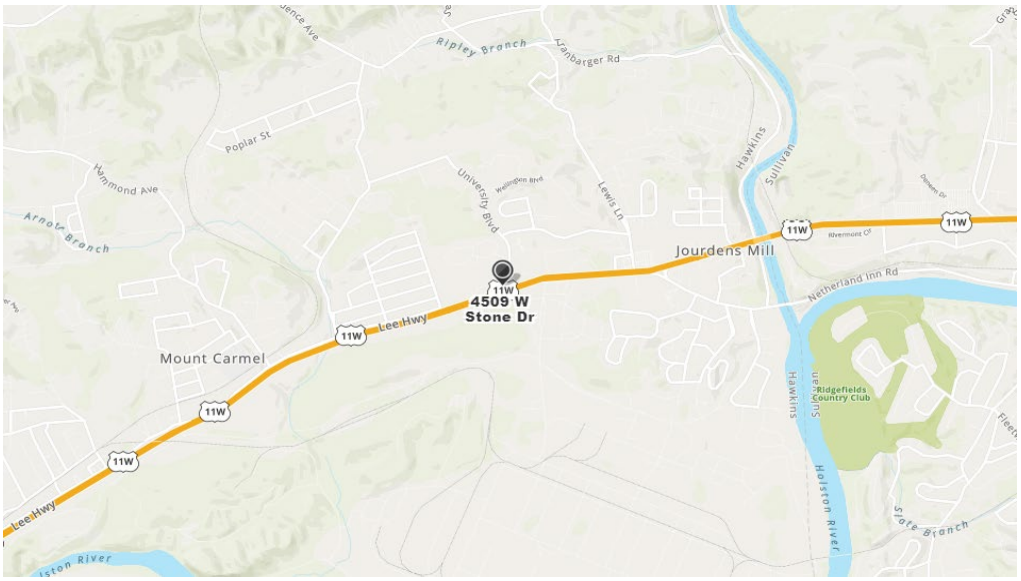
EEO/AA/ADAAA inquiries or complaints may be directed to the ADAAA Coordinator, TDEC HR Division, at 615-532-0200. Hearing impaired callers may use the Tennessee Relay Service (1-800-848-0298).

If you would like to receive notices like this directly, contact the Public Participation Officer in DSWM's Central Office for a Mailing List Request form. Email Solid.Waste@tn.gov or call 615-532-0963.

NOTICE ISSUED: June 10, 2020



FACT SHEET

REQUEST TO MODIFY HOLSTON ARMY AMMUNITION PLANT'S ORDER

Facility Name:	Holston Army Ammunition Plant
Location:	4509 West Stone Drive Kingsport, Tennessee 37660
EPA Identification Number:	TN5210020421
Order Number:	03-HCA003
Modification Number:	19-D(48)
Respondent:	Holston Army Ammunition Plant (HAAP)
Regulated Units:	Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs).
Facility Owner/Operator:	United States Department of Defense Department of Army
Facility Contact:	Laura Peters Restoration Program Manager Holston Army Ammunition Plant 4509 West Stone Drive Kingsport, Tennessee 37660 Phone: 931-454-7609 E-mail: laura.l.peters15.civ@mail.mil
Comment Period:	Begins: June 10, 2020 Ends: July 27, 2020

PURPOSE

This Fact Sheet and the Statements of Basis are prepared pursuant to Tennessee Rule 0400-12-01-.07(7)(d) for the draft order amendment (modification) developed by the Tennessee Department of Environment and Conservation (TDEC) Division of Solid Waste Management (DSWM). The purpose of this modification process is to afford all interested persons the opportunity to review and comment on the selected final remedies, updates to language in the order, changes to the sampling and analysis plan, and to evaluate the ability of the Respondent to apply the applicable hazardous waste management (corrective action) requirements. The proposal is for the Class 3 Permit Modification to be issued under the authority of the Tennessee Hazardous Waste Management Act of 1977, as amended, Tennessee Code Annotated, Section 68-212-101 et seq.,

and Rule Chapter 0400-12-01, Hazardous Waste Management. The permit modification is prepared in accordance with the provisions of Rule 0400-12-01-.07.

FACILITY DESCRIPTION

HAAP is located at 4509 West Stone Drive, Kingsport, Tennessee (Figure 1). HAAP consists of two plant areas referred to as Area A and Area B (Figure 2). Area A is located within the City of Kingsport in Sullivan County, Tennessee, on State Route 93. Area B is located in Hawkins County about 4 miles west of downtown Kingsport, on U.S. Route 11W. Area A and Area B are linked by a fenced interplant railroad that is approximately 3.7 miles long (Figure 2).

Area A, the smaller of the two areas, is approximately 60 acres and is located within a heavily industrialized area of Kingsport adjacent to several private sector commercial industrial facilities. Area B is approximately 5,913 acres and contains the explosives production area, where explosive manufacturing and packaging takes place. During most of the history of HAAP, the region around Area B has been residential and agricultural, along with limited commercial activities. Since the early 1980s, residential and commercial developments have increased significantly around Area B, particularly around West Stone Drive. Residential developments abut the northeast and northwest plant boundaries of Area B. Highway 11W separates Area B from the majority of residential and commercial areas to the north and northwest. Residential areas to the south are separated from Area B by sections of Holston River Mountain, Bays Mountain, and Bays Mountain Park.

This order does not address operating requirements for the Burning Pans (SWMU 45) which are regulated by the Hazardous Waste Management Open Burn Permit, TNHW-148, issued March 31, 2011.

ORDER HISTORY

The Former Solvent Burn Tank Unit (Unit) was operated from the early 1960s to 1983. A closure plan was approved by DSWM in 1984, removal of the tanks was completed the same year. In 1991 HAAP was required to meet the clean closure equivalency standards for the Unit. In 1993 an investigation was performed that indicated groundwater contamination was present at the unit. HAAP performed soil and groundwater assessments 1995 to early 1997. In 1997 HAAP completed the closure certification for soil, no soil removal was required. DSWM issued HAAP a Post-Closure Corrective Action Order (Order) that required a Corrective Plan for contaminated groundwater. In 2003, HAAP requested a modification to the Order to address groundwater monitoring and any required corrective action at the Unit under the corrective action program. The current Order was issued on May 16, 2003 replacing the Post Closure Corrective Action Order. The Order listed SWMUs and AOCs that required Confirmatory Sampling or RCRA Facility Investigations including the Solvent Burn Tank. The Order was modified on January 24, 2013 to reflect final status for all SWMUs and AOCs at the facility.

PROPOSED PERMIT MODIFICATION

DSWM has drafted an amendment to Holston's Corrective Action Order Number 03-HCA003. Containing the following changes:

1. Appendix A, Table A-1(a), List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action under this order at this time:

    a. Added SWMU 25 – Area B Tar Burial Site.

    b. Added new SWMU 110 - Acetic Acid Spill.

    c. SWMU 1 Industrial Sewer was split into three separate SWMUs 1A, 1B, and 1C.

    d. SWMU 3 Catch Basins was split into 103 separate SWMUs, 49 of those SWMUs are included in Table A-1(a) as No Further Action.

2. SWMU 21 Rock Dam Landfill and SWMU 23 Fly Ash Landfill were removed from Table A-1(b) which is a list of SWMUs and AOCs Regulated Under Another Program.

3. The following changes were made to Appendix A, Table A-6, List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Implementation of a Corrective Action Remedy:

    a. Removed SWMU 25 Area B Tar Burial Site (moved to Table A-1a).

    b. Added new SWMU 109 WW II Coal Tar Site.

    c. Added SWMU 21 Rock Dam Landfill and SWMU 23 Fly Ash Landfill (moved from Table A-1(b).

    d. SWMU 3 Catch Basins was split into 103 separate SWMUs, 12 of those SWMUs are included in Table A-6 requiring implementation of a final remedy.

4. SWMU 3 Catch Basins was split into 103 separate SWMUs, 42 of those SWMUs were included in Table A-7, List of Active SWMUs and AOCs Requiring Implementation of a Corrective Action Remedy.

The list attached to this Fact Sheet identifies the units and their proposed status. Also attached to this Fact Sheet are Statements of Basis that provide a summary of the investigation, the interim remedial actions, and the proposed final remedial actions for SWMUs 21, 25, 109, 110, and parts of SWMU 3.

5. Appendix F, Page 1, Site Description was revised to account for SWMU 25 and 109 receiving NFA, SWMU 1 and 3 being subdivided, and the addition of SWMUs 21, 23, and 109 to Table A-6.

6. Appendix F, Page 2, I.D was revised to say that a safety permit is not required to perform landfill repairs.

7. Appendix F, Page 4, III.B – change references from Table G-3 to Table G-2.

8. The following figures in Appendix F were updated:

    a. Figures 1 through 6 - Updated to new GIS formatting.

    b. Figure 4 – Removed building/area labels per BAE security request.

    c. Figure 5 – Added SWMU 109 and SWMU 110. Removed building labels from SWMU 3 per BAE security request and depict SUMU 3 as the entire production area.

    d. Figure 6 – Removed wells MW-55 and MW-114.

9. Appendix G, Page 1, I, second paragraph was revised to reflect the correct number of wells after the removal of MW-55 and MW-114 from the monitoring program.

10. The second paragraph was removed from Appendix G, Page 1, Section II Target Analytes and Groundwater Protection Standards.

11. Appendix G, Page 1, II – change references from Table G-3 to Table G-2.

12. Appendix G, Page 2, Section III.C.4 was updated so that the text matches what is in Table G-2 as follows:

    Explosives including RDX and RDX Degradation Compounds – SW-846 8330

13. Revised the wording in Appendix G, Page 2, Section III so that this section corresponds with text elsewhere in the corrective action order where it says to use the most recent analytical methods:

    If not specified in this order, laboratory methods must be those specified in the most recent version of Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, or an equivalent method approved by the Commissioner. The most current of the following USEPA analytical methods shall be used:

14. In Appendix G, Page 3, Section III.C, the letter designations following SW846 laboratory analytical methods in bullet 1 were removed.

15. Combined Tables G-2 and G-3 creating a new Table G-2 and eliminating Table G-3.

16. The following revisions were made to the sampling program depicted on new Table G-2:

    a. Eliminated monitoring wells MW-55 and MW-114 (these wells will continue to be maintained and inspected for future sampling as necessary).

    b. Changed the sampling frequency from semi-annual to biennial at MW-104, -105, -106, and -107 on even-numbered years.

c. Changed the sampling frequency for all Area B boundary wells (MW-101, MW-101B, MW-11, MW-11B, MW-102, MW-102B, MW-S1A, MW-91, MW-91B, STMW-15, GM-12, and GM-14), to biennial on even numbered years.

d. The RDX Tapwater Regional Screening Level (RSL) was updated from 0.61 ug/L to the new RSL of 0.97 ug/L. The groundwater protection standard was updated to 1,549 ug/L (it was calculated from the new RSL).

e. Revised the target analyte list for the following monitoring wells:

1. MW-48 - Removed fluorene and 2-Methylnaphthalene

2. MW-115 and MW–116 - Removed Dibenzofuran, fluorine, 2-Methylnaphthalene, n-Nitrosodiphenylamine and Arsenic

3. MW-116 - Removed Dibenzofuran, fluorine, 2-Methylnaphthalene, n-Nitrosodiphenylamine, and Arsenic

4. MW-68 – Removed Chromium and Arsenic

5. MW-101, MW-101B, MW-11, MW-11B, MW-102, MW102-B, MW-S1A, MW-91, MW-91B, GM-12, GM-14, and MW-99– Removed 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene, 2-amino-4,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene

6. STMW-15 - Removed 2,4-dinitrotoluene, 2,6-dinitrotoluene; 2,4,6-trinitrotoluene, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, Benzene, Toluene, Ethylbenzene, and Xylenes.

7. MW-73, MW-75, and MW-76 – Removed alpha-chlordane, gamma-Chlordane, and Bromacil.

PUBLIC PARTICIPATION

HAAP conducted a public meeting on August 22, 2019, at the East Tennessee State University Allandale Campus, Room 236, as announced in the August 5, 2019 Rogersville Review. The purpose of the meeting was to inform the communities of HAAP's planned modification. Two members of the public attended the meeting. Four comments were received but did not affect the proposed final remedies. No other comments were received during the 60-day comment period which ended on October 11, 2019.

DSWM has made a preliminary determination to modify the Corrective Action Order. Pending consideration of any contrary information received, it is the present intent of DSWM to modify the order to incorporate the selected final remedies along with other changes and updates for the HAAP facility. DSWM has drafted the modification with the necessary supporting data and

documentation and published a public notice announcing a 45-day comment period to review and comment on the remedies ending on July 27, 2020.

COMMENTS

DSWM invites the public to review and submit comments on the draft Order modification anytime during the 45-day comment period ending on July 27, 2020. Electronic copies of the modification request, draft Order, public notice, fact sheet, and Statement of Basis are available to review online at tn.gov/environment/notices/holston on the Solid Waste Management Dataviewer and at the DSWM Central Office, TN Tower, 312 Rosa L. Parks Avenue, 14th Floor, Nashville, TN 37243 (615-532-0780). Due to limited library availability, hard copies of the available documents are available by contacting Kathy O. Cole, 4509 W. Stone Dr., Kingsport, TN 37660 (423-578-6285; kathy.o.cole.civ@mail.mil) or the TDEC Johnson City Environmental Field Office, 2305 Silverdale Road, Johnson City, TN 37601 (423-854-5400).

To comment on the proposal or request a public hearing, contact Mr. Roger Donovan in the Hazardous Waste Permitting Section of DSWM's Central Office, TN Tower, 312 Rosa L. Parks Avenue, 14th Floor, Nashville, TN 37243 (615-532-0864), email Roger.Donovan@tn.gov or fax 615-532-0938. **Comments must be received by 4:30 p.m. CDT, July 27 2020, to assure consideration.** A request for a hearing requires a significant degree of public interest, shall be in writing, including the contact information of the requestor, and shall state the nature of the issues to be raised at the hearing.

After considering all comments, DSWM will make a final decision to either issue or deny the modified hazardous waste permit. Notice will be given to the applicant and each person who has submitted written comments or requested notice of the final decision. At the time of a final permit decision, a Response to Comments addressing all significant input received on the draft permit will be made available to the public. The final permit decision shall become effective upon signing by the Director of DSWM.

TDEC is an Equal Employment Opportunity/Affirmative Action (EEO/AA) employer. TDEC does not unlawfully discriminate on any basis prohibited by applicable law in any of its programs, services or activities.

EEO/AA/ADAAA inquiries or complaints may be directed to the ADAAA Coordinator, TDEC HR Division, at 615-532-0200. Hearing impaired callers may use the Tennessee Relay Service (1-800-848-0298).

If you would like to receive notices like this directly, contact the Public Participation Officer in DSWM's Central Office for a Mailing List Request form. Email Solid.Waste@tn.gov or call 615-532-0788.

PROPOSED STATUS OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Proposed Change	Proposed Status
1A	Industrial Sewer	Unit consists of sumps, drains and underground/aboveground pipes located throughout Area A.	SWMU 1, Industrial Sewer was split into separate units.	Remains NFA
1B	Industrial Sewer	This unit consists of sumps, drains and underground/aboveground pipes located throughout Area B.	SWMU 1, Industrial Sewer was split into separate units.	Remains NFA
1C	Industrial Sewer	This unit consists of sumps, drains and underground/aboveground pipes located throughout the interplant rail corridor.	SWMU 1, Industrial Sewer was split into separate units.	Remains NFA
3B3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units.	Active SWMU Final Remedy Institutional Controls and Inspections
3B5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units.	NFA
3B11	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units.	NFA
3D1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units.	Final Remedy Institutional Controls and Inspections
3D2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units.	Final Remedy Institutional Controls and Inspections
3D3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units.	NFA
3D5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units.	Active SWMU Final Remedy Institutional Controls and Inspections
3D6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units.	NFA
3D7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Proposed Change	Proposed Status
3D8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Final Remedy Institutional Controls and Inspections
3D9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3D10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3E1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Final Remedy Institutional Controls and Inspections
3E2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Final Remedy Institutional Controls and Inspections
3E3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3E4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3E5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Final Remedy Institutional Controls and Inspections
3E6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3E7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3E8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Proposed Change	Proposed Status
3E9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Final Remedy Institutional Controls and Inspections
3E10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3G1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3G2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3G3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3G4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3G5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3G6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3G7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3G8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Proposed Change	Proposed Status
3G9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Final Remedy Institutional Controls and Inspections
3G10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3H1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3H2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Final Remedy Institutional Controls and Inspections
3H3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Final Remedy Institutional Controls and Inspections
3H4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3H5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3H6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3H7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3H8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Final Remedy Institutional Controls and Inspections

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Proposed Change	Proposed Status
3H9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Final Remedy Institutional Controls and Inspections
3H10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3I1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3I2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3I3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3I4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3I5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3I6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3I7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3I8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3I9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3I10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3J1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Proposed Change	Proposed Status
3J2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3J3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3J4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3J5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3J7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3J8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3J9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3J10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3K1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3K3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3K5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3K7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3K9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Proposed Change	Proposed Status
3K10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3L1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3L2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3L3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3L4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3L5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3L6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3L7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3L8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3L9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3L10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Proposed Change	Proposed Status
3M1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3M2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3M3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3M4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3M5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3M6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3M7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3M8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3M9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3M10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3N1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3N2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Proposed Change	Proposed Status
3N3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3N4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3N5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3N6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3N7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3N8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3N9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3N10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3O1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3O3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
3O5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Proposed Change	Proposed Status
3O7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3O9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	NFA
3N4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	SWMU 3, Catch Basins was split into separate units	Active SWMU Final Remedy Institutional Controls and Inspections
21	Rock Dam Landfill	Unit managed demolition and excavation wastes, scrap metal, wooden debris and domestic refuse.	Move from Table A1(b) to Table A-6	Final Remedy Institutional Controls and Inspections
23	Former Fly Ash Landfill	Unit is a 7-acre unlined clay capped landfill that received fly ash.	Move from Table A1(b) to Table A-6	Final Remedy Institutional Controls and Inspections
25	Area B Tar Burial Site	Unit managed coal tar and fly ash	Move from Table A-6 to Table A-1(a) due to removal action.	NFA
109	WW II Coal Tar Site 2	Unit managed coal tar	New SWMU	Final Remedy Institutional Controls and Inspections
110	Acetic Acid Spill	Acetic acid/explosives pipeline expansion rupture.	New SWMU	NFA

NFA - No further Action
Active SWMU – SWMU still in use for product production

STATEMENT OF BASIS

SWMU 3 – Catch Basins
Holston Army Ammunition Plant, Kingsport, Tennessee
EPA ID No. TN5210020421

1.0 INTRODUCTION

This Statement of Basis presents an overview of the environmental investigations and selected final remedies for each area under Solid Waste Management Unit (SWMU) 3, Catch Basins, at the Holston Army Ammunition Plant (HAAP) in Kingsport, Tennessee (Figure 1). SWMU 3 originally served as the single site associated with all production areas with a catch basin and apron. However, in order to more effectively manage each area according to its status, the Army wishes to designate each area that was part of SWMU 3 as a separate subdivision of SWMU 3. Therefore, the remainder of this document identifies each area and its associated SWMU 3 subdivision. For example, area K1 of SWMU 3 is identified as SWMU 3K1.

A synopsis of the area locations, operating history, investigation results, and an explanation of the final remedy is provided. Information summarized in this Statement of Basis can be found in greater detail in the Supplemental Confirmation Sampling Report for Solid Waste Management Unit 3, dated February 2012 (SAIC, 2012); Final RCRA Facility Investigation Solid Waste Management Unit 3, dated October 2014 (Bay West, 2014); and other documents in the facility's administrative record, located at the offices of the Tennessee Department of Environment and Conservation Division of Solid Waste Management, William R. Snodgrass TN Tower, 312 Rosa L. Parks Ave. 14th Floor, Nashville, TN 37243.

2.0 SITE BACKGROUND

SWMU 3 is located in Area B, Main Production area. No catch basins at Area A are currently included in this site because no explosives are managed at Area A. The production area is relatively flat and is covered with grass and some trees (Figure 1).

The production area started operations around 1942 for explosives manufacturing during World War II. Since then, the area has undergone multiple changes to meet current production needs. As part of the production waste management process, each building (area) is equipped with an apron and catch basin to facilitate process waste and wastewater going to the industrial wastewater system. Water that is used to facilitate building and equipment cleaning is sent through a trough inside the apron to a catch basin. The catch basin is a box with baffles that allows solids to settle out of the wastewater prior to flowing to the industrial wastewater treatment plant. In addition, the wash water and aprons that surround the building also collect water and any accidental material discharged from the area and drains to the catch basin. SWMU 3 encompasses the catch basin, apron, and surrounding soil for each building.

SWMU 3 is currently under Table A-7: List of Active SWMUs and Areas of Concern (AOC) Requiring Implementation of a Corrective Action Remedy. This table is used to distinguish the active SWMUs from the inactive contaminated SWMUs. During the investigations mentioned in

Section 1, non-operational areas were evaluated for contamination under SWMU 3. This resulted in three categories of buildings: operational, non-operational without contamination, and non-operational with contamination. In order to more effectively manage each area according to its category, HAAP is requesting to divide SWMU 3 by area and associate it with its respective category/table. This document addresses each area and how the Army is requesting for it to be categorized.

3.0 SUMMARY OF PREVIOUS INVESTIGATIONS

SWMU 3 was originally identified in the 1996 RCRA Facility Assessment (RFA). The sampling visit of this phase sampled soil from around two catch basins to determine if any releases had occurred to the environment from these units. Metals, Semi-Volatile Organic Compounds (SVOCs), and explosives were detected in soil at areas G-7 and H-5.

As part of the 2003 Interim Measures (IM) for site-wide groundwater, sediment samples were collected from H-8 and H-9 to determine if a localized source was responsible for the high cyclotetramethylene-tetranitramine (HMX) and cyclotrimethylenetrinitramine (RDX) concentrations in groundwater monitoring well, MW-99. The report states that sediment samples did not contain sufficient explosive concentrations to adversely impact the adjacent groundwater.

In 2012, a supplemental confirmatory sampling investigation (CS) took place to document any contamination present at inactive areas within SWMU 3. A total of 61 areas were sampled under this effort with sampling data from three additional areas conducted by the operating contractor also being included. Further investigation was recommended for 14 areas, based on detections of RDX concentrations above either the residential or industrial soil screening level. No Further Action (NFA) was recommended for 46 areas that did not indicate the presence of explosives above residential soil screening levels. One building was being prepared for re-activation and sampling was deferred until building closure.

In 2012-2014, the 14 areas recommended for additional sampling, along with one additional building that was missed during the 2012 effort, were sampled as part of the RCRA Facility Investigation (RFI). Of the 15 buildings, three were recommended for NFA because soil contamination was below residential soil screening levels.

A summary of the sampling at each area and the associated recommendation is provided in Section 4.0 below.

4.0 SELECTED FINAL REMEDY

The following sections summarize the results for each area, based on the associated sampling event(s) and provides a justification for the recommended remedy. The results are presented by group, based on the selected remedy.

4.1 No Further Action

The sections below summarize the areas recommended for NFA, based on either the CS or RFI report.

4.1.1 2012 Confirmatory Sampling

Based on the soil sampling completed under the 2012 supplemental CS, the following areas and SWMU 3 designations are recommended for NFA:

3B5- six soil samples were collected from 3-9 feet (ft) below ground surface (bgs). All samples were non-detect for explosives.

3B11- seven soil samples were collected from 0.5-10.5 ft bgs. Only one sample had a detection with HMX recorded significantly below the HMX residential soil screening level of 3,900 milligrams per kilogram (mg/kg).

3D3- four soil samples were collected from 1-8.5 ft bgs. Two samples had detections of both HMX and RDX at values significantly below the residential soil screening level of 3,900 and 8.3 mg/kg, respectively.

3D6- four soil samples were collected from 0.5-8 ft bgs. All four samples had detections of HMX at values significantly below the residential soil screening level.

3D7- four soil samples were collected from 0.5-9 ft bgs. All samples were non-detect for explosives.

3D9- four soil samples were collected from 1-8 ft bgs. Only one sample had a detection of both HMX and RDX at values significantly below the residential soil screening levels.

3E8- five soil samples were collected from 1-8.5 ft bgs. Three samples had detections of both HMX and RDX at values significantly below the residential soil screening levels.

3G1- four soil samples were collected from 0-10 ft bgs. Only one sample had a detection of RDX with a value significantly below the residential soil screening level.

3G2- four soil samples were collected from 1-10 ft bgs. Two samples had detections of both HMX and RDX at values significantly below the residential soil screening levelss.

3I1- seven soil samples were collected from .5-11.5 ft bgs. All samples were non-detect for explosives.

3I2- seven soil samples were collected from 3.5-13 ft bgs. Only one sample had a detection of HMX with a value significantly below the residential soil screening level.

3I4- six soil samples were collected from 3-10.5 ft bgs. Four samples had a detection for HMX and three for RDX at values significantly below the residential soil screening levels. One sample had a detection for 1,3,5-Trinitrobenzene at a value significantly below the residential soil screening level of 2,200 mg/kg.

3I7- seven soil samples were collected from 4.5-7 ft bgs. All samples were non-detect for explosives.

3I8- seven soil samples were collected from 2-9 ft bgs. Only one sample had a detection of HMX and RDX with values significantly below the residential soil screening levels. One sample had a detection of 2,4,6-Trinitrotoluene significantly below the residential soil screening level of 19 mg/kg. One sample had a detection of 4-Amino-2,6-Dinitrotoluene significantly below the residential soil screening level of 150 mg/kg.

3I9- six soil samples were collected from 3-8.5 ft bgs. Two samples had a detection of RDX with values significantly below the residential soil screening level. Only one sample had a detection of HMX with a value significantly below the residential soil screening level. One sample had a detection of 2,4,6-Trinitrotoluene and 4-Amino-2,6-Dinitrotoluene significantly below the residential soil screening levels. One sample had a detection of 2-Amino-4,6-Dinitrotoluene with a value significantly below the residential soil screening level of 150 mg/kg. One sample had a detection of 3,5-Dinitroaniline.

3J1- six soil samples were collected from 5-9 ft bgs. All samples were non-detect for explosives.

3J2- seven soil samples were collected from 6.5-8.5 ft bgs. All samples were non-detect for explosives.

3J4- seven soil samples were collected from 6-7.5 ft bgs. Three samples had a detection for 1,3,5-Trinitrobenzene at values significantly below the residential soil screening level. Only one sample had a detection of HMX with a value significantly below the residential soil screening level. Only one sample had a detection of RDX with a value significantly below the residential soil screening level.

3J5- six soil samples were collected from 1.5-9.5 ft bgs. One sample had a detection for 1,3,5-Trinitrobenzene at a value significantly below the residential soil screening level. Two samples had a detection of HMX with values significantly below the residential soil screening level. Only one sample had a detection of RDX with a value significantly below the residential soil screening level.

3J6- seven soil samples were collected from 7.5-8.5 ft bgs. All samples were non-detect for explosives.

3J7- six soil samples were collected from 1.5-10.5 ft bgs. Only one sample had a detection of both HMX and RDX at values significantly below the residential soil screening levels.

3J8- seven soil samples were collected from 6.5-8 ft bgs. One sample had a detection for 1,3,5-Trinitrobenzene at a value significantly below the residential soil screening level.

3J9- seven soil samples were collected from 3.5-6 ft bgs. Two samples had a detection for 1,3,5-Trinitrobenzene at values significantly below the residential soil screening level. Three samples had a detection of 2-Amino-4,6-dinitrotoluene with values significantly below the residential soil screening level. Two samples had a detection of 2,4,6-Trinitrotoluene significantly below the residential soil screening level. Two samples had a detection of 3,5-dinitroaniline. Two samples had a detection of 4-Amino-2,6-dinitrotoluene with values significantly below the residential soil screening level. One sample had a detection of HMX and RDX with values significantly below the residential soil screening levels.

3K1- four soil samples were collected from 0.5-11 ft bgs. All samples were non-detect for explosives.

3K7- three soil samples were collected from 0.5-8 ft bgs. Two samples had a detection for 2,4,6-Trinitrotoluene at values significantly below the residential soil screening level. One sample had a detection of 4-Amino-2,6-dinitrotoluene with a value significantly below the residential soil screening level.

3K9- five soil samples were collected from 0.5-9 ft bgs. Two samples had a detection for 2,4,6-Trinitrotoluene at values significantly below the residential soil screening level.

3L2- six soil samples were collected from 2.5-12 ft bgs. One sample had a detection of 2,4,6-Trinitrotoluene, HMX, and RDX at values significantly below the residential soil screening levels.

3L7- seven soil samples were collected from 5-8 ft bgs. All samples were non-detect for explosives.

3L9- seven soil samples were collected from 3.5-7.5 ft bgs. Three samples had a detection of 1,3,5-Trinitrobenzene at values significantly below the residential soil screening level. Two samples had a detection for 2,4,6-Trinitrotoluene at values significantly below the residential soil screening level. Four samples had a detection of 2-Amino-4,6-dinitrotoluene with values significantly below the residential soil screening level. Three samples had a detection of 3.5-Dinitroanaline. No soil screening levels exist for this explosive. Three samples had a detection of 4-Amino-2,6-dinitrotoluene with values significantly below the residential soil screening level. Two samples had a detection of HMX and RDX with values significantly below the residential soil screening levels.

3M1- seven soil samples were collected from 5.5-7.5 ft bgs. All samples were non-detect for explosives.

3M2- seven soil samples were collected from 6.5-8.0 ft bgs. All samples were non-detect for explosives.

3M7- seven soil samples were collected from 5.5-8.5 ft bgs. One sample had a detection for 2,4,6-Trinitrotoluene at a value significantly below the residential soil screening level.

3M8- seven soil samples were collected from 5.5-8.5 ft bgs. Three samples had a detection for 2,4,6-Trinitrotoluene at values significantly below the residential soil screening level. One sample had a detection of HMX and RDX with values significantly below the residential soil screening levels.

3M9- seven soil samples were collected from 6.0-8.5 ft bgs. All samples were non-detect for explosives.

3M10- seven soil samples were collected from 6.5-9.0 ft bgs. All samples were non-detect for explosives.

3N1- four soil samples were collected from 0.5-7.0 ft bgs. All samples were non-detect for explosives.

3N2- three soil samples were collected from 0.5-11.0 ft bgs. One sample had detections of 1,3,5-Trinitrobenzene, HMX, and RDX with values significantly below the residential soil screening levels.

3N9- three soil samples were collected from 0.5-8.0 ft bgs. One sample had a detection of HMX, and RDX at values significantly below the residential soil screening levels.

3N10- four soil samples were collected from 0.5-8.5 ft bgs. One sample had a detection of HMX at a value significantly below the residential soil screening level.

3O1- eight soil samples were collected from 0.0-7.0 ft bgs. Two samples had a detection of HMX at values significantly below the residential soil screening level. Three samples had a detection of RDX at values significantly below the residential soil screening level.

3O5- five soil samples were collected from 0.5-10.5 ft bgs. Two samples had a detection of HMX at values significantly below the residential soil screening level.

3O7- four soil samples were collected from 0.5-10.5 ft bgs. All samples were non-detect for explosives.

3O9- three soil samples were collected from 0.5-6.5 ft bgs. All samples were non-detect for explosives.

4.1.2 2011-2012 Demolition Program

In 2011 and 2012, HAAP initiated a building demolition program. As part of this program, three areas were sampled for RDX by BAE Systems. Six small catch basins were located at each of these areas and an associated soil sample was collected for each. The sampling results are included in the 2012 supplemental CS report. Based on the soil sampling completed, the following areas and SWMU 3 designations are recommended for NFA:

> 3I10- Demolished 8/2011. Six soil samples were collected from the surface soil. One sample had a detection of RDX with a value below the residential soil screening level.
>
> 3J10- Demolished 8/2012. Six soil samples were collected from the surface soil. One sample had a detection of RDX with a value significantly below the residential soil screening level.
>
> 3L10- Demolished 8/2011. Six soil samples were collected from the surface soil. All samples were non-detect for explosives.

4.1.2 2014 RFI

3H1- SWMU 3H1 was originally sampled under the 2012 CS effort. Four samples were collected from 0.5-9.5 ft bgs. HMX and RDX were detected in two samples, with RDX exceeding the industrial soil screening value in one sample at the surface. This area was subsequently demolished. During the RFI, an area around the sample with the RDX exceedance was sampled in order to determine the nature and extent of contamination. Nine soil borings were installed, and three soil samples were collected from each boring. RDX and HMX were detected in two soil samples, but at values below the residential soil screening levels. It is likely that the building demolition removed the contaminated surface soil that was above the industrial screening level. RFI results indicate that no contamination is present in the soil above the residential soil screening levels. NFA is recommended for this area.

3H10- SWMU 3H10 was originally sampled under the 2012 CS effort. Four samples were collected from 1.5-8.5 ft bgs. HMX was detected in three samples and RDX was detected in four samples. RDX exceeded the industrial soil screening value in one sample near the surface. This area was subsequently demolished. During the RFI, an area around the sample with the RDX exceedance was sampled, in order to determine the nature and extent of contamination. Nine soil borings were installed, and two soil samples were collected from each boring. RDX and HMX were detected in seven of the nine borings, but at values below the residential soil screening levels. It is likely that the building demolition removed the contaminated soil near the surface that was above the industrial screening level. RFI results indicate that no contamination is present in the soil above the residential soil screening levels. NFA is recommended for this area.

3K10- SWMU 3K10 was inadvertently left out of the original 2012 CS effort and was, therefore, added to the RFI. One sample was collected adjacent to each of the five catch basins at the 3.5-4.0

ft bgs interval and analyzed for RDX and HMX. All samples were non-detect for both explosives. NFA is recommended for this area.

4.2 Long Term Management

The following SWMUs were sampled under the 2012 CS and 2014 RFI:

3D1, 3D2, 3D8, 3E1, 3E2, 3E5, 3E9, 3G9, 3H2, 3H3, 3H8, and 3H9

The RFI determined the nature and extent of contamination originally identified in the CS at each area. RDX and/or HMX are present in the soil above the residential and/or industrial soil screening levels. As a result, the recommended remedy for these areas is Long Term Management with land use controls (LUCs), signs notifying personnel of the soil contamination, and semi-annual inspections to ensure the LUCs are being followed. No change is recommended to the remedy. However, it is recommended that these areas be moved from Table A-7 to Table A-6 of the Corrective Action Order, *List of SWMUs and AOCs Requiring Implementation of a Corrective Action Remedy* as they are not active areas.

4.3 Active Areas

The SWMUs listed below are considered active, therefore no change is recommended.

3B3, 3D5, 3D10, 3E3, 3E4, 3E6, 3E7, 3E10, 3G3, 3G4, 3G5, 3G6, 3G7, 3G8, 3G10, 3H4, 3H5, 3H6, 3H7, 3I3, 3I5, 3I6, 3J3, 3K3, 3K5, 3L1, 3L3, 3L4, 3L5, 3L6, 3L8, 3M3, 3M4, 3M5, 3M6, 3N3, 3N4, 3N5, 3N6, 3N7, 3N8, and 3O3

LUCs and inspections will continue.

5.0 REFERENCES

US Army Center for Health Promotion and Preventative Medicine, 1996. *Survey Phase RCRA Facility Assessment Number 38-EH-5035-95*, Holston Army Ammunition Plant, Kingsport, Tennessee. 8-16 July 1996.

SAIC, 2012. *Supplemental Confirmation Sampling Report for Solid Waste Management Unit 3, Holston Army Ammunition Plant, Kingsport*, Tennessee. April 2012.

Bay West 2014. *Final RCRA Facility Investigation for Waste Management Unit 3, Holston Army Ammunition Plant, Kingsport*, Tennessee. October 2014.

TDEC, 2013. Modification Approval of the Holston Army Ammunition Plant Class 3 Modification for Final Remedy, Corrective Action Order Case Number 03-HCA003, January 2013.

Figure 1

SOURCE:
US ARMY CENTER FOR HEALTH PROMOTION
AND PREVENTIVE MEDICINE
ABERDEEN PROVING GROUND, MARYLAND

Coordinate System: NAD83 StatePlane Tennessee FIPS 4100 Feet
Basemap: ESRI World Imagery WMS

ENGR'G S.M.	DATE	Bay West	
DRAWN T.P.	11/22/04	Customer-Focused Environmental & Industrial Solutions	
REV. S.G.	11/15/17		
PROJECT NAME	HSAAP - KINGSPORT, TN		
TITLE	SWMU 3 SITE MAP		
DWG. NO. J160167 2017 FWO	SCALE AS SHOWN	FIGURE # 1	

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\SWMU_3\003_LLC\PU160167 FIG F17 SWMU 3 Site Map_003.mxd

Note: Numerical key cypher available upon request

STATEMENT OF BASIS

SWMU 21 – Rock Dam Landfill
Holston Army Ammunition Plant, Kingsport, Tennessee
EPA ID No. TN5210020421

1.0 INTRODUCTION

This Statement of Basis presents an overview of the environmental investigation and selected final remedy for Solid Waste Management Unit (SWMU) 21, Rock Dam Landfill, at the Holston Army Ammunition Plant (HAAP), in Kingsport, Tennessee (Figure 1). A synopsis of the site location, operating history, investigation results, and an explanation of the final remedy are provided. Information summarized in this Statement of Basis can be found in greater detail in the Confirmatory Sampling (CS) Report dated April 2000 (USACHPPM, 2000) and other documents in the facility's administrative record located at the offices of the Tennessee Department of Environment and Conservation Division of Solid Waste Management, William R. Snodgrass TN Tower, 312 Rosa L. Parks Ave. 14th Floor, Nashville, TN 37243.

2.0 SITE BACKGROUND

SWMU 21 is located in Area B to the southwest of the main production area. This 5-acre landfill is north of the Holston River, adjacent to several other closed landfills from the same and newer time periods. The landfill surface is relatively flat, with grass and a gravel road. The northern boundary of the landfill is a steep, 30-foot (ft) rocky slope. To the east, is a wooded area. To the south, is the toe of the landfill and the Holston River. To the west, is the former sanitary landfill, also known as SWMU 17, and the Area B Tar Burial Site, SWMU 25 (Figure 1).

The Rock Dam Landfill was created when the area was dammed to form a pond. However, a sinkhole formed beneath the pond, causing the water to drain. A rock and earth wall was built north of the sinkhole to create the landfill. Only inert, non-contaminated construction debris, wood, non-asbestos insulation, tree stumps, and soil fill were disposed of in this landfill. Operations began around 1966. In the late 1970s, the State of Tennessee implemented landfill regulations. An inspection of all HAAP landfills determined that the location of the Rock Dam Landfill was not suitable as a landfill. Therefore, the landfill was closed in 1983. The closure conditions included a 2-ft clay cap and re-seeding with vegetation. The cover has been mowed, inspected, and maintained by HAAP since that time.

3.0 SUMMARY OF CONTAMINANT EVALUATION

SWMU 21 was originally identified in the 1996 RCRA Facility Assessment (RFA). This assessment determined that the waste included inert material that should not pose a potential for release of contaminants to the environment. To support this determination, the 3rd quarter 1995 surface water sampling was included as part of the appendix to the 1996 RFA. This sampling did not show any evidence of leachate from the landfill. The 1996 RFA recommended No Further Action for SWMU 21.

SWMU 21 was part of the 2000 CS that took place at HAAP. Three surface water samples and four sediment samples were collected at SWMU 21. Samples were analyzed for Volatile Organic Compounds, Semi-Volatile Organic Compounds, Explosives, and Metals. No samples showed detections of contaminants above screening levels. Therefore, the CS recommended no further action.

After the CS report, it was believed that this landfill was part of the post closure program, managed by the Johnson City Field Office of TDEC. Therefore, SWMU 21 was placed on Table A1(b) List of Solid Waste Management Units and Areas of Concern Requiring No Further Action Under this Order at this Time. These units are currently regulated under another program. Since the 2013 modification to the Corrective Action Order (CAO), HAAP has learned that SWMU 21 is not managed by the Johnson City Field Office and should be managed under the CAO.

4.0 SELECTED FINAL REMEDY

Based on the discovery that SWMU 21 is not managed by the Johnson City Field Office, this SWMU should be managed under the CAO. While the sampling data from January 2000 do not indicate that contamination was being released to the environment, waste remains in place. Therefore, SWMU 21 should be moved to Table A6- "List of Solid Waste Management Units and Areas of Concern Requiring Implementation of a Selected Corrective Action Remedy." The final remedy should include a means to prevent cap disturbance and monitoring through the following actions:

- Land use and excavation controls to prevent construction at the site;
- Installation of updated signs to warn that the area is a landfill'
- Revision of the HAAP Land Use Control and Implementation Plan to include SWMU 21;
- Complete semi-annual inspections to ensure that land use controls are maintained and no unauthorized excavation has taken place;
- Update the HAAP Geographic Information System to ensure the land use controls are documented.

5.0 REFERENCES

US Army Center for Health Promotion and Preventative Medicine, 1996. *Survey Phase RCRA Facility Assessment Number 38-EH-5035-95*. Holston Army Ammunition Plant, Kingsport, Tennessee. 8-16 July 1996.

US Army Center for Health Promotion and Preventative Medicine, 2000. *Confirmatory Sampling Report for the Holston Army Ammunition Plant, Kingsport*, Tennessee. Volume 1 of 2, April 2000.

State of Tennessee Department of Environment and Conservation, 2008. Letter to Robert Ragan. Re: Confirmatory Sampling Report, Dated April 2000; Final Additional CS Report, March 2002; Addendum to the CS Reports, May 2008. June 5, 2008.

State of Tennessee Department of Environment and Conservation, 2013. Modification Approval of the Holston Army Ammunition Plant Class 3 Modification for Final Remedy, Corrective Action Order Case Number 03-HCA003. January 2013.

Legend

SWMU Boundaries

SWMU 21

SWMU 17 and 25

Holston Army Ammunition Plant

SWMU 21 Figure 1

Feet

0 150

STATEMENT OF BASIS

SWMU 25 – Area B Coal Tar Burial Site
Holston Army Ammunition Plant, Kingsport, Tennessee
EPA ID No. TN5210020421

1.0 INTRODUCTION

This Statement of Basis presents an overview of the environmental investigation and selected final remedy for Solid Waste Management Unit (SWMU) 25 soil at the Holston Army Ammunition Plant (HAAP) in Kingsport, Tennessee (Figures 1 and 2). This SWMU is designated as U.S. Army Installation Restoration Program unit HAAP-08 in the HAAP Installation Action Plan. A synopsis of the site location, operating history, investigation results, and an explanation of the final remedy are provided. Information summarized in this Statement of Basis can be found in greater detail in the RCRA Facility Investigation (RFI) report for this unit dated February 2006 (Bay West and SAIC, 2006), and other documents in the facility's administrative record located at the offices of the Tennessee Department of Environment and Conservation Division of Solid Waste Management, William R. Snodgrass TN Tower, 312 Rosa L. Parks Ave. 14th Floor, Nashville, TN 37243.

SITE BACKGROUND

SWMU 25, the Area B Tar Burial Site, is located on the west end of Area B (Figure 1), southeast of the Closed Sanitary Landfill (SWMU 17) (Figure 2). The exact boundaries of SWMU 25 had not been determined until the 2006 RFI. The RFI determined that SWMU 25 consisted of a trench estimated to be 15 feet (ft) wide, 75 ft long, and 10 ft deep (Figure 2). Between 1978 and 1980, approximately 60 cubic yards (yds^3) of coal tar from the Area A Gas Producer Facility were reportedly disposed in the trench. The site was covered with a 2-ft clay cap in 1980, and an additional 2 ft of clay were added in 1985. The final cover at the site is vegetated with grass. SWMU 25 is listed on the state of Tennessee Superfund List of Inactive Hazardous Substances Sites (USACHPPM, 1996). The current and reasonably anticipated future land use at this unit is industrial, government-controlled restricted access.

SWMU 25 is listed in Table 5 of the facility's Corrective Action Order (CAO) as requiring a corrective action remedy. The remedy described in the CAO requires institutional controls that include access restrictions, signage, excavation restrictions, and annual perimeter fence and land use control inspections.

3.0 SUMMARY OF CONTAMINANT EVALUATION

No investigations specific to SWMU 25 had been conducted prior to the investigation conducted in 2005 for the RFI. During the Survey Phase of the RCRA Facility Assessment and Environmental Baseline Survey, the clay cover at the unit was observed to be in fair-to-good condition (USACHPPM 1996, 1997). The objectives of the SWMU 25 RFI (Bay West and SAIC, 2006) consisted of a visual inspection of the unit and collection of soil samples from subsurface borings to define the boundaries of the disposal trench and to determine the occurrence and distribution of any residual contaminants at the boundaries of the unit. In general, the clay cover capping the disposal pit was observed to be in good condition with well-

established vegetative cover. Coal tar seepage was evident in a few small areas. Five direct-push soil borings were installed in April 2005 at points along the edge of the SWMU's clay cap (Figure 2). Two soil samples were collected from each direct-push boring and analyzed for semi-volatile organic compounds. The samples were collected from approximately the 5-to-7 and the 10-to-12-ft below ground surface (bgs) interval of each boring, corresponding to the mid-point depth and the bottom depth of the disposal trench, as estimated from operational records. No contamination was detected above remedial action levels. Targeted surficial coal tar was removed, and cap repairs were completed at SWMU 25, as part of routine fiscal years 2005, 2007, and 2010 Long-Term Monitoring (LTM)/Long-Term Operations (LTO) Program activities.

HAAP elected to close SWMU 25 so that institutional controls could be discontinued. An Interim Measures (IM) Work Plan describing proposed field activities was submitted to the Division on April 9, 2013. The Division approved the lM Work Plan on May 1, 2013. The objective of the IM was to close SWMU 25 by removing coal tar and coal tar-impacted soil that exceeded the residential Regional Screening Levels (RSLs) for polycyclic aromatic hydrocarbons (PAHs). Between June 4 and 7, 2013, 2,158 tons of coal tar and coal tar-impacted soil were excavated from SWMU 25 (Figure 3) and disposed at the Carter Valley Landfill under a TDEC-approved Special Waste Permit. Twenty-seven confirmation soil samples and three duplicate samples were collected from the sidewalls and bottom of the excavation for PAH analysis.

Only one of the 27 samples (025SO-001; 10.5 ft bgs) exhibited PAH compounds above the reporting limits; all the detections were below the remedial action levels (May 2013 residential RSLs). From June 10 and 12, 2013, the excavation was backfilled with clean fill from the on-site borrow pit, compacted, and covered with topsoil, seed, and straw to establish vegetation (Bay West, 2013).

Groundwater

In 2006, well MW-125 was installed downgradient of SWMU 25 as part of the Area of Concern Groundwater (AOC-GW). Samples collected from the well did not identify constituents attributable to coal tar above the remedial action levels.

4.0 SELECTED FINAL REMEDY

The SWMU 25 RFI adequately defined the boundaries of the SWMU and documented the absence of soil contamination above remedial action levels outside of the burial pit. The Interim Measure was successful in removing coal tar and coal tar-contaminated soil to below relevant regulatory levels thereby reducing the risk to human health and the environment. No further action is required at SWMU 25. In a letter dated October 31, 2013, TDEC agreed with the NFA recommendation.

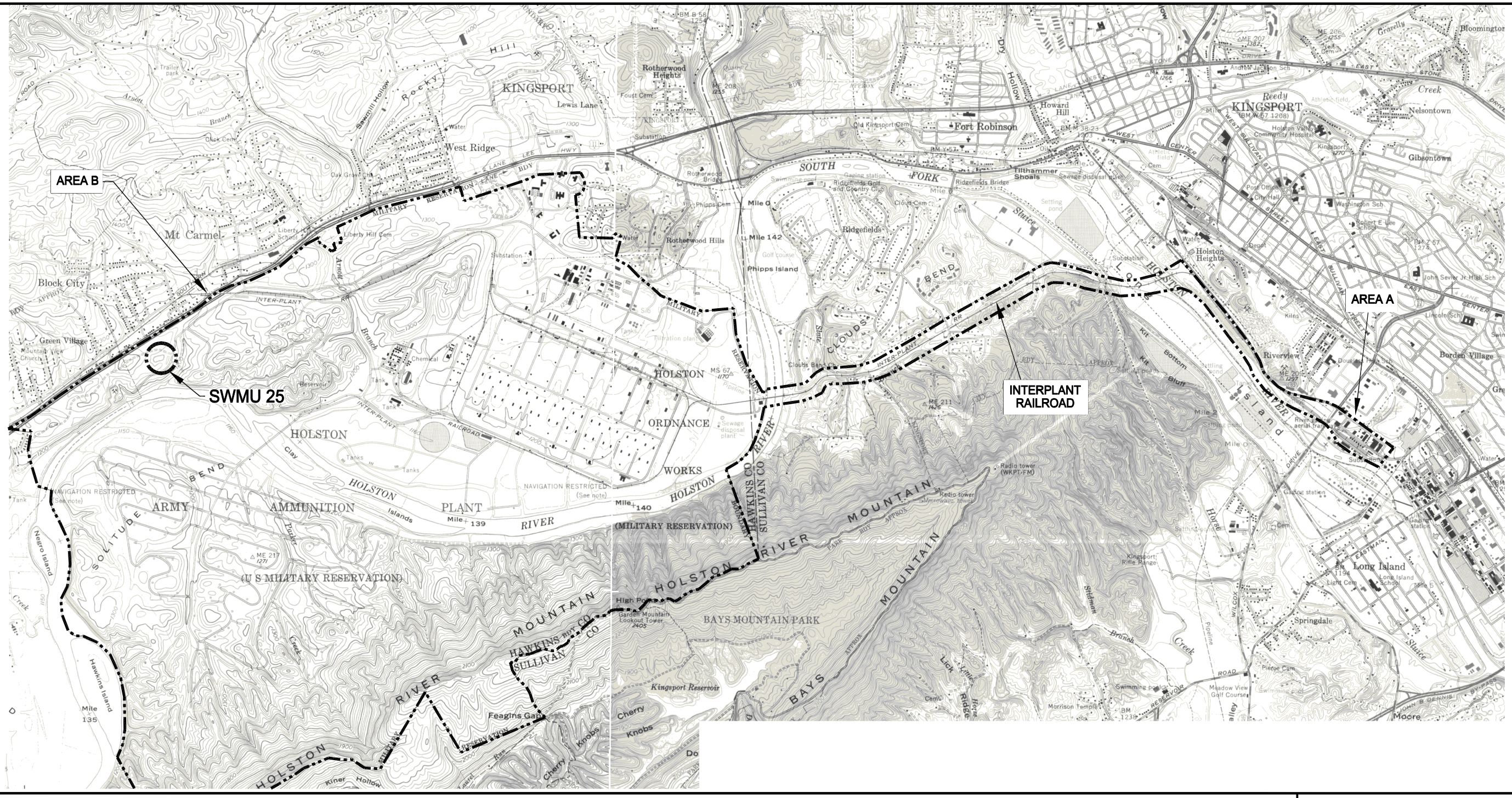
REFERENCES

Bay West and SAIC, (Bay West, Inc. and Science Applications International Corporation) 2006. *RCRA Facility Investigation Report for SWMU 25 – Area B Tar Burial Site, February 2006, Holston Army Ammunition Plant, Kingsport, Tennessee,* FPRI Contract W9128F-04-D-0018, Task Order 0001, BWJ040296, February.

Bay West, 2013. *Final Interim Measures Report for SWMU 25 – Area B Tar Burial Site, Holston Army Ammunition Plant, Kingsport, Tennessee,* ERS Contract W9128G-09-D-0052, Task Order CK01, BWJ120094, September.

USACHPPM (U.S. Army Center for Health Promotion and Preventive Medicine), 1996. *Survey Phase, RCRA Facility Assessmen*t No. 38-EH-5035-96, GWSWP, July.

USACHPPM, 1997. *Environmental Baseline Survey No. 38-EH-6956-97, Holston Army Ammunition Plant, Kingsport, Tennessee*, June 23 – July 2.



LEGEND:

- BUILDING
- ASPHALT ROAD
- GRAVEL ROAD
- RAILROAD TRACKS
- FENCE LINE
- STREAM
- GROUND CONTOUR (100-FT INT.)
- GROUND CONTOUR (20-FT INT.)
- HSAAP SITE BOUNDARY

SAIC®
Science Applications International Corporation

HOLSTON ARMY AMMUNITION PLANT FPRI ENVIRONMENTAL REMEDIATION SERVICES

DRAWN BY:	REV. NO./DATE:	CAD FILE:
R. BEELER	0 / 08-21-06	/04048/DWGS/B40SITE02

Figure 1. HSAAP Site Map

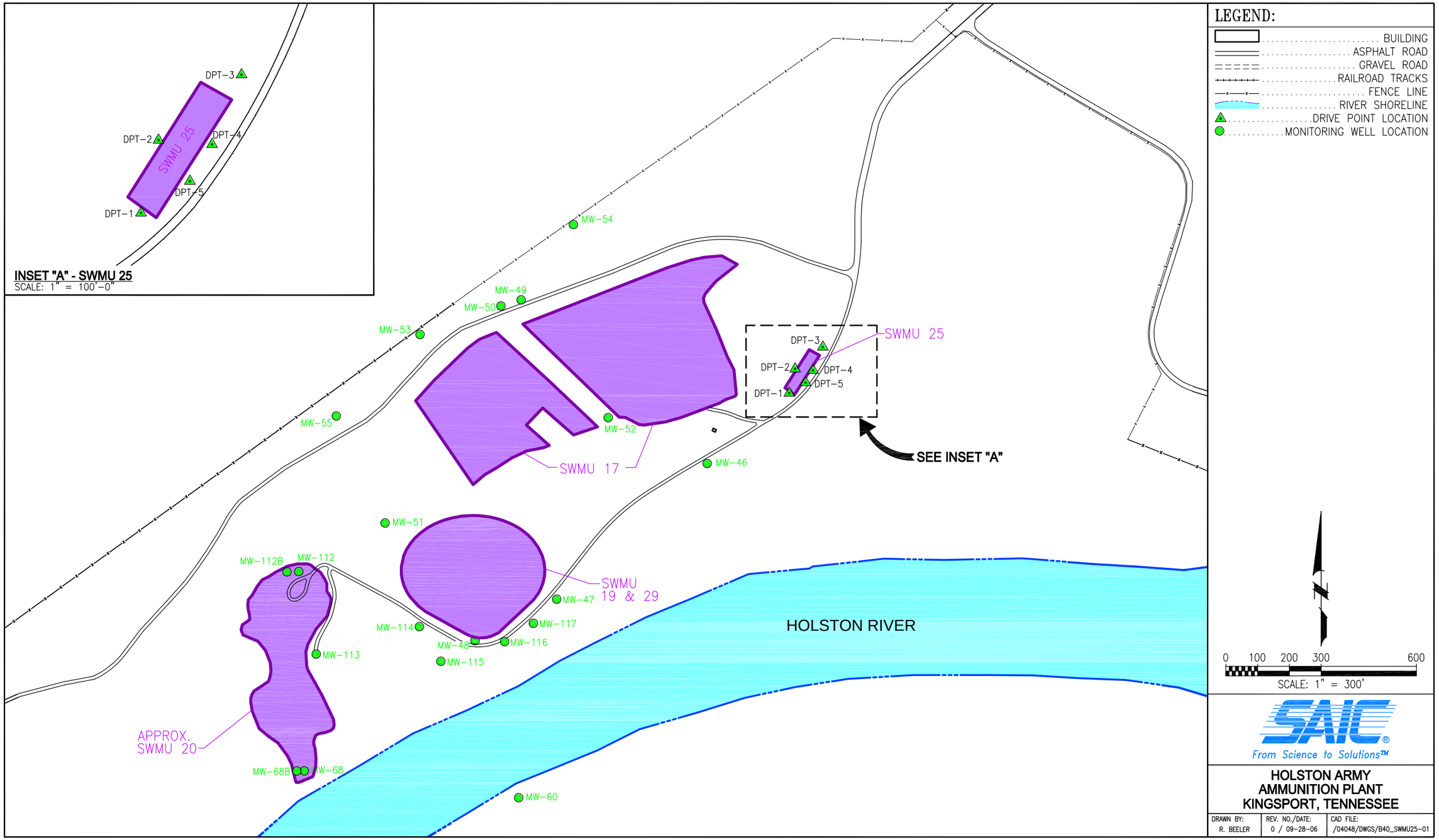


Figure 2 SWMU 25 RFI Surveyed Soil Boring Locations

Figure 3

SWMU 25 Confirmation Sample Results (June 2013)

HAAP
Kingsport, TN

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Basemap: Bing Aerial WMS

0 30 60 Feet
0 9 18 Meters

1 inch = 30 feet

- Electrical Pole
- Monitoring Well
- Abandoned Monitoring Well
- SAIC 2005 Soil Probe
- Soil Sample (Bay West 2013)
- *(9.5)* Excavation Depth (Feet)
- OE Overhead Electrical Line
- OE Overhead Electrical Line Removed For Excavation
- Ditch
- Extent Of Excavation

Sample ID (Depth)	
Date Sampled	
Compound Name	Result (µg/kg)

Notes:
* - All Other Sample Locations were Reported Below Laboratory Detection Limits for All Analyzed Compounds
J - Concentration is an estimated value
µg/kg = micrograms per kilogram

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: SG Date Drawn/Revised: 12/12/2013 Project No. J120094

025SO-001 (10.5')	
6/5/2013	
Acenaphthene	2.1 J
Acenaphthylene	7.9 J
Anthracene	8.6
Benzo[a] anthracene	4.1 J
Fluoranthene	8.7
Fluorene	11
Phenanthrene	17
Pyrene	6.7 J

025S0-023 (9)*
025S0-030 (9.5)*
025S0-024 (21)*
025S0-028 (12.5)*
025S0-029 (12.5)* Dup
DPT-3
025S0-027 (10)*
025S0-025 (21)*
025S0-021 (11)*
025S0-020 (21)*
025S0-026 (12.5)*
025S0-019 (9.5)*
025S0-017 (17)*
025S0-022 (11)*
025S0-016 (10)*
025S0-015 (18)*
025S0-018 (9.5)*
025S0-009 (9)*
DPT-2
025S0-008 (14.5)*
025S0-014 (10)*
DPT-4
025S0-012 (9.5)*
025S0-013 (9.5)* Dup
025S0-007 (9.5)*
025S0-006 (14.5)*
025S0-004 (15)*
025S0-005 (9.5)*
025S0-011 (10)*
DPT-5
025S0-002 (16)*
025S0-003 (16)* Dup
025S0-010 (10.5)*
025S0-001 (10.5)
DPT-1
MW-125
MW-46
OE

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_OMAHA\Holston_AAP\SWMU_25\MapDocs\J120094 FIG 4-1 SWMU 25 Confirmation Soil Sample Results.mxd

STATEMENT OF BASIS

SWMU 109 – World War II Coal Tar Site 2
Holston Army Ammunition Plant, Kingsport,
Tennessee EPA ID No. TN5210020421

1.0 INTRODUCTION

This Statement of Basis presents an overview of the environmental investigation and selected final remedy for Solid Waste Management Unit (SWMU) 109 at the Holston Army Ammunition Plant (HAAP), in Kingsport, Tennessee (Figures 1 and 2). This SWMU is designated as U.S. Army Installation Restoration Program unit CCHSAP-42 in the HAAP Installation Action Plan. This document provides the information necessary for the Tennessee Department of Environment and Conservation (TDEC) to prepare a Statement of Basis for the subject SWMU, which serves as the decision document for the final remedy for waste material within the unit and adjacent soil. The decision for the final remedy will be documented through a modification to the Resource Conservation and Recovery Act (RCRA) Post-Closure Corrective Action Order (CAO) for HAAP, which will be subject to public notice and comment, as specified under Tennessee Rule 0400-12-01-.06.

A synopsis of the site location, operating history, investigation results, and an explanation of the final remedy are provided. Information summarized in this Statement of Basis can be found in greater detail in the RCRA Facility Investigation (RFI) report for this unit dated August 2016 (Bay West, 2016), and other documents in the facility's administrative record located at the offices of the TDEC Division of Solid Waste Management, William R. Snodgrass TN Tower, 312 Rosa L. Parks Ave. 14th Floor, Nashville, TN 37243.

2.0 SITE BACKGROUND

SWMU 109 is in Area B on the flood plain of the Holston River (Figures 1 and 2). The topography is relatively flat; however, several possible subsidence trenches were noted on aerial photographs. These trenches appeared to run east-west through the south-central portion of the SWMU. The subsidence trenches are visible in an area approximately 600 feet (ft) wide by 550 ft long south of the cooling channel (Figure 2). Investigation of these trenches in 2014 indicated that they are only surface soil features and are not related to any past solid/hazardous waste disposal practices. The northern portion of the SWMU is densely vegetated and bordered to the north by railroad tracks. Two surface water drainage features transect the SWMU: a cooling channel oriented east-west that conveys surface water to the main cooling channel at the west edge of the SWMU, and a drainage ditch oriented north-south that conveys surface water northward to the cooling channel (Figure 2).

SWMU 109 is a new SWMU not currently listed in the facility's Corrective Action Order Modification (03-HCA-002) (CAO Mod), dated January 24, 2013 (TDEC, 2013). The proposed final remedy requires institutional controls that include access restrictions, signage, excavation restrictions, and land use control (LUC) inspections.

3.0 SUMMARY OF CONTAMINANT EVALUATION

On March 31, 2014, HAAP personnel discovered coal tar on the ground surface and in the cooling channel. Upon further inspection, coal tar was identified on the ground surface in three areas (Figure 2). The first area is located north of the cooling channel and is approximately 12 ft wide and 12 ft long. The second coal tar area lies within the cooling channel and is approximately 12 ft wide and 55 ft long. The third coal tar area is located south of the cooling channel and is approximately 2 ft wide by 10 ft long.

In June 2014, six hand auger soil borings were completed by HAAP at the locations shown on Figure 2. Coal tar was encountered at Location 2 at a depth of approximately 3 inches below ground surface (bgs). No coal tar was observed in any of the other borings, including those completed in the subsidence area. No soil samples were submitted for laboratory analysis during the inspection or hand auger boring completion. The results of the hand auger investigation indicated that no historical disposal activities took place in the area of possible subsidence trenches.

HAAP submitted the SWMU 109 Site Assessment to TDEC in June 2014. The report described the activities completed on-site and concluded that an RFI was warranted to further investigate the nature and extent of coal tar in site soils, sediment, surface water, and groundwater. The SWMU 109 Site Assessment Report also recommended no further action at the subsidence area. TDEC approved the Site Assessment Report on October 21, 2014.

Bay West LLC (Bay West) was contracted to complete an RFI at SWMU 109. The RFI Work Plan was submitted to TDEC on December 2, 2014. TDEC approved the work plan on January 5, 2015. Field work started in March 2015 and was completed in May 2016. A total of 21 hand auger borings, 35 direct push borings, and 85 soil samples were collected to evaluate site soils. Coal tar at the ground surface and within the borings and surface waterways was delineated. Two groundwater monitoring wells were installed, and groundwater samples were collected from the new wells and one upgradient off-site monitoring well. Three surface water samples and 14 sediment samples were collected for analysis.

The findings of the RFI were presented in a report titled “Final RCRA Facility Investigation, Solid Waste Management Unit 109, World War II Coal Tar Site, CCHSAP-42” (Bay West, 2016). The RFI indicated the presence of surficial coal tar and contaminated soil and sediment in the area delineated on Figure 3. Most of the surficial coal tar was observed in the waterways in an area centered on the intersection of the cooling channel and the drainage ditch. There are large masses of coal tar in the cooling channel to the east and west of the intersection with the drainage ditch, and in the northern end of the drainage ditch. There is also coal tar on the ground north of the cooling channel/ditch intersection; this coal tar extends from the cooling channel to the toe of the railroad embankment slope. There are also areas of surficial coal tar on the ground surface to the south of the cooling channel on both sides of the drainage ditch. This coal tar is generally within the upper 2 ft and consists of both large masses and fragments.

Polynuclear aromatic hydrocarbon (PAH)-contaminated soil is present to the south of the cooling channel. There is one area west of the drainage ditch that contains subsurface soil with PAH contamination above the United States Environmental Protection Agency (USEPA) residential and industrial screening levels (RSLs). The remaining areas of contaminated soil are below the industrial RSLs but above the residential RSLs. PAH-contaminated sediment is present east and west of the coal tar in the cooling channel and south of the coal tar in the drainage ditch. There are PAHs above the industrial RSLs in the sediment adjacent to the downstream extent of the coal tar in the cooling channel; the remaining contamination in the sediment is above the residential RSLs but below the industrial RSLs. The extent of PAH contamination exceeding industrial and/or residential RSLs is depicted on Figure 4.

Surface water samples collected from the cooling channel and drainage ditch did not indicate PAHs above the screening criteria.

Depth to groundwater at SWMU 109 ranged from 7 to 13 feet below ground surface. As part of the RFI, two groundwater monitoring wells (MW-126 and MW-127) were installed south of the coal tar at SWMU 109 to evaluate groundwater quality downgradient of the site. Existing monitoring well MW-77, located north of SWMU 109, was sampled to evaluate groundwater quality upgradient of the site.

Groundwater samples were collected in August 2015. One sample was collected from each of the newly installed wells MW-126 and MW-127 and existing well MW-77. Naphthalene, found in upgradient well MW-77, was the only analyte detected, at a concentration exceeding the tapwater RSL. PAHs have historically been detected in MW-77 due to its proximity to SWMU 24. Groundwater downgradient of the site has not been impacted by PAH contamination at the site. Monitoring well locations and analytical results are depicted on Figure 5.

RFI Recommendations

Additional RFI investigations or interim measures were not recommended for SWMU 109. Current data adequately defined contaminant conditions. Since any foreseeable future use of the SWMU would be government-controlled industrial usage, the development of the land for incompatible use is unlikely. There is no significant risk to human health and the environment under current and future use.

As no active remediation is required, a Corrective Measures Study and recalculation of the site screening criteria were not warranted.

To prevent uncontrolled human exposure to the contaminants that remain above the USEPA RSLs, it was recommended that LUCs be established for the site. Signs should be installed to identify the site and warn about presence of contaminated materials at the site. Excavation controls should be placed on the site, including no excavation/disturbance of the site without prior written TDEC approval, implementation of appropriate safety controls, and Safety Dig Permit approval for all excavation activities.

A Statement of Basis was recommended for SWMU 109 with the site's final remedy incorporated into the next revision of the TDEC CAO.

The RFI Report was submitted to TDEC on October 3, 2016; TDEC approved the report on November 21, 2016.

4.0 SELECTED FINAL REMEDY

The SWMU 109 RFI adequately defined the boundaries of the SWMU and documented the vertical and horizontal extent of residual coal tar and soil contamination with PAHs exceeding residential and industrial RSLs. The final remedy selected for SWMU 109 to prevent uncontrolled human exposure to residual coal tar and contaminated soil includes the following:

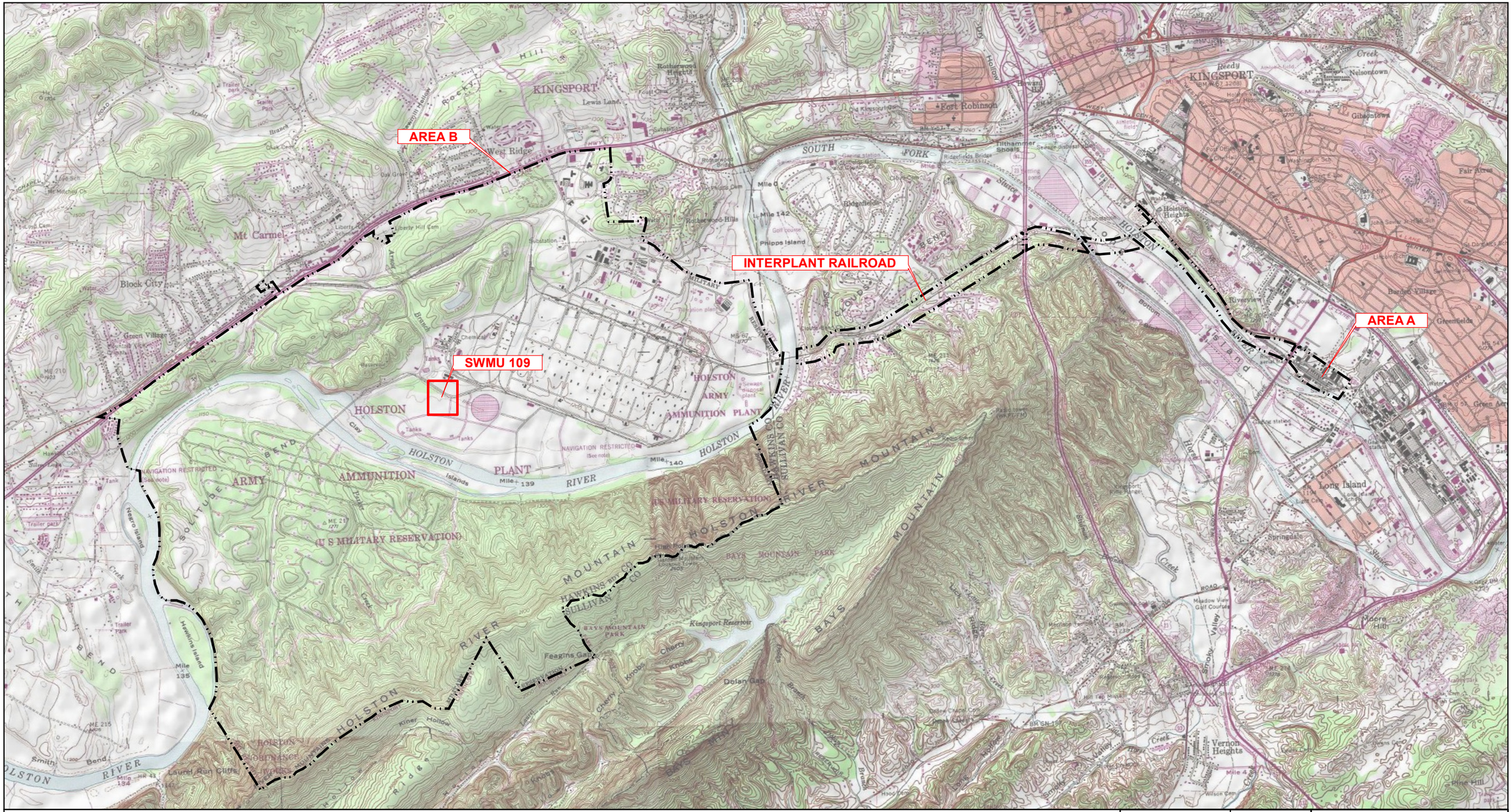
- Imposition of LUCs to prevent uncontrolled human exposure to the contaminants;
- Installation of signs restricting access to the site (locations illustrated on Figure 6);
- Imposition of excavation controls within the area illustrated on Figure 6;
- Revision of the HAAP LUCIP to include SWMU 109;
- Update of the HAAP GIS to identify site hazards to facility planners;
- Completion of semi-annual inspections to ensure that the LUCs are maintained and that no unauthorized excavation has taken place;
- Preparation of a Statement of Basis to document the final remedy in the next revision of the CAO; and
- Inclusion of SWMU 109 in the CAO requiring implementation of Institutional Controls and Inspections.

The elements of the selected remedy, including sign installation at SWMU 109, were implemented during the semiannual Long-Term Management/Long Term Operations (LTM/LTO) event, completed in October 2017.

5.0 REFERENCES

Bay West, 2016. *Final RCRA Facility Investigation, Solid Waste Management Unit 109, World War II Coal Tar Site 2, CCHSAAP-42. Holston Army Ammunition Plant, Kingsport, Tennessee.* Contract W9128F-09-D-0052, TO #CK01, August.

TDEC, 2013. Modification Approval of the Holston Army Ammunition Plant Class 3 Modification for Final Remedy, Corrective Action Order Case Number 03-HCA003, January.



Kingsport

TENNESSEE

Installation Boundary

SWMU 109 Location

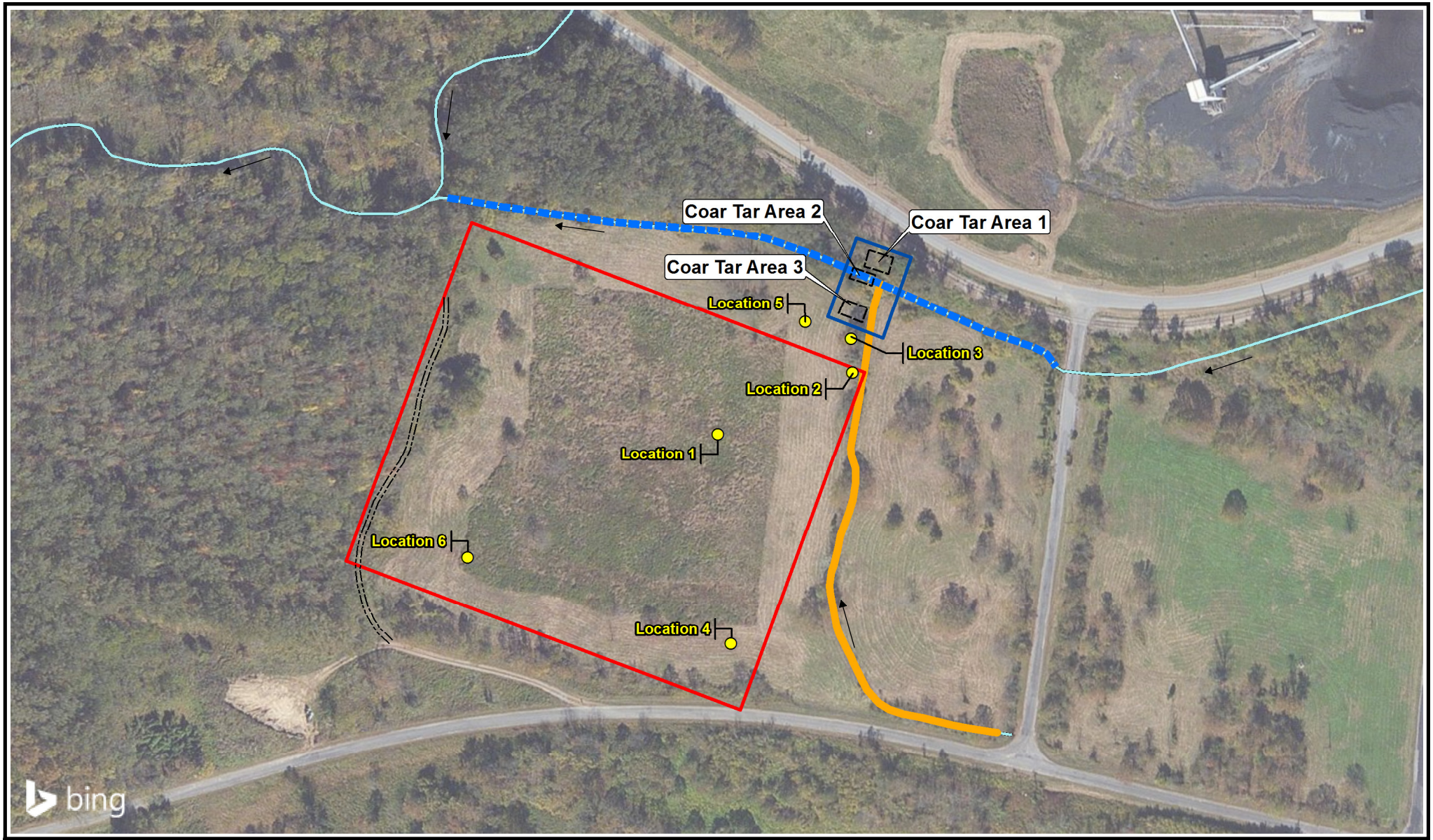
0 3,000 6,000 Feet

0 900 1,800 Meters

N W E S

SOURCES: Basemap: 2013 National Geographic Society, i-cubed

ENGR'G:	SG	DATE	
DRAWN:	SG	12/18/2013	Bay West — Customer-Focused Environmental & Industrial Solutions
REV:	SG	6/16/2016	
PROJECT NAME:	HAAP - KINGSPORT, TN		
TITLE:	HAAP LOCATION MAP		
DWG. NO: J160167	SCALE: 1:3,000	FIGURE #: 1	



N
W E
S

0 100 200
Feet

Coordinate System: NAD 1983 State Plane Tennessee FIPS 4100 Feet
Basemap: Bing Aerial WMS

- Hand Auger Location (June 2014)
- Flow Direction
- Gravel Drive
- Cooling Channel
- Drainage Ditch
- Approximate Main SWMU 2 Drainage Ditch Location/ Main Cooling Channel
- Boundary Of Subsidence Area
- Coal Tar Boundary Observed During 2014 Site Assessment
- 2014 Site Assessment Coal Tar Area

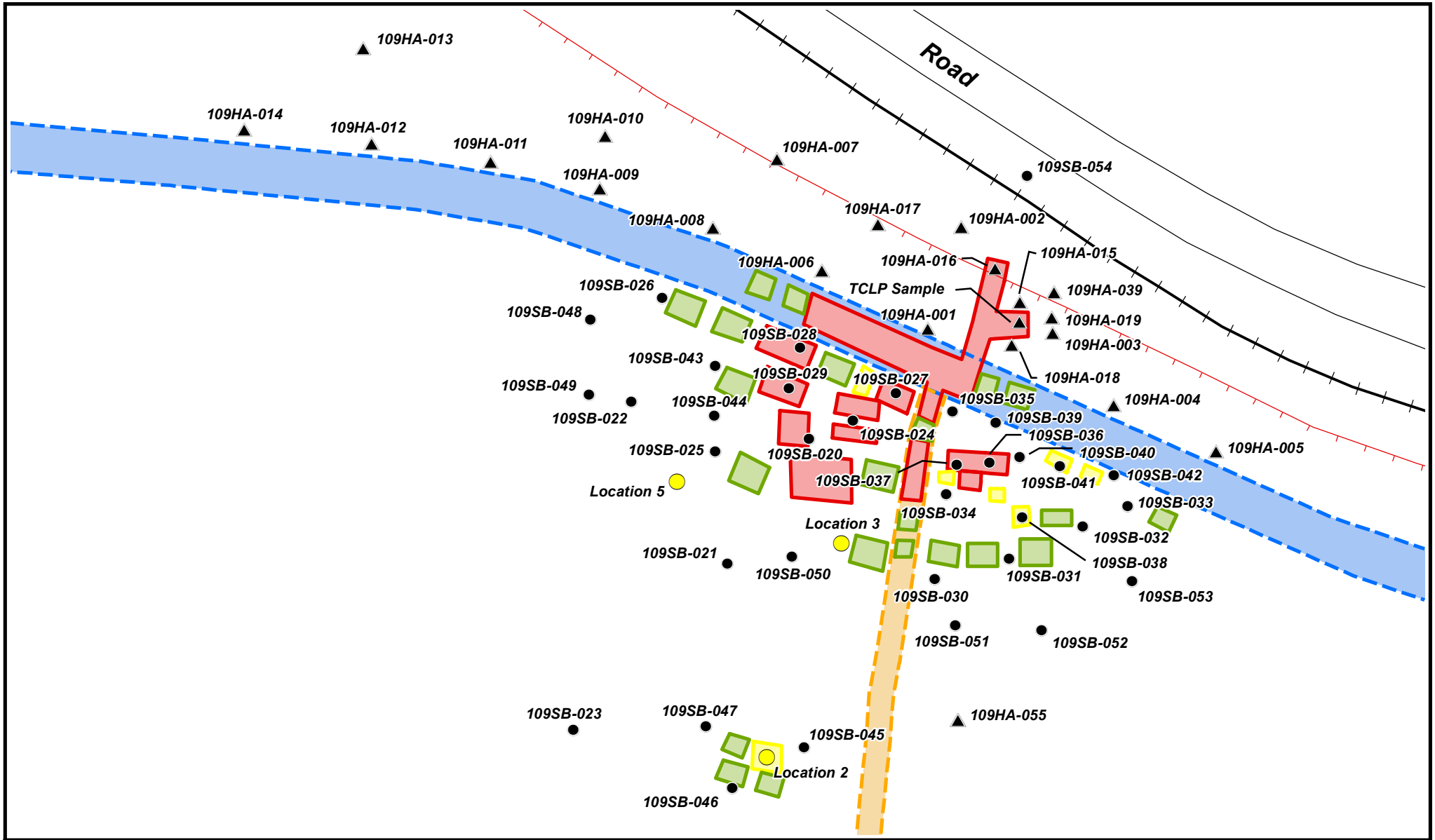
Figure 2

SWMU 109 2014 Site Assessment Map

World War II Coal Tar Site 2
Holston Army Ammunition Plant
Kingsport, Tennessee

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: SG Date Drawn/Revised: 8/1/2016 Project No. J160167



Coordinate System: NAD 1983 State Plane Tennessee FIPS 4100 Feet
Basemap: Bing Aerial WMS

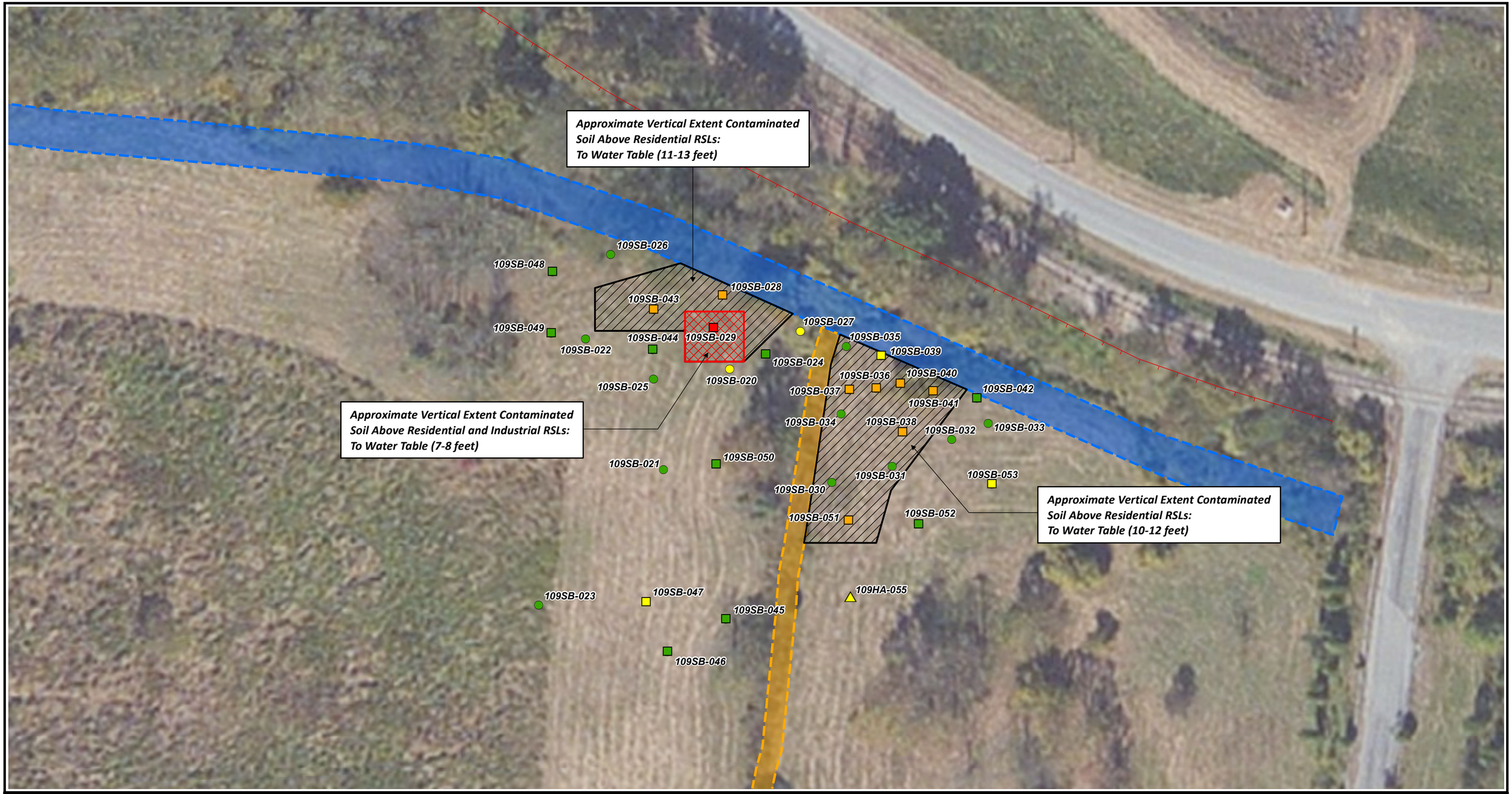
Figure 3

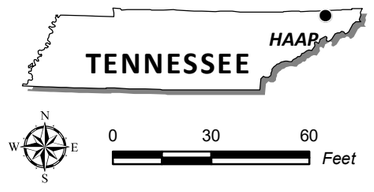
SWMU 109
Coal Tar Locations

World War II Coal Tar Site 2
Holston Army Ammunition Plant
Kingsport, Tennessee

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: SG Date Drawn/Revised: 7/21/2016 Project No. J160167





Coordinate System: NAD 1983 State Plane Tennessee FIPS 4100 Feet
Basemap: ESRI World Imagery WMS

- Hand Auger Location
- Soil Boring Location (Shallow - 5' bg)
- Soil Boring Location (Deep - >5' bg)
- Drainage Ditch
- Cooling Channel
- Approximate Toe of Railroad Embankment

- PAHs Not Detected
- PAH Detection Below Residential RSLs
- PAH Detection Above Residential RSL and Below Industrial RSL
- PAH Detection Above Industrial RSL
- Approximate Limits of Contaminated Soil Above Residential RSLs
- Approximate Limits of Contaminated Soil Above Industrial RSLs

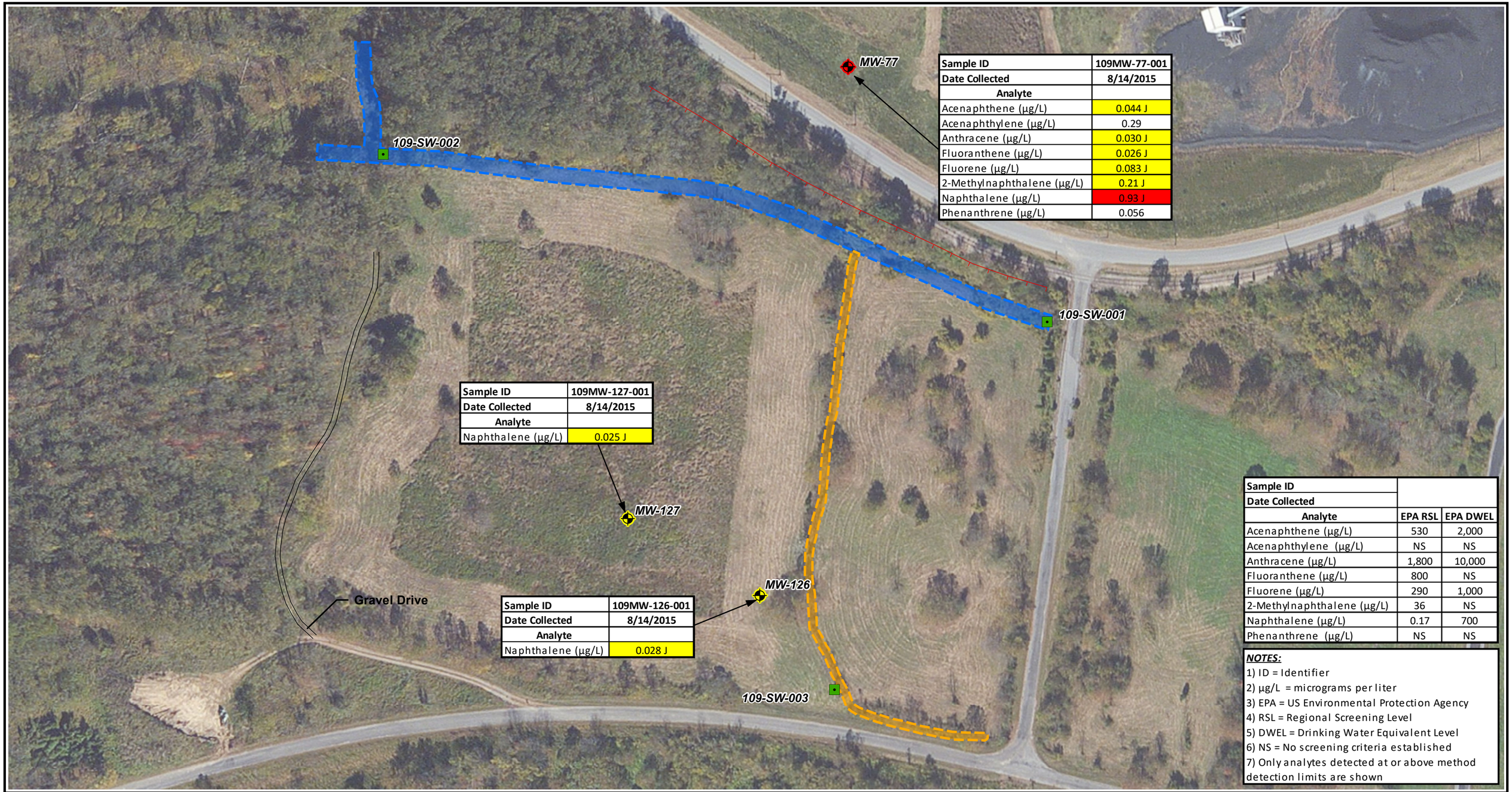
Figure 4

SWMU 109
Soil Contamination Extents

World War II Coal Tar Site 2
Holston Army Ammunition Plant
Kingsport, Tennessee

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: SG Date Drawn/Revised: 12/28/2017 Project No. J160167



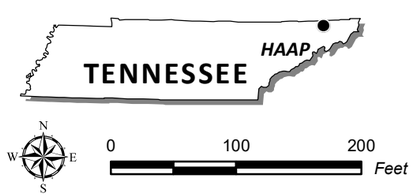
Sample ID	109MW-77-001
Date Collected	8/14/2015
Analyte	
Acenaphthene (µg/L)	0.044 J
Acenaphthylene (µg/L)	0.29
Anthracene (µg/L)	0.030 J
Fluoranthene (µg/L)	0.026 J
Fluorene (µg/L)	0.083 J
2-Methylnaphthalene (µg/L)	0.21 J
Naphthalene (µg/L)	0.93 J
Phenanthrene (µg/L)	0.056

Sample ID	109MW-127-001
Date Collected	8/14/2015
Analyte	
Naphthalene (µg/L)	0.025 J

Sample ID	109MW-126-001
Date Collected	8/14/2015
Analyte	
Naphthalene (µg/L)	0.028 J

Sample ID		
Date Collected		
Analyte	EPA RSL	EPA DWEL
Acenaphthene (µg/L)	530	2,000
Acenaphthylene (µg/L)	NS	NS
Anthracene (µg/L)	1,800	10,000
Fluoranthene (µg/L)	800	NS
Fluorene (µg/L)	290	1,000
2-Methylnaphthalene (µg/L)	36	NS
Naphthalene (µg/L)	0.17	700
Phenanthrene (µg/L)	NS	NS

NOTES:
1) ID = Identifier
2) µg/L = micrograms per liter
3) EPA = US Environmental Protection Agency
4) RSL = Regional Screening Level
5) DWEL = Drinking Water Equivalent Level
6) NS = No screening criteria established
7) Only analytes detected at or above method detection limits are shown



Coordinate System: NAD 1983 State Plane Tennessee FIPS 4100 Feet
Basemap: ESRI World Imagery WMS

- Surface Water Sample
- Monitoring Well Location
- Approximate Toe of Railroad Embankment
- Cooling Channel
- Drainage Ditch
- No Screening Level Established
- PAHs Not Detected
- PAH Detection Below Tapwater RSLs
- PAH Detection Above Tapwater RSL

Figure 5

SWMU 109 2015 Monitoring Wells and Surface Water Analytical Results

World War II Coal Tar Site 2
Holston Army Ammunition Plant
Kingsport, Tennessee

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: SG Date Drawn/Revised: 12/28/2017 Project No. J160167

SIGN LOCATION
MONITORING WELL
COOLING CHANNEL
DRAINAGE DITCH
RAILROAD TRACKS
GRAVEL ROAD
APPROXIMATE MAIN COOLING CHANNEL
AREA OF RESTRICTED EXCAVATION
LIMITS OF SWMU 109

N
W E
S

0 150 300 Feet
0 50 100 Meters

Coordinate System: NAD83 StatePlane Tennessee FIPS 4100 Feet
Basemap: ESRI World Imagery WMS

SOURCE:
US ARMY CENTER FOR HEALTH PROMOTION
AND PREVENTIVE MEDICINE
ABERDEEN PROVING GROUND, MARYLAND

ENGR'G S.M.	DATE	Bay West Customer-Focused Environmental & Industrial Solutions	
DRAWN T.P.	11/22/04		
REV. S.G.	12/28/17		
PROJECT NAME	HSAAP - KINGSPORT, TN		
TITLE	SWMU 109 SITE MAP WITH EXCAVATION RESTRICTIONS AND WARNING SIGNS		
DWG. NO. J160167	SCALE AS SHOWN	FIGURE # 6	

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILEHolston_AAP\J160167\MapDocs\SWMU_109\004_SOBJ160167 FIG 6 SWMU 109 Site Map With Excavation Restrictions and Warning Signs.mxd

STATEMENT OF BASIS

SWMU 110 – Acetic Acid Spill Site
Holston Army Ammunition Plant, Kingsport, Tennessee
EPA ID No. TN5210020421

1.0 Introduction

This Statement of Basis summarizes the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI), interim measures (IM), and proposed final remedy for Solid Waste Management Unit (SWMU) 110 at the Holston Army Ammunition Plant (HAAP) in Kingsport, Tennessee. A synopsis of the site location, operating history, investigation results, Interim Measures results, and an explanation of the proposed final remedy are provided. Information summarized in this Statement of Basis can be found in greater detail in the 2015 RCRA Facility Investigation (Bay West, 2015) and 2017 SWMU 110 IM Report (BAE Systems 2017) as well as other documents in the facility's administrative record. The administrative record is located at the offices of the Division of Solid Waste Management (DSWM), Tennessee Department of Environment and Conservation, William R. Snodgrass TN Tower, 312 Rosa L. Parks Ave. 14th Floor, Nashville, TN 37243.

2.0 Site Background

The Acetic Acid Spill Area is located within a grassy area in the Area B explosives production area (Figures 1 and 2). The site is bounded by Buildings E-4 and G-4 and a paved access road to the west; Buildings E-5 and G-6 and a paved road to the east; aboveground pipelines to the north; and a paved road to the south. The topography is relatively flat. There are surface water ditches on the east and west sides of the grassy area. The west side ditch is immediately adjacent to the site. The two ditches merge at the southern boundary of the grassy area and ultimately drain to a permitted non-contact cooling water outfall (Outfall 31) at the Holston River to the south. There is a treed area on the eastern side of the site.

On July 18, 2013, a weak acetic acid release occurred from the failure of a flexible expansion joint in a pipeline in the northwest corner of the grassy area during a material transfer (Figure 1). The amount of acetic acid spilled was documented to be 34,720 pounds; the liquid contained approximately 1% explosives. Following the initial emergency response, it was determined that the majority of the spilled material was confined to the field adjacent to the pipeline and had not entered the Holston River. Emergency response personnel excavated a pit and trenches to collect and recover the liquid. The liquid was recovered with a vacuum truck and taken to a settling basin at the HAAP Industrial Wastewater Treatment Plant (IWWTP) where it was introduced for treatment. The failed flexible expansion joint was replaced on 18 July 2013. On July 19, 2013, soda ash was applied to the spill area, and the field was flushed with water. Approximately 30,000 gallons of flush water were recovered and transported to the settling basin at the IWWTP for treatment. The released acetic acid killed the grass, so the extent of the spill was visible during the 2014 growing season.

3.0 Summary of Contaminant Evaluation

2013-2014 Confirmatory Sampling

On July 20 2013, BAE Systems (BAE) collected soil samples from 1 to 2 inches bg (below grade) and 6 to 9 inches bg at three locations for cyclotrimethylenetrinitramine (RDX) and cyclotetramethylene-tetranitramine (HMX) analysis. While RDX was detected above the laboratory detection limits in three samples, the only exceedance of the RDX Regional Screening Level (RSL) was in the sample from C1 at 1 to 2 inches below ground surface (bgs). RDX in this sample was 54 milligrams per kilogram (mg/kg); the industrial RSL is 28 mg/kg and residential RSL is 6.1 mg/kg. HMX was detected in four samples; all the results were below the residential RSL of 3,900 mg/kg. Based on these results, approximately 90 cubic yards (cy) of soil was excavated from the area and treated at the HAAP Burning Ground in September 2013. Confirmatory soil samples were collected from the excavation; RDX and HMX were less than the residential RSLs (6.1 mg/kg and 3,900 mg/kg, respectively).

Nine additional soil samples were collected from locations generally along the median of the spill area in September 2013 for RDX and HMX analysis. Based on these results, the quantity of contaminated soil requiring removal and treatment was estimated to be 1,000 to 1,700 cy.

Because treatment of that volume of soil at the HAAP Burning Ground was not a viable option, BAE and DSWM agreed that a pilot test would be performed on the contaminated soils using field-applied lime and a commercial treatment. Two soil samples were collected from the pilot test area in March 2014 prior to the start of the test. Following the application of the lime and a commercial product, soil samples were collected in the appropriate locations of samples two weeks later. Results of the pilot test reported an approximate 50% RDX concentration reduction with the lime-treated soil and no appreciable reduction with the commercial product.

HAAP submitted the SWMU 110 Site Assessment Report for the Acetic Acid Spill near E-4 to DSWM in May 2014. The report described the recovery and sampling activities and concluded that an RFI was warranted to delineate RDX contamination in soil and surface water. Groundwater was not recommended for further action at the site, as RDX in groundwater within the explosives production area is already being addressed as part of Area of Concern Groundwater (AOC GW). The SWMU 110 Site Assessment Report also concluded that HMX concentrations did not warrant further delineation. DSWM approved the Site Assessment Report on October 21, 2014.

As the site was newly discovered and not part of the DSWM Facility Action Plan Process, an RFI Work Plan was submitted in December 2014 describing the proposed investigative activities to delineate the RDX contamination (Bay West, 2014). DSWM approved the Work Plan on January 5, 2015.

2015 RCRA Facility Investigation

Bay West completed an RFI at the site in August and September 2015 (Bay West, 2015). The RFI delineated the extent of the RDX contamination. A total of eight samples were collected from soil borings showing remaining contamination in need of removal at four of the sample locations. The RFI also concluded that the RDX contamination stayed within the vertical extent of the upper 1-to-2 foot and horizontal extent of 25-foot leaving an approximate 575 cubic yards of soil above the residential RDX RSL in need of removal. HAAP elected to close SWMU 110 so that LTM activities can be discontinued.

2017 Interim Measures

A Field Work Order (FWO) describing proposed IM activities was submitted to DSWM for approval on December 13, 2016. DSWM approved the FWO on December 19, 2016.

Interim Measures were implemented at SWMU 110, Acetic Acid Spill Site near E-4 in June 2017. The objective of the IM was to excavate soil contaminated with explosives above residential RSLs.

Field activities started on June 12, 2017 (BAE, 2017b). The excavation of soil from areas started on June 12th and lasted until June 15th. Confirmation samples were taken post-excavation in the same previously sampled locations. Six confirmation soil samples were taken on June 15th. BAE sampled six primary verification soil samples from the excavation in the same general locations seen in Figure 2 and corresponding to S7, S8, S9, S2, S5, and S6. A total of four separate areas were marked for excavation. The extent of excavation is depicted (see note) on Figure 3. A total of 21 tandem truck loads (~230 cubic yards) of soil were taken to the landfill for disposal as a special waste. Samples were sent to an off-site laboratory for analysis (ESC Lab Sciences / Pace Analytical). EPA Method 8330B was performed for RDX. All samples received a non-detect result. Backfilling of the excavation areas was performed July 5th through July 7th.

4.0 Selected Final Remedy

Based on the analytical results from the confirmation soil samples collected and visual observations, the IM was successful at removing previously contaminated soil at SWMU 110. No further action is recommended as the final remedy for the site.

References

A.T. Kearney, Inc. (Kearney) 1991. *RCRA Facility Assessment of Holston Army Ammunition Plant, Kingsport, Tennessee*, EPA I.D. No. TN5210020421, August 30.

Bay West 2014. *RFI Work Plan for SWMU 110, Acetic Acid Spill near E-4, Holston Ammunition Plant, Kingsport, Tennessee*, Contract W9128F-09-D-0052, Task Order CK01, November2014.

BAE 2016a, *Interim Measures Work Plan for SWMU 110, Acetic Acid Spill near E-4, Holston Army Ammunition Plant, Kingsport, Tennessee*, 2016.

BAE 2016b, *Interim Measures Final Report for SWMU 110, Acetic Acid Spill near E-4, Holston Army Ammunition Plant, Kingsport*, Tennessee, 2016.

Figure 1

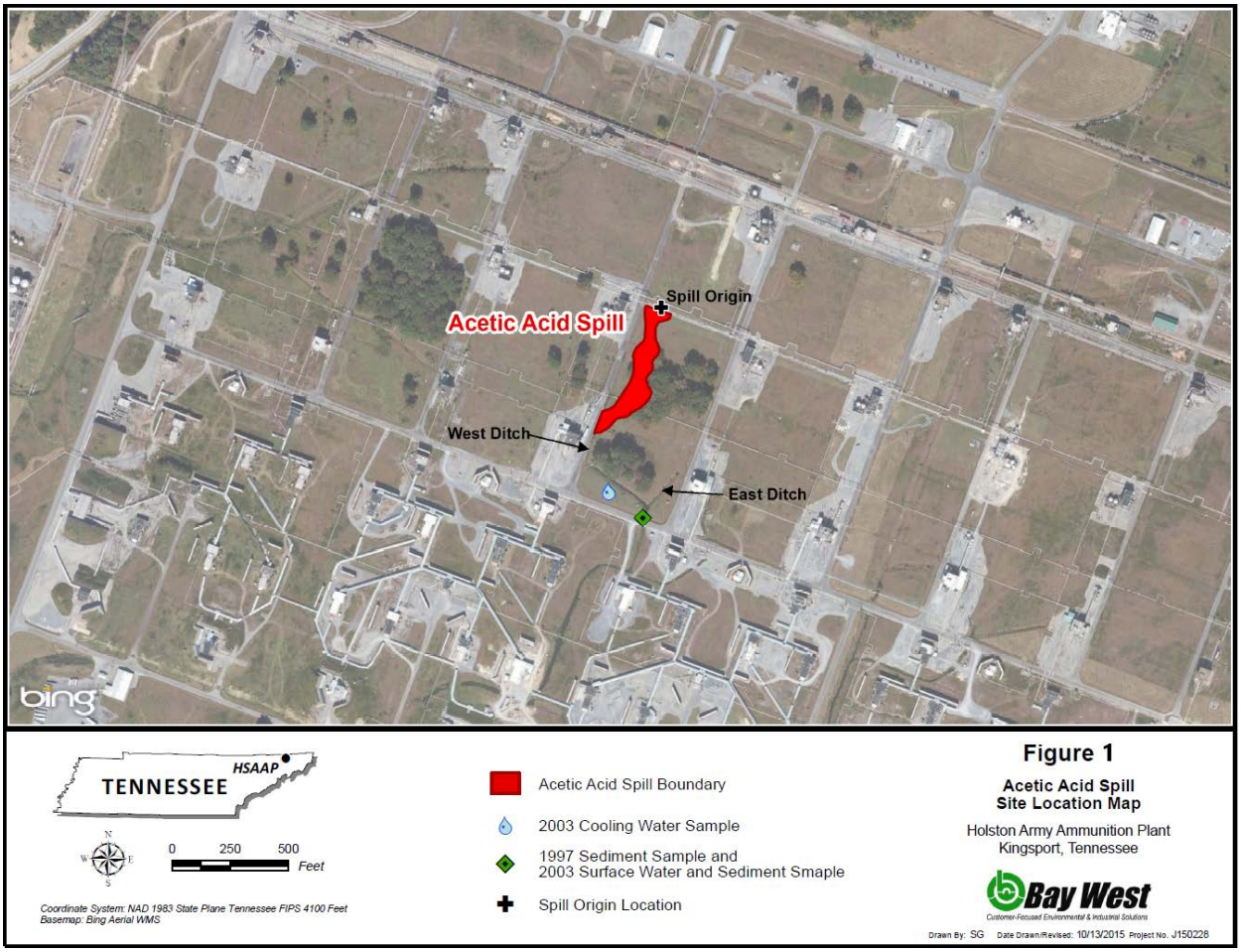

Spill Origin
Acetic Acid Spill
West Ditch
East Ditch
bing
TENNESSEE
HSAAP
0 250 500
Feet
Coordinate System: NAD 1983 State Plane Tennessee FIPS 4100 Feet
Basemap: Bing Aerial WMS
Acetic Acid Spill Boundary
2003 Cooling Water Sample
1997 Sediment Sample and
2003 Surface Water and Sediment Smaple
Spill Origin Location
Figure 1
Acetic Acid Spill
Site Location Map
Holston Army Ammunition Plant
Kingsport, Tennessee
Bay West
Customer-Focused Environmental & Industrial Solutions
Drawn By: SG Date Drawn/Revised: 10/13/2015 Project No. J150228

Figure 2

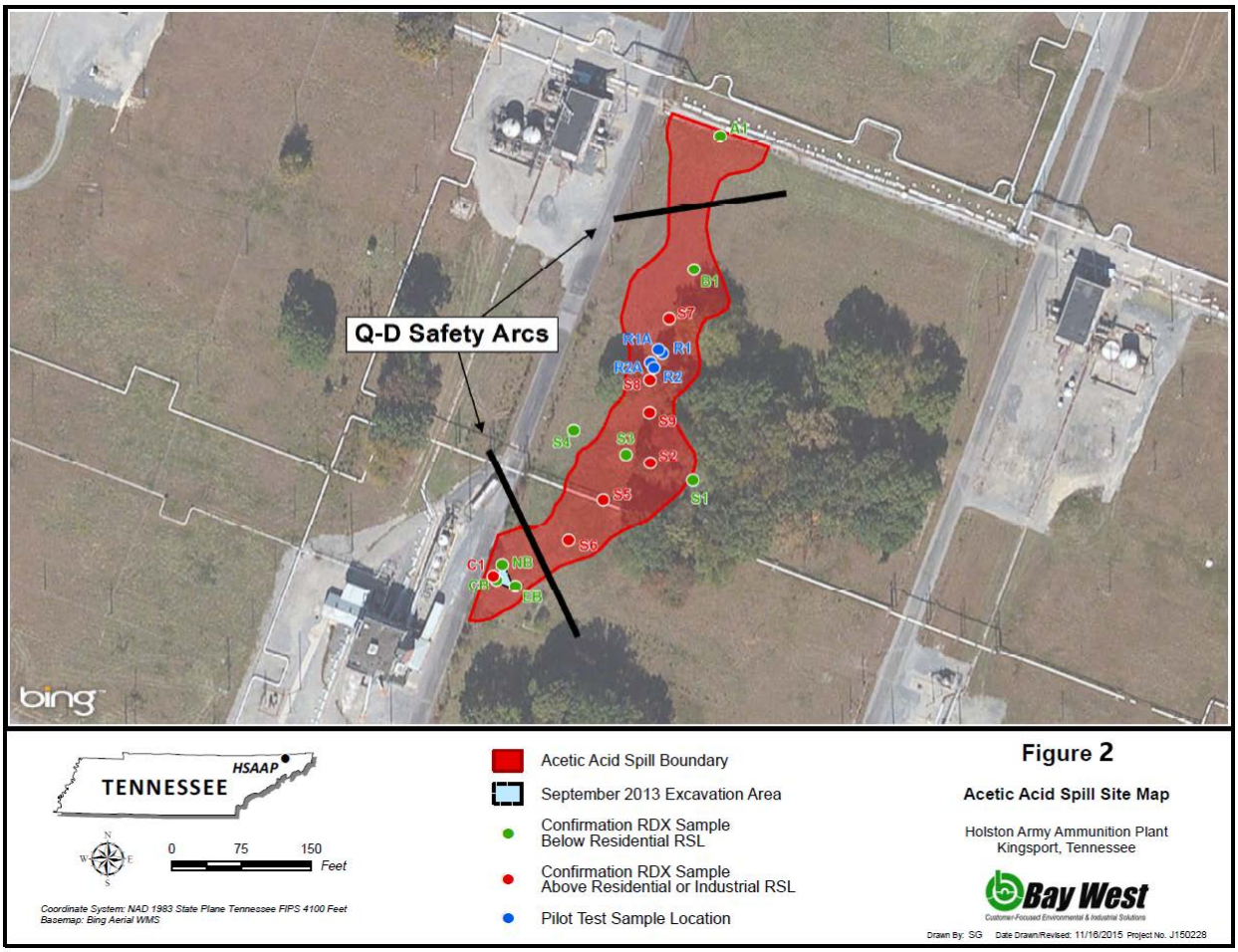
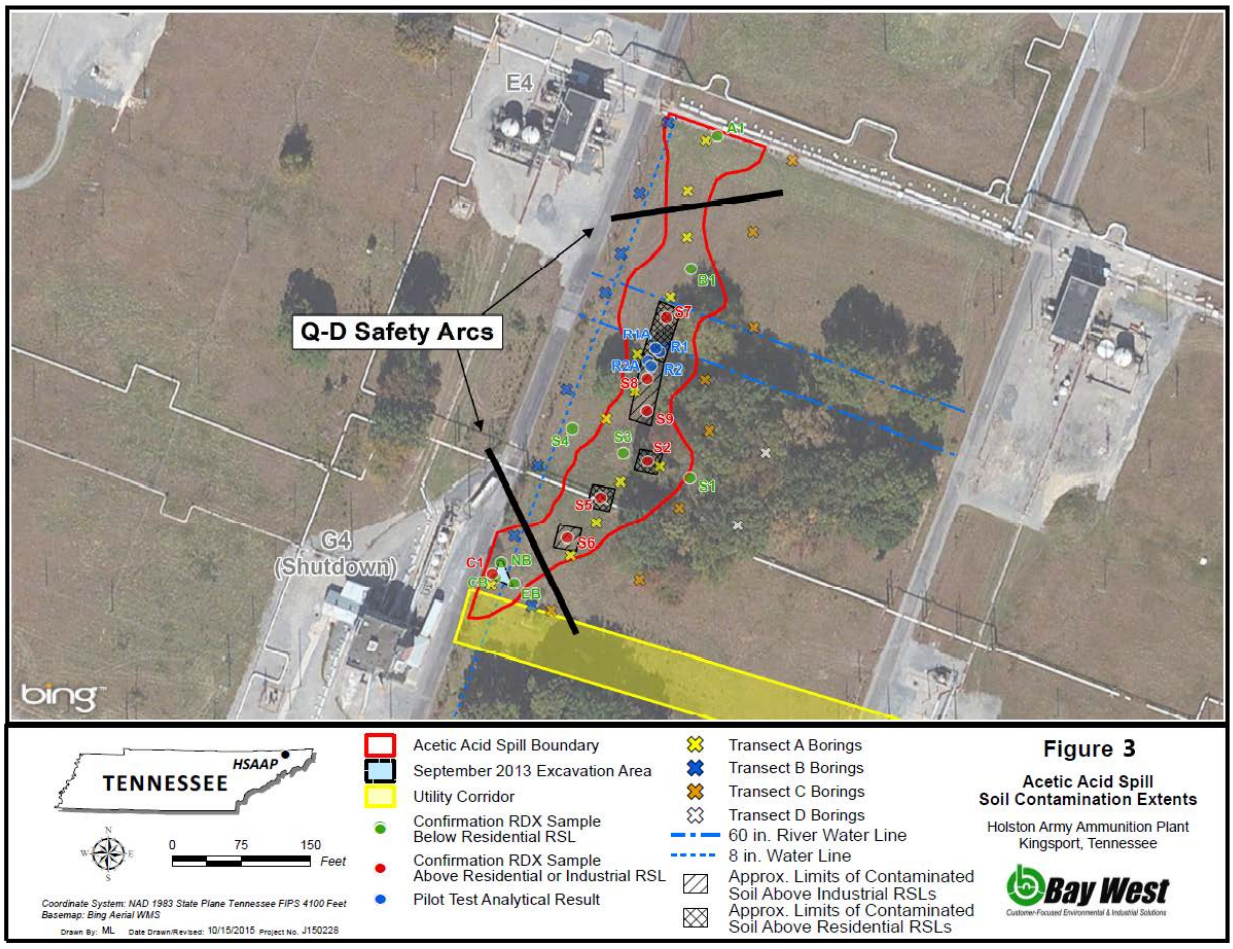

Q-D Safety Arcs
A1
B1
S7
R1A
R1
R2A
R2
S8
S9
S4
S3
S2
S1
S5
S6
C1
NB
CB
EB
bing
TENNESSEE
HSAAP
0
75
150
Feet
Coordinate System: NAD 1983 State Plane Tennessee FIPS 4100 Feet
Basemap: Bing Aerial WMS
Acetic Acid Spill Boundary
September 2013 Excavation Area
Confirmation RDX Sample Below Residential RSL
Confirmation RDX Sample Above Residential or Industrial RSL
Pilot Test Sample Location
Figure 2
Acetic Acid Spill Site Map
Holston Army Ammunition Plant
Kingsport, Tennessee
Bay West
Customer-Focused Environmental & Industrial Solutions
Drawn By: SG
Date Drawn/Revised: 11/16/2015
Project No. J150228

Figure 3



Note: The extent of excavation is the same depicted in the black hashed boxes labelled as the Approx. Limits of Contaminated Soil Above Residential RSLs.

APPENDIX A

REQUIREMENTS FOR SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) Under this Order at this Time:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
1A	Industrial Sewer	Unit consists of sumps, drains and underground/aboveground pipes located throughout Area A.	1942–Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
1B	Industrial Sewer	This unit consists of sumps, drains and underground/aboveground pipes located throughout Area B.	1942–Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
1C	Industrial Sewer	This unit consists of sumps, drains and underground/aboveground pipes located throughout the interplant rail corridor.	1942–Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
2	Surface Drainage Ditches	Unit consists of unlined drainage ditches throughout Areas A and B that discharge surface runoff to the Holston River.	1942–Present	Confirmatory Sampling determined no releases; NFA approval DSWM – 8/13/04
3B5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3B11	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3D3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3D6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3D7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3D9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3E8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3G1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12

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SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
3G2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3H1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Demolished 07/2012, prior to RFI. RFI did not confirm CS results; NFA approval DSWM–4/06/15
3H10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Demolished 12/2011, prior to RFI. RFI did not confirm CS results; NFA approval DSWM–4/06/15
3I1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3I10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Demolished 08/2011. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J4	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) Under this Order at this Time:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
3J6	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Demolished 11/2012. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3J10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Demolished 08/2012. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3K1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3K7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Demolished 10/2012. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3K9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3K10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	CS completed as part of RFI; NFA approval DSWM–4/06/15
3L2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3L7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3L9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3L10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Demolished 08/2011. Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) Under this Order at this Time:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
3M1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3M10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3N1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3N2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3N9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3N10	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3O1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3O5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3O7	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
3O9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Confirmatory sampling determined no releases; NFA approval DSWM–5/11/12
5	Acetic Anhydride Sludge Tanks	The tanks store sludge generated by base heater that refines acetic anhydride in Building 6.	1943–Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) Under this Order at this Time:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
6	Ball Mill Solids Pit and Dumpster	Unit receives wash-down water from acetic anhydride operations. Solids settle to bottom, liquid is discharged to Industrial Wastewater Treatment Plant (IWTP).	1942–Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
7	Propyl Formate Tanks	Unit consists of three banded steel tanks with capacities of 2,000 to 2,500 gallons.	1972–1995	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
8	Area A Industrial Boilers	Unit consists of 8 boilers that burn coal, coal tar, and propyl formate wastes (D001) for heat recovery.	1940s–Present	Clean Closed; Confirmation of clean closure DSWM – 7/16/99
9	Area A Fly Ash Loading Station	Unit consists of one uncurbed concrete pad and one smaller pad beneath the fly ash hoppers of Building 8 in Area A.	1942–1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
10	Rail Car Loading Area	Unit is part of the facility railroad that links Areas A and B.	1942–Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
11	Area A Parts Cleaners	Unit consists of covered metal containers which hold solvents for cleaning metal parts.	1942–Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
12	Area A Spill Pond	Unit was once part of the Area A Aeration Basin. The unit has managed acetic acid and acetic anhydride waste waters.	1983–1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM– 2/14/00
13	Area A Aeration Basin	This clay-lined basin is also referred to as the Area A Industrial Waste Water/ Equalization Lagoon or Treatment Lagoon. The unit managed acetic acid and acetic anhydride waste waters.	1975–1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
15	Coal Tar Landfill 2	Unit is a ¼-acre unlined landfill that managed coal tar and fly ash.	Unknown	Interim Measures Report; NFA Approval DSWM – 10/23/07
16	Coal Tar Container Storage Area	Unit is an interior storage area in Building 13 (Area A) used to store coal tar drums.	Unknown–1990s	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
25	Area B Tar Burial Site	Unit managed coal tar and fly ash	1978-1980	Interim Measures Report; NFA Approval DSWM – 10/31/13
30	Former Nitric Acid Equalization Basin	This unlined unit managed industrial wastewaters from processes conducted in the Nitric Acid Manufacturing Area.	1978–1984	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
31	Existing Nitric Acid Equalization Basin	Unit receives industrial wastewater from the Nitric Acid Manufacturing Area and the Nitric Acid Spill Pond. The waste is neutralized and discharged to the IWTP.	1985–Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91

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SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
32	Explosive Settling Basins	Unit acted as settling basins for wastewater particulate matter coming from the manufacturing area.	1983– 1989	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
33	Neutralization Basins	These below-grade basins manage industrial wastewaters generated from processes in the Nitric Acid Manufacturing Area.	1978– Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
34	Area B Industrial Boilers	Unit consists of nine boilers which generate fly ash.	1942– Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
35	Unlined Spill Pond	Unit managed industrial wastewater from the Industrial Sewer (SWMU 1).	1983–1986	Additional Confirm. Sampling Report determined no releases; NFA approval DSWM – 6/5/08
36	Lined Spill Pond	Unit received industrial wastewaters from acetic acid recovery processes conducted in Area B.	1987–1988	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
40	Sodium Nitrate Pond 3	This unlined unit received waste waters from the B-Line Production Areas.	1970–1987	No indication of release of RCRA hazardous waste/constituent. Closed by TDEC Division of Water Pollution Control in 1980s.
41	Sodium Nitrate Pond 4	This unlined unit received waste waters from the B-Line Production Areas.	1973–1987	Did not contain hazardous constituents. Closed by TDEC Division of Water Pollution Control in 1980s.
42	A – 1 Equalization Basin	Unit managed wastewaters containing ammonia and dimethylamines.	1979–1994	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
43	Burning Ground	Unit regulated by Hazardous Waste Management Permit TNHW-148. Unit receives explosive-contaminated wastes.	1940s– Present	RFI Report; NFA approval DSWM – 12/18/08
46	Burning Cages (2)	These two cages are located in the Burning Ground Area (SWMU 43).	1940s– Present	RFI Report; NFA approval DSWM – 12/18/08
48	Sludge Dewatering Station	Unit is located in the Burning Ground Area (SWMU 43). It received explosive contaminated wastes for dewatering.	Mid 1940s –1981	RFI Report; NFA approval DSWM – 12/18/08
49	Vehicle Wash Pad at Burning Ground	Unit is located in the Burning Ground. Area (SWMU 43). This unit managed wash water that may have contained oil, grease, gasoline and explosives. The pad drains to IWTP.	About 1983 –Present	RFI Report; NFA approval DSWM – 12/18/08

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SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
50	Former Solvent Burn Tank	Unit is located in the Burning Ground Area (SWMU 43). It was utilized for the open burning of explosive contaminated, spent non-halogenated solvents and oils.	1980–1984	RCRA unit NFA under PCCAO dated 3/31/99. Groundwater included in AOC-GW.
51	Vehicle Wash Pad Outside Bldg. 105	Unit manages wash water that may have contained oil, grease, gasoline and explosive residues.	1980–Present	Confirmatory sampling determined no releases; NFA approval DSWM – 10/10/05
52	Vehicle Wash Pad inside Bldg. 105	Unit manages wash water that may have contained oil, grease, gasoline and explosive residues.	1942–Present	Confirmatory sampling determined no releases; NFA approval DSWM – 10/10/05
53	WWII Vehicle Wash Pad	Unit managed wash water that may have contained oil, grease, gasoline, fly ash, metal glass and explosive residues.	1940s–1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
54	Vehicle Wash Pad at Bldg. 556	Unit manages wash water that may contain oil, grease, gasoline, and explosive residues.	App. 1960 –Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
55	Steam Cleaning Pad at Bldg. 556	Unit is used for steam cleaning heavy equipment. The unit manages wash water that may contain oil, grease, gasoline and explosive residues.	1942–Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
57	Oily Rag Satellite Accumulation Areas (SAAs)	These SAAs manage oily rags that contain petroleum hydrocarbons.	1940s–resent	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
58	Waste Oil SAAs	These SAAs manage waste oils that contain petroleum hydrocarbons.	1940s–Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
59	Used Tire SAA	Unit is used to store tires prior to their disposal.	Unknown	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
60	Waste Oil Drainage Pad	Unit manages waste oils and oil contaminated materials.	1960–Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
61	Oil/Water Separator	Unit manages oily wastewaters.	1960-Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
62	Area B Parts Cleaners	Unit manages waste oil, grease removed from machine parts, spent Stoddard solvent, mineral spirits and varsol.	1942–Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00

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SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
63	Laboratory Explosives SAA	Unit manages waste explosives and explosive-contaminated material collected in the catch basin behind the laboratory building (Building 8).	Unknown	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
64	Paint Sludges SAA	Unit managed paint sludges or still bottoms resulting from the recovery of thinners in a distillation unit at the Paint Shop.	1988–1990s	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
65	Respirator Cartridge SAA	Unit manages spent respirator filters that had failed TCLP testing for cadmium.	1989–Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
66	Former Paint Waste SAA	Unit managed paint wastes from Area B paint shop.	1988–1989	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
67	Used Battery SAAs	Unit manages used batteries generated by vehicles and equipment.	Unknown	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
68	Sulfuric Acid SAA	Unit is used to collect spent sulfuric acid from used batteries that are drained prior to disposal.	Unknown	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
69	Scrap Metal Yard	Unit managed scrap metal and equipment.	Mid 1940s –1990s	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
70	Production Yards	These units are located throughout the facility. The units managed potentially contaminated equipment, scrap metal, decontaminated materials, and materials waiting reuse.	1942–1990s	*Yards 1-5, 8-11* – Confirmatory Sampling (CS) Report determined no releases; NFA approval DSWM – 6/19/00. *Yards 6-7* – CS Report determined no releases; NFA approval DSWM – 6/5/08. *Yard 12* – Interim Measures Report; NFA approval DSWM – 10/11/05.
71	PCB Storage Area	The unit manages the storage of PCB transformers and PCB-contaminated materials.	1981–Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
72	Former Battery Storage Area	The unit managed the storage of used vehicle batteries prior to disposal.	1960s–1988	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
73	Waste Fuel Oil Drum Storage Area	The unit managed waste fuel oil from Sanitary Wastewater Treatment Facility.	1991	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
74	Ball Field Staging Area	This unit managed soil contaminated with petroleum hydrocarbons.	1989–1990s	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00

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SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
75	T–1 Bldg. Staging Area	This unit managed coal tar/soil mixture, a PCB-oil transformer, and calcium chloride.	1990s	Confirmatory Sampling Report determined no releases; NFA approval DSWM–6/5/08
76	Dumpster	The unit received various non-hazardous waste and general refuse such as paper, glass, metal, incinerator ash, and fly ash prior to disposal.	1942–1990s	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
79	Waste Oil Underground Storage Tank (UST) at Bldg. 105	This unit is a 2,000-gallon carbon steel tank that was used to store waste motor oil, lubricating oil, and non-PCB transformer oil.	1968–1994	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
80	Waste Oil UST at Bldg. 556	This unit consists of a 2,500-gallon steel UST that stored spent mineral spirits, Stoddard chemical and varsol from parts cleaners.	1983–1994	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
81	Waste Oil UST at Bldg. 302	This unit consisted of one 130-gallon UST which received waste oil that had been captured in the oil room sump. The building and UST have been removed.	1970–1994	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
82	Area B Fly Ash Loading Station	This unit consists of a paved loading area for the transfer of fly ash.	App. 1957 –Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
83	Decontamination Ovens	These ovens manage metal parts and scrap metal that have been contaminated with explosive residues.	1961–Present	Interim Measures Report; NFA approval DSWM–10/13/05
84	Incinerators	This unit consists of incinerators used to thermally remove non-explosive waste materials from the plant site such as paper, cardboard, wooden boxes, plastic bags, oily rags, rubbish, foliage, and garbage.	1974–Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
85	Incinerator Staging Area	Unit manages the storage of non-hazardous, non-explosive, combustible garbage prior to incineration.	1974–Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
89	Industrial Waste Water Treatment Facility	Unit treats the wastewater from the facility.	1983–Present	NFA per EPA RFA Report (A. T. Kearny) 8/30/91
90	Area A Former Coal Piles	Unit is a grass covered area that stored coal. It also managed ball mill solids.	1942–1989	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
91	Sewage Treatment Plant	Unit is a 758,000-gallon per day trickling filter waste-water treatment facility.	1960–Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08

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SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
93	Sandblasting Area 1	Unit had been used to perform general sandblasting.	1990–1992	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
94	Sandblasting Area 2	Unit had been used to perform general sandblasting.	1980s–1990	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
95	Sandblasting Area 3	Unit was used to perform general sandblasting. The area is approximately 200 feet long by 200 feet wide. The area was once gravel but is now covered by an asphalt lot.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
97	Coal Tar Contamination Along the Rail Corridor	Unit is a coal tar disposal area along the rail corridor between Areas A and B.	Unknown	Interim Measures Report; NFA approval DSWM – 2/23/06
98	Coal Tar Contamination South of SWMU 17	Unit is a coal tar disposal area in Area B.	Unknown	Interim Measures Report; NFA approval DSWM – 3/14/06
99	Landfill	Unit is a possible landfill north of Building C-6.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
100	Possible Drum Rinsing Area near Bldg. R-6	Unit is a possible drum rinsing area near Building R-6. Area is presently a parking lot. This unit had been used to perform general sandblasting.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
101	Bldg. 105 Oil/ Water Separator and Associated Drain Pad	Unit was reportedly used for temporary storage of new oil drums. Unit had been used to perform general sandblasting.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM – 6/5/08
102	Former Penn–Dixie Sedimentation Pond	This surface impoundment is a natural low area approximately three acres. Runoff and leachate from a Penn-Dixie cement kiln dust waste pile was managed at this unit. This unit had been used to perform general sandblasting.	Unknown	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
104	Firing Range West of Building 134	Firing range used in the mid-1960s.	1960s	RFI/Interim Measures Report; NFA approval DSWM – 4/28/06
105	Firing Range at the Water Reservoir	Small arms practice range.	1984–Unknown	RFI/Interim Measures Report; NFA approval DSWM – 4/28/06

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) Under this Order at this Time:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
106	Firing Range at Building 234	Area is the site of a former firing range. Range likely destroyed to construct Building 234.	1967–1983	RFI/Interim Measures Report; NFA approval DSWM – 4/28/06
107	Diesel UST at Rail Car Building	Diesel/fuel oil tank at in-plant fueling station which was taken out of service and abandoned in place at an unknown date.	Unknown	Interim Measures Report; NFA approval DSWM – 5/29/08
108	Armed Forces Reserve Center and Maintenance Shop	Area used for disposal of fly-ash type material.	Unknown	SWMU Assessment Report determined no releases; NFA approval DSWM – 5/12/09
110	Acetic Acid Spill near 3E4	Acetic acid/explosives pipeline expansion joint rupture	July 2013	Interim Measures Report; NFA DSWM approval – Nov 2017
A	Mad Branch Stream	This stream currently receives the facility's non-contact cooling water from Areas A and waters from the AFG Stream (AOC B).	1942–Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
B	AFG Stream	This stream receives non-contact cooling water from Area A.	1942–Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
C	UST Gasoline Leak	Unit consisted of a filling station that contained three USTs that held diesel fuel and gasoline for facility vehicles. The tanks went through a UST closure.	1968–1994	RFI Addendum Report; NFA approval DSWM – 9/17/07
D	Existing Product USTs	These nineteen USTs managed products.	1942–1994	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
E	Removed Product USTs	These eight USTs no longer exist. They managed product materials.	1942–1991	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
F	Manganese Ore Piles	Unit consisted of several former and existing manganese ore piles stored directly on the ground.	1955–1987	Interim Measures Report; NFA approval DSWM – 3/14/06
G	Arnot Branch	This stream receives non-contact cooling water and surface drainage from the plant.	1942–Present	Confirmatory Sampling Work Plan determined no releases; NFA approval DSWM – 2/14/00
H	Other Possible Fly Ash Sites	This unit consists of four sites in Area B identified as possible fly ash landfill locations.	Unknown	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00

Table A-1(a) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) Under this Order at this Time:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**NFA Documentation**
I	Explosive Demonstration Ground	This area is located near the laboratory building. It contains a rectangular concrete pad where small quantities of explosives were detonated for training purposes.	1942–Present	Interim Measures Report; NFA approval DSWM–2/23/06
J	Area B Former Coal Pile	Soil and gravel areas that stored coal.	1942–Present	Confirmatory Sampling Report determined no releases; NFA approval DSWM–6/5/08.
K	PCB Spill Site #2	This is a PCB spill from a transformer that was stored on a concrete pad east of Building 334 in Area B.	1987	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
L	PCB Spill Site #1	This area of contamination was located outside of Building #1 in Area A. The spill was the result of a transformer leak.	1987	Confirmatory Sampling Report determined no releases; NFA approval DSWM–2/14/00
O	Coal Tar Behind Building 20	This unit is a coal tar site on the west side of Building 20 in Area A.	Unknown	RFI/Interim Measures Report; NFA approval DSWM–9/28/07

Table A-1(b) - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring No Further Action (NFA) Under this Order at this Time. These Units are Currently Regulated Under Another Program:			
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**
17	Active Sanitary Landfill	Unit is an 8.25-acre unlined landfill that received wastes from throughout the facility. *Regulated by TDEC Johnson City DSWM Field Office - Class II Sanitary Landfill: Permit No. IDL 37-104-0192.*	1983–1996
22	Active Fly Ash Landfill	Unit is a 5.5-acre unlined landfill that received fly ash. *Regulated by Regulated by TDEC Johnson City DSWM Field Office - Class II fly Ash Landfill – Permit No. IDL 37-104-0062.*	1983–1997
28	Sedimentation Pond for Fly Ash Landfill	Unit manages runoff from the Active Fly Ash Landfill (SWMU 22). *Regulated by TDEC Johnson City DSWM Field Office – Landfill – Permit No. IDL 37-104-0062.*	1983–Present
45	Burning Pans (4)	Regulated by Hazardous Waste Mgmt Permit TNHW-148. Unit receives explosive-contaminated wastes. (Pans are in Burning Ground Area - SWMU 43)	1984–Present
92	New Sanitary Landfill	Unit is used to dispose of nonhazardous, nonexplosive, sanitary and inert waste and garbage generated at HAAP. *Regulated by TDEC Johnson City DSWM Field Office: Permit No. IDL 37-104-0090.*	1997–Present

Table A-2 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Confirmatory Sampling (CS):
There are no SWMUs or AOCs requiring Confirmatory Sampling.

Table A-3 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring a RCRA Facility Investigation (RFI):
There are no SWMUs or AOCs requiring a RCRA Facility Investigation.

Table A-4 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Interim Measures (IM):
There are no SWMUs or AOCs requiring Interim Measures.

Table A-5 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring a Corrective Measures Study (CMS):
There are no SWMUs or AOCs requiring a Corrective Measures Study.

Table A-6 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
3D1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Institutional Controls and Inspections
3D2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Institutional Controls and Inspections
3D8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Institutional Controls and Inspections
3E1	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Institutional Controls and Inspections
3E2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Institutional Controls and Inspections
3E5	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Institutional Controls and Inspections
3E9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Institutional Controls and Inspections
3G9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Institutional Controls and Inspections
3H2	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Institutional Controls and Inspections
3H3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Institutional Controls and Inspections
3H8	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Institutional Controls and Inspections
3H9	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-Unknown	Institutional Controls and Inspections
4	Coal Tar Tanks	Unit consists of two 2,000-gallon aboveground steel tanks that stored coal tar. The tanks have been removed.	1978–1994	Institutional Controls and Inspections
Note: Institutional controls include access restrictions, signage, excavation restrictions, and annual perimeter fence and land use control inspections. Please see Appendix F, Corrective Action Remedies, for specific details.				

Table A-6 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
14	Coal Tar Landfill 1	Unit is a three-acre unlined landfill that managed coal tar and fly ash.	1948–1978	Institutional Controls and Inspections
18	Former Sanitary Landfill	Unit is a 7-acre unlined clay capped landfill that received domestic refuse, light bulbs, bagged asbestos and empty pesticide containers.	1967–1984	Institutional Controls and Inspections
19	Construction Debris Landfill	Unit has managed construction debris as well as runoff from the Active Sanitary Landfill.	1984–1990s	Institutional Controls and Inspections
20	Area B Rock Quarry Landfill	Unit managed light metal, cinders, fly ash, fiberglass insulation, concrete, rubber, non-salable metal, automobile batteries and approximately six cubic yards of explosive contaminated concrete.	1940–1983	Institutional Controls and Inspections
21	Rock Dam Landfill	Unit managed demolition and excavation wastes, scrap metal, wooden debris and domestic refuse.	1966-1983	Institutional Controls and Inspections
23	Former Fly Ash Landfill	Unit is a 7-acre unlined clay capped landfill that received fly ash.	1977-1984	Institutional Controls and Inspections
26	WWII Coal Tar Site	Unit managed coal tar and fly ash.	Early 1940s	Institutional Controls and Inspections
29	Former Sedimentation Pond for Sanitary Landfill	Unit managed runoff from the Active Sanitary Landfill (SWMU 17).	1983–1984	Institutional Controls and Inspections
38	Sodium Nitrate Pond 1	Unlined unit received waste waters from the B-Line Production Areas.	1969–1972	Institutional Controls and Inspections
39	Sodium Nitrate Pond 2	Unlined unit received waste waters from the B-Line Production Areas.	1969–1972	Institutional Controls and Inspections
44	Former Burning Pads (2)	These two pads are located in the Burning Ground Area (SWMU 43).	Mid 1940s –1984	Institutional Controls and Inspections
47	Burning Piles (5)	These piles are located in the Burning Ground Area (SWMU 43).	Mid 1940s –Present	Institutional Controls and Inspections
Note: Institutional controls include access restrictions, signage, excavation restrictions, and annual perimeter fence and land use control inspections. Please see Appendix F, Corrective Action Remedies, for specific details.				

Table A-6 - List of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
77	Pesticide Rinsate UST 148 – 1	Unit consisted of one 500-gallon pre-filter tank (UST) which received pesticide rinsate from pesticide spraying operations. The tank has been removed.	App. 1970s –2004	Institutional Controls and Inspections
78	Pesticide Rinsate UST 148 – 2	Unit consisted of one 130-gallon septic tank (UST) which received pesticide rinsate from pesticide spraying operations. The tank has been removed.	App. 1970s –2004	Institutional Controls and Inspections
86	Pesticide Drain Field	Unit managed pesticide rinsate. The drain field has been removed.	1960s–2004	Institutional Controls and Inspections
87	Active Pesticide Wash-Down Area	Unit consists of a concrete wash pad with a three-foot concrete sump in the center. The unit is curbed on three sides. The unit managed pesticide rinsate.	1960s–1986	Institutional Controls and Inspections
88	WWII Pesticide Wash-Down Area	Unit managed pesticide rinsate from tractors and spraying equipment.	1942–1970s	Institutional Controls and Inspections
96	Gas Producer Coal Tar Storage Tanks	Unit managed coal tar generated during production of coal gas in Building 10. Evidence of coal tar was reported during a pit excavation.	1940s–1993	Institutional Controls and Inspections
103	Coal Tar Site, Ditch behind Gas Producer Building	Unit managed coal tar generated during production of coal gas in Building 10. Evidence of coal tar was reported during a pit excavation. The SWMU is the end of a ditch that carried discharge from Gas Producer Building.	1942–1994	Institutional Controls and Inspections
109	WW II Coal Tar Site 2	Unit managed coal tar	Early 1940s	Institutional Controls and Inspections
N	Hydraulic Fluid Leak, Elevator at Building G-2	This was site of hydraulic fluid leak at the elevator building associated with Building G-2	1940s–1970s	Institutional Controls and Inspections
GW	Site-Wide Groundwater	Unit addresses groundwater contaminationat Areas A & B.	Unknown	Monitoring, Reporting, and Well Inspections
Note: Institutional controls include access restrictions, signage, excavation restrictions, and annual perimeter fence and land use control inspections. Please see Appendix F, Corrective Action Remedies, for specific details.				

Table A-7 - List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
3B3	Catch Basin	Catch basin in Area B which collect solids, most associated with explosive manufacturing buildings.	1946-Present	Institutional Controls and Inspections
3D5	Catch Basin	Catch basin in Area B which collect solids, most associated with explosive manufacturing buildings.	1946-Present	Institutional Controls and Inspections
3D10	Catch Basin	Catch basin in Area B which collect solids, most associated with explosive manufacturing buildings.	1946-Present	Institutional Controls and Inspections
3E3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3E4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3E6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3E7	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3E10	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3G3	Catch Basin	Catch basin in Area B which collected solids; most associated with explosive manufacturing buildings.	1943-	Institutional Controls and Inspections
3G4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3G5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3G6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
3G7	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943–Present	Institutional Controls and Inspections
Note: Institutional controls include access restrictions, signage, excavation restrictions, and annual perimeter fence and land use control inspections. Please see Appendix F, Corrective Action Remedies, for specific details.				

Table A-7 - List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
3G8	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3G10	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3H4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3H5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3H6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3H7	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3I3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3I5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3I6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3J3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3K3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3K5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3L1	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
Note: Institutional controls include access restrictions, signage, excavation restrictions, and annual perimeter fence and land use control inspections. Please see Appendix F, Corrective Action Remedies, for specific details.				

Table A-7 - List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
3L3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3L4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3L5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3L6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3L8	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3M3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3M4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3M5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3M6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N4	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N5	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N6	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
Note: Institutional controls include access restrictions, signage, excavation restrictions, and annual perimeter fence and land use control inspections. Please see Appendix F, Corrective Action Remedies, for specific details.				

Table A-7 - List of Active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Implementation of a Corrective Action Remedy:				
SWMU/ AOC	**SWMU/AOC Name**	**Unit Comment**	**Dates of Operation**	**Remedy**
3N7	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3N8	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
3O3	Catch Basin	Catch basin in Area B which collect solids; most associated with explosive manufacturing buildings.	1943– Present	Institutional Controls and Inspections
24	Bldg. 200 Coal Tar and Fly Ash Landfill	This unit managed fly ash, coal tar and possibly hexamine.	1960s	Institutional Controls and Inspections
27	Sedimentation Pond for Coal Pile	This unit stores coal directly on the ground.	1989- Present	Institutional Controls and Inspections
37	Nitric Acid Spill Pond	This unlined unit receives overflows from the Nitric Acid Production.	1940s– Present	Institutional Controls and Inspections
56	Existing Coal Pile	This unit stores coal directly on the ground.	1989– Present	Institutional Controls and Inspections
Note: Institutional controls include access restrictions, signage, excavation restrictions, and annual perimeter fence and land use control inspections. Please see Appendix F, Corrective Action Remedies, for specific details.				

APPENDIX F

CORRECTIVE ACTION REMEDIES

This Appendix provides the selected corrective action remedy to be implemented by Holston Army Ammunition Plant (HAAP or Respondent). It includes a general description of the facility and all the necessary corrective action requirements to minimize exposure risks to contamination associated with the solid waste management units and areas of concern at the operating facility.

SITE DESCRIPTION

HAAP, located at 4509 West Stone Drive in Kingsport, Tennessee, consists of two plant areas (Figure 1). Area A is located within the City of Kingsport in Sullivan County, Tennessee, on State Route 93 (Figure 2). Area B is located on U.S. Route 11W in Hawkins County about 4 miles west of downtown Kingsport (Figure 2). Area A and Area B are linked by a fenced interplant railroad that is approximately 3.7 miles long (Figure 3).

Area A, the smaller of the two areas, is approximately 112 acres and is located within a heavily industrialized area of Kingsport adjacent to several private sector commercial industrial facilities. Area B is approximately 5,913 acres and contains the explosives production area, where explosive manufacturing and packaging takes place. During most of the history of HAAP, the region around Area B has been residential and agricultural, along with limited commercial activities. Since the early 1980s, residential and commercial developments have increased significantly around Area B, particularly around West Stone Drive. Residential developments about the northeast and northwest plant boundaries of Area B. Highway 11W separates Area B from the majority of residential and commercial areas to the north and northwest. Residential areas to the south are separated from Area B by sections of Holston River Mountain, Bays Mountain, and Bays Mountain Park.

The tables in Appendix A provide the requirements for all the solid waste management units (SWMUs) and areas of concern (AOCs) at HAAP. Figures 3 through 6 depict the locations of these units. Specifically, there are 130 SWMUs and 13 AOCs that require no further action under this order at this time (Table A-1(a)). There are no SWMUs or AOCs that require confirmatory sampling (Table A-2), a RCRA facility investigation (Table A-3), interim measures (Table A-4) or a corrective measures study (Table A-5). The 79 SWMUs and two AOCs requiring implementation of a corrective action remedy are listed in Appendix A, Tables A-6 and A-7. As detailed in paragraph II.I.2, on order attachment page 21, additional investigation and other possible remedial actions, may be necessary for the 46 operationally active units listed in Table A-7. Those actions shall be addressed during unit or plant closure.

CORRECTIVE ACTION REQUIREMENTS

The following sections describe how the Respondent shall implement the selected corrective action remedies at HAAP. The sections are Site Security Measures and Institutional Controls; Groundwater Monitoring; Surface Water Monitoring; and, Inspections. Controls are necessary to protect human health and the environment by preventing exposure to the materials contaminated

with hazardous constituents associated with SWMUs and AOCs. This shall be accomplished through site access controls and enforcement of internal administrative policies. Inspections will verify that these controls are maintained and that the installed cap/cover systems remain intact. Groundwater monitoring will identify changes in groundwater quality at or near prior release locations and along the downgradient facility boundary. The point of compliance (POC) is defined by the boundary wells that monitor groundwater quality prior to discharge to the Holston River. Surface water monitoring will verify that migration of hazardous contaminants from Area B SWMUs and AOCs has not impacted the water quality of the Holston River.

I. SITE SECURITY AND INSTITUTIONAL CONTROLS

This section provides the conditions for site security and the institutional controls that are required to be maintained at HAAP. Respondent shall provide appropriate security measures at the facility that will mitigate the potential for uncontrolled exposures to remaining hazardous constituents at or from the SWMUs and AOCs listed in Tables A-6 and A-7 of Appendix A. Existing security measures limit public access to the facility, as well as restrict worker access to these areas. The conditions of this section shall apply to the units in Table A-7 for limiting the risk of exposure, but shall only be applied to the normal operational procedures of the active SWMUs as necessary to prevent exposures.

A. Respondent shall maintain, in good condition, the existing facility perimeter six-foot chain-link fence in areas where SWMUs and AOCs contain hazardous constituents at concentrations that do not allow for unrestricted use. This fencing system, in conjunction with the river, acts as a barrier to unauthorized foot ingress. The fence shall be regularly inspected as described in Section IV of this Appendix. Access to these areas of the facility is controlled through use of security guards and/or gates.

B. Respondent shall maintain signs or provide other means, as approved by the Division, to readily identify the location of the SWMUs and AOCs that are listed in Appendix A, Tables A-6 and A-7, that require institutional controls (ICs).

C. Respondent shall not allow any digging, drilling, construction, or other activities that disturb the soils, landfill covers or wastes within the SWMUs and AOCs that are listed as requiring ICs in Appendix A, Tables A-6 and A-7, without prior written authorization by the Commissioner and acquiring a HAAP safety permit approval.

D. Respondent shall ensure that no work is started at a designated site until a Safety Permit has been issued by the HAAP Safety Manager. All requests for Safety Permits shall be made to the Safety Manager a minimum of 24 hours in advance of the start of the work. The 24-hour requirement shall be waived in the event of landfill repairs or an emergency response. The Safety Manager shall ensure all work has been authorized by the HAAP Environmental Manager. Failure to conform to plant safety rules and the conditions of the Safety Permit will result in revocation of the Safety Permit.

E. To minimize the threat of exposure to hazardous constituents at HAAP, Respondent must ensure that workers adhere to established safety measures during inspections, maintenance, or any other activities at the SWMUs and AOCs that are listed in Appendix A, Tables A-6 and A-7.

F. To ensure that unauthorized excavation or other disturbances of the landfill caps or soil covers have not taken place, Respondent shall perform semiannual land use control inspections of the SWMUs and AOCs that are listed in Appendix A, Tables A-6 and A-7.

G. Respondent shall notify the Commissioner of the Department of Environment and Conservation within fifteen (15) days of discovery of any significant and/or ongoing noncompliance with the institutional controls or security measures specified in this order.

II. GROUNDWATER MONITORING

This section provides the conditions for groundwater monitoring, which includes the sampling and analysis procedures to be performed by the Respondent at HAAP.

A. Respondent shall maintain the groundwater monitoring wells for AOC GW in accordance with the monitoring well construction details in Table G-1, Appendix G, at the locations shown on Figures 4 through 6 of this Appendix.

B. Respondent shall collect groundwater samples as specified in Appendix G, Groundwater Monitoring, and as summarized in Table G-2.

C. Respondent shall analyze the monitoring well samples using the methods listed in Subsection III.C of Appendix G, Groundwater Monitoring.

D. In order to comply with Rule 0400-12-01-.06(6)(l), Respondent shall compare the analytical results from boundary well monitoring to the Groundwater Protection Standards (GWPS) in Table G-2 of Appendix G. The GWPS, including all the Tennessee General Water Quality Criteria used to develop the risk-based concentrations for the site's Target Analytes are presented in Table G-2. Respondent shall notify the Commissioner within fifteen days of discovery that a GWPS has been exceeded at a boundary well. An exceedance may require additional sampling, implementation of corrective measures and/or modification of the remedy. The notification shall include recommendations for further action.

E. Respondent shall comply with all groundwater reporting requirements of this Order including the submittal of an annual report.

F. At such time that closure is necessary and with prior written approval by the Commissioner, Respondent shall close the monitoring wells listed in Table G-1

according to the procedures specified in the HAAP Site Well Plugging and Abandonment Plan (Appendix J).

III. SURFACE WATER MONITORING

This section provides the conditions for surface water monitoring, which includes the sampling and analysis procedures to be performed by the Respondent at HAAP. The monitoring of the Holston River is to verify that any constituent of concern (Target Analyte) in groundwater discharging to the river from the Respondent's facility is not statistically impacting the surface water body.

A. Respondent shall collect appropriate upgradient and downgradient surface water samples to monitor for any impact of groundwater discharging to the Holston River from HAAP's Area B.

B. Respondent shall annually collect surface water samples for all the Target Analytes listed in Appendix G, Table G-2, in accordance with the procedures contained in the HAAP Site Sampling and Analysis Plan (SAP – Appendix H) dated February 2005, and the Site Quality Assurance Project Plan (QAPP – Appendix I) dated February 2005. The annual sampling shall alternate from a spring event in the years that bi-annual groundwater samples are collected, to a fall event in the years bi-annual groundwater samples are not collected.

C. Respondent shall use the same sample handling techniques, including preservation methods, chain-of-custody procedures and other quality control measures to assure surface water sample integrity, as described for groundwater samples in Section II of this appendix and in Appendix G. Duplicate samples will not be required. The trip blanks used for groundwater sampling events will suffice for the surface water samples if the two events coincide.

D. Respondent shall analyze the surface water samples using the same methods as prescribed for the groundwater samples, which are listed in Subsection III.C of Appendix G, Groundwater Monitoring.

E. Respondent shall statistically compare the analytical results of the upgradient sample(s) to the downgradient sample(s). Respondent shall use the most appropriate statistical method for evaluating the surface water analytical data as selected from EPA's guidance document "Data Quality Assessment: Statistical Methods for Practitioners EPA QA/G-9S," which can be found online at epa.gov/quality/qs-docs/g9s-final.pdf. The statistical analysis must be performed within forty-five (45) calendar days of the receipt of the analytical results.

F. Respondent shall include a map of the surface water monitoring locations, the rational for the sample locations' choices, the analytical results, the statistical test method(s) used, conclusions, and any recommendations as part of their annual report.

G. Respondent shall notify the Commissioner within fifteen (15) calendar days of determining that the groundwater discharge is impacting the Holston River. The notification shall include recommendation(s) and a schedule for further action.

Figure 1

Site Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Basemap: National Geographic Society, i-cubed

0 5,000 10,000 Feet

0 1,000 2,000 Meters

1 inch = 6,000 feet

Site Boundary

Class 3 Modification – 1/24/2013
Class 3 Modification - Draft

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised:11/7/2018 Project No.J160167

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167MapDocs\Basewide\004_CAOJ160167 FIG 1 HSAAP Site Location.mxd

Figure 2

Site Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Basemap: National Geographic Society, i-cubed

0 2,000 4,000 6,000 8,000 10,000 Feet

0 1,000 2,000 3,000 Meters

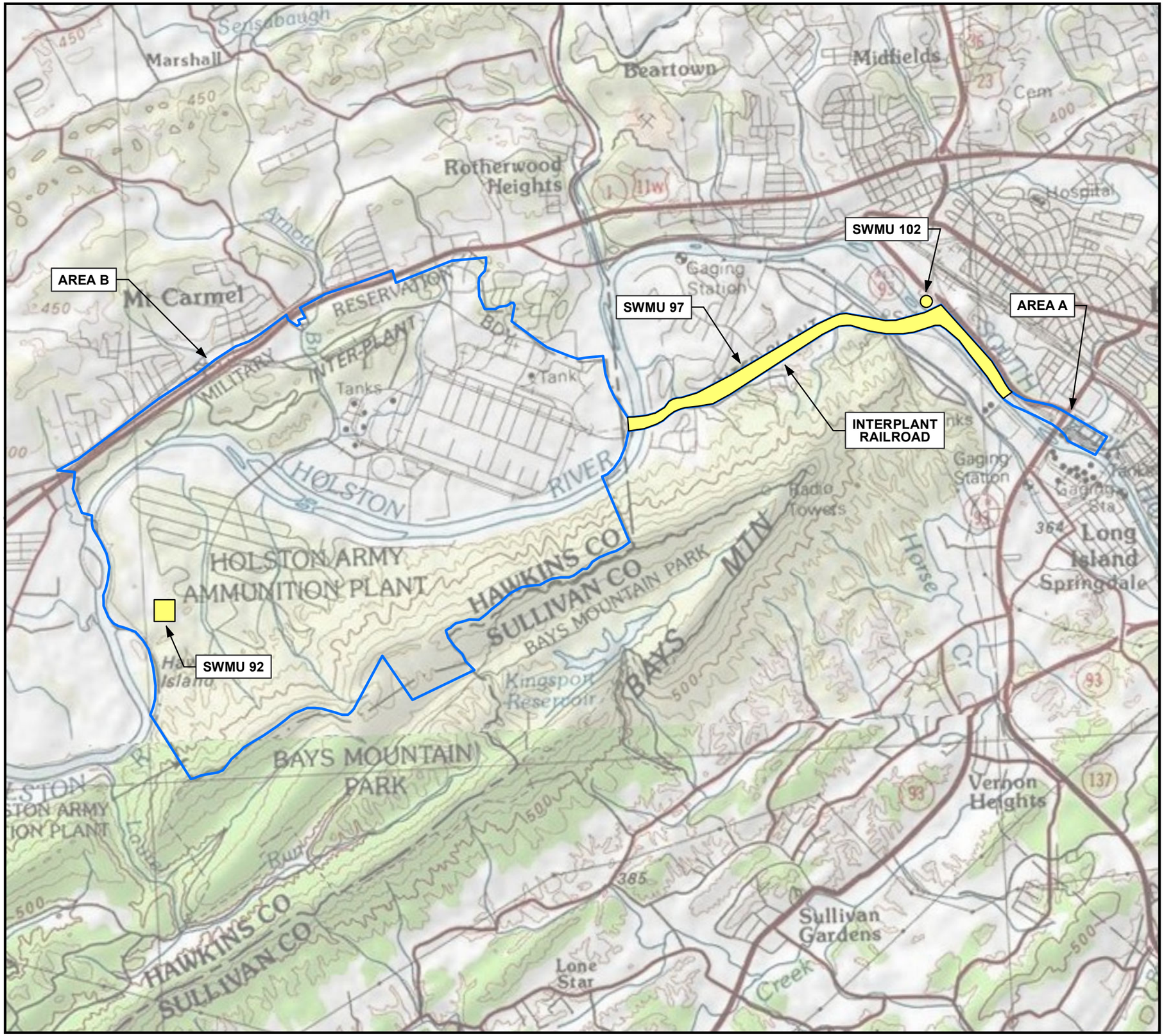
Project Site Boundary

Class 3 Modification – 1/24/2013
Class 3 Modification - Draft

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised: 11/7/2018 Project No.J160167

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAO\J160167 FIG 2 Site Map.mxd



Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAO\J160167 FIG 3 HSAAP Rail Corridor and Off-Site Area - SWMU_AOC Location Map.mxd

Figure 3

HAAP Rail Corridor and Off-Site Area - SWMU AOC Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Basemap: National Geographic Society, i-cubed

0 2,000 4,000 6,000 8,000 10,000 Feet

0 1,000 2,000 3,000 Meters

Solid Waste Management Unit (SWMU)

Project Site Boundary

Class 3 Modification – 1/24/2013
Class 3 Modification - Draft

Bay West
Customer-Focused Environmental & Industrial Solutions

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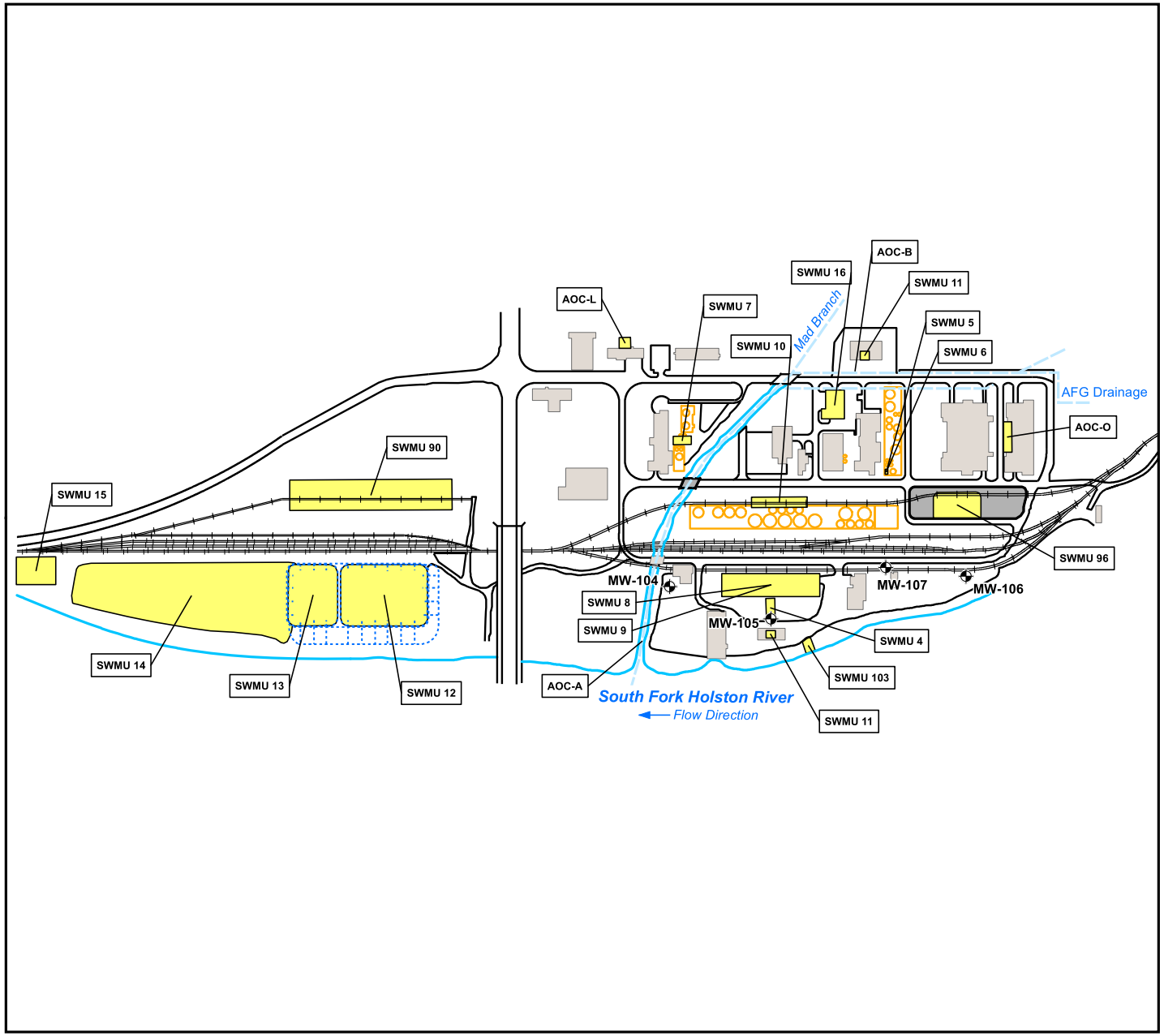


Figure 4

HSAAP Area A SWMU/AOC and Monitoring Well Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet

0 250 500 750 1,000 Feet

0 100 200 300 Meters

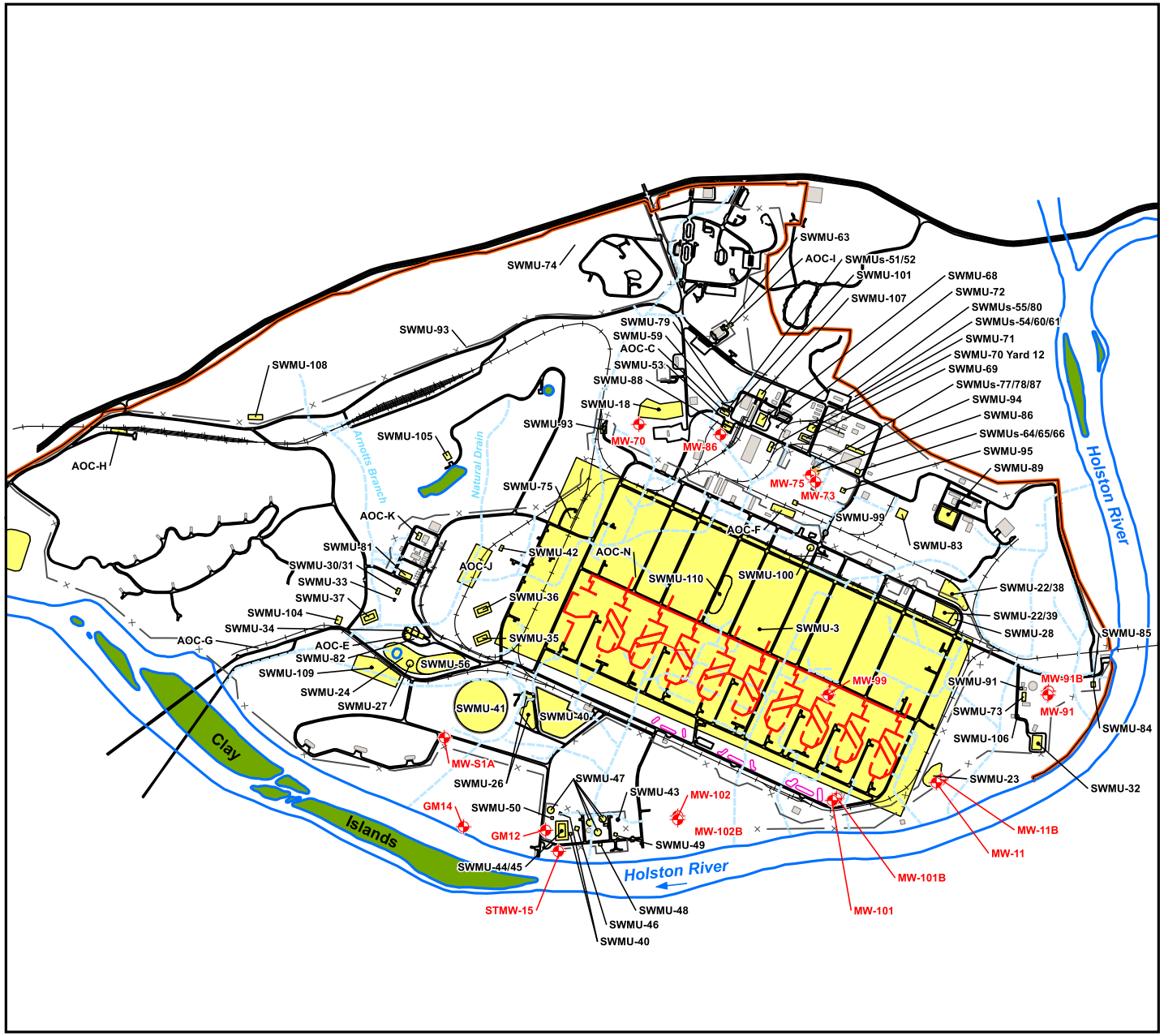
- Long Term Monitoring Well Location
- Holding Pond
- Railroad
- Road
- Ditch
- River
- Building
- Bridge
- Solid Waste Management Unit (SWMU) or Area of Concern (AOC)
- Storage Tank
- Project Site Boundary

Drawn By: N.J. Date Drawn/Revised: 11/7/2018 Project No.J160167

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAO\J160167 FIG 4 HSAAP Area A SWMU_AOC and Monitoring Well Location Map.mxd

Class 3 Modification – 1/24/2013

Class 3 Modification - Draft



Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAOU160167 FIG 5 HSAAP Area B Production and Shop Areas SWMU_AOC and Monitoring Well Location Map - Copy.mxd

Figure 5

HSAAP Area B Production and Shop Areas SWMU/AOC and Monitoring Well Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet

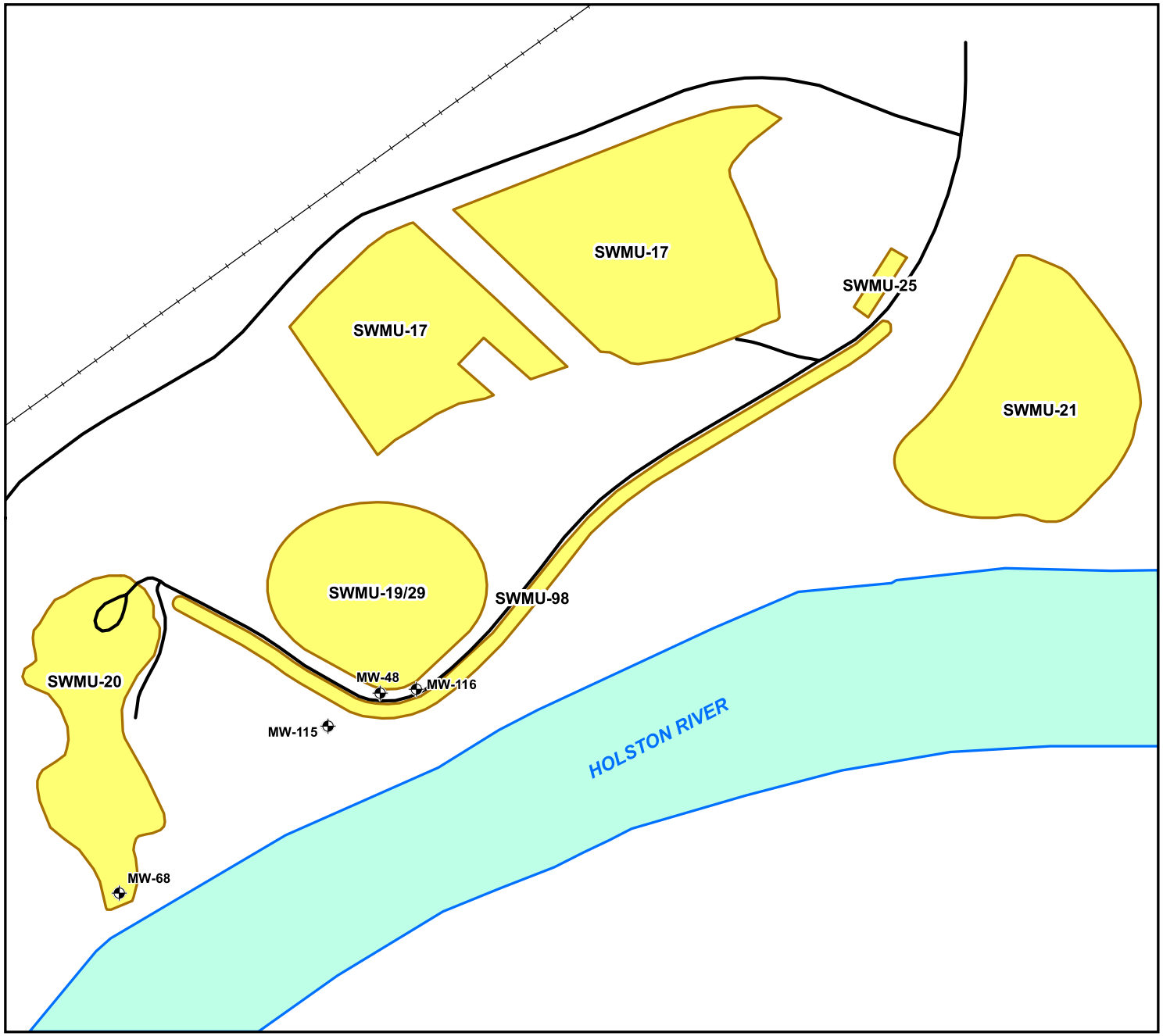
0 1,000 2,000 3,000 4,000 Feet

0 250 500 750 1,000 Meters

- Long Term Monitoring Well Location
- Drainage Ditch
- River
- Road
- Cat-Walk
- Fence
- Property Boundary
- Railroad
- Storage Tank
- Islands
- Bunker
- Building
- Solid Waste Management Unit (SWMU) or Area of Concern (AOC)

Drawn By: N.J. Date Drawn/Revised: 11/7/2018 Project No.J160167

Class 3 Permit Modification - 1/24/2013
Class 3 Permit Modification - DRAFT



Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_MOBILE\Holston_AAP\J160167\MapDocs\Basewide\004_CAOU160167 FIG 6 HSAAP Area B Landfill Area SWMU_AOC and Monitoring Well Location Map.mxd

Figure 6

HSAAP Area B Landfill Area SWMU/AOC and Monitoring Well Location Map

Holston AAP

Kingsport, TN 37660

Map Projection: NAD 1983 StatePlane Tennessee FIPS 4100 Feet

NOT TO SCALE

- Long Term Monitoring Well Location
- Railroad
- Road
- River
- Solid Waste Management Unit (SWMU)

Drawn By: N.J. Date Drawn/Revised: 11/29/2018 Project No.J160167

Class 3 Modification – 1/24/2013
Class 3 Modification - Draft

APPENDIX G

GROUNDWATER MONITORING

This Section provides the description of the groundwater monitoring program and includes the Groundwater Protection Standards and sampling and analysis procedures for Holston Army Ammunition Plant (HAAP).

I. MONITORING WELLS

Construction details and monitoring protocol for the wells included in the AOC-GW monitoring network are listed on Tables G-1 and G-2, respectively. Locations of monitoring wells are shown on Figures 4 through 6 of Appendix F. The wells were selected to identify changes in groundwater quality at or near prior release locations (interior wells), and to verify that migration of contaminants will not impact the water quality of the Holston River (boundary wells).

There are five interior wells at Area B that monitor source trends. There are three boundary wells at the Area B landfill area downgradient of SWMUs 19/29 and 20. There are twelve boundary wells at the Area B production and shops area including four co-located well pairs to monitor unconsolidated and bedrock intervals, and an additional two unconsolidated and two bedrock wells. There are four boundary monitoring wells at Area A, which are downgradient of legacy sources and upgradient of the South Fork of the Holston River.

II. TARGET ANALYTES AND GROUNDWATER PROTECTION STANDARDS

The target analytes for long-term groundwater monitoring, are shown in Table G-2 of this appendix. The selected target analytes are based on process knowledge and characteristics of known releases and wastes managed at solid waste management units (SWMUs). The Groundwater Protection Standards were selected to be protective of groundwater and the water quality of the Holston River. Respondent shall compare all analytical results for each target analyte to the Groundwater Protection Standards in Table G-2.

III. GROUNDWATER SAMPLING AND ANALYSIS PROCEDURES

Respondent shall be responsible for performing groundwater monitoring in accordance with the following procedures:

A. Groundwater samples shall be collected and analyzed in accordance with the frequencies shown on Table G-2.

B. Groundwater samples shall be collected in accordance with the procedures contained in the HAAP Site Sampling and Analysis Plan (SAP – Appendix H)

dated February 2005, and the Site Quality Assurance Project Plan (QAPP – Appendix I) dated February 2005, as summarized below:

1. The low-flow purging method described in the SAP shall be used to collect the samples. In the event low-flow purging cannot be conducted without drawing down the water level in the well, sampling shall be conducted using a pump or bailer and purging the well to dryness per the SAP. Samples shall be collected from the recovered well within a 24-hour period. If all required samples cannot be collected with the initial 24-hour period, samples shall be collected in order of importance within consecutive intervals not to exceed 24-hours each.

2. Field parameters, including pH, temperature, specific conductivity, dissolved oxygen, and oxidation/reduction potential, shall be measured during all groundwater sampling events.

3. Groundwater samples shall be collected in laboratory-prepared sample containers.

C. If not specified in this order, laboratory methods must be those specified in the most recent version of Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, or an equivalent method approved by the Commissioner. The most current of the following US EPA analytical methods shall be used:

1. Volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene and xylenes (BTEX) – SW-846 8260

2. Semivolatile organic compounds (SVOCs) – SW-846 8270

3. RCRA Metals – SW-846 6010, 6020, and 7470 (Mercury only)

4. Explosives including RDX and RDX Degradation Compounds – SW-846 8330

5. Pesticides – SW-846 8081

6. Bromacil – SW-846 8141

D. Groundwater samples shall be placed in coolers on ice or refrigerated immediately following collection while awaiting shipment to the laboratory. Completed chain-of-custody forms shall accompany all shipments to the laboratory.

E. Quality control samples to be collected include:

1. Duplicate samples shall be collected to evaluate the laboratory's ability to reproduce the analytical results. One duplicate groundwater sample shall be collected for every 10 field samples.

2. One trip blank shall accompany each cooler of VOC samples to identify contamination that may have been contributed to the field samples during transport. The trip blank shall be prepared by the laboratory, shipped with the glassware to be used for sample collection, and analyzed for VOCs.

3. Equipment rinsate blanks shall be used to determine the effectiveness of the field decontamination. The blank shall be collected after decontamination of the sampling device by pouring ASTM Type I water (or equivalent) over and into the device and collecting the water directly into sample containers. Rinsate blanks shall be collected at a frequency of 10% or one per day per matrix.

4. Source water blanks shall be collected from each water source (ASTM Type I lot or potable water source) used for decontamination purposes.

F. The results of the sampling events shall be reported annually. The reports shall include summary tables of the analytical results and potentiometric surface maps based on groundwater level measurements collected during each sampling event. The report shall also include an evaluation of long-term trends at interior source wells, as applicable. Field sampling data sheets, laboratory analytical reports, and quality assurance summaries shall be attached to the annual reports.

Table G-1 - Long-Term Monitoring Well Construction Data

Area[a]		Well	Well Depth (ft BGS)	Bottom of Well (ft AMSL)	Ground Surface (ft AMSL)	Top of Casing Elevation (ft AMSL)	Screen Length (ft)	Bottom of Screen (ft AMSL)	Top of Screen (ft AMSL)	Geology of Screened Interval	Construction	Year Constructed
I. Area A		MW-104	19.00	1,180.45	1,199.45	1,199.40	10	1,180.95	1,190.95	Alluvium and shale (screen 2 ft into weathered shale)	2-in. PVC, flush-mount	2001
		MW-105	19.50	1,180.65	1,200.15	1,200.08	10	1,181.15	1,191.15	Alluvium and shale (screen 7 ft into weathered and competent shale)	2-in. PVC, flush-mount	2001
		MW-106	19.60	1,181.46	1,201.06	1,201.00	10	1,181.96	1,191.96	Alluvium and shale (screen 8 ft into weathered and competent shale)	2-in. PVC, flush-mount	2001
		MW-107	19.00	1,181.28	1,200.28	1,200.16	10	1,181.78	1,191.78	Shale – weathered	2-in. PVC, flush-mount	2001
II. Area B - Landfill Area		MW-48	66.90	No data	No data	1,200.52	No data	No data	No data	Limestone – dolostone	2-in. PVC, above-ground	1997
		MW-68	41.40	1,141.26	1,182.36	1,184.83	20	1,141.76	1,161.76	Limestone – dolostone	2-in. PVC, above-ground	1997
		MW-115	38.00	1,152.80	1,190.80	1,193.65	10	1,153.40	1,163.40	Limestone – dolostone	2-in. PVC, above-ground	2005
		MW-116	116.80	1,087.70	1,204.50	1,207.50	20	1,087.90	1,107.60	Limestone – dolostone	2-in. PVC, above-ground	2005
III. Area B - Explosives Production and Shop Areas	**A. Installation Boundary near Holston River**	MW-101	17.41	1,157.56	1,174.97	1,177.17	10	1,158.06	1,168.06	Alluvium and weathered shale (screen into weathered shale 2 ft)	2-in. PVC, above-ground	2001
		MW-101B	61.44	1,113.00 (OB)	1,174.44	1,176.81	37 (OB)	1,113 (OB)	1,150 (OB)	Shale – competent	4-in. PVC, above-ground	2001
		MW-11	14.20	1,150.69	1,164.89	1,168.69	10	1,151.20	1,161.20	Alluvium and weathered shale (screen into weathered shale 5 ft)	2-in. PVC, above-ground	1980
		MW-11B	60.50	1,105.1 (OB)	1,165.60	1,168.57	47 (OB)	1,105.1 (OB)	1,152.1 (OB)	Shale – competent	4-in. PVC, above-ground	2001
		MW-102	16.09	1,151.72	1,167.81	1,169.72	10	1,152.22	1,162.22	Alluvium	2-in. PVC, above-ground	2001
		MW-102B	24.35	1,117.5 (OB)	1,167.35	1,169.49	24.5 (OB)	1,117.5 (OB)	1,142 (OB)	Shale – competent	4-in. PVC, above-ground	2001
		MW-S1A	14.50	1,147.70	1,162.20	1,164.71	5	1,148.20	1,153.20	Alluvium above contact with shale	2-in. PVC, above-ground	1990
		MW-91	14.24	1,155.13	1,169.37	1,171.57	10	1,155.63	1,165.63	Alluvium	2-in. PVC, above-ground	2001
		MW-91B	41.00	1,128.4 (OB)	1,169.40	1,171.55	20 (OB)	1,128.4 (OB)	1,148.4 (OB)	Shale – competent	4-in. PVC, above-ground	2001
		STMW-15	30.21	1,135.99	1,166.20	1,168.39	10	1,136.49	1,146.49	Alluvium and shale	2-in. PVC, above-ground	1999
		GM-12	70.71	1,094.53	1,165.24	1,168.26	20	1,094.53	1,114.53	Shale – competent	4-in. PVC, above-ground	1994
		GM-14	44.29	1,119.06	1,163.35	1,166.37	20	1,119.06	1,139.06	Shale – competent	4-in. PVC, above-ground	1994
	B. Internal Source Area Trending/ Corrective Measures Performance	MW-99	15.56	1,190.82	1,206.38	1,209.22	10	1,191.32	1,201.32	Alluvium	2-in. PVC, above-ground	2001
		MW-70	50.00	1,222.60	1,272.60	1,275.10	10	1,223.10	1,233.10	Alluvium	2-in. PVC, above-ground	1997
		MW-73	15.00	1,214.40	1,227.40	1,228.90	10	1,214.90	1,224.90	Alluvium and weathered shale (screen into weathered shale 2 ft)	2-in. PVC, above-ground	1997
		MW-75	13.00	1,213.08	1,226.08	1,228.58	10	1,213.08	1,223.08	Alluvium and weathered shale (screen into weathered shale 1 ft)	2-in. PVC, above-ground	1997
		MW-86	17.27	1,221.35	1,238.62	1,241.26	10	1,221.85	1,231.85	Alluvium and weathered shale	2-in. PVC, above-ground	1997

[a] Areas selected based on hydrogeologic considerations (bedrock stratigraphy and flow regime) and geographic proximity.
ft AMSL = Ft above mean sea level.
ft BGS = Ft below ground surface.
OB = Open borehole.
PVC = Polyvinyl chloride

Table G-2. Long-Term Groundwater Monitoring Program and Groundwater Protection Standards at AOC-GW Component Units
Holston Army Ammunition Plant (HAAP), Kingsport, Tennessee

Source Area	Source Unit	Sample Location	Sampling Frequency			Chemical Compound Class	Target Analyte	Screening Criteria[a]		
			Semiannual (Spring and Fall)	Annual (Spring)	Biennial (Spring of even-numbered years)			MCL or RSL if Unavailable	Lowest Water Quality Criteria	Groundwater Protection Standard[b]
Area A	SWMU 96	MW-104			X	VOCs	Benzene	MCL	5	8,500
							Methylene chloride	MCL	5	8,500
						SVOCs	Naphthalene	RSL	0.17	289
		MW-105			X	VOCs	Benzene	MCL	5	8,500
							Methylene chloride	MCL	5	8,500
						SVOCs	Naphthalene	RSL	0.17	289
		MW-106			X	VOCs	Benzene	MCL	5	8,500
							Methylene chloride	MCL	5	8,500
						SVOCs	Naphthalene	RSL	0.17	289
		MW-107			X	VOCs	Benzene	MCL	5	8,500
							Methylene chloride	MCL	5	8,500
						SVOCs	Naphthalene	RSL	0.17	289
	SWMUs 19/29	MW-48	X			SVOCs, metals	Bis(2-ethylhexyl)phthalate	MCL	6	10,200
							Dibenzofuran	RSL	7.9	13,430
							Naphthalene	RSL	0.17	289
							n-Nitrosodiphenylamine	RSL	12	20,400
							Lead	MCL	15	25,500
		MW-115	X			SVOCs, Metals	Bis(2-ethylhexyl)phthalate	MCL	6	10,200
							Naphthalene	RSL	0.17	289
							Lead	MCL	15	25,500
		MW-116	X			SVOCs, Metals	Bis(2-ethylhexyl)phthalate	MCL	6	10,200
							Naphthalene	RSL	0.17	289
							Lead	MCL	15	25,500
	SWMU 20	MW-68	X			Explosives	RDX	RSL	0.97	1,649
						RDX MNA[c]	DNX	--	NV	NV
							MNX	--	NV	NV
							TNX	--	NV	NV

Table G-2. Long-Term Groundwater Monitoring Program and Groundwater Protection Standards at AOC-GW Component Units
Holston Army Ammunition Plant (HAAP), Kingsport, Tennessee (continued)

Source Area	Source Unit	Sample Location	Sampling Frequency			Chemical Compound Class	Target Analyte	Screening Criteria[a]		
			Semiannual (Spring and Fall)	Annual (Spring)	Biennial (Spring of even-numbered years)			MCL or RSL if Unavailable	Lowest Water Quality Criteria	Groundwater Protection Standard[b]
Area B Explosives Production and Shop Area (continued)	Boundary Wells	GM-12			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		GM-14			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-11			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-11B			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-91			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-91B			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-101			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-101B			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-102			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-102B			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		MW-S1A			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649
		STMW-15			X	Explosives	Nitroglycerin	RSL	2	3,400
							RDX	RSL	0.97	1,649

Table G-2. Long-Term Groundwater Monitoring Program and Groundwater Protection Standards at AOC-GW Component Units
Holston Army Ammunition Plant (HAAP), Kingsport, Tennessee (continued)

Source Area	Source Unit	Sample Location	Sampling Frequency			Chemical Compound Class	Target Analyte	Screening Criteria[a]		
			Semiannual (Spring and Fall)	Annual (Spring)	Biennial (Spring of even-numbered years)			MCL or RSL if Unavailable	Lowest Water Quality Criteria	Groundwater Protection Standard[b]
Area B Explosives Production and Shop Area (continued)	Explosives Production Area	MW-99		X		Explosives	RDX	RSL	0.97	1,649
							Nitroglycerin	RSL	2	3,400
						RDX MNA[c]	DNX	--	NV	NV
							MNX	--	NV	NV
							TNX	--	NV	NV
	SWMU 18	MW-70		X		Metals	Mercury	MCL	2	3,400
	SWMUs 77/78/86/87	MW-73		X		Pesticides	Dieldrin	RSL	0.0018	3.06
		MW-75		X		Pesticides	Dieldrin	RSL	0.0018	3.06
	SWMU 88	MW-86		X		Pesticides	Dieldrin	RSL	0.0018	30.6
Holston River	Upgradient and downgradient of Area B	Surface Water	X[d]			Explosives	Nitroglycerin	RSL	2	NA
							RDX	RSL	0.97	NA

[a] Screening Criteria, the U.S. Environmental Protection Agency MCLs by default, RSLs are used for constituents with no established MCL.
[b] Groundwater Protection Standards are the lowest criteria multiplied by the site-specific dilution factor of 17,000, multiplied by 10 percent (%).
[c] MNA analysis performed on an annual basis at this well (spring event only).
[d] Surface water samples are collected annually in the fall of odd-numbered years and in the spring of even-numbered years.
CAO = Corrective Action Order.
DNX = Hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine.
IWTP = Industrial wastewater treatment plant.
MCL = Maximum contaminant level (as of April 2019).
MNA = Monitored natural attenuation (RDX degradation intermediates: hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine; hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine; and hexahydro-1,3,5-trinitroso-1,3,5-triazine, annual spring event only).
MNX = Hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine.
NA = Not applicable.
NV = No value is established by the State of Tennessee.
RDX = Hexahydro-1,3,5-trinitroso-1,3,5-triazine.
RSL = Regional screening level at target hazard quotient (THQ) = 1.0 (updated November 2018).
SVOC = Semivolatile organic compound.
SWMU = Solid waste management unit.
TNX = Hexahydro-1,3,5-trinitroso-1,3,5-triazine.
VOC = Volatile organic compound.
All units are in micrograms per liter (µg/L), which is equivalent to parts per billion (ppb).

STATEMENT OF BASIS

SWMU 23 – Former Fly Ash Landfill
Holston Army Ammunition Plant, Kingsport, Tennessee
EPA ID No. TN5210020421

1.0 INTRODUCTION

This Statement of Basis presents an overview of the environmental investigation and selected final remedy for Solid Waste Management Unit (SWMU) 23, Former Fly Ash Landfill, at the Holston Army Ammunition Plant (HAAP), in Kingsport, Tennessee (Figures 1 and 2). A synopsis of the site location, operating history, investigation results, and an explanation of the final remedy are provided. Information summarized in this Statement of Basis can be found in greater detail in the Survey Phase RCRA Facility Assessment Report, dated July 1996 (USACHPPM, 1996) and other documents in the facility's administrative record located at the offices of the Tennessee Department of Environment and Conservation (TDEC), Division of Solid Waste Management (DSWM), William R. Snodgrass TN Tower, 312 Rosa L. Parks Avenue 14th Floor, Nashville, TN 37243.

2.0 SITE BACKGROUND

SWMU 23 is located in Area B to the southwest of the main production area. This 7-acre landfill is bordered by woods, a field, and the Holston River to the south, wastewater operations to the east, and an active railway to the north and west. The landfill surface is relatively flat, with grass and located within the 100-year floodplain (Figure 1). The Former Fly Ash Landfill was created around 1977 to dispose of the fly ash generated by the coal-fired steam plant. In the late 1970s, the State of Tennessee implemented landfill regulations. An inspection of all HAAP landfills determined that the location of the Former Fly Ash Landfill was not suitable as a landfill, and thus the landfill was closed in 1984. The closure conditions included a 2-foot clay cap and re-seeding with vegetation. The cover has been mowed, inspected, and maintained by HAAP since that time.

3.0 SUMMARY OF CONTAMINANT EVALUATION

SWMU 23 was originally identified in the 1996 RCRA Facility Assessment (RFA). This assessment determined that the waste included fly ash mixed with clay and gravel. Existing upgradient well MW-12 and downgradient well MW-11 (Figure 2) were sampled for a suite of metals, anions, and general water quality parameters. Based on groundwater sampling results from 1995/1996, total dissolved solids (TDS), chloride, and manganese were elevated in the downgradient well. The 1996 RFA recommended a RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) for SWMU 23.

SWMU 23 was part of the 2002 RFI of Site-Wide Groundwater. As part of this effort, an additional downgradient monitoring well (MW-11B) was installed as a deep well and paired with shallower well MW-11. Both downgradient wells MW-11 and MW-11B were sampled during the RFI for metals, anions, and general water quality parameters. Samples showed only detections of manganese above screening levels. Therefore, the RFI recommended that wells MW-11 and MW-11B be retained only as boundary wells and sampled for explosives and volatile organic compounds (VOCs).

After the RFI report, it was believed that SWMU 23 was part of the solid waste landfill post-

closure program managed by the DSWM Johnson City Environmental Field Office. Therefore, SWMU 23 was listed in the Corrective Action Order (CAO) on Table A1(b)- "List of Solid Waste Management Units and Areas of Concern Requiring No Further Action Under this Order at this Time. These Units are Currently Regulated Under Another Program."

Since the 2013 modification to the CAO, HAAP has learned that SWMU 23 is not managed by the DSWM Johnson City Environmental Field Office and, therefore, should be managed under the CAO. This fact was brought up at the 2017 Facility Action Plan (FAP) meeting, where TDEC requested that the monitoring wells be resampled for prior analytes to determine a path forward for the site.

In March 2018, HAAP sampled MW-11 and MW-11B for general field parameters and the following analytes: chloride, sulfate, total cyanide, alkalinity, and metals (including mercury). Analytes were tested as both filtered and unfiltered. Results showed elevated iron in MW-11B, but only in the unfiltered sample. Manganese was elevated in both samples from MW-11B, but only in the unfiltered sample from MW-11. The June 2018 Groundwater Sampling Results Report for Monitoring Wells 11 and 11B reported these results and concluded that iron was not a contaminant of concern because elevated levels were not present in the filtered sample, while manganese was consistent with historical groundwater values for this area of the plant. Therefore, further sampling of MW-11 and MW-11B for these parameters was not recommended. DSWM approved the report on July 26, 2018.

4.0 SELECTED FINAL REMEDY

Based on the determination that SWMU 23 is not managed by the Johnson City Environmental Field Office, this SWMU should be managed under the CAO. While past and present sampling data from MW-11 and MW-11B do not indicate that contamination is being released to the environment, waste remains in place. The proposed final remedy for SWMU 23 includes the following:

- land use controls to prevent access to the waste and to protect the cap;
- signage; and
- semi-annual inspections.

5.0 REFERENCES

US Army Center for Health Promotion and Preventative Medicine, 1996. Survey Phase RCRA Facility Assessment NO. 38-EH-5035-95. Holston Army Ammunition Plant, Kingsport, Tennessee. 8-16 July 1996.

US Army Center for Health Promotion and Preventative Medicine, 2002. RCRA Facility Investigation of Site-Wide Ground Water April-June 2001 and January 2002 Holston Army Ammunition Plant, Kingsport, Tennessee. May 2002.

Holston Army Ammunition Plant, 2018. Groundwater Sampling Results Monitoring Wells 11 and 11B Solid Waste Management Unit 23. June 2018.

Figure 1

Figure 2

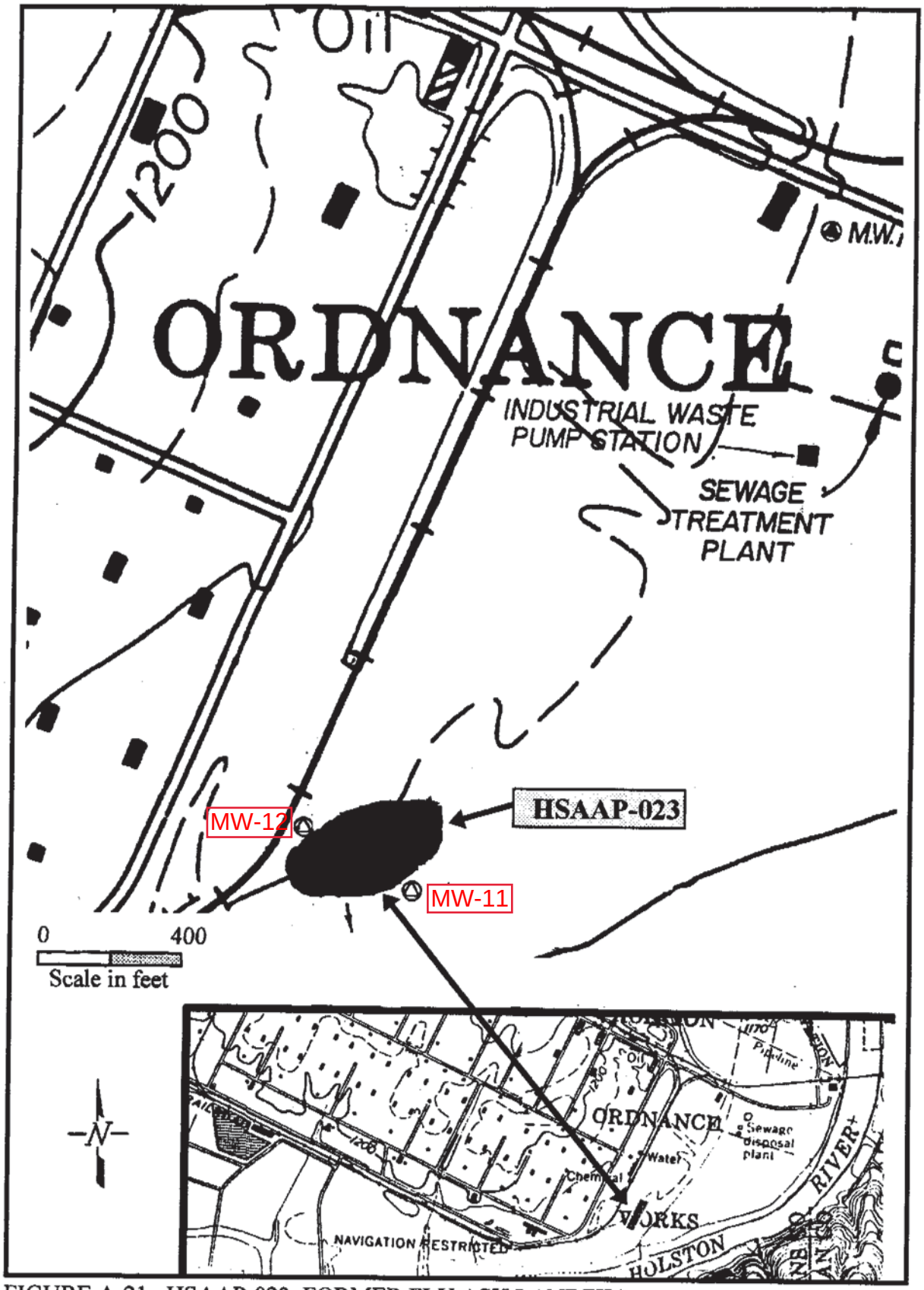


FIGURE A-21. HSAAP-023, FORMER FLY ASH LANDFILL.