**DEPARTMENT OF THE ARMY**
BLUE GRASS ARMY DEPOT
431 BATTLEFIELD MEMORIAL HIGHWAY
RICHMOND, KENTUCKY 40475

October 09, 2025

SUBJECT: Hazardous Waste Storage & Treatment Renewal Application
Resource Conservation and Recovery Act (RCRA) Permit
Transportation and Storage of Nerve Agent-Related Items (Permit Section R) Permit Renewal Request
Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP)
Blue Grass Army Depot (BGAD)
EPA ID #KY8-213-820-105, AI #2805

Commonwealth of Kentucky
Department for Environmental Protection (KDEP)
Division of Waste Management, Hazardous Waste Branch
ATTN: Ms. April Webb, PE, Manager
300 Sower Boulevard, 2nd Floor
Frankfort, KY 40601

Dear Ms. Webb:

The purpose of this correspondence is to submit the subject renewal application for supporting the Transportation and Storage of Nerve Agent-Related Items (Permit Section R) for igloos located in the Blue Grass Army Depot (BGAD) former Chemical Limited Area. The submittal includes RCRA Part A and entire Part B applications along with the relevant supporting plans and documents. The complete renewal package will be made available for public review on the BGAD and Program Executive Office, Assembled Chemical Weapons Alternatives (PEO ACWA) websites and in the following repositories for public review:

- Madison County Public Library, Richmond Branch
- Madison County Public Library, Berea Branch
- Estill County Public Library
- Crabbe Library, Eastern Kentucky University
- Hutchins Library, Berea College
- KDEP Public Repository

The applications will be available for review and comments for a period of sixty (60) days, in accordance with the public notice requirements.

If you have any questions or require additional information, please contact Mr. Jeff Krejsa, ACWA Environmental Engineer, at (859) 779-7604, or Mr. Ramesh Melarkode, BGAD Environmental Division Chief at (859) 779-6268.

SUBJECT: Hazardous Waste Storage & Treatment Renewal Application
Resource Conservation and Recovery Act (RCRA) Permit
Transportation and Storage of Nerve Agent-Related Items (Permit Section R)

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

Sincerely,

PENDERGRASS.SHANNON.LEIGH.1229325643
Digitally signed by PENDERGRASS.SHANNON.LEIGH.1229325643
Date: 2025.10.09 15:05:24 -04'00'

Shannon L. Pendergrass
Site Project Manager
PEO ACWA
BGCAPP
Permit Operator

MORGAN.SAMUEL.WELLINGTON.III.1036357483
Digitally signed by MORGAN.SAMUEL.WELLINGTON.III.1036357483
Date: 2025.10.11 07:42:15 -04'00'

Samuel W. Morgan III
Colonel, U.S. Army
Commanding
BGAD
Permit Owner

Enclosures

cc:
Olivia Beasley, DWM-KDEP
Todd Powers, DWM-KDEP
David Postley, DWM-KDEP
Ramesh Melarkode, BGAD
Wes Harrison, BGCA
Bill Buchanon, BPBG

Program Executive Office
Assembled Chemical Weapons Alternatives

# Resource Conservation and Recovery Act (RCRA)

## Hazardous Waste Storage and Treatment Permit Application

## Section R
## Transport and Storage of Nerve Agent Wastes

**Blue Grass Army Depot, Richmond, Kentucky**
**EPA ID# KY8-231-820-105**

*Submitted to*:
Energy and Environment Cabinet
Kentucky Department for Environmental Protection
Division of Waste Management
300 Sower Boulevard
Frankfort, Kentucky 40601

*Submitted by:*
Blue Grass Army Depot
431 Battlefield Memorial Highway, Richmond, Kentucky 40475

and

Assembled Chemical Weapons Alternatives
Blue Grass Chemical Agent-Destruction Pilot Plant
830 Eastern Bypass, Suite 106, Richmond, Kentucky 40475

**October 2025**

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| ACWA | Assembled Chemical Weapons Alternatives |
| ADP | agent degradation product |
| AOPC | area of potential concern |
| BGAD | Blue Grass Army Depot |
| BGCAPP | Blue Grass Chemical Agent-Destruction Pilot Plant |
| BGCA | Blue Grass Chemical Activity |
| CFR | Code of Federal Regulations |
| CLA | Chemical Limited Area |
| COPC | chemical of potential concern<br>constituent of potential concern |
| CPS | closure performance standard |
| DOT | Department of Transportation |
| EPA | Environmental Protection Agency |
| GB | sarin nerve agent |
| GPL | general population limit |
| H | mustard agent |
| HEPA | high efficiency particulate air |
| HWSU | hazardous waste storage unit |
| KAR | Kentucky Administrative Regulations |
| KDEP | Kentucky Department for Environmental Protection |
| $mg/m^3$ | milligram(s) per cubic meter |
| PCB | polychlorinated biphenyl |
| PE | Professional Engineer |
| PEO | Program Executive Office |
| RCRA | Resource Conservation and Recovery Act |
| RSL | regional screening level |
| SFT | shipping and firing tube |
| VSL | vapor screening level |
| VX | V-series nerve agent |

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# United States Environmental Protection Agency
# RCRA SUBTITLE C SITE IDENTIFICATION FORM

**1. Reason for Submittal** (Select only one.)

| | |
|---|---|
| ☐ | Obtaining or updating an EPA ID number for on-going regulated activities (Items 10-17 below) that will continue for a period of time. |
| ☐ | Submitting as a component of the Hazardous Waste Report for _____ (Reporting Year) |
| | ☐ Site was a TSD facility, a reverse distributor, and/or generator of ≥ 1,000 kg of non-acute hazardous waste, > 1 kg of acute hazardous waste, or > 100 kg of acute hazardous waste spill cleanup in **one or more months of the reporting year** (or State equivalent LQG regulations) |
| ☐ | Notifying that regulated activity is no longer occurring at this Site |
| ☐ | Obtaining or updating an EPA ID number for conducting Electronic Manifest Broker activities |
| ☑ | Submitting a new or revised Part A (permit) Form |

**2. Site EPA ID Number**

| K | Y | 8 | 2 | 1 | 3 | 8 | 2 | 0 | 1 | 0 | 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|

**3. Site Name**

**Blue Grass Army Depot (BGAD)**

**4. Site Location Address**

| | | |
|---|---|---|
| Street Address: **431 Battlefield Memorial Highway** | | |
| City, Town, or Village: **Richmond** | | County: **Madison** |
| State: **KY** | Country: **United States** | Zip Code: **40475** |
| Latitude | Longitude | ☐ Use Lat/Long as Primary Address |

**5. Site Mailing Address** ☑ Same as Location Street Address

| | | |
|---|---|---|
| Street Address | | |
| City, Town, or Village | | |
| State | Country | Zip Code |

**6. Site Land Type**

☐ Private ☐ County ☐ District ☑ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

**7. North American Industry Classification System (NAICS) Code(s) for the Site (at least 5-digit codes)**

| | | | |
|---|---|---|---|
| A. (Primary) | **928110** | C. | **N/A** |
| B. | **N/A** | D. | **N/A** |

**8. Site Contact Information**

☑ Same as Location Address

| | | |
|---|---|---|
| First Name **Joe** | MI **L** | Last Name **Elliott** |
| Title **BGAD, Director of Public Works** | | |
| Street Address **431 Battlefield Memorial Highway** | | |
| City, Town, or Village **Richmond** | | |
| State **KY** | Country **United States** | Zip Code **40475** |
| Email **joseph.l.elliott16.civ@army.mil** | | |
| Phone **859-779-6374** | Ext **N/A** | Fax **859-779-6465** |

**9. Legal Owner and Operator of the Site**

**A. Name of Site's Legal Owner**

☑ Same as Location Address

| | |
|---|---|
| Full Name **U.S. Department of the Army** | Date Became Owner (mm/dd/yyyy) **4/1/1942** |

Owner Type

☐ Private ☐ County ☐ District ☑ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

| | | |
|---|---|---|
| Street Address **431 Battlefield Memorial Highway** | | |
| City, Town, or Village **Richmond** | | |
| State **KY** | Country **United States** | Zip Code **40475** |
| Email **samuel.w.morgan.mil@army.mil** | | |
| Phone **859-779-6246** | Ext **N/A** | Fax |
| Comments **N/A** | | |

**B. Name of Site's Legal Operator**

☑ Same as Location Address

| | |
|---|---|
| Full Name **Assembled Chemical Weapons Alternatives - BGCAPP** | Date Became Operator (mm/dd/yyyy) **7/11/2016** |

Operator Type

☐ Private ☐ County ☐ District ☑ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

| | | |
|---|---|---|
| Street Address **830 Eastern Bypass, Suite 106** | | |
| City, Town, or Village **Richmond** | | |
| State **KY** | Country **United States** | Zip Code **40475** |
| Email **shannon.l.pendergrass.civ@army.mil** | | |
| Phone **859-779-7450** | Ext **N/A** | Fax |
| Comments **Assembled Chemical Weapons Alternatives (ACWA) - Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP): ACWA's mission is chemical weapons destruction.** | | |

**10. Type of Regulated Waste Activity (at your site)**

Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

**A. Hazardous Waste Activities**

| | | |
|---|---|---|
| ☐Y ☑N | 1. Generator of Hazardous Waste—If "Yes", mark only one of the following—a, b, c | |
| ☐ | a. LQG | -Generates, in any calendar month, 1,000 kg/mo (2,200 lb/mo) or more of non-acute hazardous waste (includes quantities imported by importer site); or<br>- Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lb/mo) of acute hazardous waste; or<br>- Generates, in any calendar month or accumulates at any time, more than 100 kg/mo (220 lb/mo) of acute hazardous spill cleanup material. |
| ☐ | b. SQG | 100 to 1,000 kg/mo (220-2,200 lb/mo) of non-acute hazardous waste and no more than 1 kg (2.2 lb) of acute hazardous waste and no more than 100 kg (220 lb) of any acute hazardous spill cleanup material. |
| ☐ | c. VSQG | Less than or equal to 100 kg/mo (220 lb/mo) of non-acute hazardous waste. |
| ☐Y ☑N | 2. Short-Term Generator (generates from a short-term or one-time event and not from on-going processes). If "Yes", provide an explanation in the Comments section. *Note: If "Yes", you MUST indicate that you are a Generator of Hazardous Waste in Item 10.A.1 above.* | |
| ☐Y ☑N | 3. Treater, Storer or Disposer of Hazardous Waste—Note: Part B of a hazardous waste permit is required for these activities. | |
| ☐Y ☑N | 4. Receives Hazardous Waste from Off-site | |
| ☐Y ☑N | 5 Recycler of Hazardous Waste | |
| ☐ | a. Recycler who stores prior to recycling | |
| ☐ | b. Recycler who does not store prior to recycling | |
| ☐Y ☑N | 6. Exempt Boiler and/or Industrial Furnace—If "Yes", mark all that apply. | |
| ☐ | a. Small Quantity On-site Burner Exemption | |
| ☐ | b. Smelting, Melting, and Refining Furnace Exemption | |

**B. Waste Codes for Federally Regulated Hazardous Wastes.** Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g. D001, D003, F007, U112). Use an additional page if more spaces are needed.

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |

**C. Waste Codes for State Regulated (non-Federal) Hazardous Wastes.** Please list the waste codes of the State hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |

**11. Additional Regulated Waste Activities (NOTE: Refer to your State regulations to determine if a separate permit is required.)**

**A. Other Waste Activities**

| | |
|---|---|
| ☐ Y ☑ N | 1. Transporter of Hazardous Waste—If "Yes", mark all that apply. |
| ☐ | a. Transporter |
| ☐ | b. Transfer Facility (at your site) |
| ☐ Y ☑ N | 2. Underground Injection Control |
| ☐ Y ☑ N | 3. United States Importer of Hazardous Waste |
| ☐ Y ☑ N | 4. Recognized Trader—If "Yes", mark all that apply. |
| ☐ | a. Importer |
| ☐ | b. Exporter |
| ☐ Y ☑ N | 5. Importer/Exporter of Spent Lead-Acid Batteries (SLABs) under 40 CFR 266 Subpart G—If "Yes", mark all that apply. |
| ☐ | a. Importer |
| ☐ | b. Exporter |

**B. Universal Waste Activities**

| | |
|---|---|
| ☐ Y ☑ N | 1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) - If "Yes" mark all that apply. Note: Refer to your State regulations to determine what is regulated. |
| ☐ | a. Batteries |
| ☐ | b. Pesticides |
| ☐ | c. Mercury containing equipment |
| ☐ | d. Lamps |
| ☐ | e. Aerosol Cans |
| ☐ | f. Other (specify) _____ |
| ☐ | g. Other (specify) _____ |
| ☐ Y ☑ N | 2. Destination Facility for Universal Waste Note: A hazardous waste permit may be required for this activity. |

**C. Used Oil Activities**

| | |
|---|---|
| ☐ Y ☑ N | 1. Used Oil Transporter—If "Yes", mark all that apply. |
| ☐ | a. Transporter |
| ☐ | b. Transfer Facility (at your site) |
| ☐ Y ☑ N | 2. Used Oil Processor and/or Re-refiner—If "Yes", mark all that apply. |
| ☐ | a. Processor |
| ☐ | b. Re-refiner |
| ☐ Y ☑ N | 3. Off-Specification Used Oil Burner |
| ☐ Y ☑ N | 4. Used Oil Fuel Marketer—If "Yes", mark all that apply. |
| ☐ | a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner |
| ☐ | b. Marketer Who First Claims the Used Oil Meets the Specifications |

**D. Pharmaceutical Activities**

| | |
|---|---|
| ☐ Y ☑ N | 1. Operating under 40 CFR Part 266, Subpart P for the management of hazardous waste pharmaceuticals—if "Yes", mark only one. Note: See the item-by-item instructions for definitions of healthcare facility and reverse distributor. |
| ☐ | a. Healthcare Facility |
| ☐ | b. Reverse Distributor |
| ☐ Y ☑ N | 2. Withdrawing from operating under 40 CFR Part 266, Subpart P for the management of hazardous waste pharmaceuticals. Note: You may only withdraw if you are a healthcare facility that is a VSQG for all of your hazardous waste, including hazardous waste pharmaceuticals. |

**12. Eligible Academic Entities with Laboratories**—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR Part 262, Subpart K.

| | |
|---|---|
| ☐ Y ☑ N | A. Opting into or currently operating under 40 CFR Part 262, Subpart K for the management of hazardous wastes in laboratories— If "Yes", mark all that apply. Note: See the item-by-item instructions for definitions of types of eligible academic entities. |
| ☐ | 1. College or University |
| ☐ | 2. Teaching Hospital that is owned by or has a formal written affiliation with a college or university |
| ☐ | 3. Non-profit Institute that is owned by or has a formal written affiliation with a college or university |
| ☐ Y ☑ N | B. Withdrawing from 40 CFR Part 262, Subpart K for the management of hazardous wastes in laboratories. |

**13. Episodic Generation**

| | |
|---|---|
| ☐ Y ☑ N | Are you an SQG or VSQG generating hazardous waste from a planned or unplanned episodic event, lasting no more than 60 days, that moves you to a higher generator category. If "Yes", you must fill out the Addendum for Episodic Generator. |

**14. LQG Consolidation of VSQG Hazardous Waste**

| | |
|---|---|
| ☐ Y ☑ N | Are you an LQG notifying of consolidating VSQG Hazardous Waste Under the Control of the Same Person pursuant to 40 CFR 262.17(f)? If "Yes", you must fill out the Addendum for LQG Consolidation of VSQG hazardous waste. |

**15. Notification of LQG Site Closure for a Central Accumulation Area (CAA) (optional) OR Entire Facility (required)**

| | |
|---|---|
| ☐ Y ☑ N | LQG Site Closure of a Central Accumulation Area (CAA) or Entire Facility. |
| | A. ☐ Central Accumulation Area (CAA) or ☐ Entire Facility |
| | B. Expected closure date: _____ mm/dd/yyyy |
| | C. Requesting new closure date: _____ mm/dd/yyyy |
| | D. Date closed : _____ mm/dd/yyyy<br>☐ 1. In compliance with the closure performance standards 40 CFR 262.17(a)(8)<br>☐ 2. Not in compliance with the closure performance standards 40 CFR 262.17(a)(8) |

**16. Notification of Hazardous Secondary Material (HSM) Activity**

| | |
|---|---|
| ☐ Y ☑ N | Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 260.30, 40 CFR 261.4(a)(23), (24), (25), or (27)? If "Yes", you must fill out the Addendum to the Site Identification Form for Managing Hazardous Secondary Material. |

**17. Electronic Manifest Broker**

| | |
|---|---|
| ☐ Y ☑ N | Are you notifying as a person, as defined in 40 CFR 260.10, electing to use the EPA electronic manifest system to obtain, complete, and transmit an electronic manifest under a contractual relationship with a hazardous waste generator? |

**18. Comments** (include item number for each comment)

**19. Certification** I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. **Note: For the RCRA Hazardous Waste Part A permit Application, all owners and operators must sign (see 40 CFR 270.10(b) and 270.11).**

| Signature of legal owner, operator or authorized representative | Date (mm/dd/yyyy) |
|---|---|
| MORGAN.SAMUEL.WELLINGTON.III.1036357483 Digitally signed by MORGAN.SAMUEL.WELLINGTON.III.1036357483 Date: 2025.10.14 10:38:26 -04'00' | |
| Printed Name (First, Middle Initial Last)<br>**Samuel W. Morgan III** | Title<br>**Colonel, U.S. Army, Commanding** |
| Email<br>**samuel.w.morgan.mil@army.mil** | |

| Signature of legal owner, operator or authorized representative | Date (mm/dd/yyyy) |
|---|---|
| PENDERGRASS.SHANNON.LEIGH.1229325643 Digitally signed by PENDERGRASS.SHANNON.LEIGH.1229325643 Date: 2025.10.09 13:27:31 -04'00' | |
| Printed Name (First, Middle Initial Last)<br>**Shannon L. Pendergrass** | Title<br>**ACWA-BGCAPP Site Project Manager** |
| Email<br>**shannon.l.pendergrass.civ@army.mil** | |

United States Environmental Protection Agency

# HAZARDOUS WASTE PERMIT PART A FORM

## 1. Facility Permit Contact

| | | | | | |
|---|---|---|---|---|---|
| First Name | **Joe** | MI | **L** | Last Name | **Elliott** |
| Title | **BGAD Director of Public Works** | | | | |
| Email | **joseph.l.elliott16.civ@army.mil** | | | | |
| Phone | **859-779-6374** | Ext | **N/A** | Fax | **859-779-6465** |

## 2. Facility Permit Contact Mailing Address

| | | | | | |
|---|---|---|---|---|---|
| Street Address | **431 Battlefield Memorial Highway** | | | | |
| City, Town, or Village | **Richmond** | | | | |
| State | **KY** | Country | **United States** | Zip Code | **40475** |

## 3. Facility Existence Date (mm/dd/yyyy)

**4/1/1942**

## 4. Other Environmental Permits

| A. Permit Type | B. Permit Number | C. Description |
|---|---|---|
| **N** | **KY0002073 7** | **KPDES Permit** |
| **P** | **V-16-0197** | **Air Quality Permit - BGCAPP (KY)** |
| **P** | **V-18-0404** | **Air Quality Permit - BGAD (KY)** |
| **R** | **KY8213820105** | **BGAD RCRA (KY)** |
| **R** | **KY8213820105** | **BGCAPP RCRA/HSWA Permit (KY)** |
| **R** | **KY8213820105** | **EPA RCRA HSWA Permit** |
| **E** | **KY8213820105** | **EPA TSCA Approval** |
| **E** | **1013** | **KY Water Withdrawal Permit** |

## 5. Nature of Business

**National Security**

**6. Process Codes and Design Capacities**

| Line Number | | A. Process Code | | | B. Process Design Capacity | | C. Process Total Number of Units | D. Unit Name |
|---|---|---|---|---|---|---|---|---|
| | | | | | (1) Amount | (2) Unit of Measure | | |
| | | | | | | | | |
| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |

**7. Description of Hazardous Wastes** (Enter codes for Items 7.A, 7.C and 7.D(1) )

| Line No. | | A. EPA Hazardous Waste No. | | | | B. Estimated Annual Qty of Waste | C. Unit of Measure | D. Processes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | (1) Process Codes | | | | | | | | (2) Process Description (if code is not entered in 7.D1)) |
| | | | | | | | | | | | | | | | | |
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**8. Map**

Attach to this application a topographical map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all spring, rivers, and other surface water bodies in this map area. See instructions for precise requirements.

**9. Facility Drawing**

All existing facilities must include a scale drawing of the facility. See instructions for more detail.

**10. Photographs**

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment, or disposal areas. See instructions for more detail.

**11. Comments**

Kentucky Department for Environmental Protection
Division of Waste Management
Hazardous Waste Branch
300 Sower Blvd, Frankfort, KY 40601
(502) 564-6716

# Part A Application Addendum

(EPA Form 8700-23)

*FOR OFFICIAL USE ONLY.*
*DO NOT WRITE IN THIS SPACE.*

FEE SUBMITTED: $___ *(See instructions to determine your fee)*

**I. Reason for Submittal** *(see instructions)*

**Reason for Submittal:**

☐ **FIRST SUBMITTAL** – Must be accompanied by the completed forms EPA 8700-12 and Addendum DWM-7037A.

☐ **REVISION – Identify the classification of the revision.** See instructions for when a revised application should be submitted.
- ☐ **Class 1 not requiring approval**
- ☐ **Class 1 requiring approval**
- ☐ **Class 2**
- ☐ **Class 3**

■ **RENEWAL** – See instructions for when a renewal application should be submitted.

☐ **STANDARDIZED PERMIT** – See instructions for the eligibility of a standardized permit.

**II. ID Numbers**

**A. EPA ID Number:** KY 8-213-820-105

**B. AGENCY INTEREST Number:** 2805

**III. Existing and New Facilities**

**Existing Facilities, the date operation began or construction commenced: (mm/dd/yyyy)** 04 / 01 / 1942

**New Facilities, the date operation is expected to begin: (mm/dd/yyyy)** / /

**IV. Contact Email Address**

**Facility Contact**

**Email address:** joseph.l.elliott16.civ@army.mil

**V. Facility Operator (2)**

**Name of Facility Operator 2** (see Instructions)**:** ACWA-BGCAPP

**VI. Type of Operator (2)**

**Type of Operator 2:** ■ Federal (F) ☐ State (S) ☐ County (C) ☐ Indian (I) ☐ Municipal (M) ☐ District (D) ☐ Private (P) ☐ Other (O) Specify:

**VII. Operator Mailing Address (2)**

**Operator 2 Street Address or P.O. Box:** 830 Eastern Bypass, Suite106

**City:** Richmond | **State:** KY | **County:** Madison | **Zip Code:** 40475

**Facility Operator 2 Telephone Number:** 859-779-7450 | **Phone Number Extension:** NA

**New Operator Assumed Responsibility for Facility on this Date: (mm/dd/yyyy)** 07 / 11 / 2016

**VIII. Facility Operator (3)**

**Name of Facility Operator 3** (see Instructions)**:**

**IX. Type of Operator (3)**

**Type of Operator 3:** ☐ Federal (F) ☐ State (S) ☐ County (C) ☐ Indian (I) ☐ Municipal (M) ☐ District (D) ☐ Private (P) ☐ Other (O) Specify:

**X. Operator Mailing Address (3)**

**Operator 3 Street Address or P.O. Box:**

**City:** | **State:** | **County:** | **Zip Code:**

**Facility Operator 3 Telephone Number:** | **Phone Number Extension:**

**New Operator Assumed Responsibility for Facility on this Date: (mm/dd/yyyy)** / /

**EPA ID Number:** KY8 – 213 – 820 – 105 **Agency Interest Number:** 2805

**XI. PROCESS DESCRIPTION:** (See Instructions)

| a. Commercial Indicator | b. Unique Unit or Group Name | c. Legal Status Code | d. Operating Status Code(s) | e. Description of Process |
|---|---|---|---|---|
| 4 | HWSU/Igloo: PK | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: OL | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: N | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: O | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: T | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: AB | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: KL | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: K | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: NM | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: MNH | PI | IN | Inactive, waiting for closure approval |

**EPA ID Number:** KY8 – 213 – 820 – 105 **Agency Interest Number:** 2805

**XI. PROCESS DESCRIPTION:** (See Instructions)

| a. Commercial Indicator | b. Unique Unit or Group Name | c. Legal Status Code | d. Operating Status Code(s) | e. Description of Process |
|---|---|---|---|---|
| 4 | HWSU/Igloo: I | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: IJ | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: J | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: MN | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: Y | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: EF | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: SH | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: WX | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: WD | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: VE | PI | IN | Inactive, waiting for closure approval |

**EPA ID Number:** KY8 – 213 – 820 – 105 **Agency Interest Number:** 2805

**XI. PROCESS DESCRIPTION:** (See Instructions)

| a. Commercial Indicator | b. Unique Unit or Group Name | c. Legal Status Code | d. Operating Status Code(s) | e. Description of Process |
|---|---|---|---|---|
| 4 | HWSU/Igloo: QJ | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: QR | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: ST | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: YZ | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: OP | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: YB | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: RI | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: V | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: ZA | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: R | PI | IN | Inactive, waiting for closure approval |

**EPA ID Number:** KY 8-213-820-105 **Agency Interest Number:** 2805

**XI. PROCESS DESCRIPTION:** (See Instructions)

| a. Commercial Indicator | b. Unique Unit or Group Name | c. Legal Status Code | d. Operating Status Code(s) | e. Description of Process |
|---|---|---|---|---|
| 4 | HWSU/Igloo: UV | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: UF | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: L | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: P | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: S | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: U | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: XC | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: M | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: Q | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: X | PI | IN | Inactive, waiting for closure approval |

**EPA ID Number:** KY 8-213-820-105 **Agency Interest Number:** 2805

**XI. PROCESS DESCRIPTION:** (See Instructions)

| a. Commercial Indicator | b. Unique Unit or Group Name | c. Legal Status Code | d. Operating Status Code(s) | e. Description of Process |
|---|---|---|---|---|
| 4 | HWSU/Igloo: Z | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: GH | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: W | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: TG | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: CD | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: KP | PI | IN | Inactive, waiting for closure approval |
| 4 | HWSU/Igloo: LO | PI | IN | Inactive, waiting for closure approval |
| | | | | |
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| | | | | |

**EPA ID Number:** KY 8 – 213 – 820 – 105 **Agency Interest Number:** 2805

**XII. WASTE STREAM DESCRIPTION** (See Instructions)

| a. Line Number | b. Waste Stream Number | c. Waste Description |
|---|---|---|
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**EPA ID Number:** KY 8- 213 - 820 - 105 **Agency Interest Number:** 2805

**XIII. Facility Status**

☐ Waste is NOT received from off-site

☐ Accepts waste from any off-site source(s) [A]

■ Accepts waste from only a restricted group of off-site sources [R]: Specify:

Other Federal/DOD Agencies

**XIV. Facility Owner Certification**

If the facility owner is also the facility operator, please skip this section and complete item XV below.

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Samuel W. Morgan III, Colonel, U.S. Army, Commanding

MORGAN.SAMUEL.WELLINGTON.III.1036357483 Digitally signed by MORGAN.SAMUEL.WELLINGTON.III.1036357483 Date: 2025.10.11 07:43:46 -04'00'

NAME (PRINT OR TYPE) SIGNATURE DATE

**XV. Operator Certification**

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Shannon L. Pendergrass, ACWA-BGCAPP, Site Project Manager

PENDERGRASS.SHANNON.LEIGH.1229325643 Digitally signed by PENDERGRASS.SHANNON.LEIGH.1229325643 Date: 2025.10.09 13:28:13 -04'00'

NAME (PRINT OR TYPE) SIGNATURE DATE

**XVI. Land Owner Certification**

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Samuel W. Morgan III, Colonel, U.S. Army, Commanding

MORGAN.SAMUEL.WELLINGTON.III.1036357483 Digitally signed by MORGAN.SAMUEL.WELLINGTON.III.1036357483 Date: 2025.10.11 07:43:57 -04'00'

NAME (PRINT OR TYPE) SIGNATURE DATE

# PART B FACILITY DESCRIPTION [401 KAR 39:050, Section 5; 40 CFR 270.14]

## B-1 GENERAL DESCRIPTION

The Program Executive Office, Assembled Chemical Weapons Alternatives (PEO ACWA) was the tenant responsible for the safe storage and destruction of chemical weapon components previously stored in hazardous waste storage units (HWSUs)/igloos at the former Chemical Limited Area (CLA) of Blue Grass Army Depot (BGAD). Closure activities have been completed in accordance with Part I (Closure Plan), and the igloos are currently awaiting closure approval.

## B-2 TOPOGRAPHIC MAP OF FACILITY

The BGAD Permit Application, Part B-2 (Topographic Map of Facility), describes the topography of BGAD and provides a topographic map in Figure B-2 (BGAD Terrain Map). The BGAD Permit Application also supplies a land use and land cover map in Figure B-3 (BGAD Land Cover Map).

The topographic map indicates gentle sloping in the storage areas, which generally allows water to drain away from the HWSUs/igloos. There are drainage provisions within the former CLA, and flooding is not a problem. The BGAD Permit Application contains Figure B-5 (BGAD Flood Plains), the Federal Emergency Management Agency (FEMA) floodplain map showing that the HWSUs/igloos are not situated in a 100-year flood zone.

A wind rose is no longer applicable because no hazardous waste remains at the site.

## B-3 FACILITY LOCATION INFORMATION

### B-3a Geological Information

This section is no longer applicable because no hazardous waste remains at the site.

### B-3a (1) Seismic Consideration

This section is no longer applicable because no hazardous waste remains at the site.

### B-3a (2) Evaluation of Subsurface Geologic Formations and Surface Topography for Solution or Karst Features

This section is no longer applicable because no hazardous waste remains at the site.

### B-3b Climate and Floodplain Requirements

This section is no longer applicable because no hazardous waste remains at the site.

## B-4 TRAFFIC INFORMATION

This section is no longer applicable because no hazardous waste remains at the site.

## B-5 REQUIREMENTS FOR APPLICANTS FOR CONSTRUCTION PERMITS

This section is not applicable.

## B-6 PAST COMPLIANCE RECORD

This section is not applicable.

## B-7 FINANCIAL RESPONSIBILITY TO CONSTRUCT AND OPERATE

This section is not applicable.

## B-8 PUBLIC PARTICIPATION

This is a permit renewal application. A public notice requesting public comments was issued with the submittal of this application.

## B-9 FEES

This application is being submitted to support the PEO ACWA chemical demilitarization mission. An existing grant from PEO ACWA to the Kentucky Department for Environmental Protection Division of Waste Management includes monies to pay the fee for filing and review of this RCRA Permit application. No additional monies are required.

## PART C WASTE ANALYSIS PLAN [401 KAR 39:060, Section 5; 40 CFR 270.14(b)(3); 264.13]

This Part is no longer applicable because no hazardous waste remains at the site.

### C-1 INTRODUCTION

Not applicable.

### C-2 WASTE CHARACTERIZATION

Not applicable.

### C-2a Pre-Acceptance Phase

Not applicable.

### C-2b Acceptance Phase

Not applicable.

### C-2c Waste Generated On-Site

Not applicable.

### C-2d Additional Requirements for Facilities Handling Ignitable, Reactive, or Incompatible Wastes

Not applicable.

### C-2e Additional Requirements Pertaining to Boiler/Industrial Furnace Facilities

Not applicable.

### C-3 ADDITIONAL WASTE ANALYSIS REQUIREMENTS PERTAINING TO LAND DISPOSAL RESTRICTIONS

Not applicable.

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# PART D PROCESS INFORMATION [401 KAR 39:090, Section 1; 40 CFR 264.170–179; 264.190–200; 264.600-603; 270.15]

## D-1 CONTAINERS

### D-1a Container Management

This section is no longer applicable because no hazardous waste remains at the site.

### D-1b Container Handling

This section is no longer applicable because no hazardous waste remains at the site.

### D-1c Containers with Free Liquids and/or F020, F021, F023, F026, and F027 Wastes

This section is no longer applicable because no hazardous waste remains at the site.

### D-1c (1) Capacity of Containment System Relative to Number and Volume of Containers to Be Stored

This section is no longer applicable because no hazardous waste remains at the site.

### D-1d Containers Without Free Liquids and/or F020, F021, F023, F026, and F027 Wastes

This section is no longer applicable because no hazardous waste remains at the site.

### D-1e Requirements for Ignitable or Reactive Wastes and Incompatible Wastes

This section is no longer applicable because no hazardous waste remains at the site.

## D-2 TANKS SYSTEMS

This section is not applicable.

## D-3 WASTE PILES

This section is not applicable.

## D-4 SURFACE IMPOUNDMENTS

This section is not applicable.

## D-5 INCINERATION

This section is not applicable.

## D-6 LANDFILLS DESIGN

This section is not applicable.

## D-7 LAND TREATMENT

This section is not applicable.

## D-8 MISCELLANEOUS UNITS

This section is not applicable.

## PART E GROUNDWATER

This Part is no longer applicable because no hazardous waste remains at the site.

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## PART F PROCEDURES TO PREVENT HAZARDS [401 KAR 39:090, Section 1; 40 CFR 264]

This Part is no longer applicable because no hazardous waste remains at the site.

### F-1 SECURITY

### F-1a Waiver

Not applicable.

### F-1b Security Procedures and Equipment

Not applicable.

### F-1b (1) 24-Hour Surveillance System

Not applicable.

### F-1b (2) Barrier and Means to Control Entry

Not applicable.

### F-1b (3) Warning Signs

Not applicable.

### F-2 INSPECTION SCHEDULE

### F-2a General Inspection Requirements

Not applicable.

### F-2a (1) Types of Problems

Not applicable.

### F-2a (2) Frequency of Inspections

Not applicable.

### F-2b Specific Process Inspection Requirements

Not applicable.

### F-2c Remedial Action

Not applicable.

### F-2c (1) Vapor-Emitting/Leaking Containers or Chemical Munitions

Not applicable.

### F-2c (2) HWSUs/Igloos

Not applicable.

### F-2c (3) Lightning Protection System

Not applicable.

### F-2c (4) Personal Protective Equipment

Not applicable.

### F-2d Inspection Log

Not applicable.

## F-3 WAIVER OF PREPAREDNESS AND PREVENTION REQUIREMENTS

### F-3a Equipment Requirements

Not applicable.

### F-3a (1) Internal Communications

Not applicable.

### F-3a (2) External Communications

Not applicable.

### F-3a (3) Emergency Equipment

Not applicable.

### F-3a (4) Water for Fire Control

Not applicable.

### F-3b Aisle Space Requirement

Not applicable.

## F-4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT

### F-4a Loading/Unloading Operations

Not applicable.

### F-4b Runoff

Not applicable.

### F-4c Water Supplies

Not applicable.

### F-4d Failure of Equipment and Power Supply

Not applicable.

### F-4e Personal Protective Equipment

Not applicable.

### F-4f Prevention of Releases to Atmosphere from HWSUs/Igloos Containing Chemical Agent

Not applicable.

## F-5 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES

### F-5a Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste

Not applicable.

### F-5b General Precautions for Handling Ignitable or Reactive Wastes and Mixing of Incompatible Wastes

Not applicable.

### F-5c Management of Ignitable or Reactive Wastes in Containers

Not applicable.

### F-5d Management of Incompatible Waste in Containers

Not applicable.

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## PART G CONTINGENCY PLAN [401 KAR 39:090 Section 1; 40 CFR 264.50, 264.56, and 264.196]

This Part is no longer applicable because no hazardous waste remains at the site.

### G-1 GENERAL INFORMATION

Not applicable.

### G-2 ROLES AND RESPONSIBILITIES

### G-2a Incident Commander

Not applicable.

### G-2b Environmental Coordinator

Not applicable.

### G-3 IMPLEMENTATION

Not applicable.

### G-4 EMERGENCY RESPONSE PROCEDURES

Not applicable.

### G-4a Notification

Not applicable.

### G-4b Identification of Hazardous Materials

Not applicable.

### G-4c Hazard Assessment

Not applicable.

### G-4d Control Procedures

Not applicable.

### G-4d (1) Fire Incidents

Not applicable.

### G-4d (2) Spills and Leaks

Not applicable.

### G-4e Prevention of Recurrence or Spread of Fires, Explosions, or Releases

Not applicable.

### G-4f Storage and Treatment of Recovered Material

Not applicable.

### G-4g Separation of Incompatible Wastes

Not applicable.

### G-4h Post-Emergency Equipment Maintenance

Not applicable.

### G-4i Container Spills and Leakage

Not applicable.

## G-5 EMERGENCY EQUIPMENT

Not applicable.

## G-6 COORDINATION AGREEMENTS

Not applicable.

## G-7 EVACUATION PLAN

Not applicable.

## G-8 REQUIRED REPORTS

Not applicable.

# PART H PERSONNEL TRAINING PLAN [401 KAR 39:090, Section 1 and 40 CFR 264.16]

This Part is no longer applicable because no hazardous waste remains at the site.

## H-1 OUTLINE OF TRAINING PROGRAM

### H-1a General Training

Not applicable.

### H-1b Specific Hazardous Waste Management Training

Not applicable.

## H-2 SCOPE AND APPLICATION

Not applicable.

## H-3 PROGRAM ADMINISTRATION

### H-3a Recordkeeping/Reports/Documentation

Not applicable.

### H-3b Job Description

Not applicable.

## H-4 EMERGENCY RESPONSE

Not applicable.

## H-5 COURSE OUTLINES

Not applicable.

### H-5a Chemical Surety Training

Not applicable.

### H-5b Department of Defense Hazard Communication Course

Not applicable.

### H-5c RCRA Compliance and Hazardous Waste Management Course

Not applicable.

## H-5d HAZWOPER Training Program

Not applicable.

## H-5d (1) 40-Hour Initial HAZWOPER Training

Not applicable.

## H-5d (2) 8-Hour Refresher HAZWOPER Training

Not applicable.

## H-5e On-the-Job Training

Not applicable.

# PART I CLOSURE PLANS, POST-CLOSURE PLANS, AND FINANCIAL REQUIREMENTS [401 KAR 39:060 and 39:090; 40 CFR Part 264 Subparts G111–120, 264.178, and 264.601]

## I-1 INTRODUCTION

This section is submitted in accordance with the 401 Kentucky Administrative Regulations (KAR) 39:090. This plan identifies the steps necessary to permanently close the hazardous waste storage units (HWSUs)/igloos located within the storage area of the Chemical Limited Area (CLA) relative to this permit application. The Program Executive Office (PEO), Assembled Chemical Weapons Alternatives (ACWA) is the operator of the HWSUs/igloos that have been turned over from Blue Grass Chemical Activity (BGCA). These HWSUs include Igloos I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AB, CD, EF, GH, IJ, KL, MN, OP, QR, ST, UV, WX, YZ, ZA, YB, XC, WD, VE, UF, TG, SH, RI, QJ, PK, OL, NM, KP, MNH, and LO.

This Closure Plan identifies the steps necessary to permanently close the HWSUs/igloos in a manner that is protective of human health and the environment. The closure goal for each HWSU/igloo is non-residential clean closure based on the use scenario at the Blue Grass Army Depot (BGAD). Therefore, the minimum criteria that must be met for chemicals of potential concern (COPCs) is industrial level. The closure monitoring, field sampling, laboratory analysis, and other supporting functions will be performed by ACWA, BGCA, and/or the Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) laboratory or commercial laboratory.

The BGAD Environmental Office will maintain a copy of the Closure Plan and all revisions to the plan until certification of closure is received on all the units.

Upon completion of operational hazardous waste management activities, the permitted HWSUs/igloos will be closed in accordance with the requirements of 401 KAR 39:060 and 39:090 and this Closure Plan. Closure of each unit could occur independently.

## I-1a General Description of HWSUs/Igloos

ACWA stores and manages chemical munition components and agent-related wastes in the CLA. HWSUs/igloos have been transferred from the BGCA Module IIII Resource Conservation and Recovery Act (RCRA) permit to the ACWA Module IX RCRA permit. HWSUs/igloos are either actively storing drained containerized rocket warheads or are empty in a non-active status.

Each HWSU/igloo within the CLA measures 15 feet high, 25 feet wide, and 80 feet long. Constructed in 1941 and 1942, the floors and walls of the igloos are made of steel-reinforced concrete and are designed to prevent leakage into or out of the structure. Igloo wall thickness varies from 1 to 2 feet at the floor to 1 foot at the top, with a 6-inch slab floor and a 10-inch-thick headwall. This design enables the igloos to maintain a temperature of approximately 40 F to 70 F year round. Additionally, each igloo is outfitted with drains, which are blocked to prevent any liquid from draining from the igloos. Due to maintenance issues with the access box system (lines and valves

freezing), BGCA opted to use an expansion plug on the interior of the HWSUs/igloos as a means of closing off the piping system. Access boxes and associated pipe removal work was completed in the fall of 2012. The Kentucky Department for Environmental Protection (KDEP) Division of Waste Management Field Operations observed this action. The Closure Report will include documentation for the HWSUs/igloos in which photos were taken during the headwall valve box/piping removal in 2012.

The chemical munitions stored in the CLA contained the chemical agents, as well as explosives and/or propellants. The three types of chemical agents were blister agent mustard (H) and nerve agents sarin (GB) and O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothioate (VX). In addition, some HWSUs/igloos previously stored chemical-munitions-related waste such as spent monitoring supplies, used laboratory materials, spent filters, used personal protective equipment, contaminated tools and equipment, and clean-up debris from leaking munitions.

The specific agent-related and non-agent-related wastes stored in BGAD's RCRA-permitted HWSUs/igloos are as follows:

- *Igloos L, M, P, Q, S, U, V, W, Z, OP, ST, UV, YZ, YB, XC, UF, TG, and RI*. These igloos contained GB chemical munitions, including GB M55 115mm rockets and/or GB M426 8-inch projectiles. They currently contain drained containerized GB M56 warheads. Igloo Q also contained GB ton containers, Igloo OP also contained shipping and firing tubes (SFTs), and Igloo ST also contained GB Department of Transportation (DOT) bottles.

- *Igloos R, X, QR, ZA*. These igloos contained GB M55 115mm rockets and GB agent-contaminated hazardous waste. They currently contain drained, containerized GB M56 warheads. Igloo ZA also contained SFTs as well as other munition components.

- *Igloo CD*. This igloo contained GB M55 115mm rockets, GB M426 8-inch projectiles, GB ton containers, H M110 155mm projectiles, VX M55 115mm rockets, GB agent-contaminated hazardous waste, empty ton containers, SFTs, and M67 rocket motors with SFTs.

- *Igloo GH*. This igloo contained GB M55 115mm rockets, GB M426 8-inch projectiles, GB DOT bottles, overpacks containing GB, SFTs, and other munition components.

- *Igloo KP*. This igloo contained H M110 155mm projectiles, GB agent-contaminated hazardous waste, H DOT bottles, SFTs, M67 rocket motors with SFTs, and other munition components.

- *Igloo LO.* This igloo contained GB, H, and VX agent-contaminated hazardous waste.

- *Igloo Y, EF, MN, SH.* These igloos contained VX M55 115mm rockets, and they currently contain drained containerized GB M56 warheads. Igloo Y also contained one VX DOT bottle.

- *Igloo WX, WD, VE.* These igloos contained GB M55 115mm rockets, and they currently contain drained, containerized GB M56 warheads.

- *Igloo PK, OL.* These igloos are listed as former GB storage locations and contained H 155mm projectiles. They currently contain drained, containerized GB M56 warheads.

- *Igloo NM.* This igloo is listed as a former GB and VX storage location and contained H 155mm projectiles. It currently contains drained, containerized GB M56 warheads.

- *Igloo MNH.* This igloo contained GB M55 115mm rockets, H 155mm projectiles, and one H DOT bottle. It currently contains drained, containerized GB M56 warheads.

- *Igloo QJ.* This igloo contained VX M55 115mm rockets and overpacked, contaminated GB M67 rocket motor assemblies.

- *Igloos I, J, K, T, and IJ.* These igloos contained VX M55 115mm rockets and/or VX 155mm projectiles. They currently contain drained, containerized VX M56 warheads.

- *Igloos N and O.* These igloos contained GB M426 8-inch projectiles, and they currently contain drained, containerized VX M56 warheads.

- *Igloo KL.* This igloo contained GB M55 115mm rockets, VX M55 115mm rockets, VX 155mm projectiles, and drained, containerized VX M56 warheads.

- *Igloo AB.* This igloo is listed as a former VX and H storage location. The igloo currently contains drained, containerized VX M56 warheads.

The closure activity for each HWSU/igloo reflects the requirements and considerations appropriate to the types of wastes stored in the unit, the exposure history, and its designated end-use.

### I-1b Closure Strategy (General Overview) [40 CFR 264.112(b)(1), (2), and (5)]

This section describes the closure strategy for the agent-related RCRA-permitted HWSUs/igloos. Prerequisite activities before beginning the closure steps include verifying the interior air is less than 1.0 short-term exposure limit ($1 \times 10^{-4}$ milligrams per cubic meter [$mg/m^3$] for GB and $1 \times 10^{-5}$ $mg/m^3$ for VX) concentration based on the unit's previous storage history. Additionally, all remaining hazardous waste wastes will be removed and disposed of properly in accordance with the Kentucky Hazardous

Waste Regulations and the Waste Analysis Plan (Module IX Part C of the BGAD RCRA Permit) for hazardous wastes managed and stored in the CLA. Disposal will be documented, and copies will be kept on file at the BGAD Environmental Office for a minimum of 5 years. Figure I-1[1] presents the closure strategy to be applied to each HWSU/igloo. In general, the following will be performed:

1. *Mechanical Cleaning.* Any residual loose material and debris will be removed from the structure's floor for disposal in accordance with the Waste Analysis Plan. If cracks in Category 1 and 1c igloos floors were sealed, sealant/caulking will be removed prior to the start of closure monitoring. The floor will be swept and/or vacuumed using a high efficiency particulate air (HEPA) vacuum.

2. *Visual Inspection.* A visual inspection of the interior floors of the units will be performed to identify areas of potential concern (AOPCs)—for example, stains provide evidence of liquid contact. The visual inspection will be accomplished and noted using a visual inspection log. The log, as well as historical records, will be used to finalize selection of sampling points and will serve as a method to inform KDEP of any potential releases. Category 1 and 1c igloos will include a review of historical documentation and interviews with BGCA personnel to help identify the specific areas where hazardous waste contacted the floor. For all HWSUs/igloos, if a suspected spill occurred (i.e., where hazardous waste contacted the floor), air monitoring of the area (headspace sampling) will be performed. If an AOPC is identified, headspace monitoring will be performed. If an AOPC is identified in a Category 1 igloo, in addition to headspace sampling, a judgmental concrete sample will be placed at the location(s) of AOPC(s) in addition to the statistical sample locations.

3. *Headspace Sampling (Tents).* Air monitoring of AOPCs identified in Step 2 will be performed at the short term exposure limit (STEL). If the headspace monitoring results indicate a confirmed value above the BGCA action level of 0.25 STEL localized decontamination will be performed. If the detection occurs in an AOPC identified in a Category 2 or Category 3 igloo, then the sampling plan for the igloo will be revised to match the sampling requirements for Category 1 igloos, including concrete sampling.

4. *Localized Decontamination.* In the event AOPC headspace monitoring results are confirmed to be above the BGCA action level of 0.25 STEL, localized decontamination of AOPCs will be performed. Decontamination solutions acceptable for decontaminating AOPCs include water, steam, sodium hydroxide solution, or other approved solutions in accordance with ACWA, BGCA, and/or BGCAPP procedures.

[1] Figures are located at the end of this Part.

5. *Unventilated Monitoring Test.* An unventilated monitoring test of the air inside each structure will verify agent vapor concentration of less than 1.0 general population limit (GPL) for igloos to be transferred to BGAD.

6. *Concrete Repair.* Any visible surface defects (e.g., cracks 1.55 millimeters or larger) will be sealed/repaired prior to pressure washing/rinsate sampling.

7. *Pressure Washing (Optional).* The interior HWSU/igloo floor will be pressure washed or cleaned using a floor cleaner. Impermeable berms and squeegees will be utilized to direct washwater for collection. Washwater will be containerized and disposed in accordance with the Waste Analysis Plan.

8. *Rinsate Sampling.* For each HWSU/igloo, a sample will be collected from a low-volume rinsate that has contacted all floor surfaces. Walls and ceilings will not be included in the rinsate sample unless there is evidence at the time of sampling that hazardous waste contacted these surfaces. Rinsate samples will be analyzed for agent degradation products (ADPs), PCBs, explosives, and RCRA metals listed in Table I-1 relevant to storage history within the specific igloo. If analytical results of the rinsate exhibit elevated levels of one or more constituents of potential concern (COPCs), up to two iterations of decontamination and rinsate sampling will be repeated. If analytical results of rinsate continue to exhibit elevated levels of one or more COPC(s), ACWA will develop a remediation plan for Kentucky Department for Environmental Protection (or KDEP) approval which will address sampling and analysis for the investigation and remediation of the HWMU. If Closure Performance Standards are not achieved because detection limits exceed the action level for one or more COPCs, ACWA will provide justification to KDEP why clean closure should be considered based on an overall evaluation of sampling and analysis, analytical capabilities, and generator knowledge.

9. *Concrete Sampling.* Discrete concrete composite chip samples will be collected from the floor area in all Category 1 and 1c igloos that stored chemical agent munitions and any Category 2 / Category 3 igloos in which headspace monitoring of AOPCs indicate a confirmed value above the BGCA action level of 0.25 STEL, as described in Section I-1c. Concrete samples will be analyzed for COPCs listed in Table I-1 relevant to storage history within the specific igloo. If the igloo stored VX or GB M55 115mm rockets, concrete chip samples will be analyzed for polychlorinated biphenyls (PCBs). If elevated levels of COPCs are indicated in concrete chip samples, ACWA will develop a remediation plan for KDEP approval which will address sampling and analysis for the investigation and remediation of the HWMU.

10. *Soil Sampling.* Two 2-point composite subsurface soil samples will be collected, one from each HWSU/igloo side drain at the approximate location and depth where access boxes were removed. No surface soil samples will be collected due to access box removal work that occurred in 2012 (see paragraph I-1a). Soil samples will be analyzed for COPCs listed in Table I-1 relevant to storage

history within the specific igloo. If elevated levels of COPCs are indicated in soil samples, ACWA will develop a remediation plan for KDEP approval which will address sampling and analysis for the investigation and remediation of the HWMU.

Monitoring and analytical results will be evaluated to determine if they meet the closure performance standards (CPSs), which are presented in Table I-1.[2] CPSs are protective of human health and the environment. Closure will follow non-residential, risk-based closure standards with CPSs defined by U.S. Environmental Protection Agency (EPA) Region IX risk-based screening levels for composite worker exposure to soil, EPA maximum contaminant levels for tap water, EPA regional screening levels (RSLs) for tap water, or background levels.

The performance standard values presented for chemical agents and agent degradation products are EPA RSLs or health-based environmental screening levels developed by the U.S. Army Public Health Command (now known as the Defense Centers for Public Health – Aberdeen) that follow the EPA Region IX risk assessment method.

Excluding arsenic, the EPA RSLs for risk-based closure are proposed for COPCs. The RSL risk method is a multi-pathway risk-based assessment that considers soil ingestion, inhalation of volatiles released from soil, dermal absorption from soil, and inhalation of airborne particulates. As described in *Pristine Background Soil Report, Addendum to the Final Depot-Wide Background Soil Investigation Report* (Jacobs, January 2002), the pristine background concentration for arsenic exceeds the established EPA RSL and therefore the established pristine background concentration is proposed for arsenic. Pristine background concentrations refer to naturally occurring concentrations present in the environment that have not been influenced by anthropogenic activities and were established based on 20 rural sample locations approved by KDEP and BGAD and collected in May 2000.

Note: All sampling will be conducted in accordance with the Closure Verification Sampling and Analysis Plan in Attachment 2.

If contamination is detected above the screening levels listed in Table I-1, ACWA will develop a remediation plan for KDEP approval which will address sampling and analysis for the investigation and remediation of the HWMU. This may include a site-specific risk assessment to demonstrate risk-based closure is acceptable. A risk-based closure determination would only be considered if non-chemical-agent constituents were greater than the industrial CPSs or background. Alternatively, the HWSU/igloo may be remediated under corrective action as a hazardous waste management unit or monitored under a post-closure permit in accordance with this Closure Plan.

Waste generated from closure activities will be managed in accordance with the Waste Analysis Plan.

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[2] Tables are located at the end of this Part.

## I-1c Unit-Specific Closure Activities

Closure activities for each HWSU/igloo reflect the specific requirements and considerations appropriate for the types of waste stored in the unit. Containers, structures, liquids, and soil will be removed or decontaminated to below the CPSs specified in Table I-1. If the removal or decontamination efforts are unsuccessful or impractical, a site-specific risk assessment based on concentrations of remaining COPCs may be conducted to demonstrate closure, or the storage unit will be subject to applicable post-closure requirements in accordance with this Closure Plan.

Prior to beginning closure activities, an assessment of the available historical documentation will be performed to determine whether an exposure to chemical agent or other hazardous waste occurred in/at the HWSU/igloo. Identification of the type and quantity of exposure will be noted, as well as whether any leaks made contact with the floor. COPCs for the ACWA units were identified based on a review of the ACWA Permit, the ACWA Permit Application, and historical operations and storage records; the list is presented in Table I-1. Closure samples will be analyzed with analytical methods approved by KDEP and in accordance with the Closure Verification Sampling and Analysis Plan (Attachment 2).

All wastes will be removed from the storage units and properly disposed per Kentucky Hazardous Waste Regulations and the Waste Analysis Plan. Decontamination of the igloos and associated equipment will begin after all waste process activities have been completed.

### I-1c (1) Igloos within CLA – Known Liquid Agent Contact (Category 1 Units)

Igloos P, R, PK, and OL are Category 1, defined as having a liquid agent exposure that contacted the floor. Igloo YB is Category 1c, defined as having a history of an unspecified exposure type; for conservatism, Igloo YB will be sampled in the same manner as a Category 1 HWSU/igloo. These Category 1 and 1c units will be cleaned/decontaminated and monitored to the applicable CPSs, as described in Section I-1b. AOPCs, such as stains or areas of known spills (i.e., where chemical agent or other hazardous waste contacted the floor), will be identified during the review of historical documentation and/or the visual inspection (Step 2).

Localized air monitoring of the AOPCs will be performed at the STEL. In the event of a confirmed exceedance of 0.25 STEL, localized decontamination and resampling will be conducted. If more than three attempts of decontamination of the area are required, a management decision will be made as to the final disposition of the structure.

Upon successful completion of AOPC monitoring, closure verification monitoring will be performed through an unventilated monitoring test of each igloo (Step 5). If cracks in igloo floors were sealed, sealant/caulking will be removed prior to the start of closure monitoring. If the CPSs are not achieved, additional decontamination of the igloo will be performed, and the unventilated monitoring test will be repeated. If decontamination efforts are unsuccessful or impractical, a site-specific risk assessment or alternative

remediation plan for the igloo will be developed in agreement with RCRA requirements and submitted to KDEP for final approval.

Upon successful execution of unventilated monitoring, any visible surface defects (e.g., cracks 1.55 millimeters or larger) will be sealed/repaired. As required, the interior HWSU/igloo floor will be pressure washed or cleaned using a floor cleaner to remove dust or debris that could interfere with rinsate analysis. A sample will be collected from a low volume rinsate that has contacted all floor surfaces. Rinsate samples will be analyzed for agent degradation products (ADPs), PCBs, explosives, and RCRA metals listed in Table I-1 relevant to storage history within the specific igloo. If analytical results of the rinsate exhibit elevated levels of one or more constituents of potential concern (COPCs), up to two additional iterations of decontamination and rinsate sampling will be performed. If analytical results of rinsate continues to exhibit elevated levels of one or more COPC(s), ACWA will develop a remediation plan for Kentucky Department for Environmental Protection (KDEP) approval which will address sampling and analysis for the investigation and remediation of the HWMU.

Eight discrete concrete chip samples will be collected with sample location defined using random sampling in grids. If the leaker location is known and/or at the location where AOPCs are identified, additional judgmental sample(s) will be collected at the location of potential or known liquid agent contact. Concrete chip samples collected in HWSUs/igloos that stored M55 115mm rockets will be analyzed for PCBs. If the CPSs are not achieved, ACWA will develop a remediation plan for KDEP approval which will address sampling and analysis for the investigation and remediation of the HWMU.

Two 2-point composite soil samples (Step 10) will be collected at the approximate location and depth of the removed access boxes at each applicable HWSU/igloo. If the CPSs are not achieved, ACWA will develop a remediation plan for KDEP approval which will address sampling and analysis for the investigation and remediation of the HWMU.

### I-1c (2) Igloos within CLA – No Known Liquid Agent Contact, Vapor Only (Category 2 Units)

Igloos L, Q, S, U, V, W, X, Z, CD, GH, OP, QR, UV, YZ, XC, TG, QJ, I, J, Y, AB, NM, KP, MNH, MN, ST, ZA, WD, UF, N, and VE are Category 2, defined as having had an exposure to liquid agent that did not contact the floor, or having had a vapor-agent or exudate exposure. These units will be cleaned, inspected, decontaminated, monitored to less than 1.0 GPL, rinsate and soil samples will be collected, and if CPS are met, transferred to BGAD, as described in Section I-1b. If an AOPC is identified during the visual inspection of the interior floors (Step 2), headspace monitoring will be performed (Step 3). If the headspace monitoring results indicate a confirmed value above the BGCA action level of 0.25 STEL, sampling requirements associated with Category 1 and 1c igloos will be implemented. Rinsate samples will be utilized for agent degradation products (ADPs), PCBs, explosives, and RCRA metals listed in Table I-1 relevant to storage history within the specific igloo. Due to the physical characteristics of

the SFTs, any PCB contamination present would be present in a solid form on the floor surface; therefore, rinsate sampling of PCBs is appropriate.

If the CPSs are not achieved, additional decontamination of the igloo will be performed. If the removal or decontamination efforts are unsuccessful, a site-specific risk assessment or alternative remediation plan for the HWSU/igloo will be developed in agreement with RCRA requirements and submitted to KDEP for final approval.

### I-1c (3) Igloos within CLA – No Agent Exposure (Category 3 Units)

Igloos LO, M, RI, O, KL, WX, K, T, EF, IJ and SH are Category 3, defined as having no documented history of agent exposure. Therefore, these units will be inspected, cleaned, decontaminated, monitored to less than 1.0 GPL, rinsate and soil samples will be collected, and if CPS are met, transferred to BGAD, as described in Section I-1b. If an AOPC is identified during the visual inspection of the interior floors (Step 2), headspace monitoring will be performed (Step 3). If the headspace monitoring results indicate a confirmed value above the BGCA action level of 0.25 STEL, then the sampling plan for the Category 3 igloo will be revised to match the sampling plan for Category 1 igloos. Rinsate samples will be utilized for agent degradation products, PCBs, explosives, and RCRA metals listed in Table I-1 relevant to storage history within the specific igloo. Due to the physical characteristics of the SFTs, any PCB contamination present would be present in a solid form on the floor surface; therefore, rinsate sampling of PCBs is appropriate.

If the CPSs are not achieved, additional decontamination of the igloo will be performed. If the removal or decontamination efforts are unsuccessful or impractical, a site-specific risk assessment or alternative remediation plan for the igloo will be developed in agreement with RCRA requirements and submitted to KDEP for final approval.

### I-1d Partial Closure and Final Closure Activities

One or more of the HWSUs/igloos could potentially be converted to a non-RCRA use. In that case, the unit(s) being converted would be closed in accordance with the provisions of this Closure Plan. The inventory of wastes in the unit(s) would either be moved to another area or managed in accordance with the procedures described in Section I-1b.

### I-1e **Maximum Waste Inventory** [40 CFR 264.112(b)(3)]

Using known typical dimensions of the HWSUs/igloos and standard storage practices, the maximum waste inventory in any unit prior to start of closure was 176 crates of 15 rockets (2,640) rockets. The total capacity for any building is 3,831 gallons. The estimated life of each building is more than 100 years. The compatibility of all wastes is considered during storage activities.

## I-1f Schedule for Closure [40 CFR 264.112(b)(6), (d), and (e); 40 CFR 264.113; and 40 CFR 264.115]

In accordance with 40 Code of Federal Regulations (CFR) 264.112(e), ACWA, BGCA, or contractor personnel may begin removing hazardous wastes and decontaminating or dismantling equipment in accordance with this Closure Plan before notification of final closure. Such activities will be considered a partial closure.

Per 40 CFR 264.112(d), BGAD shall notify KDEP in writing at least 45 days prior to the date on which final closure activities of the RCRA-permitted HWSUs/igloos in the CLA are expected to commence. The anticipated commencement date is no later than 30 days after the date on which a permitted unit receives the known final volume of hazardous waste, or if there is a reasonable possibility that the unit will receive additional hazardous wastes, or within 1 year after the date on which the unit received the most recent volume of hazardous waste.

No shipments of hazardous waste will be received at a specific ACWA HWSU/igloo after the first day of the unit-specific closure period. Per 40 CFR 264.113, within 90 days of receiving the final hazardous waste volume, all hazardous waste stored in the HWSU/igloo undergoing closure will be transferred to a treatment, storage, and disposal facility. Partial and final closure activities will be completed within 180 days of receiving the final volume of hazardous waste. An extension request for completion of partial and final closure activities, if needed, will be submitted to the KDEP Division of Waste Management Director in accordance with 40 CFR 264.113(b)(1). Residual materials identified in storage facilities will be sampled and analyzed within 30 days of the initiation of closure and will be disposed of within 90 days.

Per 40 CFR 264.115, within 60 days of completion of final closure, ACWA shall submit to the KDEP Hazardous Waste Branch Manager a qualified, Kentucky-registered Professional Engineer's (PE's) certification of completion of closure in accordance with the final, unit-specific Closure Plan. The certification will be signed by the ACWA Site Project Manager or designee and the PE.

The general schedule for closure activities is presented in Table I-2.

## I-1g Disposal or Decontamination of Equipment, Structures, and Soils [40 CFR 264.112(b)(4); 40 CFR 268.45]

This section describes how BGAD and ACWA intend to decontaminate and dispose of closure-generated waste, the equipment utilized in the process, and the structures. It also describes when BGAD/ACWA will determine that closure requirements have been achieved for the structures and the surrounding area.

Equipment will be decontaminated to a level that permits safe disposal of wastes and safe future use of the property, as appropriate. Decontamination will be accomplished according to the strategy described in Sections I-1b and I-1c. The selected decontaminant and decontamination technique will depend on the COPC. For example, the use of bleach (sodium hypochlorite) is a standard decontamination technique for

agent-contaminated non-porous surfaces (metal, glass, plastic, etc.) and is identified as a suitable decontaminant under chemical destruction technology in 40 CFR 268.45, Table 1. Similarly, the table identifies detergent and water washing as an appropriate chemical extraction technique for heavy metals, and high-pressure water sprays (i.e., an industrial water scrubber) as an appropriate extraction technology for most contaminants. The decontamination/cleaning solutions are generally applied manually through use of a spray device or by wiping down with cloth or paper towels and wipes. Other decontamination methods as described in 40 CFR 268.45, Table 1, may also be used if appropriate. Spent decontamination solutions and water will be collected, characterized, and sent for disposition in accordance with the Waste Analysis Plan.

Where chemical decontamination proves inadequate, more aggressive techniques may be required. One technique used previously in the chemical demilitarization program is scabbling, which removes a surface layer from contaminated concrete surfaces. The surface layer is removed either by a series of cutter blades or by impact hammers that break up the material. Scabbling typically removes about 1/4 inch of material in a single pass. Multiple passes may be necessary to remove all contamination in heavily contaminated areas. Scabbling requires specialized equipment including vacuum systems, collection hoppers, and dust collection systems to ensure worker safety and to prevent the spread of possible contamination. The scabbled concrete will be sampled for analysis according to criteria in Table I-3. Waste solids will be collected, managed, and disposed in accordance with the Waste Analysis Plan.

The concrete surface is considered decontaminated when analysis of collected samples demonstrates CPSs in Table I-1 have been achieved for the hazardous waste constituents in Table I-3 relevant to storage history within the specific igloo.

Containment berms and temporary containment systems will be maintained during decontamination activities. Containment berms must not be removed until all hazardous wastes have been removed. These measures should prevent contamination from being inadvertently spread to the surrounding environment during closure.

It is not anticipated that soil removal will be necessary during closure because any incidents involving chemical agent release (or other hazardous waste) during the operations life of the structure will be addressed under the ACWA Contingency Plan (Module IX Part G).

However, should it be determined at the time of closure that soil removal or remediation is required, ACWA will submit a remediation plan for KDEP approval which will address sampling and analysis for the investigation and remediation of the HWMU. If, after removing or decontaminating residual materials and making all reasonable efforts to effect removal or decontamination of contaminated components, subsoils, structures, and equipment, as required in 40 CFR 264.178 and 264.112, BGAD finds that not all contaminated subsoils can be practicably removed or decontaminated, BGAD will close the facility and perform post-closure care in accordance with the Closure and Post-Closure Plans. The permittee must submit a Post-Closure Plan to KDEP within 90 days from the date that the owner or operator or KDEP determines that the

RCRA-permitted HWSU/igloo must be closed as a landfill, subject to the requirements of 40 CFR 264.117 through 264.120.

### I-1h Closure Certification [40 CFR 264.115]

Within 60 days of the completion of final closure, ACWA will submit to the KDEP Hazardous Waste Branch Manager, by registered mail, a certification signed by a ACWA Site Project Manager or designee and a qualified, Kentucky-registered PE. The certification will state that the HWSUs/igloos have been closed in accordance with the specifications contained in the approved Closure Plan. The certification will specify the required documentation to be submitted to the Hazardous Waste Branch Manager. Documentation supporting the PE's certification shall be furnished to KDEP upon request. Documentation of closure activities will be maintained by the certifying PE and the Army. Documentation and information supporting the closure status of the permitted HWSUs/igloos will be maintained and provided to KDEP upon request. The supporting documentation includes the following:

- Pertinent field notes related to closure activities
- Description of any minor deviations from the approved Closure Plan and justification for these deviations
- Documentation of the final disposition of all hazardous wastes and residual hazardous wastes, including contaminated media, debris, and all treatment residues
- All laboratory and/or field data, including quality assurance/quality control data, for all samples and measurements
- Summary report that itemizes the data reviewed by the certifying PE and tabulates the analytical results of samples taken to determine and/or confirm closure requirements have been achieved.

### I-1i Amendment to Closure Plan [40 CFR 264.112(c)]

Personnel will notify KDEP if unexpected events occur during Closure Plan implementation that require a modification to the approved Closure Plan.

## I-2 POST-CLOSURE PLAN [40 CFR 264.118]

Because of the nature of the hazardous waste management operations in the HWSUs/igloos and the ability to thoroughly decontaminate the structures and/or remove their contents, there is no need for post-closure plans for these units. Should there be any changes in the BGAD hazardous waste management practices, the need for post-closure planning will be reviewed. With thorough decontamination, HWSUs/igloos would not need any post-closure care or monitoring.

## I-3 NOTICE REQUIRED FOR DISPOSAL FACILITIES

This section is not applicable.

## I-4 CLOSURE COST ESTIMATE

This section is not applicable.

## I-5 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE

This section is not applicable.

## I-6 LIABILITY REQUIREMENT

This section is not applicable.

## Table I-1. Closure Performance Standards

| COPC [a] | Air Monitoring | Solid Samples Industrial (mg/kg) | Aqueous Samples (µg/L) | Source of Closure Performance Standard [b] |
|---|---|---|---|---|
| **Chemical Agents** | | | | |
| H | < GPL [c] | 0.3 | 47 | USAPHC 2011 |
| VX | < GPL [c] | 1.1 | 4 | USAPHC 2011 |
| GB | < GPL [c] | 32 | 4 | USAPHC 2011 |
| **Agent Degradation Products** | | | | |
| IMPA | NA | 8,200 | 200 | EPA 2023 |
| EMPA | N/A | 4,200 | 200[d] | ORNL 2007 |
| DIMP | N/A | 9,300 | 160 | EPA 2023 |
| MPA | N/A | 4,900 | 120 | EPA 2023 |
| Thiodiglycol | N/A | 7,900 | 140 | EPA 2023 |
| **Explosives** | | | | |
| 2,4,6-trinitrotoluene | N/A | 51 | 0.98 | EPA 2023 |
| HMX | N/A | 5,700 | 100 | EPA 2023 |
| RDX | N/A | 38 | 0.97 | EPA 2023 |
| Tetryl | N/A | 230 | 3.9 | EPA 2023 |
| **PCBs** | | | | |
| Aroclor 1254 | N/A | 0.97 | 0.040 | EPA 2023 |
| **Metals** | | | | |
| Arsenic | N/A | 9.43[e] | 10 | Jacobs, 2002<br>EPA 2023 |
| Barium | N/A | 22,000 | 2,000 | EPA 2023 |
| Cadmium | N/A | 10 | 5 | EPA 2023 |
| Chromium | N/A | 36,000 | 100 | EPA 2023 |
| Lead | N/A | 800 | 15 | EPA 2023 |
| Mercury | N/A | 4.6 | 2 | EPA 2023 |
| Selenium | N/A | 580 | 50 | EPA 2023 |
| Silver | N/A | 580 | 9 | EPA 2023 |

Notes:

a COPCs based on hazardous waste storage history.

# Table I-1. Closure Performance Standards

Notes: (Continued)

b Sources used to define closure performance standards:
**EPA 2009.** *Primary Drinking Water Regulations.* Environmental Protection Agency. EPA 816-F-09-004. https://www.epa.gov/sites/default/files/2016-06/documents/npwdr_complete_table.pdf.
**EPA 2023a.** *Regional Screening Level (RSL) Composite Worker Soil Table (TR=1E-06, HQ=0.1) November 2023.* U.S. Environmental Protection Agency. https://semspub.epa.gov/work/HQ/404340.pdf.
**EPA 2023b.** *Regional Screening Level (RSL) Resident Tapwater Table (TR=1E-06, HQ=0.1) November 2023*. U.S. Environmental Protection Agency. https://semspub.epa.gov/work/HQ/404352.pdf.
**ORNL 2007.** *Reevaluation of 1999 Health-Based Environmental Screening Levels (HBESLs) for Chemical Warfare Agents.* Oak Ridge National Laboratory. ORNL/TM-2007/00, May 2007.
**USAPHC 2011.** *Chemical Agent Health-Based Standards and Guidelines Summary Table 2: Criteria for Wastewater, Soil, Waste as of July 2011*. U.S. Army Public Health Command Public Health Notice 0711-03. https://www.peoacwa.army.mil/wp-content/uploads/Appendix-C-1-USAPHC_BTRA.pdf.
**Jacobs Engineering Group Inc**. and Stratum Engineering, Inc. January 2002. *Pristine Background Soil Report, Addendum to Final Depot-Wide Background Soil Investigation Report, Blue Grass Army Depot, Richmond, KY.*

c The air monitoring requirement for GB is $1 \times 10^{-6}$ mg/m$^3$, VX is $6 \times 10^{-7}$ mg/m$^3$, and H is $2 \times 10^{-5}$ mg/m$^3$.

d Neither a HBESL nor a RSL has been established for EMPA. Based on similar physical and chemical properties, the RSL for IMPA is applied for EMPA.

e Corresponds to pristine subsurface background established for Blue Grass Army Depot.

| | |
|---|---|
| COPC | constituent of potential concern |
| DIMP | diisopropyl methylphosphonate |
| EMPA | ethyl methylphosphonic acid |
| EPA | U.S. Environmental Protection Agency |
| GB | sarin |
| GPL | general population limit |
| H | mustard agent |
| HBESL | health-based environmental screening level |
| HMX | octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine |
| IMPA | isopropyl methyl phosphonic acid |
| mg/kg | milligrams per kilogram |
| mg/L | milligrams per liter |
| mg/m$^3$ | milligrams per cubic meter |
| MPA | methylphosphonic acid, corrosive |
| N/A | not applicable |
| ORNL | Oak Ridge National Laboratory |
| PCB | polychlorinated biphenyl |
| RDX | hexahydro-1, 3, 5-trinitro-1, 3, 5-triazine |
| RSL | regional screening level |
| USAPHC | U.S. Army Public Health Command |
| VX | O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothioate |

## Table I-2. Closure Schedule for HWSU/Igloo Used to Store Chemical Munitions

| Activity | Time Sequence (days) | Total Elapsed Time (days) |
|---|---|---|
| Notification of Intent to Close [a] | 180 | 0 |
| Removal of all Stored Wastes from HWSU/Igloo | 0 | 180 |
| Baseline Monitoring | 30 | 210 |
| Cleaning of HWSU/Igloo | 90 | 300 |
| Certification of Closure | 90 | 360 |

Notes:

a It is anticipated that all munitions/components will have been removed from the HWSU/Igloo prior to notice of intent to close.

HWSU hazardous waste storage unit

## Table I-3. Closure Verification Sampling Requirements

| HWSU/Igloo | Headspace [a] | Unventilated Monitoring Test [a, h] | Minimum Number and Type of Sample (per HWSU/Igloo) | | |
|---|---|---|---|---|---|
| | | | Rinsate [b, d] | Concrete Chip [c,d] | Soils [c, d, g] |
| **Category 1** | | | | | |
| P, R, PK, OL | AOPC [f] | GPL | 1 composite | 8 discrete[e] | 2 composite |
| **Category 1c** | | | | | |
| YB | AOPC [f] | GPL | 1 composite | 8 discrete[e] | 2 composite |
| **Category 2** | | | | | |
| L, Q, S, U, V, W, X, Z, CD, GH, OP, QR, UV, YZ, XC, TG, QJ, I, J, Y, AB, NM, KP, MNH, MN, ST, ZA, WD, UF, N, VE | AOPC [f] | GPL | 1 composite | NR [f] | 2 composite |
| **Category 3** | | | | | |
| LO, M, O, KL, WX, RI, K, T, EF, IJ, SH | AOPC [f] | GPL | 1 composite | NR [f] | 2 composite |

Notes:

a Analysis for H, GB, and/or VX COPCs required according to the unit's storage/release history.
b Analysis for ADP, PCB, explosive, and metal COPCs (as defined in Table I-1) required according to the unit's storage/release history.
c Analysis for H, GB, VX, ADP, PCB, explosive, and metal COPCs (as defined in Table I-1) required according to the unit's storage/release history
d If COPCs are detected above the CPSs in rinsate, up to three decontamination and resampling iterations may be performed. If more than three decontamination attempts are required for rinsate samples, or exceedances in concrete or soil are observed, a management decision will be made as to the final disposition of the structure. ACWA will develop a remediation plan for KDEP approval which will address sampling and analysis for the investigation and remediation of the HWMU.
e Where an AOPC is identified through historical review or inspection, an additional judgmental sample will be collected from the location of the AOPC.
f If stains are identified through the visual inspection, headspace monitoring of the AOPC is required. If confirmed headspace sample results exceed 0.25 STEL, localized decontamination and resampling will be conducted. If more than three decontamination attempts are required, a management decision will be made as to the final disposition of the structure. If confirmed headspace sample results for an AOPC in a Category 2 / Category 3 igloo exceed 0.25 STEL, Category 1 sampling requirements (i.e., 8 discrete chip samples and a judgmental sample at the AOPC) will be performed.
g Subsurface soils at the approximate location and depth of the removed access boxes will be collected and composited.
h In the event of a GPL exceedance, localized headspace monitoring, decontamination and resampling will be conducted. If more than three decontamination attempts are required, a management decision will be made as to the final disposition of the structure.

| | | | |
|---|---|---|---|
| ADP | agent degradation product | GPL | general population limit |
| AOPC | area of potential concern | H | mustard agent |
| COPC | constituent of potential concern | HWSU | hazardous waste storage unit |
| CPS | closure performance standard | NR | not required |
| EXP | explosives | PCB | polychlorinated biphenyl |

| | |
|---|---|
| GB | sarin |
| VX | O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothioate |

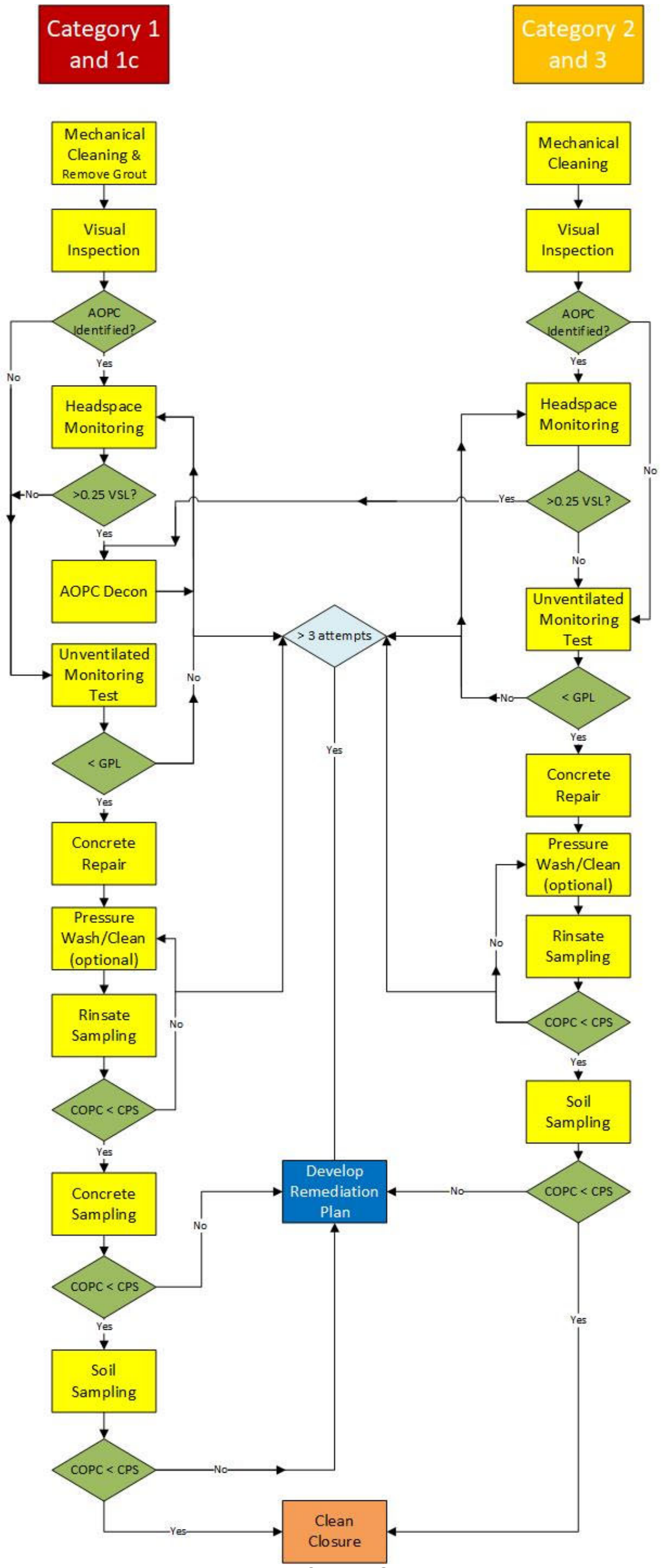


**Figure I-1. Closure Strategy**

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# PART J OTHER FEDERAL LAWS

This Part is no longer applicable because no hazardous waste remains at the site.

## J-1 WETLANDS

Not applicable.

## J-2 WILD AND SCENIC RIVERS ACT

Not applicable.

## J-3 ENDANGERED SPECIES ACT

Not applicable.

## J-4 COASTAL ZONE MANAGEMENT ACT

Not applicable.

## J-5 FISH AND WILDLIFE COORDINATION ACT

Not applicable.

## J-6 NATIONAL HISTORIC PRESERVATION ACT

Not applicable.

## J-7 HAZARDOUS, TOXIC, OR RADIOLOGICAL WASTE

Not applicable.

## J-8 EXPLOSIVE ORDNANCE

Not applicable.

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## PART K WASTE MINIMIZATION [401 KAR 39:060 Section 5; 40 CFR 270.30]

This Part is no longer applicable because no hazardous waste remains at the site.

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## PART L SIGNATURES [401 KAR 39:060 Section 5; 40 CFR 124 and 270]

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

PENDERGRASS.SHANNON.LEIGH.1229325643 Digitally signed by PENDERGRASS.SHANNON.LEIGH.1229325643 Date: 2025.10.09 13:28:40 -04'00'

Shannon L. Pendergrass
Site Project Manager
Assembled Chemical Weapons Alternatives
Blue Grass Chemical Agent-Destruction Pilot Plant
Permit Operator

MORGAN.SAMUEL.WELLINGTON.III.1036357483 Digitally signed by MORGAN.SAMUEL.WELLINGTON.III.1036357483 Date: 2025.10.11 07:43:17 -04'00'

Colonel Samuel W. Morgan III
Commander
Blue Grass Army Depot
Permit Owner

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