

APPENDIX 2-4
PCD SOP-PU-0000-M-486
CHEMICAL OPERATIONS

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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS <small>For use of this form, see AR 25-30; the proponent agency is OAASA</small>	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE 04 June 2014
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TO: (Forward to proponent of publication or form) (Include ZIP Code) Pueblo Chemical Depot Publications Management - Document Control 45825 Hwy 96 East Pueblo, CO 81006-9330	FROM: (Activity and location) (Include ZIP Code) Pueblo Chemical Depot Chemical Operations Division 45825 Hwy 96 East Pueblo, CO 81006-9330
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PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER						DATE	TITLE
SOP PU-0000-M-486						26 Feb 2014	Chemical Operations
ITEM	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <small>(Provide exact wording of recommended changes, if possible).</small>	
*****						The following changes are provided to clarify the application of personnel limits to operations performed in accordance with this SOP:	
1	14	eee	2			Change the verbiage for this paragraph to read: "Operator and Transient personnel limits stated for each operaton in this SOP apply to all personnel inside or outside the storage structure that are required to perform the steps required by this SOP."	
2	19	2a	1			Change the verbiage to read: "(O) Verify that Security personnel have removed the Security lock from the igloo door and have deactivated the IDS to the structure."	
3	19	2b	1			Delete ", along with Security personnel," from the sentence.	
4	64	n/a	n/a			Change the verbiage underneath "WARNING SIGN" to read: "(place warning signs east and west of the opertion igloo at sufficient distance to provide positive and efficient control of the operating area).	

TYPED NAME, GRADE OR TITLE HAWKINS M. CONRAD, JR. Chief, Chemical Operations, GS-13	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 719-549-4259	SIGNATURE <u>CONRAD.HAWKINS.MEADOR.JR.1228809859</u>
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TO: <i>(Forward direct to addressee listed in publication)</i>	FROM: <i>(Activity and location) (Include ZIP Code)</i>	DATE
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PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER			DATE		TITLE			
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III - REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS <small>For use of this form, see AR 25-30; the proponent agency is OAASA</small>					Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).		DATE 17 March 2014
TO: (Forward to proponent of publication or form) (Include ZIP Code) Pueblo Chemical Depot Publications Management - Document Control 45825 Hwy 96 East Pueblo, CO 81006-9330					FROM: (Activity and location) (Include ZIP Code) Pueblo Chemical Depot Chemical Operations Division 45825 Hwy 96 East Pueblo, CO 81006-9330		
PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER SOP PU-0000-M-486					DATE 26 Feb 2014		TITLE Chemical Operations
ITEM	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <small>(Provide exact wording of recommended changes, if possible).</small>	
*****						Based on observations made by the DAIG during the 2014 PCD CSI, the following changes are requested:	
1	19	3	n/a			Change "WARNING: Personel must pay careful attention to the stacks while inspecting the inside of the igloo" to read; "Note: Operators will report any unusual conditions noted during FEM to the Ammunition Surveillance Office".	
2	77	n/a	n/a			Add the attached 1000 CFM Start Up/Shut Down Checklist as "Appendix G".	
3	9	n/a	n/a			Rename current Appendix G (Hazard Analysis) as "1000 CFM Start Up/Shut Down Checklist".	
4	9	n/a	n/a			Add new "Appendix H" with the description of operation being "Hazard Analysis" and the page number lisetd as "79".	
TYPED NAME, GRADE OR TITLE HAWKINS M. CONRAD, JR. Chief, Chemical Operations, GS-13					TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 719-549-4259		SIGNATURE <u>CONRAD.HAWKINS.MEADOR.JR.1228809859</u> 

TO: <i>(Forward direct to addressee listed in publication)</i>	FROM: <i>(Activity and location) (Include ZIP Code)</i>	DATE
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PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

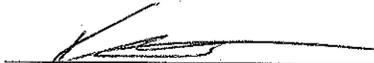
PUBLICATION NUMBER			DATE		TITLE			
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

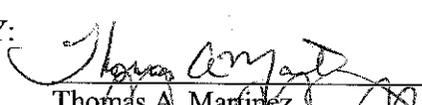
PART III - REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

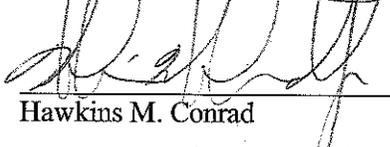
TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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SOP COVER SHEET
1. PUEBLO CHEMICAL DEPOT
STANDING OPERATING PROCEDURE FOR:

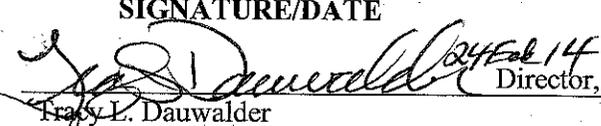
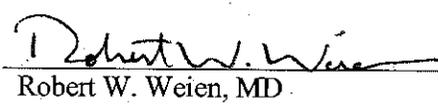
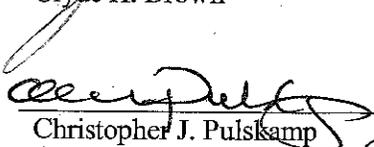
2. ITEM:	3. OPERATION: Chemical Operations
a. Ctg. 105MM, M60 HD, 1315-C442	4. ESTIMATED DAILY PRODUCTION RATE: N/A
b. Proj. 105MM M60 HD 1315-C442	5. ORGANIZATIONAL SYMBOL: CMPC-MOD-CD
c. Proj. 155MM, M110 HD 1320-D543	6. SOP NO: PU-0000-M-486 Date: 12 Apr 65
d. Proj. 155MM, M104 HD 1320-D484	a. REV NO. 35 Date:
e. Ctg. 4.2" M2 HT, 1315-C698	b. CHANGE Date: FEB 26 2014
f. Ctg. 4.2" M2A1 HD 1315-C703	7. AUTHORITY: DA PAM 385-61 (13 Nov 2012); AR 385-10 (23 Aug 2007); and AMC-R 700-107 (03 Feb 2003)
g. Packaged chemical munitions are (12) 1.2	
h. Unpackaged chemical munitions are (12) 1.2	
i. Chemical hazard symbol 1, set 1, and H	

8. PREPARED BY:  2/19/14 Title: Toxic Material Handler
 Kevin S. Bessert Date Phone Ext: DSN: 749-4548

9. REVIEWED BY:  2/19/14 Title: Supervisor, Toxic Material
 Thomas A. Martinez Date Handlers
 Phone Ext: DSN: 749-4306

10. SUBMITTED BY:  19 FEB 14 Title: Chief, Chemical Operations
 Hawkins M. Conrad Date Division
 Phone Ext: DSN: 749-4259

11. CONCURRENCES:

OFFICE	SIGNATURE/DATE	TITLE
Director, Mission Operations	<u></u> <u>24 Feb 14</u> Tracy L. Dauwalder	Director, Mission Operations
Ammunition Surveillance Office	<u></u> <u>19 Feb 14</u> Lisabeth A. Wachutka	Chief, Ammunition Surveillance
Occupational Health Clinic	<u></u> Robert W. Weien, MD	Competent Medical Authority
Chemical Surety & Compliance Office	<u></u> Clyde H. Brown	Chemical Surety Officer
Environmental Management Office	<u></u> Christopher J. Pulskamp	Chief, Environmental Management Office
Safety & Occupational Health Office	<u></u> Randy J. Wojtala	Manager, Safety & Occupational Health
Public Works	<u></u> for Edward J. Dunn	Chief, Public Works Division

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STANDING OPERATING PROCEDURE
SUBMITTAL SUMMARY SHEET
Proponent is Chemical Operations Division

Installation: Pueblo Chemical Depot, Pueblo, Colorado Date Submitted: _____

SOP No. PU-0000-M-486

Reason for Submittal:

Procedures Involve Material that is:

<u> </u>	New	Explosive	<u>XX</u>
<u>XX</u>	Revision (see Remarks)	Inert	<u> </u>
<u> </u>	Change: <u> </u> (see Remarks)	Toxic Chemical Munitions	<u>XXX</u>

Type SOP

<u>XX</u>	Maintenance (Renovation, Modification, Supervisor)
<u>XX</u>	Preservation & Packing
<u> </u>	Demilitarization
<u>XX</u>	Receipt, Storage and Issue
<u>XX</u>	Inspection/Surveillance Test
<u> </u>	Administrative
<u> </u>	Other: Protective Ensemble

Operation Covered by SOP

<u> </u>	Operation is underway and will conclude
<u> </u>	Operation is scheduled to start on or about
<u>XX</u>	Operation is conducted intermittently
<u>XX</u>	Operation is conducted on a continuing basis

Hazard Analysis

<u>XX</u>	Is required for critical operation number(s)	<u>ALL</u>
<u> </u>	Is not required	
<u>XX</u>	Is available in the Risk Management Office	
<u> </u>	Is not available	

XX Hazard Analyses were performed by PCD HAWG

SOP Validation, AMC-R 700-107

Phase 1 was accomplished _____ was not accomplished _____

Phase 2 was accomplished _____ was not accomplished _____

Phase 3 was accomplished _____ was not accomplished _____

Validation not required XX

SUPERVISOR'S STATEMENT

1. The supervisor will sign this statement:
 - a. When first assigned as supervisor of the operation.
 - b. When an approved change is made to the SOP.
 - c. At least once per quarter during continuing operations.
 - d. After absence from the job in excess of 15 consecutive workdays.

2. I have personally reviewed each of the operational steps of the SOP and have no question in my mind that the operation can be performed safely, efficiently, and in compliance with environmental restrictions noted in the SOP. I have verified to my satisfaction that operators have been trained and are capable of performing their part of the operation in a safe and efficient manner and have instructed them to follow the SOP without deviation.

SUPERVISOR'S PRINTED/TYPED NAME: _____

SUPERVISOR'S SIGNATURE

DATE

SOP

OPERATOR'S STATEMENT

INDEX OF OPERATIONS

Oper. No.	Bldg/Site	Bay No.	Total Expl. Allowed in Bay	Description of Operation	Page No.
1	Igloo	N/A	N/A	Site Set-Up	15
2	Igloo	N/A	Igloo Limit	First Entry Monitoring (FEM)	18
3	Igloo	N/A	Igloo Limit	Storage, Handling and Transport Procedures	21
4	Igloo	N/A	Igloo Limit	Intrusion Detection System (IDS) Test	26
5	491	VCC2	64 LBS	Verification Inspection of VCC	28
6	Igloo	N/A	Refer to site plan	Detection Actions Taken – Vapor Leaker	34
7	Igloo	N/A	Refer to site plan	Detection and Actions Taken – Suspect Liquid	37
8	Igloo	N/A	Refer to site plan	Leaker Isolation and Containerization	39
9	Igloo	N/A	Refer to site plan	1000 CFM Filter Installation and Operation	49
10	Igloo	N/A	Refer to site plan	Decontamination of PCE, Equipment, and Facilities	53
11	As Applicable	N/A	N/A	Donning and Doffing of Level A	56
12	As Applicable	N/A	N/A	Donning and Doffing of Level B	61
APPENDIX A				Mini Hot-Line & Secondary Hot-Line Layouts	64
APPENDIX B				Personal Protective Clothing and Equipment	66
APPENDIX C				Specific Safety Requirements for Handling Materials Treated w/PCP	69
APPENDIX D				Overpack Container Marking Instructions	71
APPENDIX E				CFM Filtering System Change Out Procedures	72
APPENDIX F				Preventative Measures – Heat Strain	75
APPENDIX G				Hazard Analysis	77

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

1. REMARKS:

a. Revision 32 of SOP-PU-0000-M-486, Chemical Operations, incorporates changes to igloo vent closure procedures, secondary hot-line set-up procedures, secondary waste decontamination procedures, VCC set-up/operation procedures, over-pack inspection procedures, and Safety/Surveillance recommended changes.

b. Revision 32, Change 1 updates signature page and adds SOP header. Incorporated Secondary Hot-line layout and Preventative Measures Heat Strain Appendices.

c. Revision 33 of SOP-PU-0000-M-486, Chemical Operations, updates signature page, references and general safety requirements. Incorporates changes for Operation 2, Step 3, Safety Operator(s) duties; and changes for Operation 3, Step 6; Closure and secure Igloo. Updates Operation 6 based on new requirements of AMC-R 740-28. Modified operational steps for the 1000 CFM, Operation 13. Incorporates minor procedural changes identified in the annual review.

d. Revision 34 of SOP PU-0000-M-486, Chemical Operations, updates the signature page, makes changes and additions to the general safety requirements, revises operational and transient personnel limits for Operations 2 through 11, removes the requirement for a "door watch" from Operation 2 for open door operations, removes operations not specific to the Chemical Operations Directorate (Inventory, SMI, and Magazine Inspection), and modifies operational steps for the 1000 CFM (operation 10). Pages and operational references have been renumbered accordingly due to the removal of the above listed operations.

e. Revision 35 of SOP PU-0000-M-486, Chemical Operations, updates the signature page, makes changes and additions to the general safety requirements. Defines Operator versus Transient. Add two pages to the Operator's Statement for signatures. Update Appendix B, Personal Protective Clothing and Equipment (PCE) to allow for commercially available and approved PCE to be worn. Update Appendix B levels of dress. Remove Pre-Operational Procedures. Incorporated minor changes and completes annual review. Updates Appendix G.

2. REFERENCES:

- a. AMC-R 350-4, Training and Certification Program for Personnel Working in Ammo Ops
- b. AMC-R 385-100, Safety Manual
- c. AMC-R 700-107, Preparation of Standing Operating Procedures for Ammunition Operations
- d. AMC-R 740-28, Toxic Chemical Munitions and Bulk Agent Inventory and Accountability
- e. AEHA Technical Guide No. 146, Pentachlorophenol-Treated Materials Handling and Disposal
- f. AR 50-6, Chemical Surety
- g. AR 200-1, Environmental Protection and Enhancement
- h. AR 385-10, The Army Safety Program
- i. DA PAM 40-173, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Mustard Agents H, HD, and HT
- j. DA PAM 385-30, Mishap Risk Management
- k. DA PAM 385-61, Toxic Chemical Agent Safety Standards
- l. DA PAM 385-64, Ammunition and Explosive Safety Standards
- m. FM 3-11.5, CBRN Decontamination
- n. FM 3-11.21, CBRN Consequence Management Operations
- o. TB 43-0142, Safety Inspection and Testing of Lifting Devices
- p. PCD Form 40-173, Site Entry Record
- q. PCD-R 40-1, Hearing Conservation
- r. PCD-R 40-21, Ergonomics Program
- s. PCD-R 40-20, Respiratory Protection Program
- t. PCD-R 50-3, PCD Site-Specific Monitoring Plan

- u. PCD-R 50-4, Equipment Decontamination Plan
- v. PCD-R 385-9 Safety, Management, Inspection, and Safe Use of Lifting Devices
- w. PCD-R40-506, Vision Conservation and Readiness Program
- x. PCD-R 385-12, Occupational Safety and Health Program
- y. PCD-R 385-507, Occupational Safety and Health Prevention of Heat and Cold Related Injuries/Illness
- z. SB 742-1, Ammunition Surveillance Procedures
- aa. SOP PU-0000-W-465, Toxic Chemical Laboratory Analytical Operating Procedures
- bb. SOP PU-0000-R-491, Near Real Time Monitoring Systems
- cc. SOP PU-0000-M-501, Protective Equipment
- dd. TM-3-220, Chemical Biological and Radiological (CBR) Decontamination
- ee. TM 3-250, Storage, Shipment, Handling and Disposal of Chemical Agents and Hazardous Chemicals
- ff. TM 3-4230-209-10, Decontamination Apparatus: Power Driven, Skid Mounted, 500 Gallon, M12A1
- gg. Flanders/CSC Installation, Operation, Maintenance & Spare Parts Manual
- hh. Interspiro 9030 Operation Instructions
- ii. Medical Management of Chemical Casualties Handbook
- jj. Mobile Personnel Decontamination System with System Upgrade Package Operations and Maintenance Manual
- kk. OASA (I&E) Memorandum, SAIE-ZX, dated 23 January 2013, Subject: Interim Guidance on Occupational Health Practices for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, GF and VX and Mustard Agents H, HD, and HT.
- ll. STEPO Technical Data Package
- mm. U.S. Army Chemical Materials Agency Letter of Instruction For Use Of The 7-inch by 27-inch Single Round Container (SRC)
- nn. U.S. Army Chemical Materials Agency Letter of Instruction For Use Of The 9-inch by 41-inch Single Round Container (SRC)
- oo. U.S. Army Chemical Materials Agency Letter of Instruction For Use Of The 12-inch by 56-inch Single Round Container (SRC)
- pp. PCD Monitoring and Inspection Compliance Plan (MICP)
- qq. PCD-R 350-400, Training and Certification Program for Personnel Working with Toxic Chemical Ammunition Operations

3. GENERAL SAFETY REQUIREMENTS:

- a. A copy of this Standing Operating Procedure (SOP) shall be available at the operation site. Supervisory personnel shall maintain copies of a complete SOP and be responsible for the enforcement of its provisions.
- b. There will be no deviation or change from this SOP without formal staffing and approval. If operational situations occur that have not been addressed in this SOP, a change will be made and approved prior to resumption of operations.
- c. Employees will not tamper with any safety devices or protective equipment.
- d. For any defect or unusual condition noted that is not covered by this SOP, field operations will stop: the Site Lead/Supervisor will report findings to the appropriate personnel: Chief, Ammo Surveillance Office (4159), the Safety and Occupational Health Office (4533), and/or the Chief, Chemical Operations (4259) to determine the corrective action prior to resuming operations.
- e. The supervisor is responsible to report all injuries and accidents occurring within their area of responsibility to the Safety and Occupational Health Office (4533) and to the Operations Center (4211). The report will first be telephonic, followed by completion and forwarding of the proper forms for the type of injury or accident.
- f. Attempts to extinguish fires in the vicinity of toxic chemical munitions may be immediately performed with available fire extinguishing materials, if the fire is in the early (incipient) stage. However, if the fire has grown beyond the incipient stage, personnel

will evacuate to a minimum distance of 450 meters or a distance equal to three magazines away from the location of the fire. The Operations Center (x4211) will be notified of the fire as soon as possible.

g. Portable equipment and hand tools used in agent operations must be identified by a permanent marking system that cannot be removed through further use in agent operations, decontaminations, or maintenance. Storage of such items should be segregated from items that have not been used in agent operations. Inventory of tools will be maintained to validate decontamination status and history.

h. The Operations Center will serve as the central control point for coordination of emergencies and will be informed of all agent operations. Operations will be coordinated with all required support organizations (medical, security, logistics, etc.).

i. Eye decontamination of liquid agent will be conducted prior to evacuation. Flush the eyes immediately with water (not soap or bleach) utilizing a 15-minute eyewash station. Supplemental eyewash will be used to supplement the 15-minute eyewash station as necessitated by the situation. If using supplemental eyewash, tilt the head first to the side before pulling the eyelids apart and pour water slowly into the eye.

j. Any agent exposure, suspected agent exposure, agent spill or release, or other abnormal situations that may result in personnel injury must be reported to supervisory personnel immediately after emergency action is taken. Personnel with possible agent exposures will report for medical evaluation as soon as possible.

k. Care will be taken to limit the potential exposure of a minimum number of personnel, for a minimum period of time, to a minimum amount of hazardous material consistent with safe and efficient operations.

l. Workers will have an unobstructed path of travel to the nearest available exit. Individuals will ensure area in immediate vicinity is clear of debris, personnel will be aware of surroundings.

m. Work locations will be maintained in a neat and orderly condition.

n. All workers will have a pre-employment and periodic physical exam and be cleared by the Competent Medical Authority (CMA) to wear Protective Clothing and Equipment (PCE)/Personal Protective Equipment (PPE).

o. Personnel who work in agent operations will report to work with their face clean-shaven to the extent that an adequate seal can be obtained and maintained between the face and the protective mask.

p. Personnel with open sores will have them evaluated at the Occupational Health Clinic (OHC) and, based on evaluation, the open wound may be treated in a manner that would allow access to chemical limited/exclusion area.

q. Personnel involved in agent operations will not wear contact lenses. Visitors and transients who would normally only don protective mask for evacuation are exempt from this requirement.

r. Eating, drinking, chewing (to include chewing tobacco), applying cosmetics (makeup, lip balm), and smoking within the Chemical Limited Area CLA are permitted only in specifically designated locations. Food, non-alcoholic beverages, chewing gum, and tobacco products may be carried through the CLA directly to buildings 492 or 475 for consumption and use during mealtime and breaks.

s. A single covered container of water or other suitable liquid replenishment and disposable cups may be located not less than 100 feet upwind from an outdoor operating site.

t. All personnel engaged in material handling operations will wear safety footwear.

u. Leather or leather-palmed gloves, safety glasses and face shield will be worn during banding operations. Leather or leather-palmed gloves will be worn when contacting munitions boxes or pallets, or when handling any other item that could cause punctures or damage to butyl gloves or the hands.

v. All hand tools shall be maintained in a good state of repair.

w. Chemical ammunition to be moved will be physically counted by inventory personnel when loaded into the Modified Ammunition Vehicle (MAV) and again upon arrival at the destination.

x. The work area will be clearly defined and access limited to authorized personnel only who have received appropriate safety training or are accompanied by someone who has been trained.

y. Work not necessary to the operation, will not be performed in the areas of agent operations.

z. Adequate operable detection equipment and materials must be maintained at all work areas. Wind-direction indicators must be provided at all areas and located so they are readily visible to area personnel.

aa. Telephones, radios, or other means of communications for advising the Operations Center of emergencies must be available at the worksite.

bb. Decontamination and first-aid equipment will be positioned at all agent operations sites. Designated personnel will be trained to operate this equipment in the event of an emergency.

cc. A vehicle suitable for patient transport will be readily available at the job site whenever operations are in progress.

dd. At each job site, one individual will be designated as the Safety Operator to assure that the equipment and supplies are available and properly positioned. The Safety Operator will monitor communications equipment, complete the Site Entry Record in accordance with form directions, and monitor time in chemical protective ensembles.

ee. A minimum of two people knowledgeable in agent exposure symptoms, self/buddy aid, and treatment must be present during agent operations. They will remain in visual contact with each other at all times

ff. All personnel working with agent will be given an off-duty telephone number to which suspected exposures can be reported.

gg. Workers will report any illness to the supervisor prior to start of daily operations or before leaving the job if the illness occurs during working hours.

hh. Operators lifting material will use proper safe handholds, assume proper lifting positions, avoid sharp objects, and avoid twisting when lifting or carrying. Employees shall not lift over 45 pounds without mechanical assistance or the use of the "buddy system".

ii. Personnel will be aware of snakes and insects while inspecting interior and exterior of structure. Use caution and be aware of hazards associated with climbing the exterior of igloo and be attentive to conditions of terrain, especially during snowy or icy conditions.

jj. Heat and flame producing items are prohibited in the (CLA) unless accompanied by the appropriate permit. The only exception is the flame photometric detector used in MINICAMS.

kk. Paint thinners, oily rags, and other highly flammable materials will be kept in approved, closed receptacles and be clearly marked.

ll. Material Safety Data Sheets (MSDSs) will be kept readily available at Building 475 and 491.

mm. When operations have been completed, all personnel will proceed to the change house (for removal of clothing and showering prior to donning personal articles of clothing). Personnel who have been in areas of possible chemical agent exposure (normally personnel downwind of an agent release or personnel who were in areas of known agent contamination) or injured will be decontaminated and quadrant monitored IAW published CMA Quadrant Monitoring policies before departing the CLA. All possible exposed workers will be immediately referred to the medical facility for medical evaluation by PCD OHC Competent Medical Authority (CMA).

nn. Proper PPE/PCE will be worn in accordance with this SOP, MSDS, or other applicable regulations and policies. All snaps, buttons, and buckles will be properly fastened while wearing PPE/PCE.

oo. Butyl rubber products that come in contact with petroleum products will be disposed of.

pp. The work rest cycle and fluid intake will be in accordance with PCD-R 385-507, Occupational Safety and Health Prevention of Heat and Cold Related Injuries/Illness and Appendix F

qq. A ground guide/spotter will be utilized during vehicles backing up and all forklift operations movements.

rr. Vehicle/Material Handling Equipment (MHE) operators will have a valid operator's permit for the particular piece of equipment being utilized either in their possession or at the change house. Seat belts will be used at all times. Forklifts will be operated in a safe manner and will not be used to transport personnel. Load backrest guard may be removed/modified only if the requirements of PCD-R 385-9 are complied with.

ss. Operators will ensure vehicles/MHE and equipment are in proper working condition and report discrepancies to supervisor. Vehicle/MHE discrepancies will be annotated on the trip ticket(s). Vehicles/MHE and equipment will not be operated until discrepancies are corrected. Any equipment found to be functioning improperly will be taken out of service/replaced until such time as it can be repaired.

tt. Type E, EE, ES, and EX rated battery-powered equipment is satisfactory for handling all classes of ammunition and explosives packed in accordance with Department of Transportation Regulations.

uu. MHE and other lifting devices will have the load rating and date of next inspection marked on them. The load rating will not be exceeded. TB 43-0142 and PCD-R 385-9 require that equipment not be used without a current inspection date.

vv. Adequate stocks of decontaminants and protective clothing required to respond to emergency situations must be maintained at the installation.

ww. Used decontaminating solutions will be collected, sampled and packaged IAW the PCD Hazardous Waste Management Plan and stored in a hazardous waste storage site.

xx. Workers may enter an agent area unmasked to perform static operations (i.e., visual inspection without handling or touching the rounds, containers, or pallets) if the storage igloo is being monitored with near real time monitors and the results indicate the agent concentration is below the set alarm level. First entry monitoring also will be completed prior to operations.

yy. Normally, only two operators may enter an igloo to perform first entry operations. An additional operator may enter the igloo when being trained on-the-job. Transient personnel may enter during first entry operations only when they have a need such as DAIG, SMR, and local safety and QA inspectors.

zz. Low level monitoring with MINICAMS will be conducted in accordance with SOP PU-0000-R-491 the entire time that operators are in the structure.

aaa. Lightning protection and storm warning response procedures will be conducted in accordance with the Installation Emergency Management Plan.

bbb. For operational efficiency, multiple operations may be scheduled simultaneously for a given open door location. However, only similar operations (i.e. Storage Monitoring Inspection (SMI), Inventory, and Magazine Inspection) may be conducted simultaneously inside the storage location. All other operations (to include Distal Line Challenges and IDS checks) will be sequenced such that no two dissimilar operations will be conducted inside the storage location at the same time.

ccc. Approvals for deviation, waivers, and exemptions' of standards addressed in this SOP will adhere to DA PAM 385-30 and PCD's Risk Management, System Safety Engineering Management Plan.

ddd. For life threatening situations involving non leaker operations, personnel in Level C3 can render assistance for emergency escape only.

eee. Operator personnel limits stated for each operation in this SOP apply to all personnel inside or outside the storage structure that are required to perform the operation.

fff. An "operator" will be defined as a person that is assigned to an operating area permanently or intermittently to perform a specific task, checkpoint, or function as required or defined in a SOP. A "transient" is a person who has official business or interest in an operation, but is not performing work to a specific operational procedure. Transient personnel will include official visitors, supervisors, oversight personnel, or other interested parties that are not performing a function as delineated in a SOP.

ggg. Real time physiological monitoring is required when utilizing impermeable ensembles Level A, B, C1, C2, D1 or any impermeable apron or suit (with or without a mask) that is determined to significantly inhibit evaporative cooling in ambient temperatures above 60 degrees F, or when ambient temperatures are predicted to be above 60 degrees F during operations requiring physiological monitoring. Real time physiological monitoring may also be required at temperatures below 60 degrees F at high work rates when high levels of metabolic heat are being generated by the employee.

4. ENVIRONMENTAL CONSIDERATIONS:

a. General Requirements: Consideration must be given to controls when performing operations which affect air, soil, surface water, and ground water. The environmental office must verify that specific requirements and limitations are met. Limitations and restrictions contained in those documents will be put into an environmental portion of the local SOP. Storage and disposition of wastes will be in compliance with Resource Conservation and Recovery Act (RCRA) and associated Federal and State regulations. Violation of these laws is subject to severe criminal penalties.

b. Emission Control: Operations should be planned to eliminate or restrict, to an acceptable minimum, any procedures that would produce residues or emissions hazardous to health or environment. Residues created must be disposed of by a safe and environmentally acceptable means.

c. Technical Assistance: Technical assistance with respect to these health and environmental restrictions can be obtained from the Environmental Office, Pueblo Chemical Depot, ext. 4201.

OPER NO: 1 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

OPERATIONS FORMAT

A. STANDING OPERATING PROCEDURE FOR Chemical Operations B. OPERATION NO. 1
 C. BAY NO. N/A
 D. SOP NO. PU-0000-M-486 DATE: 12 Apr 65
 E. REV NO. 35 DATE: _____
 F. CHANGE NO. _____ DATE: _____

G. OPERATION: Site Setup
 H. EXPLOSIVE LIMITS: UNITS Igloo Limits EXPLOSIVE LBS. Igloo Limits
 I. PERSONNEL LIMITS: OPERATORS Various TRANSIENTS: Various
 J. _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Change clothes as appropriate.	1a. (O) Personnel will pick up the level of protective clothing required for the operation at the change house. Specific assignments and corresponding protective clothing levels will be made by the chemical supervisor-in-charge. 1b. (O)(S)(QC) Personnel will inspect their protective clothing for defects, such as missing buttons, broken snaps, tears, etc. Defective items will be returned to the change house attendant and replacement items obtained.
2.	Site Setup.	2a. (O)(QC) Position chemical warning signs on the road to the east and west of the igloo in which operations are to be performed to establish the operation area. For operations on the end of a row, place one warning sign on the road at the intersection with the crossroad, the other at the opposite side of the igloo.

OPER NO: 1 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
2.	Site Setup. (con't)	2b. (O) Position the following at the operational site: See Paragraph L.
3.	Specific duties of the Safety Operator	3a. (O) Monitor and respond to radio calls for the operational site. 3b. (O)(S) Screen all personnel entering the work area (See SPECIAL REQUIREMENTS). 3c. (O)(S) All personnel will surrender their chemical badge to the Safety Operator at the van upon entering each storage location and will collect their badge upon exiting each location after completing all required operations inside the storage structure. 3d. (O)(S) Safety Operator at the van will maintain Site Entry Record, PCD Form 40-173 (latest version). Record all data per site entry form instructions. Record potential exposure time for each person between their first entering the igloo and upon exiting the igloo following completion of their activities. Origi PCD Form 40-173 will be sent through the Laboratory to annotate monitoring results, completed forms will be sent to the installation Safety Office. The Safety Office will process the forms IAW PCD-R 385-12.
	CAUTION: Safety Operator will have Level C1 protective clothing available for use. See Appendix B for definition of Levels of Dress.	
	NOTE: Do not white out or obliterate entries; line through erroneous entry <u>1</u> time, initial or sign, and annotate correct entry	
	NOTE: Safety Operator at the Van and the Lead /Supervisor will be separate individuals; one will not perform the functions of the other. The Lead /Supervisor is responsible for the overall coordination of activities and operational oversight.	
4.	Remove King Tut block.	4. (O) Utilize a 6,000 lb (or over) gas/diesel forklift to remove King Tut block.
	CAUTION: Personnel will don protective mask when approaching within 14 feet of ventilators of an "unmonitored" chemical storage site IAW PCD-R 385-12.	
	NOTE: Care will be exercised when removing the King Tut block and when opening the doors to avoid disturbance of insects or snakes. The King Tut block will be in a position that will not preclude a direct and clear path for personnel to escape from the igloo and/or operations on the apron to the egress vehicle(s).	
5.	Remove Locks.	5a. (O) Chemical Operations and Security personnel, wearing gloves (i.e. butyl, leather, or other suitable work glove) will remove locks and return upwind. 5b. (O) Proceed to appropriate operation.

K. SPECIAL REQUIREMENTS:

1. For operations involving leaking, handling, transport or movement of munitions the Mini Hot-Line will be set up IAW Appendix A. For other operations, the equipment to set up the Mini Hot-Line will be available at the operation site but remain in a standby status.

2. It is advisable to enter igloo operations from the upwind side. The Safety Operator may grant permission to enter unmasked

OPER NO: 1 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

from the downwind side if air monitoring results do not indicate presence of agent.

3. Once monitoring of the igloo has been conducted IAW SOP PU-0000-R-491, personnel may approach igloo unmasked and remove lock from the door if low level monitoring results are negative (verify results from RTAP operator). Gloves (i.e. butyl, leather, or other suitable work glove) must be worn when removing lock.

4. All personnel present at the operation site must ensure that mobile radio transmissions are not made inside/near of the RTAP since interference with the equipment is possible. Required radio communication will be accomplished at least 10 ft away from the RTAP. 5. Two Type 10BC or ABC fire extinguishers will be placed on both sides of the apron (one on each side) near the door during loading and unloading of chemical munition operations.

6. Operators must perform and complete the applicable portion of the "Chemical Operation Section – Inspection Checklist" (MICP, Appendix B., Table Ib.) at least monthly. During open door operations, operators will complete the "Daily During Chemical Operations" (MICP, Appendix B., Table Ia.) portion of the checklist for each storage structure entered during the day in accordance with the MICP.

L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES.

ITEM	QUANTITY	SPEC/DWG	NSN
Warning Signs	As Required	Locally Procured	N/A
First Aid Kit	As Required	Locally Procured	N/A
Step Pans	As Required		8135-00-852-8178
Brushes	As Required		7920-00-234-9317
Sponges	As Required		7920-00-559-8464
Liquid Soap	As Required		7930-00-968-1527
Portable Eyewash Units, Capable of 15 minutes dispensing time	2 Each	NIIS	
Sodium Hypochlorite (5% nominal)	As required		6810-00-598-7316
Backboard	1 Each	Locally Procured	N/A
Blanket	2 Each	Locally Procured	
Plastic Containers for Protective Clothing	As Required		7240-00-000-0001
Plastic Bags	As Required		8105-01-195-8730
Plastic Sheets	As Required	Locally Procured	
Portable Shower	1 Each	Locally Procured	N/A
Flashlights	2 Each	Locally Procured	Various
Fire Extinguishers, Type ABC	2 Each	Locally Procured	
Audible Alarm	1 Each	Locally Procured	N/A
Igloo Stick	1 Each	Locally Procured	N/A
M8 Detector Paper (2 Lots)	As Required		6665-00-050-8529
Radios	As Required	Locally Procured	N/A
Forklift, 6,000 Lb (or over)/Gas/diesel	1 Each	Locally Procured	N/A
Forklift, 2,000 Lb (or over)/Electric (E, EE, ES OR EX)	As Required	Locally Procured	N/A
Safety Glasses	As Required	Locally Procured	
Hearing Protection	As Required	Locally Procured	
Ladder (fiberglass/aluminum)	As Required		
Wheel Chocks	2 Each	Locally Fabricated	
Leather/Leather Palmed Gloves	As Required	Locally Procured	N/A
Bottle, Insecticide Sprayer	1-gal min	Locally Procured	N/A
1000 CFM Portable Filtering Units	As Required	Locally Procured	
Defibrillator	As Required	Locally Procured	
Liquid Spill Kit	As Required	Locally Procured	
RTAP/MINICAMS support	As Required	Locally Procured	
Bottled water	As Required	Locally Procured	
Metal Tongs	1 Each	Locally procured	

OPER NO: 2 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

OPERATIONS FORMAT

A. STANDING OPERATING PROCEDURE FOR Chemical Operations B. OPERATION NO. 2
 C. BAY NO. _____ IGLOO No. _____
 D. SOP NO. PU-0000-M-486 DATE: 12 Apr 65
 E. REV NO. 35 DATE: _____
 F. CHANGE NO. _____ DATE: _____

G. OPERATION: First Entry Monitoring (FEM)

H. EXPLOSIVE LIMITS: UNITS Igloo Limits EXPLOSIVE LBS. Igloo Limits

I. PERSONNEL LIMITS: OPERATORS 6 TRANSIENTS: 2

J.

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Prior to Entry. NOTE: All operators will be trained in the proper donning/doffing of PCE/PPE.	1a. (O)(S)(QC) Prior to entry, monitoring will be performed IAW SOP PU-0000-R-491. Monitoring results will be verified prior to approaching the igloo. 1b. (O)(S) The Site Lead/Supervisor will conduct an "All Hands" safety brief for personnel involved in operations prior to entry of the first location by the team. The Site Lead/Supervisor will assure that a STAR card/form is completed to document the "All Hands" briefing. Each attendee will sign the STAR card/form indicating their attendance. 1c. (O)(S) If near real time (NRT) monitoring results are below the Reportable Limit (RL), personnel may enter the structure in Level C3 (see Appendix B). 1d. (O)(S) If NRT monitoring results indicates a potential detection of mustard agent at or above the RL, the RTAP operator will notify the site Lead/Supervisor and notify the Operations Center (OC) IAW SOP PU-000-R-491. The RTAP Operator will perform agent confirmation IAW SOP PU-0000-R-491 and notify the site Lead/Supervisor and the OC of the results. If agent is confirmed through monitoring, follow procedures in Operation 6 through 12, as appropriate. If inustard agent is not confirmed, resume normal operations.

FEB 26 2014

OPER NO: 2 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
2.	Open Igloo Door.	<p>2a. (O) Verify that Security personnel have called the SSCC (Post 5) and deactivated the IDS.</p> <p>2b. (O) Operator, along with Security personnel, will unlock the igloo door. Using the igloo stick, Operator will open the igloo door.</p> <p>2c. (O) The Safety Operator will notify the OC when entry is made</p>
3.	Perform Visual Inspection.	<p>3a. (O) Operators will visually inspect stationary sampling lines for damage. Operators will ensure that sample lines are placed in accordance with PCD-R 50-3; Sample line 1 (front) will be positioned approximately 20 feet from the igloo door and approximately 5 feet from the floor down the center/main aisle. Sample line 2 (rear) will be positioned approximately 20 feet from the rear of the igloo and approximately 8 feet from the floor down the center/main aisle.</p> <p>WARNING: PERSONNEL MUST PAY CAREFUL ATTENTION TO THE CONDITIONS OF AMMUNITION STACKS WHILE INSPECTING THE INSIDE OF THE IGLOO.</p> <p>3b. (O) Both operators will proceed to the rear of the igloo and conduct a thorough visual inspection of the igloo and its contents for evidence of contamination, leakage or hazardous conditions (peeling, discolored, or blistered paint, or the presence of liquid). Using a flashlight, operators will inspect each accessible item of the stacks while maintaining visual contact with each other. Operators will thoroughly inspect igloo floor for evidence of liquid. Repeat this procedure until the entire igloo has been inspected. If no visual indication contamination or leakage is noted, the igloo will be considered clear and the OC will be notified that the igloo is "clear".</p> <p>3c. (O) If operators visually observe excessive rodent droppings they will report observation to Site Lead/Supervisor and a clean-up operation will be scheduled. See SPECIAL REQUIREMENTS.</p> <p>NOTE: H-series agents act as solvents on most paints, causing the paint to peel, dissolve, or discolor, which may indicate leakage of these agents.</p>
4.	Verify Suspect Liquid.	<p>4a. (O)(S) If the visual inspection reveals suspect liquid without a MINICAMS alarm, personnel will immediately exit the igloo and close the door. Personnel (wearing Level C1 PPE/PCE, minimum) will re-enter and test the suspected liquid with M8 paper. If confirmed agent, personnel will exit the igloo, close and secure door and process through the Mini Hot-Line. Filter emplacement operations will be conducted IAW Operation #9.</p> <p>4b. (O)(S) In the event the MINICAMS alarms, the RTAP operator will immediately sound the alarm, operators will exit the igloo, close the door, and wait for confirmation on the hot side. If the MINICAMS alarm is confirmed, operators will process through the Mini Hot-Line.</p> <p>Note: M8 paper will be maintained with two different lots and handled IAW MSDS. Ensure M8 paper shelf life is not expired.</p> <p>NOTE: Isolation, decontamination, containerization, and transportation of leakers will be performed IAW Operations 3,7-12 of this SOP.</p>
5.	Close and Secure Igloo.	<p>5a. (O)(S) Prior to igloo door being closed the two operators assigned as the first entry team will proceed to the rear of the igloo and conduct a thorough visual inspection of the igloo to ensure all personnel have exited the igloo. Operators will report findings to the Site Lead/Supervisor.</p>

OPER NO: 2 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
5.	Close and Secure Igloo. (con't)	5b. (O)(S). Notify assigned key control personnel to replace locks. Inform Security that operations are complete.
		5c. (O)(S) Using a 6,000 lb. or over forklift, MHE personnel will place King Tut block in position. Once completed Site Lead/Supervisor will report completion to the Safety Operator at the van.
	NOTE: Safety Operator at the van will ensure both the exposure log is annotated with the exit time for all personnel that entered the igloo and a positive check has been made that all badges have been returned to the appropriate personnel.	5d. (O)(S) Safety Operator at the van will then notify the OC, by phone or radio, that igloo is clear, secured and King Tut has been replaced and that operations are complete.

K. SPECIAL REQUIREMENTS:

1. Transient personnel may enter during first entry operations only when required by DAIG-CSI, Chemical Surety Management Review (CSMR), local inspections, or training.
2. Operator will spray rodent droppings with bleach and let soak for 20 minutes prior to removal. Bag all droppings and seal bag, prior to placing in an enclosed outdoor container. A minimum of Level D2 with a NIOSH full-face respirator with P100 filters and organic vapor cartridges will be required during these clean up operations.
3. Operators must perform and complete the monthly portion of the "Chemical Operation Section – Inspection Checklist" (MICP, Appendix B., Table Ib.) at least monthly. During open door operations, operators will complete the daily portion (MICP, Appendix B, Table Ia.) of the checklist for each storage structure entered during the day in accordance with the MICP.
4. Personnel inside an igloo/exclusion area will comply with the two man rule at all times.
5. Prior to entering the change house for lunch or breaks, all Topological Agent Protective (TAP) clothing used in Toxic Chemical Material (TCM) operations will be removed and left at the work site, outside the Change House, or in the aeration room. At the completion of the day's operation, protective clothing worn during first entry monitoring, and not subjected to agent liquid or vapor contamination, will be aerated for at least 12 hours prior to reuse. This protective clothing will be laundered once every three months as a minimum, IAW DA PAM 385-61. Protective clothing worn in known or suspected agent contaminated areas will be handled IAW Operation 10.

L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES. (See Operation 1, Paragraph L)

OPER NO: 3 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

OPERATIONS FORMAT

A. STANDING OPERATING PROCEDURE FOR Chemical Operations B. OPERATION NO. 3
 C. BAY NO. N/A
 D. SOP NO. PU-0000-M-486 DATE: 12 Apr 65
 E. REV NO. 35 DATE: _____
 F. CHANGE NO. _____ DATE: _____

G. OPERATION: **Storage, Handling, and Transport Procedures**

H. EXPLOSIVE LIMITS: UNITS Igloo Limits EXPLOSIVE LBS. For Truck:
 UNITS (Truck) 300 210 - 4.2 INCH 90 -105MM
 300 160 - 155MM
 192

I. PERSONNEL LIMITS: OPERATORS 16 TRANSIENTS: 6

J.

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Prepare for operation. NOTE: Operator and Transient personnel limits will be applied individually at the shipping and receiving igloo.	1a. (O)(S) At both the shipping and receiving igloo, set up a Mini Hot-Line (Appendix A) and perform First Entry Monitoring IAW Operation 1 and 2 of this SOP. Continuous monitoring of both sites will be performed IAW SOP PU-0000-R-491. 1b. (O)(S) A mobile secondary hot-line (Appendix A) with a minimum of two operators will be on standby inside the CLA, (if operators are not available for standby, the secondary hot-line will be setup prior to beginning of operation) but remain outside the temporary exclusion area for current operation. In the event of a chemical accident/incident the mobile unit will be deployed a minimum of 450 meters up wind from the accident/incident. Lead/Supervisor on site will determine set-up location based upon the hazard analysis and current weather conditions. 1c. (O) Inventory personnel will initiate DA Form 4508 and provide planographs for both origin and destination locations. 1d. (O)(S) Establish a temporary exclusion area for loading/unloading operation large enough to accommodate a vehicle used to transport the munition item and all operations incident to the movement.
	NOTE: An area with controlled access in and out is sufficient for establishment of an exclusion area.	

OPER NO: 3 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Prepare for operation. (con't)	<p>1e. (O)(S)(QC) The Ammo Surveillance will verify that the MAV has a current inspection using DD Form 626 (or equivalent) prior to loading the ammunition.</p> <p>1f. (O)(S) Turn off motor vehicle ignition of MAV. Set parking brake and chock wheels.</p>
	<p>NOTE: On-post movement of surety materiel within the Chemical Limited Area (CLA) will be accomplished by at least two Chemical Personnel Reliability Program (CPRP) certified personnel.</p>	
	<p>NOTE: Driver of munitions laden vehicle must have CDL w/ HAZMAT endorsement and valid DOT medical certificate.</p>	
2.	Material handling/storage practices.	<p>2a. (O)(S)(QC) Operators handling wooden pallets or boxes will wear leather or leather-palmed gloves over their butyl gloves. When operators come in contact with agent filled munitions, boxes, pallets, or DOT bottles, operator will wear Level D1. The forklift operator and MAV driver/passenger will wear minimum of Level D2.</p>
	<p>CAUTION: Operators will follow procedures outlined in Appendix D of this SOP when working with or in the vicinity of PCP treated pallets or boxes.</p>	
	<p>CAUTION: Spotter/ground guides will be utilized during all TCM forklift movements. Forklift Operators will inspect the forklift prior to use and ensure that equipment is in proper working order prior to use.</p>	
	<p>WARNING: PALLETS REMOVED FROM STACKS OR TRUCK WILL BE LOWERED IMMEDIATELY.PALLETIZED AMMUNITION WILL BE LOWERED TO APPROXIMATELY 6 INCHES FROM THE FLOOR PRIOR TO MOVEMENT.</p>	<p>2b. (O)(S)(QC) Inspect pallets/box prior to handling to ensure they are not damaged due to wood rot, missing planks. Ensure rope lifting handles are serviceable prior to use. Make sure any and all slip/trip/fall hazards are cleared from work path.</p> <p>2c (O)(S)(QC) Motor vehicle operators (MVO) will wear Level D2 PPE in the absence of agent readings above the RL. MVOs will have Level C1 readily available when loading/transporting TCM.</p> <p>2d. (O)(S) Store item(s) IAW current ammunition storage drawings. Individual lots will be consolidated into the fewest number of magazines possible. There will be only one less than full (light) box and/or pallet (unit) per lot, except for 155mm ammunition. Light boxes/units will be located with the rest of the lot, in the most visible portion in the magazine possible (i.e., on the aisle and as near the door as possible). Light boxes/units will be marked with orange paint and stenciled. Light boxes will only be in the top layer and visible from the aisle.</p> <p>2e. (O)(QC) Verify and identify items by NSN and Lot Number as required on DA Form 4508 (Ammunition and Transfer Record). Inventory Personnel will physically count TCM and verify lot numbers whenever loaded onto or unloaded. Maintain lot integrity at all times.</p>

FEB 26 2014

OPER NO: 3 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
2.	Material handling/storage practices. (con't)	2f. (O) Inventory personnel will be present for all TCM movements to ensure that all DA Form 4508 and Magazine Data cards are accurate and complete. They will also perform a physical count at the origin and destination. Verification criteria will include, but is not limited to: Stock Number, Lot Number, Condition Code, Quantity, and signatures of operation personnel. Inventory personnel will grid igloos (transferring and receiving) and place magazine data card on stack or appropriate item.
3.	Modified Ammo Vehicle (MAV)—Load/Unload.	3a. (O)(S) Appropriate fire symbol and chemical hazard symbol(s) will be placed on each side of MAV as soon as items are loaded.
	NOTE: Spotter/ground guides will be utilized during all TCM motor vehicle movements.	
	WARNING: WHEN CROSS MEMBERS ARE NOT IN A POSITION TO SECURE THE LOAD, A POSITIVE STOP WILL BE INSTALLED ON THE CONVEYOR ROLLERS.	3b. (O)(S) Remove fire symbol and chemical hazard symbols from MAV when last pallet is unloaded.
	WARNING: PALLETS WILL NOT BE DOUBLE STACKED.	3c. (O) Pallets/skids (on drip pans) will be transferred to/removed from MAV by forklift.
	CAUTION: When transporting individually boxed munitions, such as treaty tagged samples, the boxes will be loaded on pallets and secured with a minimum of two tie-down straps or bands; a blocked/braced wooden box may be used in place of pallet.	3d. (O)(S)(QC) Ammunition will be secured sufficiently to preclude movement.
	CAUTION: MAV is a rolling exclusion area.	3e. (O)(S)(QC) The loading supervisor, MVO, and Ammo Surveillance will verify that the load is adequately secured prior to closing and securing the door.
		3f. (O)(S) Close and secure doors when loading or unloading is completed.
		3g. (O)(S) The two-man rule applies during movement. The speed of loaded MAV will be limited to 15 mph within the CLA. Vehicles will not be operated on off-road surface. Corners (90 degrees) are taken at no more than 5 miles per hour MAV lights will be turned on and flashing.
4.	MAV NRT Monitoring/Leaker Isolation.	4a. (O)(S) Prior to opening the rear door and unloading, the MAV will be monitored IAW SOP PU-0000-R-491. If monitoring results are below the RL; open door and continue with the operation.. If monitoring of the MAV results in confirmed agent readings above the RL during any phase of this operation, proceed to Step 4b.
		4b. (O)(S)(QC) Disconnect the monitoring line from the MAV. The leaker segregation will be performed in the MAV .

OPER NO: 3 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
4.	MAV NRT Monitoring/Leaker Isolation. (con't)	4c. (O)(S)(QC) Personnel in Level C2 at a minimum will connect 1000 CFM Filter to the MAV and the igloo, if necessary,
	NOTE: Ensure the make-up air inlets are open prior to conducting filter operations.	
	NOTE: Personnel may wear safety shoes in lieu of butyl boots when connecting 1000 CFM Filter to igloo.	
	WARNING: PERSONNEL WILL MAINTAIN SITUATIONAL AWARENESS AND STAY CLEAR OF THE REAR EDGE OF THE CARGO AREA TO AVOID FALLING OUT OF THE VEHICLE.	4d. (O)(S)(QC) After a minimum of 30 minutes of filtering, the MAV will be NRT monitored to assure that filtering has lowered the readings as much as possible prior to opening the vehicle. The filter unit will remain running until leaker containment has been performed or the pallets have been moved to another location under engineering controls. Steps will be positioned at the rear of the MAV to allow personnel to access the cargo area. Once personnel are in the cargo area, remove the steps to allow the forklift access to the munitions.
		4e. (O)(S)(QC) Personnel in appropriate level of dress (PCE/PPE) will start leaker segregation in the MAV by placing plastic over each pallet (or bundle/2 pallets for 155 mm pallets). If there is evidence of a liquid leaker (liquid on the item or in the drip pan), place a plastic bag over the pallet/bundle and place a flat piece of plastic on the ground at the rear of vehicle to prevent the spread of contamination. Set the pallet/bundle on the plastic. Move forklift and secure the bottom piece of plastic to the sides of the plastic bag, previously placed over the pallet/bundle, utilizing duct tape. Re-position the forklift to pick up the pallet, puncturing the plastic only where necessary and move to the filtered igloo.
		4f. (O)(S)(QC) Operators will place a piece of plastic on the floor of the igloo. Move the enshrouded pallet/bundle(s) into the igloo and place them upon the plastic sheet on the floor. Inspect the plastic enshrouding the pallet/bundle for any holes or openings caused by the movement. Duct tape will be placed over any holes or or openings. Segregation and containerization of the leaking round(s) will be performed IAW Operation 8. Re-position the steps at the rear of the MAV, after the munitions have been removed from the vehicle, to allow easy exit of personnel.
	NOTE: Ensure personnel process thru the Mini Hot-Line when operation is complete.	4g. (O)(S)(QC) Once the leaking round(s) is/are containerized, it/they will be moved/stored in a permitted storage structure.
5.	Close and secure igloo.	5. (O) Close and secure igloo in accordance with Operation 2, step 5.

FEB 26 2014

OPER NO: 3 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
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K. SPECIAL REQUIREMENTS: If attaching a 1000 CFM Filter to a magazine where monitoring indicates a negative presence of agent (such as for training purposes) personnel may perform this operation in level D2 and avoid processing thru the step pans.

L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES. (See Operation 1, Paragraph L)

OPERATIONS FORMAT

A. STANDING OPERATING PROCEDURE FOR **Chemical Operations** B. OPERATION NO. 4
 C. BAY NO. Igloo Storage Site
 D. SOP NO. PU-0000-M-486 DATE: 12 Apr 65
 E. REV NO. 35 DATE: _____
 F. CHANGE NO. _____ DATE: _____

G. OPERATION: **Intrusion Detection System (IDS) Test**

H. EXPLOSIVE LIMITS: UNITS Igloo Limits EXPLOSIVE LBS. Igloo Limits
 I. PERSONNEL LIMITS: OPERATORS 7 TRANSIENTS: 3

J.

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Intrusion Detection System, Semi-Annual Inspection. NOTE: IDS personnel may wear Level D2 with 7 mil butyl gloves.	1a. (O)(S) The Interior IDS Semi-Annual Inspection requires entry into the igloo. Ensure that Operations 1 and 2 have been accomplished prior to entry. 1b. (O)(S)(QC) Personnel entering igloo will wear a minimum of Level D2 protective clothing, provided NRT monitoring with negative results is performed IAW SOP-PU-0000-R-491. 1c. (O) IDS Inspections will be performed by Public Works personnel using their own internal guidance. 1d. (O)(S)(QC) Material in storage will not be moved, handled or touched by personnel in this operation.
2.	IDS, 1-1/4", for Quarterly and After Maintenance Inspections. NOTE: Level C3 is required for this inspection. Personnel will don protective masks within 14 feet of doors and ventilators of an unmonitored igloo.	2. (O)(S)(QC) The quarterly and after maintenance inspections require simply opening the igloo door approximately one and one quarter inches and waiting for the alarm to go off to validate the IDS. Igloo monitoring is not required for the 1-1/4" IDS operation because no entry into the igloo is made. 1 1/4" inspections may be performed by trained TMH personnel.
3.	Close and secure igloo.	3. (O) Close and secure igloo in accordance with Operation 2, step 5.

OPER NO: 4 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
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K. SPECIAL REQUIREMENTS: N/A

L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES. (See Operation 1, Paragraph L)

OPER NO: 5 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

OPERATIONS FORMAT

A. STANDING OPERATING PROCEDURE FOR B. OPERATION NO. 5

Chemical Operations C. BAY NO. Bldg. 491, Receiving and VCC

D. SOP NO. PU-0000-M-486 DATE: 12 Apr 65

E. REV NO. 35 DATE: _____

F. CHANGE NO. _____ DATE: _____

G. OPERATION: **Verification Inspection of Vapor Containment Chamber (VCC)**

H. EXPLOSIVE LIMITS: UNITS 8 EXPLOSIVE LBS. 64 LBS.
BOXES: 4

I. PERSONNEL LIMITS: OPERATORS 14 TRANSIENTS: 6

J.

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Preparation of Bldg. 491/VCC.	1a. (O)(S)(QC) Verify with Ammo Surveillance Office that Bldg. 491 has a current Lightning Protection System (LPS) inspection and bonding checks have been performed IAW SOP PU-0000-R-376. 1b. (O)(S) Post personnel and explosive limits in the bay(s) and in the VCC. 1c. (O)(S)(QC) Verify that the backup generator is operable.
	CAUTION: If power is lost while munitions are present in Bldg. 491, personnel will evacuate the building until power is restored (by main power source or generator) and proper monitoring is re-established.	
	NOTE: Prior to the initial start of operations, assure the Industrial Hygiene Office has verified that the primary and backup ventilation systems are operating within established airflow parameters.	1d. (O)(S)(QC) Operators will ensure the VCC is turned on and operational daily prior to the start up of the operations. A ribbon will be placed in the front of the VCC vent to provide visual verification of the ventilation system's operational status.

OPER NO: 5 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 216 2011

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Preparation of Bldg. 491/VCC. (con't) CAUTION: Work tables will be equipped with side ledges to prevent munitions from rolling off of the table.	1e. (O)(S)(QC) Verify that all necessary MHE, tools, supplies & equipment are on hand, serviceable and set up. (Specifically including but not limited to, internal and/or external decontamination stations, drip pans, inspected single round containers (SRC) for possible leakers, containers to dispose of any possible solid/liquid contaminated waste/dunnage, conductive flooring, fire extinguishers, grounding equipment.) Verify that necessary emergency shower and eye wash capability is present at operation site. 1f. (O)(S)(QC) If required, ensure Rapid Deluge System daily operational checks are completed and the unit is operational (follow "Power Up" procedures IAW SOP PU-0000-R-468, Appendix H). 1g. (O)(S)(QC) Verify presence of Medical Support Personnel prior to start of operations. Medical support personnel will wear identification vests while in PPE/PCE to facilitate ease of identification. 1h. (O)(S) A 1000 CFM will be pre-positioned and installed as an emergency back-up filter system. 1i. (O)(S)(QC) Verify portable wind socks positioned outside of Bldg. 491 are readily visible from building exits. 1j. (O)(S)(QC) Using the Operational Checklist (SOP PU-0000_R-468, Appendix G), operators at each work station will verify all required items are present and work station is ready for operations. Operations Lead/Supervisor will conduct a final walk thru of worksite and, using the checklist, verify all pre-operational checks have been completed. 1k. (O)(S) Prior to start of operations, Operations Lead/Supervisor will conduct a Safety briefing. All personnel (to include Medical, Inventory and Security) involved must be present for the briefing. At a minimum, the briefing will include: <ol style="list-style-type: none"> 1. An overview of the operation. 2. Transportation routes for the movement of the rounds from storage and to Bldg. 491 and back to storage. 3. Location of decontamination station(s). 4. Rally points. 5. Chemical and fire evacuation routes. 6. Level of PCE/PPE required. 7. Medical monitoring requirements and use of physiological heart rate monitors.

FEB 26 2014

OPER NO: 5 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
2.	Transport selected Munitions/Samples.	<p>2a. (O)(QC) Verify that Operations 1 and 2 have been completed. Inventory personnel will prepare the DA Form 4508 to transfer samples to and from Bldg. 491. Samples will be transported IAW Operation 4.</p> <p>2b. (O)(S)(QC) Tag samples to be inspected; include the storage location on the tag or box to ensure rounds are returned to the proper storage location after inspection. Transport only enough samples for 4 hours work. Samples, in support of a Treaty Inspection, will be selected by the Treaty Inspection team.</p>
3.	Receive Munitions/Samples at Bldg. 491.	<p>3a. (O)(S) Post appropriate fire and chemical symbols on Bldg. 491 prior to positioning the vehicle in the receiving bay.</p> <p>3b. (O)(S) Building 491 will be considered an exclusion area whenever TCM are present in the building. Access to Building 491 will be controlled through the use of Security guards and barricades.</p> <p>CAUTION: Ensure two person rule is maintained within established exclusion areas.</p> <p>3c. (O) When the MAV is positioned in the receiving bay and the engine is turned off, all doors to the outside of Bldg 491 will be closed.</p> <p>WARNING: MAV DOOR WILL BE CLOSED AFTER EACH AMMUNITION SAMPLE IS REMOVED.</p> <p>3d. (O)(S)(QC) Position the MAV vehicle in the receiving bay in such a way that the monitoring lines can be attached to the monitoring ports of the MAV. Turn off the engine, chock the wheels, place two ABC fire extinguishers at rear of the MAV, and monitor the vehicle prior to opening the cargo door. All monitoring will be performed IAW SOP PU-0000-R-491.</p> <p>CAUTION: All doors to bldg 491 will be closed during operations (exception: one door maybe propped open just enough to be used to allow monitoring line access to the building). Door to monitoring room will be closed during operations.</p> <p>3e. (O)(S) If NRT monitoring results in readings above the RL, immediately sound the chemical alarm system and evacuate personnel out of the immediate area, process through the mini hot line (See Appendix A) as needed, and notify pertinent supervisory personnel and the Operations Center.</p> <p>NOTE: If a positive MINICAMS reading is obtained from the monitoring of the MAV, the 1000 CFM filter unit will remain in operation for a minimum of 30 minutes prior to opening the MAV.</p> <p>3f. (O)(S) If agent readings are confirmed, operators in Level C1 will attach the 1000 CFM filter to the MAV IAW Operation 3, verify that the make-up air inlets are open, and operate to reduce the concentration level.</p>

FEB 26 2014

OPER NO: 5 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
3.	Receive Munitions/Samples at Bldg. 491. (con't)	<p>3g. (O)(S) Operators, in appropriate level of dress will move the munitions from the MAV to VCC for leaker isolation and/or containerization IAW Operation 8, of this SOP.</p> <p>3h. (O)(S) If negative NRT monitoring readings are obtained, open the cargo door of the MAV.</p> <p>3i. (O)(QC) Inventory and Ammo Surveillance personnel will ensure that NSN, LOT Number, and quantities received match the DA Form 4508. The same information must be verified prior to returning the ammunition to storage.</p> <p>3j. (O) Remove munitions from the vehicle (one box/container at a time) and place on pallet. Close MAV cargo door. With a forklift or pallet jack, move the pallet to the east end of VCC. Single boxes of munitions (i.e. 4.2" or 105mm) will be carried to the unpack area utilizing the two person lift/carry process. Lift boxes with both hands on caring ropes.</p>
	<p>CAUTION: Operators handling munitions/boxes will wear Level D1 and leather or leather-palmed gloves over butyl rubber gloves when handling wooden boxes and/or banding. Non-participating personnel will wear Level D2 protective clothing as long as NRT monitoring is conducted continuously in accordance with SOP PU-0000-R-491.</p>	
4.	Unpack Munitions/Samples.	<p>4a. (O)(S) When cutting banding, one operator, wearing leather or leather-palmed gloves, and face shield, and safety eye wear (if unmasked) will secure the band being cut to keep the banding from cutting protective clothing. Remove banding and/or seals, as applicable, and place bands/seals in the metal scrap container.</p> <p>4b. (O)(S) BOXED: Position one box of munitions sideways on worktable (NOT facing operators) and gently tip over until fiber containers slip out of box on to the lid. If boxes are end opening type, position box on table so rounds do not exit box towards operators. A speed wrench may be used to release the end wing nut. Inspect visible end of fiber container then remove using a pair of tongs. Pull fiber container from box and place fiber on table. Set box aside until needed for repack. Place fiber containers in tray/pan and push via the roller conveyor into the VCC. PALLETIZED: After cutting and removing banding from the pallet and removing munitions from the box, place munitions (one or two at a time) in tray/pan and push via the roller conveyer into the VCC.</p>
	<p>NOTE: Banding, boxes and fibers will be considered as "Never Been Contaminated", if there is no alarm from MINICAMS during operations. Non contaminated lead seals will be collected and turned over to Environmental Management Office (EMO) for disposition.</p> <p>WARNING: WHILE OPENING BOXES AND REMOVING ROUNDS BE ALERT FOR SIGNS OF AGENT LEAKAGE (E.G. EXUDATE, WET SPOTS ON FIBER CONTAINER, DETERIORATED FIBER ETC.). ENSURE MUNITIONS ARE POSITIONED OVER THE TABLE OR CONVEYOR AT ALL TIMES.</p>	
5.	VCC Operation.	<p>5a. (O)(S) Rounds in Fiber Containers: Carefully remove tape and place tape in trash container. Pull fiber container lid a sufficient distance to access the vent hole for air sampling. If a vent hole is not present in the fiber container, remove the lid just enough to gain access for a vapor test.</p>
	<p>CAUTION: There must be at least 2 operators inside VCC with the doors closed and the filter unit running prior to samples entering the VCC.</p> <p>NOTE: Operators in the VCC will wear Level C1 at a minimum.</p>	

OPER NO: 5 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
5.	VCC Operation. (con't)	<p>5b. (O)(S) Place opened fiber container/munition in tray/pan and place cover/lid for monitoring. Monitor tray for one MINICAMS cycle. Monitoring personnel will notify VCC personnel visually of sample start/stop time and monitoring results.</p> <p>5c. (O)(S)(QC) If a MINICAMS alarm occurs, evacuate the building to the Mini Hot-Line and notify supervisory personnel to evaluate the situation. If there is no reading, proceed with Step 6.</p>
6.	Visual Inspection.	<p>6a. (O) For 105mm rounds: remove lid on projectile end of fiber container and inspect for signs of agent leakage. Special attention will be paid to the fuze end of the round. One operator will hold the projectile base while the other removes the fiber container with cartridge case</p> <p>6b. (O)(S) For 4.2 Inch Rounds: Over the worktable, raise fiber to allow projectile to slide out carefully. For 4.2-inch mortars, retain any loose propellant and remove the round just far enough to verify the markings and check for leaks, keeping the base inside the container lid to protect the primer.</p> <p>6c. (O)(S)(QC) Visually inspect the projectile for signs of leakage, such as corrosion, paint deterioration, etc. Test suspect areas with M8 paper. If positive results are obtained, confirm with MINICAMS (with different column) and prepare for containerization. If agent presence is not confirmed, proceed to the next step.</p> <p>6d. (O)(QC) If inspection is in support of a Treaty Inspection,, position projectiles in such a way that the inspectors can see the round and its markings from outside the VCC window. Proceed to next step once inspectors are satisfied. Once visual inspection is completed, ensure round is placed back into fiber (if round was in a fiber). Place rounds (and fiber lids if present) in tray and send to station 3 outside the VCC for repack.</p>
7.	Station 3 - Repack Munitions/Samplings.	<p>7a. (O)(S) BOXED: Transfer empty box from unpack area to Station 3. Repack round in its fiber container, tape fiber leaving at least a 1" pull tab, and place back in the original box and close lid.</p> <p>7b. (O) Repeat the steps as necessary for the remainder of rounds.</p> <p>7c. (O)(QC) Operators will apply a seal and banding to each box and place on pallet or cart. Open MAV cargo door. With a forklift, pallet jack, or ammunition cart, return the boxes to the MAV.</p>

WARNING: LEVEL A MUST BE WORN IF LIQUID IS PRESENT.

WARNING: OPERATORS HANDLING WOODEN BOXES AND/OR BANDING WILL WEAR LEATHER OR LEATHER-PALMED GLOVES OVER BUTYL RUBBER GLOVES.

OPER NO: 5 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

7. Station 3 - Repack Munitions/Samplings. (con't) 7d. (O)(QC) Operators will place the boxes that have been inspected in a drip pan at the rear of the MAV.

CAUTION: Operations conducting banding operation will wear safety glasses and a face shield.

- 7e. (O)(QC) Repeat the steps as necessary for the remainder of the boxes in the MAV, being careful each time to select boxes that have not been inspected previously.
8. Return Munitions/Samples to storage. 8a. (O)(S)(QC) Return the rounds to appropriate storage location IAW Operation 3 of this SOP.
- 8b. (O)(QC) Inventory personnel will verify the rounds are returned to proper storage locations. Check the sample tag on the box to ensure box is returned to proper storage location.

K. SPECIAL REQUIREMENTS:

1. Verify that the back-up generator for Building 491 is switched to the auto position when preparing to conduct operations in the VCC.

2. Personnel in the same room/bay where boxes or munitions are present, with no duties requiring handling the boxes or munitions, may wear Level D2 protective clothing as long as NRT monitoring is performed IAW SOP PU-0000-R-491. Transient Personnel within the building, but not in the room/bay where boxes or munitions are being handled, may wear a Non-Chemical Worker level of dress.

L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES. (See Operation 1, Paragraph L)

ITEM	QUANTITY	SPEC/DWG	NSN
Band Cutter	As Required	Locally Procured	
Band Stretcher	As Required	Locally Procured	
Band Crimper	As Required	Locally Procured	
Banding	As Required	Locally Procured	
Seals	As Required	Locally Procured	
Seal Crimper	2 Each	Locally Procured	
Diagonal Cut Pliers	1 Each	Locally Procured	
Tape, Pressure Sensitive, Plastic, Black OR	As Required	8135-00-823-8073	MIL-T-43036
Tape, Cotton, 2 In., Olive Drab	As Required	7510-00-266-5016	
Strap Wrench	As Required		
Monitoring Tray	As Required	Locally Procured	
Speed Wrench	As Required	Locally Procured	
Pallet Jack	1 Each		
Pallet	As Required		
Leather-Palmed Gloves	As Required		
Metal Scrap Container	1 Each		
Trash Container	1 Each		
Level D1,2	As Required		
Level C1,2,3	As Required		
Face Shield	As Required		
Identification Vests	As Required		

OPER NO: 6 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

OPERATIONS FORMAT

A. STANDING OPERATING PROCEDURE FOR B. OPERATION NO. 6

Chemical Operations C. BAY NO. N/A

D. SOP NO. PU-0000-M-486 DATE: 12 Apr 65

E. REV NO. 35 DATE: _____

F. CHANGE NO. _____ DATE: _____

G. OPERATION: Detection Actions Taken – Vapor Leaker

H. EXPLOSIVE LIMITS: UNITS Igloo Limits EXPLOSIVE LBS. Igloo Limits

I. PERSONNEL LIMITS: OPERATORS Various TRANSIENTS: Various

J.

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Real Time Analytical Platform (RTAP) obtains a positive reading while monitoring a structure.	1a. (O)(S) The Monitoring Systems Operator will sound the alarm and notify the Operations Center (OC) by radio IAW SOP PU-0000-R-491; operations personnel will mask immediately. 1b. (O)(S) Verify ALL personnel at work site are masked.
	NOTE: If an RTAP Operator confirms the presence of agent at or above the RL, the RTAP Operator will monitor the passive filter units attached to the location at the mid-bank for potential breakthrough IAW with SOP PU-0000-R-491.	1c. (O)(S) If operators are inside the igloo, evacuate the structure and close doors. Evacuate upwind to the location of the Mini Hot-Line and contact the OC.
2.	Perform personnel decontamination using the Mini Hot-Line.	2a. (O)(S) For routine operations, Mini Hot-Line (Appendix A) may have been set up prior to the start of operations IAW Operation 1. If not, Mini Hot-Line should be set up by the field crew for conducting this operation.
	NOTE: Step #2 is applicable only for personnel inside the storage structure during open door operations. It is not applicable if performing headwall monitoring of closed storage structures	2b. (O)(S) Upon exiting the igloo, process through two step pans positioned at site. Decontaminate gloves and boots (concentrating on soles), using a scrub brush provided in the first pan containing bleach. Rinse off decontaminant in the next pan containing water.

OPER NO: 6 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
2.	Perform personnel decontamination using the Mini Hot-Line. (con't)	2c. (O)(S) Proceed to the Mini Hot-Line and decontaminate PCE/PPE (boots, gloves, apron, hood) using a common garden weed spray tank with bleach.
	WARNING: CARE MUST BE TAKEN TO PREVENT LIQUID FROM ENTERING THE PROTECTIVE MASK CANISTER. PERSONNEL WILL COVER INLET VALUE OF CANISTER WHILE BEING DECONTAMINATED.	
		2d. (O)(S) Flush PCE/PPE using soapy water.
		2e. (O)(S) Boots & gloves will be water rinsed in third step pan. Apron & hood will be water rinsed utilizing the portable shower, starting from head and methodically working down.
	WARNING: DO NOT PERMIT POTENTIALLY CONTAMINATED PCE/PPE TO COME IN CONTACT WITH INDIVIDUAL'S SKIN.	
		2f. (O)(S) Upon rinse completion, remove all Butyl (TAP) PCE/PPE and cross hot-line.
		2g. (O)(S) Contact supervisor to determine the next course of action.
3.	Filter emplacement.	3a. (O)(S) Monitoring personnel will provide confirmation of agent detection in accordance with SOP PU-0000-R-491.
		3b. (O)(S) If detection is confirmed, 1000 CFM filter unit will be attached to vent stack IAW Operation 9, this SOP.
4.	Leaker isolation and containerization.	4. (O)(S) Leaker isolation and containerization will be conducted IAW Operation 8 of this SOP.

K. SPECIAL REQUIREMENTS:

- Monitoring Systems Operator will immediately notify the Operations Center (OC) by radio, IAW SOP PU-0000-R-491, with readings above the action level.
- Personnel will be trained in hot line procedures prior to conducting operations. Following decontamination procedures, decontaminated protective clothing and equipment will be placed into plastic bags and sealed in accordance with Operation 10 for subsequent monitoring.

L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES. (See Operation 1, Paragraph L)

ITEM	QTY REQD	SPEC NO./DWG NO.	MCSN/NSN
Radios, portable	As Required	Various	
Lights, portable	As Required	Locally procured	
Audible alarm/siren	As Required	Locally procured	
Personnel Vehicle	As Required		
PCE	As Required	MIL-C-2181	See TM 10-8415-210
Step Pans	As Required	Locally procured	
Forklift, 6000 lbs. or over	1 Each		
Shower unit or water truck w/shower	1 Each	Locally procured	
Warning signs	As Required	Various	Locally furnished
Brushes/Sponges	As Required		
Eyewash station	As Required		

OPER NO: 6 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES. (See Operation 1, Paragraph L)

ITEM	QTY REQD	SPEC NO./DWG NO.	MCSN/NSN
5% Hypochlorite solution (bleach)	As Required		
Liquid Soap			
M8 detector paper	As Required		

FEB 26 2014

OPER NO: 7 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

OPERATIONS FORMAT

A. STANDING OPERATING PROCEDURE FOR B. OPERATION NO. 7

Chemical Operations C. BAY NO. N/A

D. SOP NO. PU-0000-M-486 DATE: 12 Apr 65

E. REV NO. 35 DATE: _____

F. CHANGE NO. _____ DATE: _____

G. OPERATION: Detection and Actions Taken – Suspect Liquid

H. EXPLOSIVE LIMITS: UNITS Igloo Limits EXPLOSIVE LBS. Igloo Limits

I. PERSONNEL LIMITS: OPERATORS 6 TRANSIENTS: 2

J.

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Suspect liquid found during FEM.	1a. (O)(S) The Safety Operator will notify the Operations Center (OC) that a visual detection of a suspect liquid has been made. 1b. (O)(S)(QC) Personnel inside the structure will immediately exit, verify negative vapor monitoring results with RTAP operator, and then prepare for liquid identification/confirmation.
2.	Confirm presence of agent.	2a. (S)(O)(QC) If vapor monitoring results are negative, two operators dressed in Level C1 will re-enter the igloo. Using M8 paper, ascertain presence of agent by dabbing M8 paper into the suspect liquid. A color change to deep red indicates the presence of mustard. 2b. (O)(S) If agent is confirmed, exit the structure and process through Mini Hot-Line Leaker isolation and containerization will be conducted IAW Operation 8 of this SOP.
3.	Exit the structure.	3. (O) Close and secure igloo.
4.	Filter emplacement.	4. (O)(S) 1000 CFM filter unit will be attached to vent stack IAW Operation 9, this SOP.

NOTE: If NRT monitoring of the suspect liquid is negative but the M8 paper returns a positive result, the liquid found is agent.

NOTE: Used M8 paper and metal tongs will be placed in the first pan, containing bleach for decontamination.

OPER NO: 7 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
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K. SPECIAL REQUIREMENTS: (See Operation 1, Paragraph K)

L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES. (See Operation 1, Paragraph L)

FEB 26 2014

OPER NO: 8 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

OPERATION FORMAT

A. STANDING OPERATING PROCEDURE FOR Chemical Operations B. OPERATION NO. 8
 C. BAY NO. N/A
 D. SOP NO. PU-0000-M-486 DATE: 12 Apr 65
 E. REV NO. 35 DATE: _____
 F. CHANGE NO. _____ DATE: _____

G. OPERATION: Leaker Isolation and Containerization

H. EXPLOSIVE LIMITS: UNITS Igloo Limits EXPLOSIVE LBS. Igloo Limits

I. PERSONNEL LIMITS: OPERATORS 14 TRANSIENTS: 4

J.

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Prepare for isolation and containerization. Note: Personnel will receive training and hands on practice wearing Level A and/or B PCE prior to using in actual operations. Note: SCBA systems will be inspected monthly to assure units are serviceable.	1a. (O)(S) Contact EMO to obtain two 55-gallon drums and position the drums nearby – one for solid waste and another for liquid waste. 1b. (O)(S) Shrouds will be prepared prior to isolation operation. The size and quantity of shrouds required will depend on the igloo layout and ammunition configuration.

OPER NO: 8 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	<p>Prepare for isolation and containerization. (con't)</p> <p>CAUTION: Each operator is responsible for inspecting his/her protective clothing. Inspect visually for discolorations, holes, tears and loose/corroded buttons and buckles. Operators will physically check their SCBA respiratory systems to ensure that the system is operating properly.</p> <p>WARNING: THE BUDDY SYSTEM WILL BE USED TO MONITOR AIR SUPPLY. IF THE RESPIRATORY SYSTEM ALARM ENGAGES THE INDIVIDUAL WILL IMMEDIATELY EXIT AND PROCESS THROUGH THE DECONCINATION STATION. BACKUP, FULLY CHARGED CYLINDERS WILL BE ON-SITE FOR IMMEDIATE USE IF REQUIRED.</p>	<p>1c. (O)(S) Operators involved in isolation, removal, decontamination, or containerization of leakers must wear proper PCE/PPE (Appendix B). Prior to the start of any operation, the level of protection required will be determined based on monitoring levels, current weather and use scenario.</p>
2.	<p>Site Preparation for Leaker Isolation and Containerization.</p>	<p>1d. (O) Assure a suitable vehicle is available for operation (step van, passenger van, etc.)</p> <p>2a. (O)(S) Verify that all applicable steps of Operations 1 and 2 have been completed prior to visual leaker inspection.</p> <p>2b. (O)(S) A mobile secondary hot-line (Appendix A) will be set up a minimum of 450 meters up wind from the leaker location. Lead/Supervisor on site will determine location of secondary hot-line based upon the hazard analysis and current weather conditions. A minimum of 2 operators with radio communication will remain on standby within the CLA and provide immediate response to the secondary hot-line in case of an accident/incident.</p> <p>2c. (O)(S) Establish a temporary exclusion area with controlled access in and out. The area will be large enough to accommodate activities.</p> <p>2d. (O)(S) Continuous monitoring will be performed while operators are performing duties in the structure, IAW DA PAM 385-61 and SOP PU-0000-R-491.</p>
3.	<p>Leaker Isolation.</p> <p>CAUTION: Operators may enter storage magazines to render emergency assistance (if required) to entry personnel provided the operator(s) are wearing as a minimum level C1 PCE, entry is of a short duration and personnel will conduct decontamination processes upon exit.</p>	<p>3a. (O)(S)(QC) An inspection of the material in storage will be conducted to the maximum extent possible without re-warehousing in an attempt to visually locate the source of contamination. Packaged items will be closely scrutinized for peeling, discolored, or blistered paint.</p>

OPER NO: 8 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
3.	<p>Leaker Isolation. (con't)</p> <p>CAUTION: While conducting shrouding, extra caution will be used while accessing stacks and pallets. If climbing ladders to drape plastic, the buddy system will be used. Only trained personnel will perform shrouding/draping procedures.</p> <p>NOTE: Vapor leaks will not be decontaminated.</p>	<p>3b. (O) If during visual inspection the leaking item cannot be located, individual stacks, pallets, or items will be shrouded for additional localized monitoring.</p> <p>3c. (O) Individually shrouded stacks, pallets, or items will be monitored using low-level monitoring to locate area(s) with elevated readings.</p> <p>3d. (O) Once the "hot stack" is located, the affected items will first be visually re-inspected, segregated (if necessary), re-shrouded as necessary and monitored individually to further isolate the source of the leak.</p> <p>3e. (O)(S)(QC) Once the leak is located, decontaminate only if it will reduce the spread of liquid contamination or reduce the potential for personnel exposure during containerization. A heavy-grade plastic bag, 4-mil or thicker, may be used as an interim drip container for leaking liquid chemical agent.</p>
4.	<p>Prepare the igloo interior for containerization.</p> <p>NOTE: Empty SRC will not be left in igloo. SRC will be moved into structure only when containerization is imminent.</p> <p>NOTE: A third step pan for drying off may be necessary if decontamination of rounds adjacent to the leaker is deemed appropriate.</p>	<p>4a. (O)(S) Place a sheet of plastic on the floor large enough to accommodate any potential spills resulting from containerization. Set prepared Single Round Container (SRC) nearby.</p> <p>4b. (O)(S) Place two step pans containing bleach and water to be used to decontaminate rounds (if necessary) next to each other and surround with spill pillows/pads to minimize runoff. Place additional two step pans containing bleach and water just inside interior of igloo for operators to wash boots and gloves prior to exiting igloo.</p>
5.	<p>Containerization.</p> <p>NOTE: Ammo Surveillance Office will issue the SRC to be used in the operation. Verify that the single round container has been visually inspected, maintained, and leak tested within 90 days.</p> <p>NOTE: Ammo Surveillance Office will be responsible for the visual inspection and testing of the SRC at the scheduled intervals and prior to use, when required.</p>	<p>5a. (O)(QC) Obtain SRC, tools and supplies required to over-pack the leaking item. Remove additional closure bolts and lock washers from within the container and retain with gasket. Replace container cover. Install only two closure bolts and lock washers (diametrically opposed) and hand tighten for transporting to the operations site. Mark the SRC with Leaker label information IAW Appendix D and attach a DD Form 1577-2 to the lid. Label information and prepared DD Form 1577-2 will be provided by Surveillance Branch personnel.</p> <p>5b. (O)(S) If palletized, carefully remove pallet containing leaker from the stack using electric forklift. Move pallet to the containerization area. Forklift tines will be at a height of approximately 6 inches from floor during movement of the munitions</p>

OPER NO: 8 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
5.	Containerization. (con't) NOTE: Operators handling banding or dunnage will wear leather-palmed gloves over butyl gloves. If possible, based upon level of PCE, face shield will be worn when handling banding during unmasked operations.	5c. (O)(S) Remove banding from pallet/box and place in 55 gallon drum – decontaminate if necessary.
6.	155MM Projectile Containerization. NOTE: For 155MM, the grommet shall be removed prior to over-packing unless the possibility of spreading the contamination presents a greater hazard. Grommets will be managed as hazardous waste. NOTE: The SRC and container cover represent an as-assembled unit. Operators should take precautions to ensure that the as-assembled, as-tested configuration is maintained. Both the container flange and flange cover are serial numbered to aid in maintaining the unit. NOTE: Be careful to record all pertinent information regarding the round, and particularly which serial number SRC it is placed in. This information is needed for the Leaker Report. Verify serial numbers of lid and container body are the same. NOTE: Multiple torque wrenches pre-set at 20-foot pounds, 40-foot pounds, and 60-foot pounds may be used.	6a. (O)(QC) Obtain and prepare SRC (9" X 41") for use. 6b. (O) Remove pallet top and place into a plastic bag for later monitoring. 6c. (O)(QC) Visually check rounds for any signs of leakage or abnormal conditions. If no liquid can be detected, bag each round, wait for vapor buildup time (determined by laboratory), and then monitor individually IAW SOP PU-0000-R-491. Confirm HD liquid IAW Operation 7. 6d. (O)(S)(QC) Once the leaking munition is isolated, place the leaking round into a SRC overpack. See SPECIAL REQUIREMENTS. 6e. (O)(QC) Remove the container closure bolts, lock washers, and container cover and set them aside on clean plastic. Place container cover with machined mating surface facing up. Verify that the gasket is properly installed on the container; ensure that the gasket does not get pinched or is twisted during lid installation. 6f. (O)(QC) Place leaking projectile upright (DO NOT DROP) in container. Retrieve container cover, lock washers, and closure bolts. Use cover handle to align bolt-holes in the cover with holes in the container body flange. Install all closure bolts, lock washers, and tighten with ratchet wrench/speed handle. 6g. (O)(QC) Using a calibrated torque wrench set at 20-foot pounds, tighten the bolts in the torque sequence shown on the lid. Set the torque wrench to 40-foot pounds and tighten the bolts in the same torque sequence. Finally, set the torque wrench to 60-foot pounds and tighten the bolts in the same torque sequence. 6h. (O)(QC) Place a plastic bag over the lid of the container leaving sufficient air inside for MINICAMS sampling.

OPER NO: 8 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
6.	155MM Projectile Containerization. (con't)	<p>6i. (O)(S) SRC headspace will be monitored to verify absence of agent vapors (see below special requirements). If agent is detected re-torque SRC bolts. If this fails, removed the cover and check to see that the O-ring is properly seated. If not properly seated or damaged, replace the O-ring. If this fails, prepare to overpack the container using a 12" X 56" SRC.</p> <p>6j. (O)(S) For pallets with a liquid leaker, decontaminate adjacent rounds by placing them in the step pan with bleach and scrubbing exterior surface; leave in the pan for five minutes to allow the chemical breakdown to occur.</p> <p>6k. (O)(S) Flush decontaminated rounds with water in the second pan.</p> <p>6l. (O)(S) Place "clean" rounds in the third pan to dry.</p> <p>6m. (O)(S) Shroud "clean" rounds in a plastic bag and place sample line for MINICAMS monitoring.</p>
7.	Reconfigured 105MM rounds (stored without propellant and cartridge case) Containerization.	<p>7a. (O)(QC) Obtain and prepare SRC (7" X 27") for use.</p> <p>7b. (O) Repeat steps 6b through 6m including notes (except for grommets).</p>
8.	Boxed 105 MM projectile and 4.2-inch rounds Containerization.	<p>8a. (O)(QC) Obtain and prepare SRC (7" X 27") for use.</p> <p>8b. (O) Visually check wooden boxes for any signs of leakage or abnormal conditions. If no liquid can be detected, bag each box, wait for vapor buildup time (determined by laboratory), and then monitor individually. Confirm HD/HT liquid IAW Operation 7.</p> <p>8c. (O)(S) Once the leaking munition can be isolated to an individual box, segregate the box from the others and prepare to open.</p> <p>8d. (O)(S) Open the wooden box and visually inspect for any signs of leakage. If none are found, commence to shroud each fiber container for low-level monitoring.</p> <p>8e. (O)(S)(QC) <u>Boxed 105MM</u>—The propellant and cartridge case should be separated from the 105MM projectile whenever possible and the projectile and cartridge case should be containerized separately.</p>

NOTE: Once the wooden box with the leaker is identified, and depending on the circumstances of the leak (agent concentration, liquid vs. vapor, condition of inner packaging, etc.), treating both rounds as leakers and overpacking them might be the best option and should be discussed as an alternative, pending HQ approval.

WARNING: IF REMOVAL OF THE 105MM EXPLOSIVE COMPONENTS PRESENTS UNNECESSARY DANGER, LEAVE IN PLACE AND CONTAINERIZE. ENSURE DOCUMENTATION REFLECTS THAT EXPLOSIVE COMPONENTS WERE LEFT IN PLACE.

FEB 26 2014

OPER NO: 8 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
8.	Boxed 105 MM projectile and 4.2-inch rounds Containerization. (con't)	<p>8f. (O)(S)(QC) Monitor energetic components IAW SOP PU-0000-R-491 and then package separately from the round in an approved container noting lot number and any other relevant identification.</p> <p>8g. (O)(S) <u>Boxed 4.2"</u>—Isolate leaking munition down to the individuals fiber container(s) without opening the fiber. Leaking munitions will be placed nose end up in the overpack container without removing the fiber, propellant or ignition cartridge. Annotate records to fully identify the packaging configuration of the containerized cartridge.</p> <p>8h. (O)(S) Once the leaking munition is isolated, place the leaking round into a 7" X 27" SRC</p> <p>8i. (O) Repeat steps 6b through 6m including notes (except for grommets).</p>
9.	Overpacks/DOT Bottles. CAUTION: The containers of previously overpacked items will not be opened during operation.	<p>9a. (O) Visually check over-packs/DOT bottles for any signs of leakage or abnormal conditions. If no liquid can be detected, bag each item wait for vapor buildup time (determined by laboratory), and then monitor individually. Confirm HD/HT liquid IAW Operation 7.</p> <p>9b. (O)(S) Overpacks determined to be leaking agent vapor will be placed in a 12" X 56" SRC. DOT bottles will be placed in a 7" X 27" SRC or a 9" X 41" SRC (depending on size of DOT bottle).</p> <p>9c. (O) For overpacks/DOT bottles repeat steps 6d through 6i including notes (except for grommets).</p> <p>9d. (O)(S)(QC) Select appropriate lifting device and safety cap. Attach the lifting device to the forklift.</p> <p>9e. (O)(S) Re-warehouse as necessary to accommodate operations. Place one or more empty SRCs in the center aisle.</p> <p>9f. (O) Place a box pallet (egg crate) for over-packed leaking items in the vicinity of the SRCs.</p> <p>9g. (O)(S)(QC) Place the appropriate lifting device over the desired propelling charge container. Hand-tighten by turning the lifting device turn bar in a clockwise direction. Verify that the clamp arms are in snug contact with the exterior of the propelling charge container body assembly. DO NOT OVER TIGHTEN.</p> <p>9h. (O)(S)(QC) If using lifting boom, position the boom so that the boom hook is located vertically over the lifting device. Slowly lower the boom and attach the boom hook to the lifting device hook. Verify that the hook is firmly attached.</p>
	CAUTION: Ensure there is sufficient space available for containerizing leaking overpacks.	

FEB 26 2014

OPER NO: 8 SOP NO: PU-0000-M-486 REV 35 CHG DATE

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
9.	Overpacks/DOT Bottles. (con't)	9i. (O)(S)(QC) Slowly lift the propelling charge container from the box pallet unit. When the propelling charge can has been lifted above the sides of the box pallet, install the appropriate safety cap on the bottom of the propelling charge container. Verify proper placement of the safety cap.
	WARNING: AN OPERATOR WILL CONTINUOUSLY OBSERVE THE CONTAINER AS IT IS BEING WITHDRAWN FROM THE BOX PALLET UNIT. IF THE CONTAINER IS DAMAGED TO THE EXTENT THAT SAFE ACCOMPLISHMENT IS QUESTIONABLE, IT WILL BE LOWERED BACK INTO THE BOX PALLET UNIT. CONTINUATION OF OPERATIONS WILL BE ASSESSED BY A SUPERVISOR DESIGNATED BY THE COMMANDER TO MAKE THE DECISION TO CONTINUE WITH THE LIFT.	
	CAUTION: Extreme care should be taken to prevent damaging machined mating surfaces during overpack operations.	9j. (O)(S)(QC) Slowly lift the propelling charge container until it comfortably clears the flange of the overpack container.
		9k. (O)(S)(QC) Position the propelling charge container over the opened overpack container.
	WARNING: THE SAFETY CAP WILL NOT BE REMOVED IF THIS PROPELLING CHARGE CONTAINER IS SEVERELY DETERIORATED AND ITS REMOVAL MIGHT CAUSE THE PROPELLING	9l. (O)(S)(QC) Remove the safety cap. If the safety cap is not removed, report the serial number of the container involved to Ammo Surveillance personnel.
	WARNING: CHARGE CONTAINER TO FALL BEFORE IT CAN BE PLACED IN THE OVERPACK. THE SAFETY CAP IS DESIGNED TO BE CONTAINERIZED WITH THE PROPELLING CHARGE CONTAINER, IF NECESSARY.	9m. (O)(S)(QC) Lower the propelling charge container into the overpack container until there is no tension on either the boom hook or the lifting device hook.
		9n. (O)(S)(QC) Disengage the lifting device from the propelling charge container by rotating the turn bar counter-clockwise.
		9o. (O)(S)(QC) Remove the lifting device from the propelling charge container and set aside.
		9p. (O)(S)(QC) Retrieve container cover, lock washers, and closure bolts. Align bolt holes in the cover with holes in the container body flange.
	CAUTION: Ensre that the gasket does not get pinched or is twisted dnring lid installation.	9q. (O)(S)(QC) Install all closure bolts, lock washers, and tighten with ratchet wrench/speed handle

OPER NO: 8 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
9.	Overpacks/DOT Bottles. (con't)	9r. (O)(S) Torque and monitor the SRC in accordance with steps 6g - 6i of this operation.
10.	<p>Secondary Waste Decontamination.</p> <p>NOTE: Liquid wastes generated as a result of operations (decontamination solutions, step pans, etc) will be collected and packaged into a 55 gallon drum appropriately lined and rated for liquid containment. Liquid wastes will be classified through an extraction sampling process IAW SOP-0000-R-491 and transferred to liquid hazardous waste storage.</p> <p>NOTE: All solid secondary wastes will be containerized by placing waste inside of plastic bags and sealing plastic bags in appropriate manner (tape, ties, etc). Plastic bags will be placed into appropriate overpack/drums and sealed prior to transferring to storage. An alternative is to line the secondary waste drums with plastic bags prior to placing the waste into the drums. Solid secondary wastes will be heated to at least 70 degrees F for a minimum of 4 hours prior to final monitoring and characterization.</p>	<p>10a. (O)(S) Secondary waste (i.e. wood, plastic, grommets, banding, PCE, decon solution etc.) will be monitored prior to decontamination process. Solid Waste monitored to levels greater than 1 Vapor Screening Level (VSL)/ 1STEL (0.003mg/m³) will require decontamination; waste monitored to levels less than or equal to 1VSL will be containerized and placed in permitted hazardous waste structure. Contents of each container will be listed and reported to EMO along with the corresponding container number and monitoring results.</p> <p>10b. (O)(S)(QC) Secondary waste above 1VSL will be submerged in a decon solution for a minimum of 10 minutes; rinsed thoroughly in a water solution; and allowed to dry overnight prior to monitoring.</p> <p>10c. (O)(S)(QC) Dry secondary waste will be placed in plastic bags and monitored after adequate vapor build-up time (determined by laboratory) is achieved.</p> <p>10d. (O)(S) Secondary waste monitored to levels less than 1 VSL will be containerized and placed in permitted hazardous waste structure; waste monitored to levels above 1VSL will be re-deconned IAW Steps 10b – 10c.</p> <p>10e. (O)(S)(QC) Steps 10b – 10c will be repeated a maximum of two additional times in an attempt to obtain a monitoring level of less than 1VSL.</p> <p>10f. (O)(S) Secondary waste monitored to levels greater than 1VSL after 3 decon processes will be containerized and placed in permitted hazardous waste structure.</p>
11.	Close and secure igloo.	11a. (O)(S) Site Lead will notify assigned key control personnel to replace locks, Inform SSCC (Post 5) by phone or radio that operations are complete.

FEB 26 2014

OPER NO: 8 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
11.	Close and secure igloo. (con't)	<p>11b. (O)(S) Using a 6,000 lb. or over forklift MHE personnel will place King Tut block in position. Once completed Site Lead will report completion to the Safety Operator at the van.</p> <p>11c. (O)(S) Safety Operator at the van will then notify the OC, by phone or radio, that igloo is clear, secure and King Tut has been returned and that operations are complete.</p>

K. SPECIAL REQUIREMENTS:

1. Stack shrouding and air monitoring is a crucial part of a systematic approach to leaker isolation. The time required for vapor to accumulate underneath shrouding may vary significantly, as factors such as the initial agent reading, weather conditions, and ammunition configuration (i.e. stack, pallet, boxes, or individual rounds) will affect the time of accumulation. The time allowed for accumulation will be determined on a case by case basis in conjunction with PCD laboratory personnel taking all factors into consideration. An elevated reading is not the only criteria used for further isolation; it is also contingent on a sustained reading that in comparison to other monitored like-items is elevated. With sufficient vapor build-up time, accurate concentration variations will effectively isolate down to one leaking munition.

2. Other than interim drip bags, material, such as water, decontaminating solution, sand, or vermiculite, will NOT be placed in overpack containers with leaking munitions. Interim plastic drip bags may be used with liquid leaks. When drip bags are present, care must be taken to avoid tearing or catching bags between gasket and flanges during packaging.

3. Container preparation should be performed in a dry environment, protected from adverse weather conditions. It should NOT be performed by individuals dressed in butyl rubber protective clothing. Prepare container(s) prior to transport to overpack operations site.

4. If the container or container cover is dropped or tipped over, during over pack operations, replace with another container with cover. The dropped container and container cover will require a visual inspection and leak test by the Surveillance Branch prior to use. The two items are an as-assembled, as-tested unit.

5. Adequate space must be provided to allow egress of workers in the igloo.

6. Restrain the container(s) from movement, minimizing the potential for worker injury and limiting the possibility of damaging machined mating surfaces. The container should be in an upright position to facilitate removal and replacement of the cover.

7. The SRC incorporates two cleaned and preserved mating surfaces, one on the lid and one on the container flange. Damage to the sealing surfaces could jeopardize agent containment capability. During loading operations, the container lid is removed and placed away from the immediate work area, flange side up, to afford protection from abrasion to the flange surface.

8. Extreme care should be taken to prevent damaging machined mating surfaces during overpack operations.

9. The Letter of Instruction for the 7" X 27" SRC is the only LOI that mentions lock washers with closure bolts. If the 9" X 41" and/or the 12" X 56" SRCs have lock washers, install with the closure bolts.

10. DO NOT use impact wrenches or power tools to tighten or loosen SRC bolts. If cover handle is not sufficient to hold container during tightening, use of a strap wrench may be necessary or else the container may be strapped to a rigid fixture to prevent movement during tightening.

11. Verify that all MHE and lifting devices have received required periodic inspection and/or load tests, as applicable. Because a forklift becomes "modified" with the addition of a propelling charge lifting device, approval from the forklift manufacturer is required. This manufacturer may require additional modifications and/or a new data plate. This approval must be documented and filed with the forklift maintenance records. For load and functional test purposes the lifting device is part of the forklift and the two items will be tested as a unit. The addition of the lifting device may affect the stability and/or center of gravity of the forklift (See CFR 1910.178, Appendix A).

12. Ammo Surveillance Office personnel will record the container serial number that is located on the flange and the flange cover, on the DSR card and inspection documentation.

13. Operators will use proper lifting techniques when removing munitions from pallets; when placing leakers in the containers; and when handling the single round containers. After sliding the leaker into the single round container, slowly raise the open end of the container to allow the round to gently contact the container bottom.

FEB 26 2014

OPER NO: 8 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

14. Supervisor will ensure that all personnel assigned to toxic chemical operations, are trained IAW AMC-R 350-4 and local containerization procedures and have read, or had read to them this and all other applicable SOP's and understand the contents thoroughly.

L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES.

ITEM	QTY REQD	SPEC NO./DWG NO.	MCSN/NSN
Lights, portable	As Required	Locally procured	
Radios, portable	As Required	Various	
Communications Equipment	As Required	Locally procured	
Audible alarm/siren	As Required	Locally procured	
Physiological heart rate monitor	As Required	Locally procured	
Personnel Vehicle	As Required		
Pallets/Dunnage	As Required	Various	
Boxes (Ammo)	As Required	Various	
Overpack			
7" by 27" SRC (for 105mm and 4.2" munitions)	As Required	Dwg S727001 thru S727009	
9" by 41" SRC (for 155mm and 8" munitions)	As Required	Dwg ACV00655	
12" by 56" SRC (for Secondary Over-pack)	As Required	Dwg ACV 00649	
Interspiro 9030 SCBA	As Required	See operating instructions	
PCE	As Required	MIL-C-2181	See TM 10-8415-210
Tape, Pressure Sensitive (Duct Tape)	As Required		7510-00-074-4955
Clear plastic bags (lrg & xlrg)	As Required	Locally procured	
Clear plastic for shrouding	As Required	Locally procured	
Secondary Containment Pool	1 Each		
Step Pans	As Required	Locally procured	
Shower unit or water truck w/shower	1 Each	Locally procured	
Forklift, 6000 lbs. or over	1 Each		
Steel strapping, 1½"	As Required	QQ-S-781	8135-00-283-0671
Steel strapping, 3/4 "	As Required	QQ-S-781	
Band cutters	As Required		5110-00-223-6281
Steel strapping stretchers	As Required		3540-00-278-1250
Steel strapping crimpers	As Required		
Hand tools	As Required	Various	Locally furnished
Warning signs	As Required	Various	Locally furnished
Leather palmed gloves	As Required	MIL-G-2366	8415-00-268-7869
Torque wrench	As Required		
Brushes/Sponges	As Required		
Eyewash station	As Required		
5% Hypochlorite solution (bleach)	As Required		
HTH	As Required		
Stretcher	As Required		
M8 detector paper	As Required		
Flashlights, explosive proof	As Required	MIL-F-3747	
Fire Extinguisher, Type 10BC or ABC	2 Each		
DD Form 1577	As Required		
SDS Form 959-R	As Required		
Ladder	As Required		
Forklift, Electric, Type (E, EE, ES, or EX)	As Required		
1000 CFM Filter Unit	1 Each		
Lifting Device	1 Each		
Spill pillows/pads	As Required		
55 gal drums	2 Each		
95 gal drums	As Required		

FEB 26 2014

OPER NO: 9 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

OPERATIONS FORMAT

A. STANDING OPERATING PROCEDURE FOR B. OPERATION NO. 9Chemical Operations C. BAY NO. N/AD. SOP NO. PU-0000-M-486 DATE: 12 Apr 65E. REV NO. 35 DATE: _____

F. CHANGE NO. _____ DATE: _____

G. OPERATION: 1000 CFM Filter Installation and OperationH. EXPLOSIVE LIMITS: UNITS Igloo Limits EXPLOSIVE LBS. Igloo LimitsI. PERSONNEL LIMITS: OPERATORS 6 TRANSIENTS: 2

J.

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Perform Pre-operational checks on 1000 CFM prior to deployment.	1. (O)(QC) Perform all the pre-operational checks listed in the 1000 CFM checklist located inside the electrical panel control box prior to deployment.
2.	1000 CFM Filter Emplacement.	2a. (O) Place filter unit on the east side of igloo as close to the rear vent as possible. Chock the wheels to prevent the unit from rolling. Level the filter unit using the jacks located at each corner of the filter unit trailer. 2b. (O)(QC) Specific instructions for setting up and running the 1000 CFM filter unit are located in the 1000 CFM checklist located inside electrical panel control box. These steps will be strictly adhered to in the operation of the filter unit. 2c. (O)(QC) Assure that the grounding rod is firmly placed into the ground. Notify the Ammunition Surveillance Office and request a test of the grounding rod and line for continuity. 2d. (O) Remove the hose assembly from the filter unit. 2e. (O)(S)(QC) Ensure the filter hose assembly has the Adapter Collar and Igloo Adapter connected to the hose. If not previously assembled, do so at this time. 2f. (O) Remove the inlet cap from the filter housing. Place the hose assembly with adapter collar to the filter inlet and secure with four swivel latches.

NOTE: If use of the 1000 CFM is required on a long term basis (longer than three months), the Ammunition Surveillance Office will periodically test the grounding rod to assure continuity and required grounding resistance is maintained,

OPER NO: 9 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
2.	1000 CFM Filter Emplacement. (con't)	<p>2g. (O) If additional hose length is required to reach from the filter unit to the rear ventilator stack, attach additional hose sections using a pair of adjustable ring clamps to reach the access door on the stack.</p> <p>NOTE: Personnel may wear safety shoes in lieu of butyl boots when connecting 1000 CFM Filter to igloo.</p> <p>2h. (O) Personnel in Level C3 at a minimum will carry the adapter and hose up to the rear ventilator and open the ventilator access door.</p> <p>2i. (O)(S) Using a utility knife and leather gloves over butyl rubber gloves, personnel will carefully cut the seal around the rear stack access door.</p> <p>2j. (O) Position the clamp tabs to the inside of the Igloo Adapter. Insert the Igloo Adapter into access opening on vent stack. Using the clamp position indicator move clamp tabs to the out board of the Igloo Adapter. Tighter knob on both sides of Igloo Adapter so the adapter is tight. Use Startup Checklist for 1000 CFM Filter and start the filter engine (check engine oil and fuel).</p> <p>CAUTION: If the use of a ladder is necessary, operators will use extreme caution during transport and placement of the ladder to the rear stack due to potential uneven terrain on the side of the igloo. Operators will assure ladder has solid footing and will maintain three points of contact with the ladder while climbing. A second operator will hold the ladder steady while the first operator is climbing and placing/removing the cap over the snorkel.</p> <p>2k. (O) Using a rear stack access platform, operators will place a rubber cap over the snorkel end of the rear passive Igloo Containment System (ICS) filter unit exhaust vent. Only in the event a rear stack platform is not available, a ladder may be used as an alternative to place the cap over the rear vent exhaust.</p> <p>WARNING: PERSONNEL MUST WEAR HEARING PROTECTING WHILE THE 1000 CFM IS OPERATING WHEN POSITIONED WITHIN 14 FEET OF THE GENERATOR OR WITHIN THREE FEET OF THE FILTER UNIT.</p> <p>2l. (O)(S)(O) Open the bypass door of the front ICS passive filter unit by turning the handle to the left. Front and back vents of the filtered structure must be open when the filter unit is operating.</p>
3.	1000 CFM Filter Start Up and Operation.	<p>3a. (O) Use Startup Checklist for 1000 CFM Filter and start the filter engine. Annotate the date, structure, agent, and monitoring results on the filter usage sheet/log maintained with the filter unit for each day filter is used.</p> <p>WARNING: IF MONITORING CONFIRMS THE BREAKTHROUGH OF CHEMICAL AGENT, THE EXTERIOR OF THE FILTER BANK WILL BE LOCKED TO PREVENT UNAUTHORIZED ENTRY. THE UNIT WILL BE MARKED WITH SIGNAGE INDICATING EXPECTED CONTAMINATE.</p> <p>3b. (O)(S)(QC) NRT monitoring will be conducted after 30 minutes of operation and daily thereafter during operation IAW SOP PU-0000-R-491 to verify absence of "break-through".</p>

FEB 26 2014

OPER NO: 9 SOP NO: PU-0000-M-486 REV 35 CHG DATE

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
3.	1000 CFM Filter Start Up and Operation. (con't)	
	NOTE: Monitoring results will be maintained by PCD Laboratory and Monitoring personnel in a database for historical purposes.	
	CAUTION: Operators must use caution when opening the door of an igloo with the CFM in operations due to the extra pull on the door caused by the CFM. Positive stops will be used to assure that the door does not un-expectantly close.	
4.	1000 CFM Filter Refueling.	4. (O) 1000 CFM filter will be shut down daily for refueling and Preventive Maintenance Checks and Services (PMCS) using the procedures in the checklist located inside the electrical panel control box. The Operations Center will be notified when the unit is shut down and when unit is started up. During refueling operations a portable fire extinguisher will be on site.
5.	1000 CFM Filter Removal.	5a. (O)(S) Filter operations will be terminated after the leaker has been containerized; filter will be removed when the laboratory has certified the igloo clean IAW PCD-R 50-3.
	CAUTION: If the use of a ladder is necessary, operators will use extreme caution during transport and placement of the ladder to the rear stack due to potential uneven terrain on the side of the igloo. Operators will assure ladder has solid footing and will maintain three points of contact with the ladder while climbing. A second operator will hold the ladder steady while the first operator is climbing and placing/removing the cap over the snorkel.	5b. (O) Close the Bypass door of the passive filter unit on the structure door by turning the handle to the right.
	NOTE: Operators will wear Level C3 to remove the flexible hose from the stack and cover the end with plastic. Personnel may wear safety shoes in lieu of butyl boots when disconnecting 1000 CFM Filter from igloo.	5c. (O) Remove the cap covering the snorkel on the rear ICS passive filter unit vent using the rear stack access platform (or ladder, if necessary) to gain access to the cap.
		5d. (O)(S) Remove the flexible hose from the rear stack. Remove the adapter from the hose and cover the end of the hose with plastic sheeting and secure with tape.
		5e. (O)(S) Monitor the 1000 CFM filters, hoses, and rear ventilator adapter assembly IAW SOP PU-0000-R-491 prior to removing from CLA.

K. SPECIAL REQUIREMENTS: (See Operation 1, Paragraph K)

1. Removal of contaminated filters will be done IAW with requirements described in Appendix E.
2. Removed filters will be managed IAW PCD Waste Management Plan.
3. If the 1000 CFM fails, replace with a serviceable unit.

FEB 26 2014

OPER NO: 9 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

4. Operators will be trained and wear proper hearing protection when working on or near filter unit. Operators will be trained on the installation and operation of the 1000 CFM Filter Unit.

5. If any portion of the Lightning Protection System (LPS) is affected by filter operations and integrity of the system is compromised, contact the Ammo Surveillance Office for corrective actions.

6. The 1000 CFM may be stored with the flexible hose either attached to the filter inlet housing or separated from it. If the hose is stored separated from the filter inlet housing, each end of each hose section will be covered with plastic sheeting secured with tape until monitoring of the hose has been completed.

L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES.

ITEM	QTY REQD	SPEC NO./DWG NO.	MCSN/NSN
1000 CFM Filtering Unit	1 Each		
Tape, Duct	As Required		
Bags, Plastic, Large	As Required		
Utility Knife	As Required		
Leather Gloves	As Required		
Hearing Protection	As Required		
Rear Stack Access Platform	As Required		
Ladder (if Required)	1 Each		
Ring Clamps	As Required		
Screwdriver/Nut Driver	1 Each		

FEB 26 2014

OPER NO: 10 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

OPERATIONS FORMAT

A. STANDING OPERATING PROCEDURE FOR B. OPERATION NO. 10

Chemical Operations C. BAY NO. N/A

D. SOP NO. PU-0000-M-486 DATE: 12 Apr 65

E. REV NO. 35 DATE: _____

F. CHANGE NO. _____ DATE: _____

G. OPERATION: Decontamination of PCE, Equipment, and Facilities

H. EXPLOSIVE LIMITS: UNITS Igloo Limits EXPLOSIVE LBS. Igloo Limits

I. PERSONNEL LIMITS: OPERATORS 5 TRANSIENTS: 1

J.

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
I.	Management and Decontamination of PCE.	1a. (O)(S)(QC) PCE not exposed to agent vapor or liquid contamination will be hung up and allowed to aerate for at least 12 hours prior to reuse. 1b. (O)(S)(QC) PCE not exposed to agent vapors or liquid shall, as a minimum, be returned to the laundry facility for laundering once every three months. 1c. (O)(S)(QC) PCE exposed to agent vapors/liquid will be placed in a plastic bag, as each individual processes through the decontamination station; Each bag will contain the PCE from one individual and will be sealed following PCE collection. During cleanup (conclusion of operations) personnel wearing butyl rubber gloves will collect and transport the sealed bags to the Building 475 monitoring shed, where the bags will be monitored IAW SOP PU-0000-R-49I. 1d. (O)(S)(QC) PCE exposed to agent vapor will, upon negative monitoring results, be returned to the laundry facility for laundering and aeration.

FEB 26 2014

OPER NO: 10 SOP NO: PU-0000-M-486 REV 35 CHG DATE

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Management and Decontamination of PCE. (con't)	<p>1e. (O)(S)(QC) PCE exposed to agent vapor which monitoring indicates levels greater than the WPL level will be decontaminated, and again bagged, heated, and monitored IAW SOP PU-0000-R-491. This process will be repeated three times or until monitoring indicates agent levels below the WPL before being returned to the laundry for laundering and aeration. If after three attempts of decontamination and the PCE exceeds the WPL, it will be treated as hazardous waste and disposed of IAW the RCRA permit at the Waste Management Plan</p> <p>1f. (O)(S) PCE subjected to liquid agent contamination will be decontaminated and placed in an approved container after testing for thoroughness of decontamination per PCD Site Specific Monitoring Plan. The PCE will be tagged, which will indicate content, degree of initial exposure, decontamination accomplished, and date packaged. The container will then be managed IAW the RCRA permit and the Waste Management Plan. Contents and monitoring results will be reported to EMO.</p>
2.	Surface decontamination.	<p>2a. (O)(S) Large surface areas will be sprayed with a solution of HTH from the M12A1 Decontamination apparatus IAW SOP PU-0000-M-302 (the M12A1 Decontamination apparatus will be charged with HTH only when required).</p>
	<p>CAUTION: When handling, mixing or applying HTH during chemical operations a minimum of Level C1 Protective Clothing will be worn.</p>	
	<p>WARNING: HTH MUST BE USED AS A SOLUTION. IN THE DRY STATE, HTH REACTS VIOLENTLY WITH LIQUID MUSTARD, ALONG WITH OTHER FLAMMABLE AND COMBUSTIBLE SUBSTANCES, AND MAY GENERATE SUFFICIENT HEAT TO CAUSE FLAME.</p>	
	<p>WARNING: HTH WILL DESTROY CLOTHING, EMITS GAS, DUSTS AND VAPORS AND WILL INJURE SKIN, EYES, AND RESPIRATORY TRACT.</p>	
	<p>WARNING: IF HTH COMES IN CONTACT WITH THE SKIN OR CLOTHING, THE AREA SHOULD BE FLUSHED WITH LARGE AMOUNTS OF WATER.</p>	
		<p>2b. (O)(S) To remove HTH residue from the floor, wash the floor first with soapy water and then flush with clear water.</p>
		<p>2c. (O)(S)(QC) Cover with plastic sheeting and monitor. If sample comes back positive, repeat steps 2a-2c.</p>

FEB 26 2014

OPER NO: 10 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
3.	Disposal of contaminated material.	<p>3a. (O)(S)(QC) Protective equipment or other material that has been contaminated with liquid agent will be processed IAW Operation 10, Step 10. Waste will be tagged to identify type and date of contamination, and managed IAW with the RCRA permit.</p> <p>3b. (O)(S) Decontamination residue (3X) from chemical operations, such as bagged TAP clothing and salvaged dunnage, may be stored in a hazardous waste storage structure/area inside or outside the CLA in accordance with the hazardous waste permit.</p>
4.	Tools and equipment.	<p>4a. (O) If the equipment has been subjected to liquid or vapor contamination, it will be marked "XXX" and returned to operations personnel after decontamination and monitoring results are below permissible exposure levels.</p>

K. SPECIAL REQUIREMENTS:

- Determination of atmosphere and surface area contamination will be made through monitoring of area by appropriate detectors. Chemical Operations Supervisor will determine level of protective clothing after review of monitoring results.
- When in doubt as to degree of agent exposure, treat PCE as though contaminated with liquid agent.
- When exiting the storage structure, personnel will rinse their boots and gloves in step pans containing bleach and water. Processing through the contamination reduction area, to include use of step pans, is intended to confine agent and spent decontaminants and is only required if known or suspected agent contamination is encountered.
- Used decontaminating solutions will be collected, sampled and packaged IAW PCD Hazardous Waste Management Plan and then stored in a hazardous waste storage site.

L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES. (See Operation 1, Paragraph L)

ITEM	QTY REQ'D	SPEC/DWG NUMBER	MCN/NSN
M12A1 Decon Apparatus	As Required		
HTH	As Required		
Tape, Duct	As Required		
Plastic Bags	As Required		

FEB 26 2014

OPER NO: 11 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

OPERATIONS FORMAT

A. STANDING OPERATING PROCEDURE FOR B. OPERATION NO. 11

Chemical Operations C. BAY NO. N/A

D. SOP NO. PU-0000-M-486 DATE: 12 Apr 65

E. REV NO. 35 DATE: _____

F. CHANGE NO. _____ DATE: _____

G. OPERATION: Donning and Doffing of Level A

H. EXPLOSIVE LIMITS: UNITS N/A EXPLOSIVE LBS. N/A

I. PERSONNEL LIMITS: OPERATORS N/A TRANSIENTS: N/A

J.

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Pre-donning Procedures. NOTE: Prior to donning Level A protective outfit, personnel will be medically monitored IAW PCD R 385-507. NOTE: Personnel will receive training and will practice wearing PCE prior to performing chemical duties in their protective outfits.	1a. (O) Remove suit from storage container. 1b. (O)(S)(QC) Ensure PCE has a current inspection date. DO NOT use a damaged suit. Check for holes, rips and abrasions. Return it to clothing inspector if found unserviceable. 1c. (O)(QC) Wearer will perform an audio-visual alarm test upon receipt of SCBA. 1d. (O) Innerwear will consist of cotton underwear and/or shorts, and cotton T-shirt.
2.	Donning Procedures. CAUTION: Ensure Heart Rate monitor is utilized IAW PCD-R 385-507 prior to donning. NOTE: Wearer will require at least one assistant to assist with donning/doffing of Level A	2a. (O) Don personal cooling system. 2b. (O) Don protective suit IAW manufacturer instructions, stopping at proper point to don SCBA.

OPER NO: 11 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
2.	Donning Procedures. (con't)	2c. (O)(S)(QC) Ensure Sign Out Sheet is present inside SCBA container. This form indicates the SCBA has a current inspection date. Form must be signed by SCBA wearer prior to donning. The user will inspect and test the SCBA unit assigned to them in accordance with the manufacturer's operating instruction and all training provided.
	CAUTION: Equipment damage. Walking or standing in protective suit booties on rough surfaces will cause abrasions or tears to booties. If surface is rough, stand on a piece of cardboard, carpet, or similar material to protect suit booties	
	CAUTION: Backpack of SCBA should be worn to the wearer's comfort.	2d. (O) Don SCBA. Open eccentric side buckles. 2e. (O) Using both hands, pull left and right waist belts straight out and clip together. 2f. (O) Using both hands, pull loose ends of waist straps to side to tighten harness assembly. 2g. (O) Lock down eccentric side buckles. 2h. (O) Don the communication system. (OPTIONAL) Position throat mike to one side of "Adam's apple". (1) Plug microphone jack into top of speaker case. (2) Place around waist as required. (3) Turn on and listen for signals indicating proper operation. (4) Set volume. 2i. (O) Fully extend face mask head harness straps and lay head harness over front of facemask. 2j. (O) Remove rubber plug from valve and retain. Connect breathing hose (from pressure gauge manifold) to suit pass-through (if applicable) and assure the safety lock is properly engaged. 2k. (O) Depress lever on breathing valve then reach back with left hand and open cylinder valve completely. 2l. (O) Place facemask on face forcing chin cup tightly against chin. 2m. (O) Pull facemask head harness over head. 2n. (O) Pull straight back on facemask head harness straps to tighten, beginning with lower jaw straps, then middle straps and finally top strap 2o. (O) Inhale, turning on positive pressure automatically. Exhale to reset diaphragm assembly in neutral position.

FEB 26 2014

OPER NO: 11 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
2.	Donning Procedures. (con't)	<p>2p. (O)(QC) Stop breathing and listen for any leakage. If leakage is heard check that there is no interference with face seal. Re-adjust head harness as necessary. Check to ensure bypass valve is closed.</p> <p>2q. (O)(QC) Check positive pressure by holding breath and inserting two fingers between sealing edge of face mask and face. Air should escape. Remove fingers. No sound of escaping air should be heard.</p> <p>2r. (O)(QC) Check bypass operation by turning bypass knob clockwise and listen for air flow. Close bypass by turning bypass knob counter clockwise until knob is against the stop.</p> <p>2s. (O)(QC) Check pressure gauge. Pressure gauge needle should be in green area.</p> <p>2t. Continue donning protective suit IAW manufacturer instructions.</p>
	<p>NOTE: To save cylinder air wearer can go to ambient air until Level A suit is zipped.</p>	
	<p>NOTE: Place a piece of terry cloth towel inside protective suit pocket to be used to clear the face shield if fogging occurs</p>	
	<p>WARNING: ALL PERSONNEL SUBJECT TO HEAT STRESS ENVIRONMENTS WILL BE GIVEN SUFFICIENT WORK/REST CYCLE TIME BETWEEN OPERATIONS TO AVOID HEAT STRESS ILLNESS. SITE SUPERVISOR WILL ENSURE THAT REQUIRED RESPIRATOR AND PCE TRAINING HAS BEEN COMPLETED; MEDICAL SCREENING MUST BE COMPLETED PRIOR TO DONNING SCBA. ALL OPERATORS SHOULD DRINK COPIOUS AMOUNTS OF WATER DURING WARM WEATHER OPERATIONS, SITE SUPERVISORS WILL MONITOR THE WBGT AND ADJUST DAILY OPERATIONS ACCORDINGLY. SITE SUPERVISORS MUST ENSURE COOLING VEST/SYSTEM IS WORN IAW HEAT STRESS PLAN IAW PCD-R 385-507.</p>	
3.	Operating Conditions.	<p>3a. (O)(S) Monitor pressure gauge. Ensure pressure gauge needle is in the green area, indicating tank has been fully charged to greater than 90% rated capacity.</p>

FEB 28 2014

OPER NO: 11 SOP NO: PU-0000-M-486 REV 35 CHG DATE

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
3.	<p>Operating Conditions. (con't)</p> <p>WARNING: LIMITED BREATHING AIR IN SCBA. LEAVE AREA IMMEDIATELY WHEN ALARM WHISTLE SOUNDS. AN AUDIBLE ALARM INDICATES REMAINING BREATHING AIR PRESSURE IN SCBA CYLINDER HAS DROPPED BELOW 25 PERCENT CAPACITY. THE "BUDDY SYSTEM" WILL BE USED TO MONITOR AIR SUPPLY.</p> <p>NOTE: Additional SCBA air tanks are available as needed.</p>	<p>3b. (O)(S) While leaving area and performing decontamination, monitor SCBA pressure gauge. A low pressure audible alarm will sound when SCBA cylinder has approximately 25 percent (approximately 1125 psig) air remaining.</p>
4.	<p>Hot Weather Precautions.</p> <p>WARNING: HEAT STRESS ILLNESS. LEVEL A USERS SHOULD BE GIVEN SUFFICIENT RECUPERATION TIME BETWEEN OPERATIONS IN HOT WEATHER ENVIRONMENTS TO AVOID HEAT STRESS ILLNESS. HEAT STRESS ILLNESS COULD RESULT FROM EXTENDED USE WITHOUT PROPER REST AND FLUID REPLENISHMENT.</p>	<p>4a. (S) Protective Suit. When the protective suit is worn in hot environments and while working at high work rates, the user will be more prone to heat stress illness. Heat stress illness may result due to heat build-up inside the protective suit and subsequent rise in body core temperature. Every effort should be made to rotate personnel in the work cycle to allow the body to recuperate.</p> <p>4b. (S) Prevention of heat stress illness. As a general rule to prevent fatigue and heat stress illness, the wearer's rest work cycle time should be equivalent to three times the period of time that the protective suit is worn; however, the final decision on the appropriate rest work cycle time will be determined by the CMA.</p> <p>4c. (S) Heat Stress Illness. If the user becomes a casualty of heat stress illness, they must be removed from the protective suit immediately. If the casualty is in a contaminated area, evacuate the casualty to an established hot-line or an uncontaminated area upwind of the work site for decontamination and removal of the protective suit.</p>
5.	<p>Doff Protective Suit.</p> <p>WARNING: ASSISTANT, DRESSED IN LEVEL C1, WILL KEEP HANDS AWAY FROM INSIDE OF SUIT TO AVOID POSSIBLE CONTAMINATION TO WEARER.</p>	<p>5a. (O) Perform decontamination procedures in accordance with Operation 10.</p> <p>5b. (O) Doff protective suit IAW manufacturer instructions.</p> <p>5c. (O) Assistant will remove communications system, if used.</p>

OPER NO: 11 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
5.	Doff Protective Suit. (con't)	5d. (O) Wearer will step completely out of protective suit and proceed to cold side of hot-line.
	CAUTION: Personnel Contamination Hazard. All equipment must be decontaminated in accordance with local procedures.	
	NOTE: Assistant will fold suit to outside and pull wearer's feet from booties preventing suit from touching wearer when stepping out of suit.	
	CAUTION: Decontamination procedures will have been accomplished; however, as a precaution, wearer will not touch outside of protective suit during doffing. Assistant will ensure protective suit is folded outward away from body.	5e. (O) Wearer will loosen facemask head harness and remove facemask.
	CAUTION: Equipment Damage. If ground/walking surface is rough, a protective covering will be used to stand on. Walking or standing in protective snit on rough surfaces will cause abrasions or tears to booties.	5f. (O) Mask breathing valve and SCBA cylinder valve will be shut off by either wearer or assistant.
		5g. (O) Wearer will release SCBA waist belt by pressing male buckle button in center.
		5h. (O)(S) Wearer will remove SCBA, using care not to drop unit.
		5i. (O)(QC) Assistant will separately bag SCBA, and Level A/related clothing, maintaining individual wearer integrity of each. PCE used in an agent environment will be managed in accordance with Operation 10 of this SOP.
		5j. (O) Level A/SCBA ensemble will be transported to Bldg 475 monitoring shed and monitored in accordance with SOP PU-0000-R-491.

K. SPECIAL REQUIREMENTS: (See Operation 1, Paragraph K). Regulatory requirements, maintenance forms and records will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES.

ITEM	QTY REQ'D	SPEC/DWG NUMBER	MCN/NSN
Level A Ensemble	As Required		
SCBA Ensemble	As Required		
Terry cloth towel	As Required		
Plastic Bags	As Required		
Tape, Duct	As Required		

FEB 28 2014

OPER NO: 12 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

OPERATIONS FORMAT

A. STANDING OPERATING PROCEDURE FOR Chemical Operations B. OPERATION NO. 12
 C. BAY NO. N/A
 D. SOP NO. PU-0000-M-486 DATE: 12 Apr 65
 E. REV NO. 35 DATE: _____
 F. CHANGE NO. _____ DATE: _____

G. OPERATION: Donning and Doffing of Level B

H. EXPLOSIVE LIMITS: UNITS N/A EXPLOSIVE LBS. N/A
 I. PERSONNEL LIMITS: OPERATORS N/A TRANSIENTS: N/A
 J.

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
1.	Obtain Protective Equipment. NOTE: Prior to donning PCE personnel will be medically monitored IAW PCD R 385-507. NOTE: Personnel will receive training and will practice wearing PCE prior to performing chemical duties in their protective gear.	1a. (O)(QC) Receive SCBA unit from Protective Equipment Section. Inspect and test and sign-out unit. 1b. (O)(QC) Receive Level B PCE from Protective Equipment Section Building 475. Inspect and sign-out.
2.	Don Protective Equipment. CAUTION: Ensure heart rate monitor is utilized IAW PCD-R 385-507 prior to donning.	2a. (O) Don butyl boots. 2b. (O) Don M3 TAP suit and butyl gloves 2c. (O)(S) After donning the M3 suit ensure the inner cuffs are snapped, pull draw strings then snap the outer cuffs. Ensure that the cuffs (wrist and ankles) are sufficiently taped leaving a 1" tab for quick removal.

FEB 26 2014

OPER NO: 12 SOP NO: PU-0000-M-486 REV. 35 CHG DATE

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
2.	Don Protective Equipment. (con't)	2d. (O) Attach M3 hood to SCBA mask.
	WARNING: ALL PERSONNEL SUBJECT TO HEAT STRESS ENVIRONMENTS WILL BE GIVEN SUFFICIENT WORK/REST CYCLE TIME BETWEEN OPERATIONS TO AVOID HEAT STRESS ILLNESS. SITE SUPERVISOR WILL ENSURE THAT REQUIRED RESPIRATOR AND PCE TRAINING HAS BEEN COMPLETED; MEDICAL SCREENING MUST BE COMPLETED PRIOR TO DONNING SCBA. ALL OPERATORS SHOULD DRINK COPIOUS AMOUNTS OF WATER DURING WARM WEATHER OPERATIONS, SITE SUPERVISORS WILL MONITOR THE WBGT AND ADJUST DAILY OPERATIONS ACCORDINGLY. SITE SUPERVISORS MUST ENSURE COOLING VEST/SYSTEM IS WORN IAW HEAT STRESS PLAN IAW PCD-R 385-507.	2e. (O) Don SCBA unit.
3.	Doff Protective Equipment.	3a. (O) Remove hood leaving SCBA unit on, only loosening waist buckle from SCBA straps.
		3b. (O) Remove tape from wrist and ankles, unsnap snaps and loosen pull string. Assistant will remove SCBA tank and harness from the back of the wearer and hand tank to wearer.
		3c. (O)(S) Assistant will remove one arm from M3 suit while wearer holds tank and harness with other arm. Wearer will then transfer tank and harness to gloved hand of freed arm..
	WARNING: ASSISTANT DRESSED IN LEVEL C1 SHOULD KEEP HANDS AWAY FROM INSIDE OF M3 COVERALLS TO AVOID POSSIBLE CONTAMINATION	3d. (O)(S) Assistant will pull suit down below waist before wearer sits on bench
		3e. (O)(S) Assistant will remove boots and suit legs, one at a time, from the suit and wearer will place one leg on the cold side while still holding the SCBA, then swing other leg to cold side Assistant will take the SCBA .After both legs and arms are on the cold side, wearer will doff gloves on hot side, then doff SCBA mask, chin first, on hot side.
		3f. (O)(QC) Assistant will individually bag SCBA/PCE as each individual processes through the decontamination station. Each bag will contain the PCE from one individual and will be sealed following PCE collection.
		3g. (O)(QC) PCE utilized in agent environments will be managed in accordance with Operation 10 of this SOP.

FEB 26 2014

OPER NO: 12 SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

STEP NO.	DESCRIPTION	SPECIFIC INSTRUCTION (SAFETY (S), OPERATIONAL (O), QUALITY CHARACTERISTICS (QC)).
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3.	Doff Protective Equipment. (con't)	3h. (O) Personnel wearing butyl rubber gloves will collect and transport the sealed bags to the Building 475 Monitoring Shed, where the bags will for monitoring in accordance with SOP PU-0000-R-491.
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K. SPECIAL REQUIREMENTS: (See Operation 1, Paragraph K)

1. Regulatory requirements, maintenance forms and records will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

2. Protective clothing will be monitored IAW SOP PU-0000-R-491.

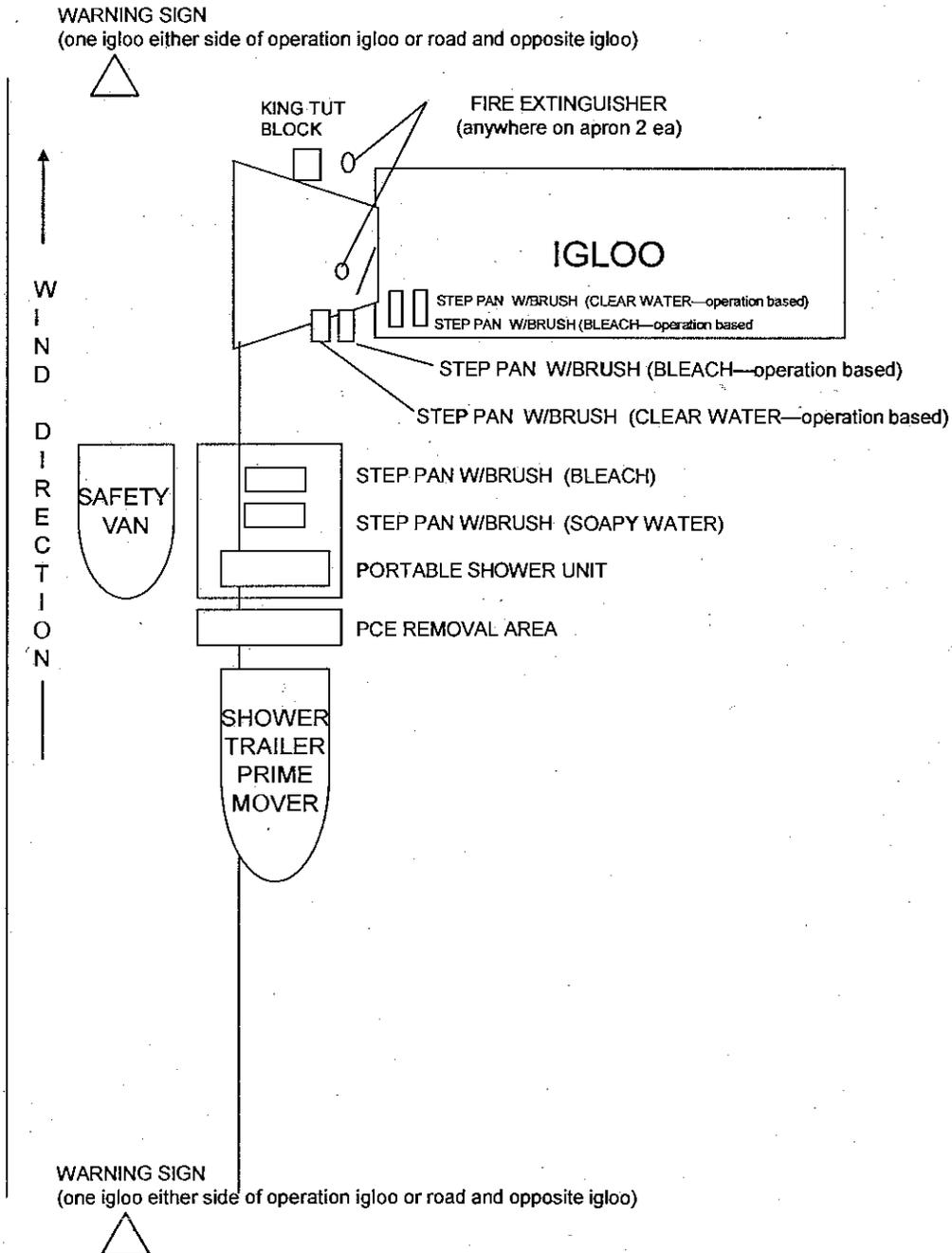
L. EQUIPMENT, TOOLS, GAGES AND SUPPLIES.

ITEM	QTY REQ'D	SPEC/DWG NUMBER	MCN/NSN
Level B Ensemble	As Required		
SCBA Ensemble	As Required		
Plastic Bags	As Required		
Tape, Duct	As Required		

APPENDIX A

MINI HOT-LINE LAYOUT

SUGGESTED TYPICAL SECONDARY HOT-LINE LAYOUT
NOTE: OPERATION LAYOUT WILL DEPEND ON WIND DIRECTION



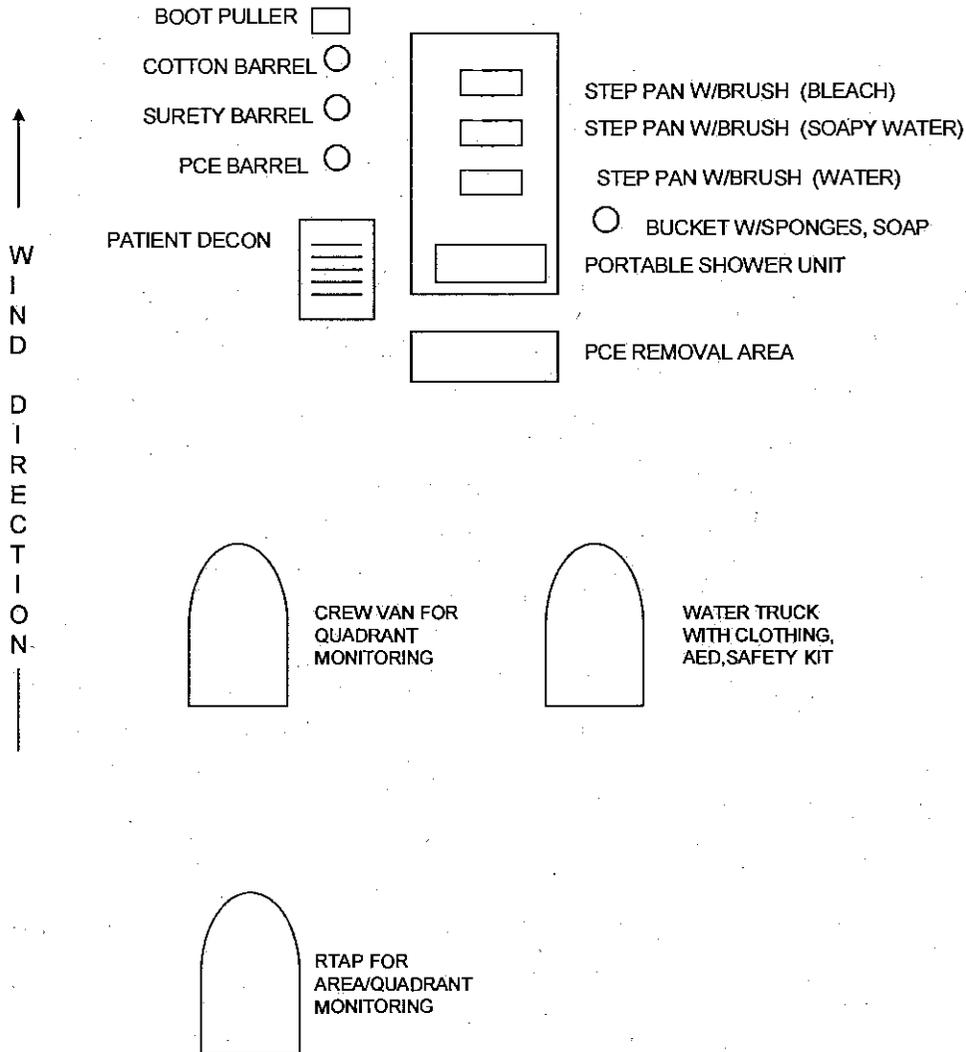
FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

APPENDIX A SECONDARY HOT-LINE LAYOUT

SUGGESTED TYPICAL SECONDARY HOT-LINE LAYOUT

NOTE: WILL BE SET UP 450M UPWIND FROM OPERATION/CAIRA. LAYOUT WILL DEPEND ON WIND DIRECTION
WILL BE EQUIPPED TO DECON APPROXIMATELY 15 EMPLOYEES. LAYOUT WILL BE DEPENDANT ON
OPERATION/CAIRA.



FEB 2014

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

APPENDIX B

PERSONNEL PROTECTIVE CLOTHING AND EQUIPMENT (PPE/PCE)
FOR H SERIES TOXIC CHEMICAL AGENTS

1. General philosophy and levels of protection.

- a. Protective Clothing and Equipment (PCE). The use of personal PCE is the least desirable method of complying with permissible exposure limits. Efforts will be made to reduce dependence upon PCE in agent operating environments through the increased use of engineering and administrative controls such as ventilation, isolation, remote operations, remote monitoring, and elimination of all nonessential entries into agent areas. Hazard analyses will reflect that these alternatives have been explored.
- b. Operational constraints when using PCE. The use of protective clothing can itself create significant worker hazards, such as heat stress, physical and psychological stress, and impaired vision, mobility, and communication. For any given situation, equipment and clothing should be selected that provides an adequate level of protection.
- c. Protection levels:

LEVEL A
COMPONENTS
Suit, Totally Encapsulating, Chemical Protective (such as TyChem Responder CSM or TyChem RF600T SV)
Positive Pressure Self Contained Breathing Apparatus (SCBA) or Supplied Air with Escape SCBA
Gloves, M3/M4; Glove Set, Butyl Outer
Boots, M2A1, Butyl with Safety Toe or BATA Boot
Government Issued Soft Clothing (i.e. coveralls/undergarments)

LEVEL B
COMPONENTS
Suit, Hooded (One or Two Piece), Chemical Resistant (such as M3, Butyl Rubber Toxic Agent Protective (TAP) suite worn with Modified M30 TAP Hood and SCBA)
Positive Pressure SCBA
Hood, Tap, Modified M30 for SCBA
Gloves, M3/M4; Glove Set, Butyl Outer
Boots, M2A1, Butyl with Safety Toe or BATA Boot
Government Issued Soft Clothing (i.e. coveralls/undergarments)

NOTE: Butyl rubber suit shall be taped to the gloves and boots in situations requiring Level B protection.

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

APPENDIX B

LEVEL C1
COMPONENTS
Chemical Resistant Apron (such as M2, Butyl (extending below boot tops), TyChem SL, or TyChem F aprons) or One Piece Coverall (such as Dupont® Tychem TF145T GY Suit)
Mask Worn, M40 Series
Hood, Quick Doff
Gloves, M3, M4, Gloveset, Butyl Outer
Boots, M2A1, Butyl, With Safety Toe or BATA Boot
Government Issued Soft Clothing (i.e. coveralls/undergarments)

LEVEL C2
COMPONENTS
Chemical Resistant Apron (such as M2, Butyl (extending below boot tops), TyChem SL, or TyChem F apron)
Mask Worn, M40 Series
Gloves, M3, M4, Gloveset, Butyl Outer
Boots, M2A1, Butyl, With Safety Toe or BATA Boot
Government Issued Soft Clothing (i.e. coveralls/undergarments)

LEVEL C3
COMPONENTS
Mask Worn, M40 Series
Gloves, M3, M4, Gloveset, Butyl Outer
Boots, M2A1, Butyl, With Safety Toe or BATA Boot
Government Issued Soft Clothing (i.e. coveralls/undergarments)

LEVEL D1
COMPONENTS
Chemical Resistant Apron (such as M2, Butyl (extending below boot tops), TyChem SL, or TyChem F apron)
Mask Slung, M40 Series
Gloves, M3, M4, Gloveset, Butyl Outer
Boots, M2A1, Butyl, With Safety Toe, BATA Boot
Government Issued Soft Clothing (i.e. coveralls/undergarments) or Lab Coat for laboratory personnel only

FEB 23 2014

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

APPENDIX B

LEVEL D2**COMPONENTS**

Mask Slung, M40 Series
Gloves, M3, M4, Gloveset, Butyl Outer
Boots, M2A1, Butyl, With Safety Toe, BATA Boot or Safety Shoes
Government Issued Soft Clothing (i.e. coveralls/undergarments) or Lab Coat for laboratory personnel only

NON CHEMICAL WORKERS**COMPONENTS**

Mask Slung, M40 Series
Street Attire (substantial closed toe shoes)
Safety Glasses or Goggles (optional or as determined by job hazard analysis)

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

APPENDIX C

SPECIFIC SAFETY REQUIREMENTS
FOR HANDLING MATERIALS TREATED WITH PENTACHLOROPHENOL (PCP)

1. The PCD Hazardous Waste Permit Waste Analysis Plan (WAP) states that wooden pallets and boxes used to store munitions are assumed to contain Pentachlorophenol (PCP), and will be treated as hazardous for D037 (PCP) unless analytical data can prove otherwise.

2. The degree of hazard associated with Pentachlorophenol treated packing materials cannot be determined by visual examination. Therefore, the following information is disseminated to provide guidance on protective measures for handling Pentachlorophenol (Penta) treated wood. This guidance should be followed under the direction of the Industrial Hygienist.

3. Recommendations:

a. Handling:

(1) Prevent skin and eye contact through the use of gloves, coveralls, and goggles. The type of gloves to be worn is dependent upon the characteristics of the wood being handled. If the wood is wet or tacky, gloves made of nitrile rubber or polyvinyl chloride (PVC) should be worn. Coveralls that are laundered on a routine basis (preferably daily) should be worn. The coveralls should not be taken home, but should remain at the work site. When handling wood with visible crystals of pentachlorophenol or when generating wood dust, chemical goggles and respirator protection should be worn.

(2) Do not smoke, eat or drink in the work area. Personnel will wash hands prior to eating, drinking, smoking, or using toilet facilities. All exposed areas of the body will be washed at the end of each workday. If the airborne Pentachlorophenol concentration exceeds or is expected to exceed the Threshold Limit (TLV) or 0.5 MG/M³ time weighted average, a NIOSH-approved organic vapor respirator with Dust Pre-filter must be worn.

b. Continue to use existing penta-treated wood (boxes, crates, pallets, etc.) for its intended purpose until the treated wood is no longer serviceable because of wear, deterioration of wood fibers, or crystal blooms visible on the wood.

c. Do not use PCP treated wood that is sold or donated for the purpose of making furniture, nor for burning in fireplaces or stoves; do not store or use within human dwellings; do not plane, saw or sand treated wood in a home setting where respiratory and personal protective measures are often not used; do not use treated wood as containers for growing food items. These recommendations are based upon either EPA recommendations or prudent practices.

d. Follow the pertinent Federal and State of Colorado laws and regulations for disposal of these items.

4. The waste items should be managed as hazardous waste per the PCD WAP, but may be managed as a non-hazardous solid waste upon confirmation of waste sampling data and a non-hazardous waste determination. This interpretation matches the recommendation of the Colorado Department of Public Health and Environment (CDPHE).

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

APPENDIX C

SPECIFIC SAFETY REQUIREMENTS
FOR HANDLING MATERIALS TREATED WITH PENTACHLOROPHENOL

5. The US EPA recommends disposal solid waste by either burial in properly operated permitted sanitary landfills or by incineration in commercial or industrial incinerators. Pueblo Chemical Depot concurs with the burial or incineration options described above, particularly as it pertains to scraps, broken, or unserviceable pieces of treated wood that have no further potential use.
6. Any penta-treated pallets and boxes that are to be disposed of, and which are not contaminated with explosives or agent should be reported to the EMO for disposition.
7. First aid procedures:
 - a. In the event of an emergency, institute first aid procedures and send for first aid or medical assistance.
 - b. Eye Exposure. If PCP or liquids containing PCP get into the eyes, immediately flush eyes with large amounts of water, lifting the lower and upper lids occasionally. Get medical assistance immediately. Contact lenses should not be worn when working with this chemical.
 - c. Skin Exposure. If PCP or liquids containing PCP get on the skin, immediately wash the contaminated area with soap or mild detergent and water. If PCP or liquids containing PCP penetrate through the clothing, remove the clothing immediately and wash the skin using soap or mild detergent and water. If irritation is present after washing, get medical assistance.
 - d. Breathing. If a person breathes in large amounts of PCP, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. Get medical assistance as soon as possible.
 - e. Swallowing. When PCP or liquids containing PCP have been swallowed and the person is conscious, immediately give the person large quantities of water. After the water has been swallowed, try to get the person to vomit by having him touch the back of his throat with his finger. Do not make an unconscious person vomit. Get medical assistance immediately.
 - f. Rescue. Move the affected person from the hazardous exposure. If the exposed person has been overcome, notify someone else and put into effect the established emergency rescue procedures. DO NOT become a casualty. Understand the facility's emergency rescue procedures and know the locations of rescue equipment before the need arises.

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

APPENDIX D

OVERPACK MARKING REQUIREMENTS

1. Overpacks used for containerization of leakers will have a properly prepared DD Form 1577 (Unserviceable [Condemned] Materiel) tag attached to the container. Configuration of 105 MM, 4.2 inch cartridges, presence or absence of fiber containers and drip bags, type of leaker, and leaker report number will be annotated on the tag. Presence or absence of grommets on the 155 MM will also be annotated. Additionally, the following data will be placed on the container:
 - a. NSN and DODIC
 - b. Nomenclature
 - c. Lot Number
 - d. Quantity
 - e. Date packaged
 - f. Type of leaker
 - g. Leaker report number
2. Additional labels or markings are permitted consistent with operational requirements and RCRA permits. Overpacks marked prior to September 2002 do not require remarking solely to comply with the criteria presented here and will be managed IAW PCD RCRA Permit.

FEB 28 2014

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

APPENDIX E

1000 CFM FILTERING SYSTEM CHANGE OUT PROCEDURES

CAUTION!!!**FILTER UNITS ARE EXTREMELY HEAVY**

If a filter needs to be lifted a forklift will be used to position the filter unit at the desired location. If it is necessary to move filter manually, use proper lifting techniques.

NOTE: SERVICEABILITY OF THE FILTERS WILL BE TRACKED IAW MANUFACTURER'S RECOMMENDATIONS.

A. REMOVING DIRTY/CONTAMINATED FILTERS.

NOTE: LEVEL C1 PROTECTIVE CLOTHING WILL BE WORN WHEN CHANGING CONTAMINATED FILTERS.

1. Determine whether the pre-filter to be changed out is dirty by visual inspection.
2. Determine whether the charcoal and HEPA filter to be changed is contaminated through monitoring of the filter system. Note the monitoring results on filter usage sheet or log for the charcoal/carbon filter. Completed filter usage sheet or logs will be provided to the Monitoring/Laboratory Branch.
3. Remove any obstructions from the filter change-out area (e.g. hosing, equipment, etc.).
4. Remove housing access door and extend bag.
5. Turn filter-locking mechanism counter-clockwise at the top and bottom until both are completely in the unlocked position. (You will feel the locking mechanism bottom out). Slight grinding or squeaking may occur when turning the mechanism; this noise has no affect on the function of the mechanism.

CAUTION!!!**FOR EXTREME OPERATING TEMPERATURES**

If the bag-in/bag-out filtering system has an operating temperature above 150°F or below 0°F consideration should be given to the PVC filter change-out bag inside the access door. Due to extreme high or low operating temperatures the filter change-out bag may become brittle and unworkable. After removing the door and before unfolding the bag, carefully check the bag's flexibility to determine whether a change-out can be conducted using the old bag. If the bag is unworkable, pull the old bag into the new bag. The old bag may now be removed with the dirty filter, using the new bag, by following the change-out procedure.

6. Remove dirty filter from housing and place into the bag by using the filter handling glove sleeve. Slowly and carefully remove the filter from the housing, holding filter at the top and bottom of frame, pulling it all the way into the bag. (If needed, place a table, or equivalent platform, at the front of the door to rest the filter on.)
7. Remove arm from bag, leaving glove sleeve inside.
8. Tightly twist and tape approximately 8" of the section between the bag "window" and the dirty filter.
9. Cut in middle of taped section. Place tool in drop bucket.
10. Tape over stubs where bag was cut.
11. Place lifting straps around filter.
12. Seal bagged filter in prefabricated, palletized box for monitoring.
13. If reported levels are below the set alarm point, dispose of the filter in accordance with local, state, and federal laws. If reported levels are above the set alarm point, proceed to place the sealed filter in permitted storage area.

APPENDIX E

B. REPLACING DIRTY/CONTAMINATED FILTERS.

1. Inspect the filter-sealing surface of the housing to ensure no foreign matter will interfere with the new filter to be installed. Remove any foreign matter observed.
2. Apply a 1/8" bead of silicone grease on center of gasket strips and evenly spread over entire gasket.
3. Place a new filter inside a new bag positioning the filter deep enough inside bag so that the filter is past the "Bag Stub Removal Glove Sleeve" and turn the filter over, pulling bag up.
4. Relocate the shock cord of bag stub between ribs of the bagging ring and attach new bag with new filter to bagging ring.
5. Place arm in the "Bag Stub Removal Glove Sleeve" and gather as much of the bag as possible into the mitten portion of the glove sleeve.
6. Pull the bag stub into the glove sleeve while turning the glove sleeve "inside-out." Ensure that the bag stub is totally within the glove sleeve to prevent any part of the bag stub from damaging the filter media when the filter installed.
7. Slide new filter into housing (use filter handling glove sleeve).
8. Twist bag stub removal glove sleeve, with old bag stub inside, and tape.
9. Separate bag stub from new bag by cutting center of twisted taped area and taping over stub ends.
10. Seal filter to the housing surface by turning the locking mechanism clockwise until tight.
11. Locate security strap between first and second ribs of the bagging ring with the gasket side of strap against the plastic bag.
12. Tighten security strap and secure and excess strap so it won't interfere with the door seal when it is replaced.
13. Extend bag out completely, fold end of bag so corners are together, then fold towards housing using a "folding or rolling" motion. Squeeze trapped air out of the folded portion of the bag after each fold. Continue folding bag until slack in the bag is neatly tucked within the bagging ring and the bag window (clear portion) is taut and evenly distributed around the bagging ring.

C. REPLACING ACCESS DOOR.

1. With the bag folded tucked inside of bagging ring, put the door in place, being careful not to disturb the gasket.
2. Hand tighten all retaining knobs, alternating between knobs as you go.
3. Using a torque wrench, first tighten any knob 10 foot-pounds or 120 inch-pounds.
4. Repeat the torque of the knobs on that door diagonally, until all have been tightened.
5. Visually check the door seal by observing the interface between the gasket and the gasket-sealing surface. Ensure that the gasket has flattened at the interface evenly.
6. If steps 1-6 do not create an acceptable seal, increase the torque in the sequence indicated until a maximum of 20 foot-pounds or 240 inch-pounds of torque is applied.
7. Repeat step A, B, and C as applicable for remaining filters to be changed.
8. Initiate a new Filter usage sheet or log and maintain with the 1000CFM.

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE FEB 26 2014

APPENDIX E

D. SPECIAL REQUIREMENTS.

1. A restricted area will be established around the work site.
2. A mini-decontamination line will be established, IAW this SOP, for personnel involved in the filter changing operation. Equipment for decontamination procedures will be readily available if necessary.
3. Chemical Materials Agency NDT Filter Team will inspect and complete performance checks on the Pre-filter, HEPA and Charcoal Filter on an annual basis. Filters that do not pass CMA Filter NDT Team performance checks will be replaced.

E. MATERIALS AND TOOLS REQUIRED.

New filters for change-out	As Required
New plastic change-out bags	As Required
Standard ratchet with short extension and 3/4" socket	As Required
One security strap per access door (should be in-place already)	As Required
Scissors or knife	As Required
Support stand or equivalent platform for filters	As Required
Duct tape	As Required
Silicone grease	
Torque Wrench Adapter	As Required
Torque Wrench (check calibration prior to start of procedures)	As Required
Palletized Box	As Required
Protective Clothing	As Required
Hammer	As Required
Nails	As Required
Forklift	As Required
Tracking sheet or log	As Required
Lifting straps	As Required

APPENDIX F

PREVENTIVE MEASURES - HEAT STRESS

1. Hydration.

(a) Hydration is the key to preventing heat stress illnesses. Most heat illnesses are caused by dehydration. Individuals sweat about a liter an hour doing heavy work and most workers exposed to hot conditions drink less fluid than needed because our thirst response is insufficient and lags behind the actual level of dehydration. Therefore, instead of depending on thirst, the worker should be encouraged to drink 4 to 8 ounces of water every 15 – 20 minutes (rather than drinking a quart at less frequent intervals). Full rehydration should be achieved before recommencing work on subsequent days. Water must be readily available to workers; workers should drink 16 ounces (0.5 liters) of fluid (preferably water or sports drinks) before beginning work during hot weather.

(b) The maximum time between hydration periods, for PCD personnel, is 2 hours. If workers have not been pre-screened medically before wearing PPE/PCE that prevents drinking, they should have the opportunity to re-hydrate every hour. This time period for rehydration covers all personnel who wear OSHA level A, B or C or who may wear a mask for prolonged periods of time. However, because of the possibility of over hydration, employees should also be cautioned to limit their fluid intake to no more than 48 ounces per hour.

(c) Normal preventative hydration for workers, whose heat stress environment is less than a WBGT index of 80° F, can be accomplished with simple water. Worker exposed to WBGT indexes higher than 80° F should hydrate with water and salty snacks or electrolyte containing fluids.

(d) The use and distribution of government furnished hydration fluids (bottled water and sports drinks) will be monitored to ensure fluid use is only by authorized individuals. Hydration fluids will be maintained at bldg 593 and issued each day based on the work plan and consumed in accordance with guidance by local onsite medical authority. These fluids will not be used as a convenience item and personnel are always expected to bring in their own drinks or purchase the necessary drinking materials for use during scheduled lunch/break times.

2. Work Environment Controls.

(a) Whenever reasonable, climate control measures (air conditioning, increased air flow, shade, etc.) should be engineered into worker environments.

(b) The following table correlates work rest cycles, recommended hydration as indicated by WBGT index.

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE MAR 17 2014

APPENDIX F

Work Rest Cycles and Fluid Intake as a Function of WBGT Index							
Heat Category	WBGT Index °F	Easy Work		Moderate Work		Hard Work	
		Work / Rest	Water intake qt/hour	Work / Rest	Water intake qt/hour	Work / Rest	Water intake qt/hour
1	78-81.9	NL	1/2	NL	3/4	40/20 min	3/4
2 (Green)	82-84.9	NL	1/2	50/10 min	3/4	30/30 min	1
3 (Yellow)	85-87.9	NL	3/4	40/20 min	3/4	30/30 min	1
4 (Red)	88-89.9	NL	3/4	30/30 min	3/4	20/40 min	1
5 (Black)	> 90	50/10 min	1	20/40 min	1	10/50 min	1

- The work rest times and fluid replacement volumes will sustain performance and hydration for at least 4 hours of the work in the specified heat category. Individual water needs will vary $\pm 1/4$ qt/hour
- NL = no limit to work time per hour
- Rest means minimal physical activity (sitting or standing), accomplished in shade if possible
- **CAUTION:** Hourly fluid intake should not exceed 1 1/2 quarts. Daily fluid intake should not exceed 12 quarts

Examples of Work Levels and Associated Tasks

Easy Work	Moderate Work	Hard Work
<ul style="list-style-type: none"> • Walking hard surface at 2.5 mph, 30 lb load • Ammo maintenance • Occasional lifting, light objects • Light or moderate work at a bench 	<ul style="list-style-type: none"> • Walking hard surface at 3.5 mph, ≤ 40 lb Load • Walking loose sand at 2.5 mph, no load • Occasional lifting, heavy objects • Individual movement techniques, i.e. climbing, stooping, squatting • Scrubbing • Leaker isolation 	<ul style="list-style-type: none"> • Walking hard surface at 3.5 mph, ≥ 40 lb load • Walking loose sand at 2.5 mph with load • Shrouding/Unshrouding stacks

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE MAR 17 2014APPENDIX G – Startup Checklist
1000 CFM Filter Mobile Filter System

Note: This checklist provides a brief summary of the steps required for routine startup of the filter system. Refer to the filter system manual for more details on the initial startup, cautions, warnings, and operation values.

1. Ensure the motor generator fuel tank is full of diesel.
2. Ensure the engine oil is within the acceptable range.
3. Secure the trailer by placing chock blocks in front and behind the trailer tires.
4. Use the jack stands as needed to level the trailer.
5. Remove the 10" cover plate from the filter unit intake and store it on the trailer in the fixture provided.
6. Connect the 10" flex duct to the filter unit.
7. Connect the 10" flex duct and inlet adapter to the structure to be filtered.
8. Loosen the hold down latch for the filter exhaust cover and ensure that the cover moves freely.
9. Check that the 3 Magnehelic gauges are zeroed.
10. Connect the spring clamp end of the grounding cable to the ground terminal on the frame of the motor generator.
11. Connect the U clamp end of the grounding cable to a suitable earth ground.
12. Ensure that the power cable is connected between the motor generator outlet and the filter electrical panel.

WARNING

The Baldor Frequency Drive (VFD) may be damaged if all circuit breakers are not set to the OFF position (as instructed in the flowing steps) prior to starting and stopping the motor generator.

1. Place the motor generator control panel main breaker (located on the right side of the control panel) in the OFF position (switch down).
2. Place all filter electrical breakers (located inside the electrical panel) to the OFF position.
3. Place the emergency light box ON/OFF switch in the ON positions (on new units the switch is inside the box).
4. Start the generator by holding the START/RUN/OFF switch in the start position and release the switch to the RUN position when generator starts.

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE MAR 17 2014

APPENDIX G – Startup Checklist
1000 CFM Filter Mobile Filter System

5. Check the generator output voltage and frequency in each of the motor generator's 3 phase legs by placing the phase switch in the L1-L2, L3-L1, and L3-L2 positions and verifying that the voltage is 208+/- 10 volts. (AC VOLT meter) and the frequency is 60 +/- Hertz (HERTZ meter).

WARNING

If the voltage or frequency indications are out of tolerance correct the problem before proceeding to the next step.

1. Place the motor generator control panel main breaker to the ON position, and the electrical panel breakers to the ON (switch is up).
2. Place all filter electrical panel breakers to the ON position.
3. Ensure that the power is applied to the BALDOR VFD (the display and the red indicator on the STOP key are lit.)

NOTE

The filter system produces 1000 cfm of air flow when a point representing the Magnehelic gauge indication (gauge located above the VFD) and a point representing the fan speed (fan speed is indicated on the VFD display) coincide on the 1000 cfm line of the graph mounted above the VFD. Typically 1000 cfm of air is produced when the Magnehelic gauge indicated 5 +/- 0.5 inches of water (IW).

1. Set the filter system to produce 1000 cfm air flow by pressing the STOP key (to put the VFD in local mode) and then the FWD key on the VFD. The fan speed will be zero (if power was shutoff to VFD). If power was not shut off to the VFD, the fan speed will ramp up to the previous speed setting.
2. Set the VFD at approximately 3 CIW, and then go open the igloo door vent.
3. Verify that the points representing the Magnehelic gauge indication and the fan speed coincide within +/-0.5 inch of the 1000cfm line on the graph above the VFD. If not adjust by using up down arrows on VFD.

Shutdown Checklist for 1000 CFM:

1. Press the STOP button on the Baldor VFD.
2. Place all filter electrical panel breakers in the OFF position (switch is down).
3. Place the motor generator control panel breaker in the OFF position (switch is down).
4. Stop the motor generator by placing the START/RUN/OFF switch in the OFF position.
5. Open the emergency light box and place the ON/OFF switch in the OFF position.

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE MAR 17 2014APPENDIX G – Startup Checklist
1000 CFM Filter Mobile Filter System

6. Close Igloo Vent on door.
7. Disconnect and store the grounding cable reel, wire, and clamps.
8. Disconnect the 10 inch flex duct and inlet adapter from the vented structure. Covering the end of the hose with a 6 MIL bag and duct tape.
9. Stow hose on trailer.

Note: If refueling follow steps 1 through 4, refuel, then reverse 4 through 1. Call OC before shut down and at restart.

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG DATE

APPENDIX H – Hazard Analysis

Prepared by: PCD HAWG

1 OPERATION	2 HAZARD	3 EFFECT OF HAZARD Personnel, Equipment & Facility	4 CAUSE OF HAZARD Condition/Action	5 HAZARD CATEGORY WITHOUT PREVENTIVE MEASURES			6 PREVENTIVE MEASURES			7 HAZARD CATEGORY WITH PREVENTIVE MEASURES		
				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC
All Operations	Donning Chemical Personal Protective Clothing / Equipment Ensembles (PCE)	Death or permanent total disability.	Heat/Cold Stress - Personnel not screened, or monitored for Heat/Cold Stress IAW with PCD's Heat/Cold Stress Regulation, resulting in a potential heat/cold casualty while wearing/working in chemical protective ensembles.	I	D	2 High	Prior to donning TAP gear, chemical protective clothing/equipment (PCE) ensembles, all personnel will be medically cleared by the IMA. In addition, prior to donning said equipment, personnel shall be medically screened and monitored IAW PCD-R 385-507. All personnel involved with or who may be required to wear these protective items will receive Heat/Cold Stress training on an annual basis. Supervisors and employees shall adhere to the responsibilities contained in PCD-R 385-507 on a continuous basis. Anytime a person exhibits severe symptoms of heat-related illnesses, he/she will be immediately cut out of their PCE and processed expeditiously to the medical facility for treatment.	I	E	3 Med		
	DoFFing Chemical Personal Protective Clothing / Equipment Ensembles (PCE)	Death or permanent total disability.	Heat/Cold Stress - At the conclusion of chemical operations, where the work required the use of TAP gear, Chemical Protective Clothing (CPC) or chemical protective ensembles in heat stress environments, post medical screening is not performed resulting in the inability to recognize personnel with potential heat/cold stress symptoms.	I	D	2 High	Chemical operations where workers wear TAP gear, PCE ensembles in a defined heat/cold stress environment, require mandatory post medically screening IAW PCD-R 385-507. All personnel involved with or who may be required to wear these protective items will receive Heat/Cold Stress training on an annual basis. Supervisors, employees and medical support personnel shall adhere to the responsibilities contained in PCD-R 385-507 on a continuous basis.	I	E	3 Med		
	Donning Chemical Personal Protective	Permanent partial disability, temporary total disability exceeding 3 months	Exposure to HD/HT Vapors/Liquid - Potential exposure to mustard agent due to damaged,	II	D	C Med	Upon receipt of PCE and prior to use thereof, individuals will visually inspect their PCE noting damage or expired items.	II	E	4 Low		

FEB 26 2014

SOP NO: PU-000-M-486 REV 35 CHG DATE

APPENDIX H – Hazard Analysis

Prepared by: PCD HAWG

1 OPERATION	2 HAZARD	3 EFFECT OF HAZARD Personnel, Equipment & Facility	4 CAUSE OF HAZARD Condition/Action	5 HAZARD CATEGORY WITHOUT PREVENTIVE MEASURES			6 PREVENTIVE MEASURES			7 HAZARD CATEGORY WITH PREVENTIVE MEASURES				
				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC		
	Clothing / Equipment Ensembles (PCE)	time.	unserviceable, or expired chemical protective equipment and/or clothing.											
	Walking & Working Surfaces	Minor injury, lost workday accident.	<i>Slips/Trips/Falls -</i> Wet surfaces, cluttered workplace, equipment items, debris etc in the workplace/worksite.	III	C	3 Med		Keep floor in work area as dry as possible. Mop up spills immediately. Keep workplace free from trip hazards; maintain good housekeeping and organization of equipment items. Workers will have an unobstructed path of travel to the nearest available exit. Use extra caution while moving in PCE. ensembles, climbing stairs/ladders, (use hand rails) working around equipment items. Take extra care when climbing in and out of transport vehicles during loading and unloading operations, use handholds where available at all times. Inspect work areas prior to start of operations.	II	D	4 Low			
	Lifting	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Muscle Skeletal Injuries -</i> Improper lifting techniques. Lifting over 45 lbs. without the use of the "Buddy System" or mechanical lifting device. Back injury, struck by, crushing injury to hands legs and feet.	II	D	3 Med		Use proper lifting techniques at all times, do not lift over 45 lbs. without a lifting device or the use of the "Buddy System." All personnel engaged in material handling will wear steel- toed footwear.	II	E	4 Low			
	Ergonomics strain	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Muscle Skeletal Injuries -</i> Poor work center design resulting in ergonomic stress and strain on the work force.	II	D	3 Med		Perform ergonomics assessment of the work center. Educate work force on ergonomics awareness training. Conduct periodic work site reviews, assessments.	II	E	4 Low			

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG DATE

APPENDIX H – Hazard Analysis

Prepared by: PCD HAWG

1 OPERATION	2 HAZARD	3 EFFECT OF HAZARD Personnel, Equipment & Facility	4 CAUSE OF HAZARD Condition/Action	5 HAZARD CATEGORY WITHOUT PREVENTIVE MEASURES			6 PREVENTIVE MEASURES			7 HAZARD CATEGORY WITH PREVENTIVE MEASURES		
				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC
	Hazardous Material Handling (Industrial Chemicals, not HT or HD)	Minor injury, lost workday accident.	Chemical Injuries - Improper storage and use of chemicals resulting in chemical dermal burns, chemical burns to eyes or face, inhalation and secondary ingestion due to poor hygiene practices.	III	C	3 Med	Comply with PCD-R 385-16, Hazard Communication Program. Operator will read and adhere to the MSDS(s) prior to using chemical. Ensure that recommended precautions and PPE/PCE are applied. Chemicals, when not in use will be stored in the appropriate storage cabinet. Eye wash stations will be immediately assessable at all locations where hazardous chemicals are stored and/or used.	II	D	4 Low		
		Minor injury, lost workday accident.	Chemical Injuries - Improper use of CPC or PPE while conducting pre-operating checks, and or operating CAIRA equipment items during emergency response, duties which may result in chemical dermal burns, chemical burns to eyes or face and/or inhalation of toxic fumes.	III	C	3 Med	Ensure safety glasses, goggles and or face shields are readily available and used by personnel working with chemical products. Eye wash stations will be immediately assessable at all location where hazardous chemical are stored and/or used. Ensure proper level of PPE/PCE is used when performing pre-operational checks and operation of the M12A1. Follow MSDS recommended PPE/PCE requirements	III	D	4 Low		
	Hazardous Material Handling (Compressed Air Cylinders)	Minor injury, lost workday accident.	Struck by - Dropping cylinders resulting in; crushing injury to hands legs or feet.	III	C	3 Med	All personnel engaged in material handling will wear steel-toed footwear. Use proper lifting techniques at all times, do not lift over 45 lbs. without a lifting device or the use of "Buddy System". Ergonomics training, work place layout review. Ensure use of proper PPE/PCE.	III	D	4 Low		
		Permanent partial disability, temporary total disability exceeding 3 months time.	Release of Un-Controlled Energy Dropped fully charged cylinders compromising the valve stem resulting in projectile hazard, uncontrolled release of stored energy, causing injury to work	II	D	3 Med	Use proper lifting techniques at all times, do not lift over 45 lbs. without a lifting device or the use of the "Buddy System" / Ergonomics training, work place layout review. Use of positioning devices, and/or table ledges to ensure cylinders do not roll off table.	II	E	4 Low		

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG DATE

APPENDIX H - Hazard Analysis

Prepared by: PCD HAWG

1 OPERATION	2 HAZARD	3 EFFECT OF HAZARD Personnel, Equipment & Facility	4 CAUSE OF HAZARD Condition/Action	5 HAZARD CATEGORY WITHOUT PREVENTIVE MEASURES			6 PREVENTIVE MEASURES			7 HAZARD CATEGORY WITH PREVENTIVE MEASURES				
				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC		
			force.											
		Minor injury, lost workday accident.	Release of Un-Controlled Energy Improper use of compressed air resulting in bodily injuries due to uncontrolled release of compressed air.	III	C	3 Med		Train personnel in hazards associated with working with compressed air. Ensure that proper PPE/PCE is used. Compressed air used for cleaning shall not exceed a pressure of 30 psi. Compressed air shall not be used on employee's skin or clothing.	III	D	4 Low			
	Noise	Minor injury, lost workday accident.	Hearing Loss - Working with or around air compressors, generators, or other noise hazard areas that exceed 85 dBA that could result in an occupational hearing loss.	III	C	3 Med		Training employees on hearing conservation and work processes where the use of hearing protection is mandated. Post warning signs "Hearing Protection Required". Adhere to PCD-R 40-1, Hearing Conservation.	III	D	4 Low			
	Lightning	Death or permanent total disability.	Electrocution - Personnel working outdoors during lightning storms, resulting lightning strikes injuring or killing personnel.	I	D	2 High		Lightning protection and storm warning procedures will be conducted in accordance with Installation Emergency Management Plan.	I	E	3 Med			
	Motor Vehicle Operations	Death or permanent total disability.	Traumatic Injuries - Vehicle crash due to mechanical equipment failure during vehicle operations injuring operator and/or passengers.	I	D	2 High		Perform daily (documented) vehicle pre- operations check. Report defective or damaged vehicle components, equipment items immediately for corrective action, maintenance prior to operation of the vehicle. Mandatory use of seat belts for operator and or passengers. For MAV operations ensure DD 626 is completed prior to loading and movement of munitions.	I	E	3 Med			

FEB 26 2014

SOP NO.: PU-0000-M-486 REV 35 CHG _____ DATE _____

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				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC
		Death or permanent total disability.	<i>Traumatic Injuries -</i> Reckless driving, speeding causing loss of vehicle control (crash) injuring operator and/or passengers.	I	D	2 High	Ensure that vehicle operators have a valid government driver's license. Ensure that vehicle operators have completed the Army's Motor Vehicle Accident Avoidance Course. Follow posted speed limits at all times. Mandatory use of seat belts for operator and or passengers. Ground guides will be utilized for all vehicles/forklifts while backing-up and positioning during set setup.	I	E	3 Med De mini mis		
		Death or permanent total disability.	<i>Traumatic Injuries -</i> Vehicle striking wild life (crash) crossing/on PCD roadways in route to and from ammunition storage sites.	I	D	2 High	Be vigilante of PCD wild life at all times during vehicle operations. Maintain posted speed limits. Be extra cautious during dawn & dusk or during times of limited visibility. Do not swerve the vehicle in an attempt to miss the animal. Mandatory use of seat belts for operator and or passengers.	I	E	3 Med De mini mis		
		Death or permanent total disability.	<i>Traumatic Injuries -</i> Vehicle crash due to physiological stress, fatigue.	I	D	2 High	Utilize assistant drivers and work/rest cycles.	I	E	3 Med De mini mis		
	Motor Vehicle Operations (Under adverse weather conditions.)	Death or permanent total disability.	<i>Traumatic Injuries -</i> High winds, wet roads, icy or snow pack roads causing loss of vehicle control injuring operator and/or passengers.	I	D	2 High	Drive with extreme caution during high winds or inclement weather conditions. Perform daily (documented) vehicle pre-operations checks. Report defective or damaged vehicle components, equipment items immediately for corrective action, and maintenance prior to operation of the vehicle. Mandatory use of seat belts for operator and or passengers. Engage vehicle 4X4 if equipped. During high winds, ensure to maintain control of vehicle doors.	I	E	3 Med De mini mis		

FEB 26 2014

DATE

CHG

REV 35

SOP NO: PU-0000-M-486

UNCONTROLLED

APPENDIX H – Hazard Analysis

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				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC
	Hantavirus	Death or permanent total disability.	<i>Biological Illness</i> -Inhalation of airborne virus.	I	D	2 High	Avoidance, if possible. A minimum of Level D2 with a NIOSH full-face respirator (for Hantavirus clean-up only) with P100 filters, organic vapor cartridges will be required during clean up operations. Spray rodent droppings with bleach. Let soak for at least 20 minutes prior to removal. Bag all droppings and seal bag, place in an enclosed outdoor trash container.	I	E	3 Med		
	Forklift Operations	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Equipment Malfunction</i> Forklift load test out of date, lack of training, daily operator's inspected/function test not completed resulting system failure while lifting, positioning or moving chemical munitions resulting in potential fire, explosion, and exposure to mustard agent.	II	D	3 Med	Forklift Operators will verify that the forklift has; current load test, required daily inspection, and function test prior to usage. All operators will have a current forklift license. Conduct forklift training specific to the lifting and movement of munitions in and out storage structures.	II	E	4 Low		
	Eye Wash Station	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Equipment Malfunction</i> Sufficient water not available for flushing eyes, dirty water and or system clogged, lack of inspection which may lead to system malfunction and the inability to provide immediate medical care for chemical agent injuries of the eyes.	II	D	3 Med	Ensure portable eyewash unit is available at site, inspected, functional and has sufficient water for flushing eyes.	II	E	4 Low		

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG DATE

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				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC
	Monitoring Equipment	Permanent partial disability, temporary total disability exceeding 3 months time.	Malfunction/Damaged System - Monitoring detection equipment system failure/damaged. Inability to achieve required operating parameters that could result in agent exposures to personnel conducting chemical operations.	II	D	3 Med	Inspect and challenge, (verify calibration) all monitoring detection equipment before use, during use, and after operations. Ensure that all equipment is operating properly. Ensure operators are properly trained and certified in PCD chemical monitoring detection protocols.	II	E	4 Low		
Operation #1 Site Set-Up	Approaching Chemical Storage Structures	Permanent partial disability, temporary total disability exceeding 3 months time.	Exposure to HD/HT Vapors Approaching chemical storage structure unmasked without confirmed NRT monitoring in place.	II	D	3 Med	Personnel will don protective mask when approaching within 14 feet of ventilators of unmonitored storage structures.	II	E	4 Low		
		Permanent partial disability, temporary total disability exceeding 3 months time.	Insect or Snake Bites - Disturbance of insects or snakes while personnel are inspecting exterior structure or removing "King Tut" block.	II	D	3 Med	Personnel will be aware of and avoid holes or turning over rocks. Care will be exercised when removing the "King Tut" block and when opening the door.	II	E	4 Low		
Operation #2 First Entry Monitoring	Entering Chemical Storage Structures	Permanent partial disability, temporary total disability exceeding 3 months time.	Exposure to HD/HT Vapors/Liquid - Entering contaminated structures in inadequate level of PCE resulting in exposure to HD/HT vapors and/or liquid agent.	II	D	3 Med	Prior to entering storage structures, NRT monitoring will be conducted IAW SOP PU-0000-R-491 IF NRT monitoring is negative, masked personnel wearing Level C3 PCE (gloves/boots worn) will enter to perform visual inspection. Continuous monitoring will be conducted during the time in the structure.	II	E	4 Low		
		Permanent partial disability, temporary total disability exceeding 3 months time.	Exposure to HD/HT Liquid - Suspected liquid agent without NRT monitoring conformation.	II	D	3 Med	If visual inspection reveals suspected liquid (without NRT monitoring), personnel will immediately exit and close the igloo door. Personnel (wearing Level C1 PCE) will re-enter and test the suspected liquid with M8 paper. If confirmed agent, personnel will exit, close door and proceed through the	II	E	4 Low		

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG DATE

APPENDIX H – Hazard Analysis

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				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC
Operation #3 Storage Handling and Transport Procedures	Handling Munitions	Death or permanent total disability.	<i>Exposure to HD/HT Vapors/Liquid, Explosion/Fire –</i> Pallet/munitions shifts and/or fall during the movement to the transport vehicle.	I	D	2 High	decontamination station. 1000 CFM Filter emplacement operations will be conducted.	I	E	3 Med De mini mis		
	Loading Munitions	Death or permanent total disability.	<i>Exposure to HD/HT Vapors/Liquid, Explosion/Fire –</i> Loading of the transport vehicle, unsecured load shifts/falls.	I	D	2 High	Operators will ensure that MHE is in proper working condition. Operators will ensure that the cross members, side brackets, and/or tie down straps are properly installed to secure the pallet(s) prior to movement. Spotters/ ground guides will be utilized during all MHE TCM motor vehicle movements. Supervisor will also ensure all MHE operators are trained, licensed and selected IAW DOD 4145.19-R-1. MHE inspections will be conducted IAW TB 43-0142. Immediately upon removal from stack, the load will be lowered. All loads will be transported approximately 6-inches from the ground while on forklift. Use proper lifting techniques and use two-person lifting. Make	I	E	3 Med De mini mis		

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG DATE

APPENDIX H – Hazard Analysis

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				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC		
								sure any and all slip/trip/fall hazards are cleared from work path to the transport vehicle.						
	Transporting Munitions	Death or permanent total disability.	<i>Exposure to HD/HT Vapors/Liquid, Explosion/Fire</i> – Unsecured load, pallets, boxes shift and fall during movement.	I	D	2 High		Supervisor will ensure that all motor vehicle drivers are in possession of a valid CDL. Vehicles will be inspected IAW DA PAM 385-64. Using DD Form 626. Speed limits specified in SOP PU-0000-M-486 will be adhered to at all times. Prior to movement of the transport vehicle ensure that proper block & bracing has been completed	I	E	3 Med			
Operation #4 Intrusion Detection System (IDS) Test	Approaching Chemical Storage Structures	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Vapors</i> Approaching chemical storage structure unmasked without confirmed NRT monitoring in place.	II	D	3 Med		Approach structures up wind. Personnel will don protective mask and wear protective gloves when approaching within 14 feet of ventilators' of unmonitored storage structures.	II	E	4 Low			
Operation #5 Verification Inspection of VCC	Loss of Engineering Controls of VCC	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Vapors</i> Loss of power to VCC, VCC malfunction, in-operable.	II	D	3 Med		Verify that the backup power generator for building 491 is operational ready. Ensure that VCC filter system has been inspected by the PCD IH for adequate airflow prior to use.	II	E	4 Low			
	Positive NRT Monitoring of MAV	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Vapors</i> During movement, rounds leak agent.	II	D	3 Med		Prior to opening MAV door, monitoring will be completed IAW SOP-PU-0000-R-491 If NRT monitoring indicates positive reading immediately sound the chemical alarm system and evacuate personnel out of the immediate area, process thru the hot-line as needed, notify site supervisor and contact the Operation Center. After conformation is obtained, personnel in PCE Level C will	II	E	4 Low			

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG DATE

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				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC
								attach the 1000 CFM filter to the MAV.				
	Off Loading Munitions from MAV	Death or permanent total disability.	<i>Exposure to HD/HT Vapors/Liquid, Explosion/Fire</i> – Munition dropped resulting in activation of fire train or leak.	I	D	2 High		Use proper lifting and two-person lifting techniques. Lift boxes with both hands on carrying ropes. Make sure any and all slip/trip/fall hazards are clear from working path.	I	E	3 Med	De mini mis
	Banding Operations	Minor injury, lost workday accident.	<i>Cuts/Lacerations to Hands, Face/Eyes</i> – While cutting bands personnel are injured by sharp metal, banding material or equipment.	III	D	4 Low		Personnel will wear the following PPE when conducting banding operations; face and eye protection and leather palmed gloves. If banding operations are being conducted during leaker operations, leather palm gloves will be worn over the butyl rubber 7 mil gloves.	III	E	5 Low	
	Opening Pallets, Boxes	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Liquid</i> Leaking agent due to degradation of round.	II	D	3 Med		Upon opening shipping crate, inspect condition of packing tubes for signs of liquid leaks, notable wet spots, discoloration, or degradation of packing tubes.	II	E	4 Low	
	Movement of munitions into VCC	Death or permanent total disability.	<i>Exposure to HD/HT Vapors/Liquid, Explosion/Fire</i> – Munition dropped resulting in activation of fire train.	I	D	2 High		When moving munitions from table to conveyor, insure munition is positioned above the table or conveyor at all times. Work table shall have side ledges to prevent munitions from rolling off the table.	I	E	3 Med	De mini mis

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG DATE

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				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC
	Inspecting munitions in the VCC	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Liquid -</i> Visual inspection of munitions shows signs of liquid agent leakage.	II	D	3 Med	Test suspect areas with M8 paper, or with sampling line to NRT monitor. If liquid agent is confirmed immediately evacuate out of the VCC. (Level A PCE must be worn if liquid agent is present)	II	E	4 Low		
Operation #6 Detection Actions Taken - Vapor Leaker	HD/HT Vapor Detected	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Vapor -</i>	II	D	3 Med	The monitoring system operator will mask and sound the alarm. All personnel on site will mask, evacuate the structure and close doors. Upon exiting the structure, personnel will perform decontamination using the Mini Hot-Line, evacuate up wind and notify the Operation Center.	II	E	4 Low		
	Cross Contamination	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Off Gassing or Liquid agent -</i> Improper procedures processing through decontamination stations. Contamination due to improper handling procedures of suspected contaminated PCE.	II	D	3 Med	All personnel will be trained and competent in hot-line operations and proper decontamination procedures in the event of possible chemical agent releases. Do not permit contaminated PCE to come in contact with individual's skin. Ensure that all potential contaminated PCE is bagged and sealed. Follow collection and monitoring protocols.	II	E	4 Low		
Operation #7 Detection and Actions Taken - Suspect Liquid	Liquid Agent	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Vapor or Liquid agent -</i> Liquid agent release from munitions container not identified, or improper conformation procedures of suspected liquid releases.	II	D	3 Med	Confirm all suspected signs of liquid leaks, using M8 paper. If monitoring is negative, operators dressed in Level C1 will ascertain presence of agent by dabbing M8 paper into suspected liquid using tongs. If agent is confirmed, exit and process through the Hot-Line. M8 paper and tongs will be placed in the first pan, containing bleach for decontamination.	II	E	4 Low		
Operation #8 Leaker	Air Supplied Respirators	Death or permanent total disability.	<i>Asphyxiation -</i> Failure to manage SCBA respiratory systems	I	E	3 Med	Prior to use in chemical operations, all personnel will receive training and hands on	I	E	3 Med		

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG _____ DATE _____

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				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC		
Isolation and Containerization			resulting in operator running out of breathable air.				practice wearing Level A and/or B. Prior to donning Level A or B PCE, operators will physically check their SCBA respiratory systems to ensure that the system is operating properly. All SCBA systems will be inspected monthly for serviceability. The buddy system will be used to monitor air supply. If the respiratory system alarm engages the individual will immediately exit and process through the decontamination station. Backup, fully charged cylinders will be on-site for immediate use if required.							De mini mis
	Leaker Isolation	Minor injury, lost workday accident.	<i>Slips, Trips, & Falls</i> - During leaker isolation, worker slips, trips or falls while shrouding stacks/pallets, improper placement use of ladders.	III	C	3 Med	While conducting shrouding, extra caution will be used while accessing stacks and pallets. If climbing ladders to drape plastic, the buddy system will be used. Ensure ladders have a current inspection tag prior to use. Personnel will receive shrouding draping training.	III	D					4 Low
	Handling Munitions	Death or permanent total disability.	<i>Ammunition Functioning</i> - Fire, explosion, agent release due to munitions mishandled or dropped.	I	E	3 Med	Ensure that all personnel assigned to toxic chemical operations, are properly trained IAW and follow SOP procedures. All personnel who handle chemical munitions will have hands on training with simulated munitions.	I	E					3 Med De mini mis
							Ensure operators performing filter change out are properly trained in Bag-In and Bag-Out operations of the system.							

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG DATE

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				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC
Operation #9 1000 CFM Filter Installation and Operation	Filter Handling	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Off Gassing</i> - Agent remains in hose after filter unit is disconnected. (Uncontrolled Release of Agent)	II	D	3 Med	Monitoring of hoses used in CFM 1000 filter operations will be conducted in IAW PU- 0000-R-491. Seal hose in container during storage.	II	E	4 Low		
		Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Off Gassing</i> - Hazardous condition not properly identified.	II	D	3 Med	Signage indicating contaminant expected in the filter system is posted on system.	II	E	4 Low		
		Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Off Gassing</i> - Unauthorized entry to the filter system. (Uncontrolled Release of Agent)	II	D	3 Med	Lock exterior of the filter bank to protect from unauthorized entry to the filter system.	II	E	4 Low		
	Fall Hazard	Permanent partial disability, temporary total disability exceeding 3 months.	<i>Trauma to due falls from height</i> - Ladder use on inclined stops, unstable surfaces.	II	D	3 Med	Train operators in rear stack platform ladder safety; maintain 3 point contact while climbing up and down ladder, use spotter to stabilize the ladder and provide guidance as needed.	II	E	4 Low		
	Fueling Operations	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Fire</i> - Fuel leak or spill ignites.	II	D	3 Me	Following refueling procedures IAW the operating manual. Keep fuel tanks properly stowed when not in use. Maintain fire breaks around igloos. During refueling operations a portable fire extinguisher will be on site.	II	E	4 Low		
	Unintended Movement (Igloo Door)	Minor injury, lost workday accident.	<i>Traumatic Injuries</i> - Increased airflow causes igloo door to shut unexpectedly.	III	D	4 Low	If access to the igloo occurs during filtering or during training events, ensure that the igloo door is prevented from closing unexpectedly by using a door stop.	III	E	5 Low		

FEB 26 2014

SOP NO: PU-0000-M-486 REV 35 CHG DATE

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				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC
	Unintended Movement (Filter Trailer Unit)	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Traumatic Injuries</i> - While attaching, moving, and setting up the filter trailer, trailer falls or is upset causing personal injury.	III	D	4 Low		During movement and setup of filter trailer, ensure that all stabilizer jacks are engaged properly. Prior to disconnecting from towing vehicle, the trailer will be chocked and blocked, and the stabilizer jacks engaged.	III	E	5 Low	
	Grounding Rod/Cable	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Electrical Shock</i> - Grounding rod/cable not connected, used, or comes off.	II	D	3 Med		Prior to startup of the generator, ensure that the grounding rod and grounding cable are securely attached. Perform daily checks to ensure the cable has not come off or has not been disturbed. ASO checks grounding rod on initial installation.	II	E	4 Low	
	Noise	Minor injury, lost workday accident.	<i>Hearing Loss</i> - Working with and around equipment items that produce noise above 85 dBA.	III	C	3 Med		While working near operating CFM 1000 filter systems, hearing protection will be worn by all individuals. Signage "Hearing Protection Required" posted on the trailers.	III	D	4 Low	
Operation #10 Decontamination of PCE, Equipment, and Facilities	Contaminated PCE, Equipment, or Facilities	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Off Gassing</i> - Handling PCE used in contaminated/leaker operations.	II	D	3 Med		PCE and or equipment items exposed to agent vapors/liquid will be placed in plastic bags, and sealed when the individual processes through the decontamination station. During the cleanup (conclusion of operations) personnel wearing butyl rubber gloves will collect the bagged PCE and equipment and transferred to Bldg 475 monitoring shed and monitored IAW SOP PU-0000-R-491.	II	E	4 Low	
	High Test Hypochlorite (HTH)	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Chemical Vapors, Dust</i> - Contact with HTH causes chemical burns to the skin. Vapors injure eyes and or respiratory tract.	II	D	3 Med		When handling, mixing, or applying HTH during chemical operations a minimum Level C1 protective clothing will be worn.	II	E	4 Low	

FEB 26 2014

DATE

CHG

REV 35

SOP NO: PU-0000-M-486

UNCONTROLLED

APPENDIX H – Hazard Analysis

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				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC
Operation #11 Donning and Doffing of Level A Interspiro	Wearing Encapsulated PCE	Death or permanent total disability.	Asphyxiation – Failure to manage SCBA respiratory systems resulting in operator running out of breathable air	I	D	2 High	Ensure sign out sheet is present and the suit has a current inspection date. Operator will review and sign sheet prior to donning suit. Wearer will perform an audio-visual alarm test of the SCBA respiratory system prior to use.	I	E	3 Med		
				I	D	2 High		When donning, ensure internal hose (bypass hose, if applicable) and safety lock are properly connected or engaged.	I	E	3 Med	
Operation #11 & 12 Donning and Doffing of Level A & B	Depleted SCBA Cylinder	Death or permanent total disability.	Asphyxiation – Failure to connect internal hose (bypass hose, if applicable) resulting in the inability to supply breathable air if main SCBA cylinder is depleted. Heat Stress - Repeated entry or extended use of Level A resulting in insufficient recuperation time for personnel exposed to heat strain environments	I	D	2 High	Follow all guidance as outlined in PCD-R 385-507 Heat/Cold Stress Prevention Program. All personnel subjected to heat stress environments will be given sufficient recuperation time between operations to avoid heat stress illnesses. Ensure adequate rest and fluid replacement is provided.	I	E	3 Med		
				I	D	2 High		Leave area immediately when alarm whistle sounds. Back up, fully charged cylinders will be on hand during all operations involving use of PCE Level A and/or B.	I	E	3 Med	
Operation #11 & 12 Donning and Doffing of Level A & B	Doffing Level A/B (Contaminated PCE)	Permanent partial disability, temporary total disability exceeding 3 months time.	Exposure to HD/HT Off Gassing or Liquid agent – Improper procedures processing through decontamination stations. Contamination due to improper handling procedures of suspected contaminated PCE.	II	D	3 Med	The Assistant (down dresser), wearing Level C1 will keep hands away from the inside of the suit to avoid possible contamination to wearer. The wearer will not touch the outside of the suit during doffing. The assistant will ensure the suit is folded outward and away from the user's body.	II	E	4 Low		
				II	D	3 Med		Contamination due to improper handling procedures of suspected contaminated PCE.	II	E	4 Low	

SOP NO: PU-0000-M-486 REV 35 CHG DATE FEB 26 2014

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				HS	HP	RAC	HS	HP	RAC	HS	HP	RAC
Appendix E 1000 CFM Filter Carbon Bank Replacement	Filter Handling	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Muscle Skeletal Injuries</i> Filter banks exceed manual lifting capacity.	II	D	3 Med	Use of lifting devices and/or two man lift will be used while handling filters during installation and or change out of filters.	II	E	4 Low		
	Filter Handling	Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Agent Off-Gases</i> – during filter change-out or maintenance (Uncontrolled Release of Agent)	II	D	3 Med	Ensure operators performing filter change out are properly trained in Bag-In and Bag-Out operations of the system.	II	E	4 Low		
		Permanent partial disability, temporary total disability exceeding 3 months time.	<i>Exposure to HD/HT Off Gassing</i> – Bag tears during filter change out. (Uncontrolled Release of Agent)	II	D	3 Med	Level C3, (gloves and mask worn) at a minimum will be worn by all operators conducting CMF 1000 Filter Installation/ Change Out Operations. During change out of filters, NRT monitoring will be conducted IAW PU-0000-R-491.	II	E	4 Low		