

NATIONWIDE NON-STOCKPILE CHEMICAL WARFARE MATERIEL SCOPING AND SECURITY STUDY



**Army Environmental Cleanup Workshop
30 January – 2 February 2006**

Background of the Study

- The U.S. Army Corps Of Engineers Is Conducting A Nationwide Effort At Formerly Used Defense Sites (FUDS) Where Historical Documentation Indicates That Chemical Warfare Materiel (CWM) Had Been Used, Produced, Stored, And/Or Tested
- Objectives:
 - Identify,
 - Prioritize,
 - Manage, And
 - Develop Cost Estimates For Future Actions

Background of the Study (Cont.)

- **Formerly Used Defense Sites** Were Used To Train Soldiers, Airmen, Sailors, And Marines, As Well As To Develop And Test New Weapons And Warfare Capabilities.
- After Wartime, Many Properties Were No Longer Needed. They Were Cleaned Up According To The Best Practices Available At The Time And Then Transferred To Other Owners.

Suspect CWM Sites

- **91 FUDS Eligible Sites Identified**
 - **7 Types Of Sites**
 - Military Airfields
 - Forts, Camps, And Ranges
 - Arsenals And Depots
 - Munitions Test Areas
 - Shipment Burial Sites
 - Non-CWM Sites

What is Chemical Warfare Materiel (CWM)?

- **Army Definition - An Item Configured As A Munition That Contains A Chemical Substance Intended To Kill, Injure, Or Incapacitate**
- **Due To Hazards, Prevalence, And Military Use; Chemical Agent Identification Sets (CAIS) Are Also Considered Chemical Warfare Materiel**

Chemical Agent Identification Sets

- Glass Vials Or Bottles Filled With Various Chemical Agents
- Stored In Steel Cylinders (“Pigs”) Or Wooden Boxes, Depending On The Type Of Sets
- Chemical Field Exercises Were Conducted Using The Identification Set Vials
 - Exploding Them With Detonators
 - Conducting Battle Exercises
- Over 100,000 Produced Between 1930 And 1960
 - Early 1980’s Approx. 21,000 Destroyed
 - Remaining Expended And/Or Disposed Of

The Study Process

Step 1

Records Review

Step 2

Additional Information (If Required)

- **Supplemental Archives Search Report**
- **Aerial Photographic Analysis**

Step 3

Site Visit (If Required)

Step 4

Field Investigation (If Required)

Recommend Path Forward And Develop Cost To Complete

- **CWM Project Close-Out**
- **Further Action**
 - **Additional Field Investigation**
 - **Remedial Action**
 - **Education and Awareness Training**

Step 5

Provide Information In Final Report

- **Site Ranking And Prioritization**
- **Costs To Complete**

Step 6

Site Ranking Process

- Relative Ranking Applied To Each Site In Order To Prioritize Future Actions
- Existing Rankings
 - RAC Score (1 – 5)
- DoD Munitions Response Site Prioritization Protocol (MRSPP)
 - Chemical Hazard Evaluation (CHE) Module
 - Maximum Score - 100 Points
 - 3 Major Factors Divided Into 9 Data Elements
 - CWM Hazard (40%)
 - Accessibility (40%)
 - Receptors (20%)

Site Ranking Process (Cont.)

➤ Example Data Element: CWM Configuration

Table 11
Classifications Within the CHE Module *CWM Configuration* Data Element

Classification	Description	Score
CWM, explosive configuration, either UXO or damaged DMM	The CWM known or suspected of being present at the MRS is: <ul style="list-style-type: none"> Explosively configured CWM that are UXO (i.e., CWM/UXO). Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged. 	30
CWM mixed with UXO	<ul style="list-style-type: none"> The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged, or nonexplosively configured CWM/DMM, or CWM not configured as a munition, that are commingled with conventional munitions that are UXO. 	25
CWM, explosive configuration that are DMM (undamaged)	<ul style="list-style-type: none"> The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged. 	20
CWM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS is: <ul style="list-style-type: none"> Nonexplosively configured CWM/DMM. Bulk CWM/DMM (e.g., ton container). 	15
CAIS K941 and CAIS K942	<ul style="list-style-type: none"> The CWM/DMM known or suspected of being present at the MRS is CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11. 	12
CAIS (chemical agent identification sets)	<ul style="list-style-type: none"> Only CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS. 	10
Evidence of no CWM	<ul style="list-style-type: none"> Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS. 	0

Site Ranking Process (Cont.)

➤ Relative Security Ranking

- Accessibility Factor From CHE Module
 - Information On The Location of CWM
 - Confirmed / Suspected
 - Surface / Subsurface
 - Ease Of Access
 - Extent Of Controls / Barriers

Site Ranking Process (Cont.)

➤ Example Data Element: CWM Location

Classification	Description	Score
No barrier	<ul style="list-style-type: none">There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible).	10
Barrier to MRS access is incomplete	<ul style="list-style-type: none">There is a barrier preventing access to parts of the MRS, but not the entire MRS.	8
Barrier to MRS access is complete, but not monitored	<ul style="list-style-type: none">There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5
Barrier to MRS access is complete and monitored	<ul style="list-style-type: none">There is a barrier preventing access to all parts of the MRS, and there is active continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	0

Example Suspect CWM Site – Target Range

- In 1943, The U.S. Army Acquired 2,283 Acres Of Land For Use As A Target And Gunnery Range
- Chemical Warfare Training Included
 - Identification Of Agents
 - Personnel Protection
 - Defense Against Chemical Attack

CWM Training at Target Range

- Mustard Training Area,
Required
Decontamination Of
Mustard Agent (H) In
1946 And A Follow-up
Decontamination In
1947
- In 1997, The
Landowner Found Two
Storage Containers For
Chemical Warfare
Agent Identification
Sets (CAIS)



Study Process

- Records Review
- Site Visit
- Supplemental
Aerial
Photography
Analysis
- Field Investigation
 - Geophysical
Survey
 - Public Meetings
 - Intrusive
Investigation
- Final Report

Field Investigation Results

➤ 54 Anomalies

- 4 Empty PIGS
- 34 K941 Intact Empty CAIS Bottles
- Numerous Broken CAIS Bottles

➤ 4 Anomalous Areas

- Conventional Ordnance Related Items
 - Empty Burster Tube
 - M69 Counterweights
 - 2 M69 Fuzed Incendiary Bomblets

Results / Recommended Action

➤ Investigation Results

- CAIS Shipping Containers / Empty Glass Vials
- UXO / Ordnance-Related Scrap
- All Metallic Anomalies Investigated

➤ Recommended Action

- Still Potential For Additional CAIS
- Remedial Investigation / Feasibility Study
- Education And Awareness Training
- Long Term Monitoring
- CWM Project Closeout

➤ Site Rating

- Varied from the highest rating of A to the lowest rating of G

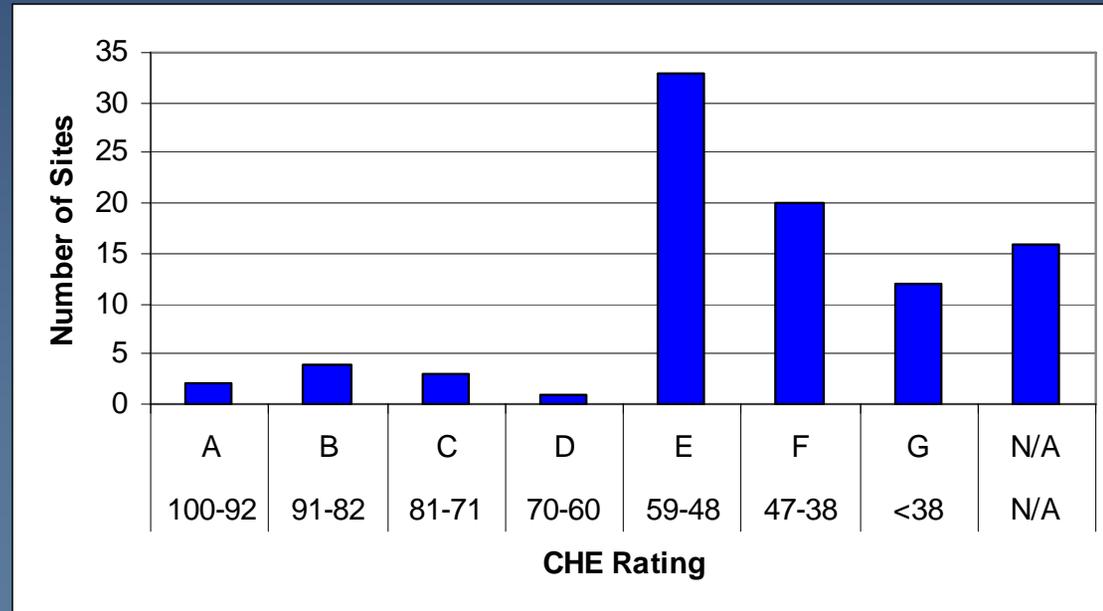
Overall Study Results

➤ Recommended Actions For 91 Sites

- 35 – CWM Project Closeout
- 56 – Further Action

➤ Overall Site Ranking

- 9 Sites In Categories A-D
- 16 Site Not Ranked
 - SI Report Indicates CWM Never Present At Site
 - Closeout Already Completed



Overall Study Results

- Cost To Complete
- Original Estimate of Cost To Complete for 91 Sites Approx. \$1 Billion
- Study Estimate (\$143 Million)
 - Further Action Sites - \$142 Million
 - Project Closeout Sites - <\$1 Million
- Key Parameters
 - Current Year Dollars
 - Long Term Management Out To 30 Years
 - Includes Closeout Costs For Further Action Sites

Public Involvement

- Generic Public Involvement Work Plan
 - **PI Program framework:** Promotes Active, Two-Way Communication Between USACE And Communities Affected By Response Actions At FUDS
 - **Toolkit:**
 - Brochures
 - Fact Sheets
 - Public Meetings
 - Displays
 - Presentations
 - Safety Video

Lessons Learned

➤ Programmatic Approach

- Cost Savings, Uniformity of Evaluation, Efficiency

➤ Technology Advancements

- GPS – Improved Site Visits, Geophysics
- GIS – Improved Photo And Map Evaluation
- Secure Website – Expedited Document Review

➤ Public Involvement

- Programmatic Approach – Uniform Message
- Cost Savings Due To Development Of Generic Information