Welcome to ITRC's Internet-Based Training
Munitions Response Historical Records Review

Thank you for joining us.

Today's training focuses on the ITRC technical and regulatory guidance document:

Munitions Response Historical Records Review

The training is sponsored by ITRC and the EPA Office of Superfund Remediation and Technology Innovation

Creating tools and strategies to reduce technical and regulatory barriers for the deployment of innovative environmental technologies

This training is designed to introduce state and federal regulators, consultants, and other stakeholders to a document created by ITRC's UXO Team titled *Munitions Response Historical Records Review*. This training focuses on providing guidance to reviewers of munitions response historical record review (MR HRR) documents.

Presentation Overview: The proper collection, analysis, and documentation of a historical records review for a munitions response (MR) provide the basis for the MR site investigation and remediation process. Because the historical review is the first step in evaluating hazards resulting from military activities at project sites, national, state, and local interest has increasingly focused on this review. Since historical evaluations can vary greatly from site to site, regulators must understand the various processes involved in preparing a historical review to evaluate the adequacy of one performed on a project site.

This training introduces state regulators, environmental consultants, site owners, and community stakeholders to the ITRC Technical and Regulatory Guidance Document *Munitions Response Historical Record Review (MRHRR)* (UXO-2), created by ITRC's UXO Team. It assists reviewers in assessing the adequacy of an MRHRR review of property potentially impacted by the use of military munitions. The course teaches the purpose, content, and terminology of munitions historical research; provides a uniform technical approach and useful tools for reviewing an MRHRR document independent of regulatory framework or authorities; and communicates state regulator expectations to those initiating, planning, and executing an MRHRR document.

ITRC – Interstate Technology and Regulatory Council (www.itrcweb.org)

EPA-OSRTI – Environmental Protection Agency – Office of Superfund Remediation and Technology Innovation (www.clu-in.org)

ITRC Course Moderator: Mary Yelken (myelken@earthlink.net)

Munitions Response Historical Records Review

Presentation Overview

- **Introduction to *Munitions Response Historical Records Reviews* (MR HRR)**
- **MR HRR Teams**
- **Questions and Answers**
- **Planning the Project**
- **Conducting the Research**
- **Analyzing and Interpreting the Data**
- **Reporting the Results**
- **Questions and Answers**
- **Links to Additional Resources**
- **Your Feedback**

Logistical Reminders

- **Phone Audience**
  - ✓ **Keep phone on mute**
  - ✓ *** 6 to mute your phone and again to unmute**
  - ✓ **Do NOT put call on hold**
- **Course Time = 2 ¼ hours**
- **2 Question & Answer Periods**

No associated notes

ITRC Disclaimer and Copyright

Although the information in this ITRC training is believed to be reliable and accurate, the training and all material set forth within are provided without warranties of any kind, either express or implied, including but not limited to warranties of the accuracy, currency, or completeness of information contained in the training or the suitability of the information contained in the training for any particular purpose. ITRC recommends consulting applicable standards, laws, regulations, suppliers of materials, and material safety data sheets for information concerning safety and health risks and precautions and compliance with then-applicable laws and regulations. ECOS, ERIS, and ITRC shall not be liable for any direct, indirect, incidental, special, consequential, or punitive damages arising out of the use of any information, apparatus, method, or process discussed in ITRC training, including claims for damages arising out of any conflict between this the training and any laws, regulations, and/or ordinances. ECOS, ERIS, and ITRC do not endorse or recommend the use of, nor do they attempt to determine the merits of, any specific technology or technology provider through ITRC training or publication of guidance documents or any other ITRC document.

Copyright 2007 Interstate Technology & Regulatory Council,
444 North Capitol Street, NW, Suite 445, Washington, DC 20001

Here's the lawyer's fine print. I'll let you read it yourself, but what it says briefly is:

•We try to be as accurate and reliable as possible, but we do not warrantee this material.

•How you use it is your responsibility, not ours.

•We recommend you check with the local and state laws and experts.

•Although we discuss various technologies, processes, and vendor's products, we are not endorsing any of them.

•Finally, if you want to use ITRC information, you should ask our permission.

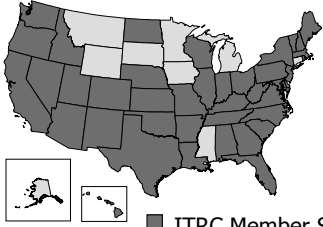# ITRC – Shaping the Future of Regulatory Acceptance

2004 Course Topics
- Alternative Landfill Covers
- Constructed Treatment Wetlands
- Munitions Response Historical Records Review
- Triad Approach
- Mitigation Wetlands
- Smalls Arms Firing Ranges: Best Management Practices
- Remediation Process Optimization
- Performance Assessment of DNAPL Remedies
- In Situ Bioremediation
- In Situ Chemical Oxidation
- Phytotechnologies
- Radiation Risk Assessment
- Soils at Small Arms Firing Ranges
- Surfactant/Cosolvent Flushing of DNAPLs
- Permeable Reactive Barriers

Host Organization

ECOS

ITRC State Members

■ ITRC Member State

Federal Partners DOE EPA DOD

Coordinating Organizations WGA SSEB

Industry, Academia, Consultants, Citizen Stakeholders

The Interstate Technology and Regulatory Council (ITRC) is a state-led coalition of regulators, industry experts, citizen stakeholders, academia and federal partners that work to achieve regulatory acceptance of environmental technologies and innovative approaches. ITRC consists of more than 40 states (and the District of Columbia) that work to break down barriers and reduce compliance costs, making it easier to use new technologies and helping states maximize resources. ITRC brings together a diverse mix of environmental experts and stakeholders from both the public and private sectors to broaden and deepen technical knowledge and advance the regulatory acceptance of environmental technologies. Together, we're building the environmental community's ability to expedite quality decision making while protecting human health and the environment. With our network approaching 7,500 people from all aspects of the environmental community, ITRC is a unique catalyst for dialogue between regulators and the regulated community.

For a state to be a member of ITRC their environmental agency must designate a State Point of Contact. To find out who your State POC is check out the "contacts" section at www.itrcweb.org. Also, click on "membership" to learn how you can become a member of an ITRC Technical Team.

Meet the ITRC Instructors

Nicole Sotak
California Department of Toxic
Substances Control
1001 I St. PO Box 806
Sacramento, CA 95812
P: 916-327-4508 F: 916-323-3215
e-mail: nsotak@dtsc.ca.gov

Jim Pastorick
Geophex UXO, Ltd.
218 N. Lee St., Suite 304
Alexandria, VA 22314
P: 703-548-5300 F: 703-548-5350
E-mail: geophexuxo@aol.com

Dave Larsen
Utah Department of Environmental
Quality, Division of Solid and Hazardous
Waste
288 N 1460 West
Salt Lake City, UT 84114-4880
P: 801-538-6749 F: 801-538-6715
E-mail: dclarsen@utah.gov

Nicole Sotak is a senior environmental planner with the Department of Toxic Substances Control within the California Environmental Protection Agency. She supervises the Environmental Analysis and Regulations unit, which manages California Environmental Quality Act projects and provides technical support to the programs on environmental analysis and planning. Nicole has managed or assisted in the preparation of environmental analyses for a variety of unexploded ordnance remediation projects throughout California. Nicole has participated in ITRC for two years and has been the subteam leader for the development of *Munitions Response Historical Records Research*. Nicole received her bachelor of science from the University of California at Davis in genetics and completed graduate course work on environmental policy at the Ohio State University.

David Larsen has worked as an environmental scientist/geologist for the Utah Division of Solid and Hazardous Waste since 1988. His work is RCRA related, including permitting, inspections, and corrective action. He represented the state of Utah on the military munitions and range rule teams. He has written RCRA storage, treatment (OB/OD), postclosure, and RD&D permits. The RD&D permits were for facilities designed to demilitarize conventional and chemical munitions. He has inspected explosive and propellant manufacturing facilities, military facilities including the chemical weapons incinerator in Utah and on Johnston Atoll, military ranges, and many of the FUDS sites in Utah. He has worked with the U.S. Army Corps of Engineers and local Army EOD and Technical Escort units on projects involving surface and subsurface clearance and subsequent management of biological, chemical, and conventional munitions. His main duties currently include acting as regulatory project manager for corrective action at military bases. One of these projects involved characterization and evaluation of a very old site that was used to open burn 30,000 chemical agent (GB)–filled M55 rockets.

Jim Pastorick is President of Geophex UXO, Ltd., a consulting firm that specializes in providing technical support to state and foreign governments on ordnance and explosives/unexploded ordnance (OE/UXO) project planning and management. He is a former Navy Explosive Ordnance Disposal (EOD) officer who graduated from the U.S. Naval School of EOD in 1986. Since leaving the Navy, he has worked as the Senior UXO Project Manager for UXB International, Inc. and IT Corporation prior to starting Geophex UXO in 1999. Mr. Pastorick is a member of the ITRC UXO Work Team and has participated as a presenter of ITRC's "Basic UXO Training" Course. He has a BA in journalism from the University of South Carolina and worked as a photographer for the *Columbia Record* prior to reentering the Navy. Before attending college he served as a Navy enlisted man in the SEABEES.

Why Is this Training Important?

- Historic research is the first step in the munitions response process
- Scope of the munitions response problem:
  - As much as 25 million acres of land in the United States alone is potentially contaminated with military munitions
  - Munitions response sites cross all military cleanup programs—IRP, BRAC, FUDS
  - Contaminated rangeland is a significant challenge associated with BRAC land transfer
  - BRAC 2005 likely to add significant challenge
- These sites pose potential for immediate public health risks

In 1983, two young boys were killed when abandoned UXO they found in the residential neighborhood of Tierra Santa (near San Diego, California) exploded.

*Munitions Response
Historical Records Review*

**A 1,000-pound chemical bomb from WW II
recently found on a former testing range**

This training was prepared by the ITRC Unexploded Ordnance (UXO) Team, which was formed in 1999. The team—composed of state regulators, federal partners, private industry, and community representatives—provides a neutral forum for exchanging ideas about UXO cleanup, technology, and related issues.

The team has developed a two-day classroom introductory course entitled "UXO Basic Training," which introduces participants to key environmental issues associated with ordnance and explosives cleanup.

The MR HRR guidance document is the first in a series of documents that will focus on different aspects of the munitions response process.

The team's next document will be on geophysical prove-outs (GPO) for munitions response projects conducted in support of geophysical survey operations.

Terminology

The MR HRR document and this training use the following terminology adopted by the Army in 2003:

- Munitions Response (MR)
- Military Munitions
- Munitions and Explosives of Concern (MEC)
- Munitions Constituents (MC)
- Munitions Response Site (MRS)
- Operational Range

40-mm projectile found on a former live-fire range

These definitions below are the complete list of definitions that have been finalized by the Department of Defense and included in an Office of the Secretary of Defense memo dated December 18, 2003 and titled "Definitions Related to Munitions Response Actions":

Defense Sites – Locations that are or were owned by, leased to, or otherwise possessed or used by the Department of Defense. The term does not include any operational range, operating storage or manufacturing facility, or facility that is used for or was permitted for the treatment or disposal of military munitions.

Discarded Military Munitions (DMM) – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations.

Explosives or Munitions Emergency Response – All immediate response activities by an explosives and munitions emergency response specialist to control, mitigate, or eliminate the actual or potential threat encountered during an explosives or munitions emergency. An explosives or munitions emergency response may include in-place render-safe procedures, treatment or destruction of the explosives or munitions, and/or transporting those items to another location to be rendered safe, treated, or destroyed. Any reasonable delay in the completion of an explosives or munitions emergency response caused by a necessary, unforeseen, or uncontrollable circumstance will not terminate the explosives or munitions emergency. Explosives and munitions emergency responses can occur on either public or private lands and are not limited to responses at RCRA facilities.

Munitions Constituents (MC) – Any materials originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

Munitions and Explosives of Concern (MEC) – This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, means unexploded ordnance, discarded military munitions, or explosive munitions constituents (e.g., TNT, RDX) present in high enough concentrations to pose an explosive hazard.

Munitions Response (MR) – Response actions, including investigation, removal, and remedial actions to address the explosives safety, human health, or environmental risks presented by unexploded ordnance or discarded military munitions or by munitions constituents.

Munitions Response Area (MRA) – Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. A munitions response area comprises one or more munitions response sites.

Munitions Response Site – A discrete location within an Munitions Response Area that is known to require a munitions response.

Military Munitions – All ammunitions products and components produced for or used by the armed forces for national defense and security, which includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical

Acronyms
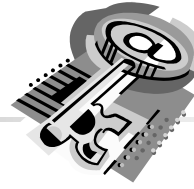
ASR	Archive Search Report
BRAC	Base Realignment and Closure
CSM	Conceptual Site Model
DQO	Data Quality Objective
EE/CA	Environmental Engineering and Cost Analysis
EOD	Explosive Ordnance Disposal
FS	Feasibility Study
FUDS	Formerly Used Defense Sites
IRP	Installation Restoration Program
PA	Preliminary Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
SI	Site Investigation

No Associated Notes

What Will You Learn from This Course?

How to review and evaluate Munitions Response Historical Records Review documents

- MR HRR purpose, content, and terminology
- Technical approach and tools for reviewing an MR HRR
- Key elements of historic records review
- Expectations of the MR HRR
- Uniform technical approach and tools compatible with any regulatory framework


This training will demonstrate how the ITRC document *Munitions Response Historical Records Review* will

1) educate state regulators and other stakeholders on the purpose, content, and terminology of an MR HRR;

2) provide a uniform technical approach and useful tools for reviewing an MR HRR that is compatible with any regulatory framework or authorities;

3) provide the key elements of the historic records review process and resulting document; and

4) communicate state regulator expectations to those planning, executing, and initiating an MR HRR.

A variety of regulatory frameworks have been used for cleanup—CERCLA, RCRA, Drinking Water Act, etc. A more extensive review of regulatory frameworks was covered in the UXO Basic Training course offered by the UXO Team (see www.itrcweb.org for more information on this training).

Key Issues
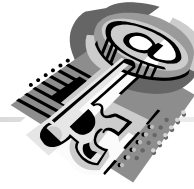
- Early stakeholder involvement in the munitions response process
- Emphasis on an open and transparent historical records research
  - Inclusion on the initial site visit
  - Establishment of a data archive
  - Establishment of a quality control program
- Development of a preliminary conceptual site model
- Establishing consistent data gathering and analysis methodology

No associated notes

MR HRR Document Organization

- Introduction
- Building the MR HRR team
- Planning the project
- Conducting the historical records review
- Analyzing and interpreting the data
- Reporting the results
- Appendices for more information

The introduction discusses how the services' missions vary and how they approach historical records research from different perspectives.

The MR HRR team is composed of stakeholders. We are using the broadest possible definition of "stakeholders" in the course of this document and training: everyone who has a stake in the project, including state and federal regulators.

Knowing how the historical records research is planned and conducted will help you to evaluate its accuracy and completeness.

This document contains checklists and the information you can use to review the final report for completeness and accuracy.

What is a munitions response historical records review?

- The collection, analysis, and documentation of historical information related to the use of military munitions on a site
- First major step in the munitions response process
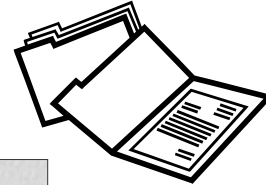
MK-80 Series bomb

A lot of these sites are old. Institutional knowledge has been lost, and there may not be any personnel available to talk about military activities. Records of these activities may be scattered around the country or lost, or historic activities may not have even been documented. Historic research will help to compile the information from various sources that is available to help military munitions use.

Historic research may indicate significant military munitions involvement that poses a potential munitions hazard, or it may establish that military munitions never existed on the site and therefore no further action is warranted.

High-quality, well-documented historic research will assist site managers, regulators and stakeholders in making confident, informed decisions concerning future site investigation and remediation work.

Role of Historical Records Review in the Munitions Response Program

- The Munitions Response (MR) process starts with identification of a potential site and ultimately leads to the closeout of MR activities
- Initial MR HRR is usually conducted early in the response process
- Historical records review may be used during any phase of process

When scoping detailed investigations of potential munitions response sites, the initial historical research should first be reviewed to determine whether additional research is warranted.

There are potential limitations of many initial historical reviews.

As historical research progresses, specific questions or data gaps can arise that are best addressed with further research.

Role of the Department of Defense in MR HRR

- **U.S. Army Corps of Engineers**
  - Formerly Used Defense Sites (FUDS)
  - Installations realigning or closing under BRAC
  - Active installations on other than operational ranges

- **U.S. Navy (including Marine Corps)**
  - Responsible for all Military Munitions Response Program activities on Navy and Marine Corps active and BRAC installations

- **U.S. Air Force**

DOD has developed a munitions response site inventory and site prioritization protocol (SPP) required by the 2002 National Defense Authorization Act. The initial inventory was open for review and comments in 2003. While the official comment period closed November 20, 2003, comments can still be submitted. See the DENIX Web site (https://www.denix.osd.mil/) for more information.

U.S. Army Corps of Engineers

•The Army is the Executive Agent for DoD's Formerly Used Defense Site (FUDS) program. The U.S. Army Corps of Engineers (USACE) executes the FUDS program for the Army and investigates—and, when appropriate, performs required responses to address—contamination resulting from former DoD use of FUDS. Because many FUDS have been inactive for long periods of time, often little is known about potential hazards on many of these sites.

•At the request of an installation, the USACE may also implement munitions responses on MRSs that are located on installations realigning or closing under BRAC or on active installations on other than operational ranges.

•USACE Engineering and Support Center, Huntsville, has developed an archives search report (ASR) process; the purpose of the ASR records search is to locate and retrieve all appropriate documents regarding a site. If the ASR documents potential contamination, additional, more exhaustive historical investigation is almost always recommended.

U.S. Navy

•Responsible for all Military Munitions Response Program (MMRP) activities on on Navy and Marine Corps active and BRAC installations.

•Navy MR sites are on installations that are active or were recently active; therefore, documentation for these sites should be more readily available than for FUDS sites.

•The Navy follows the CERCLA process for MR sites. Therefore, information gathered during the MR HRR is documented in the Preliminary Assessment (PA).

•Navy and USAF do continuous MR HRR and document new findings in the appropriate document (for example, the PA, SI, RI, FS or a separate archive report document).

•The Marine Corps has completed comprehensive ASRs on 10 installations.

U.S. Air Force

•Has a similar mission and follows a process very similar to that of the Navy.
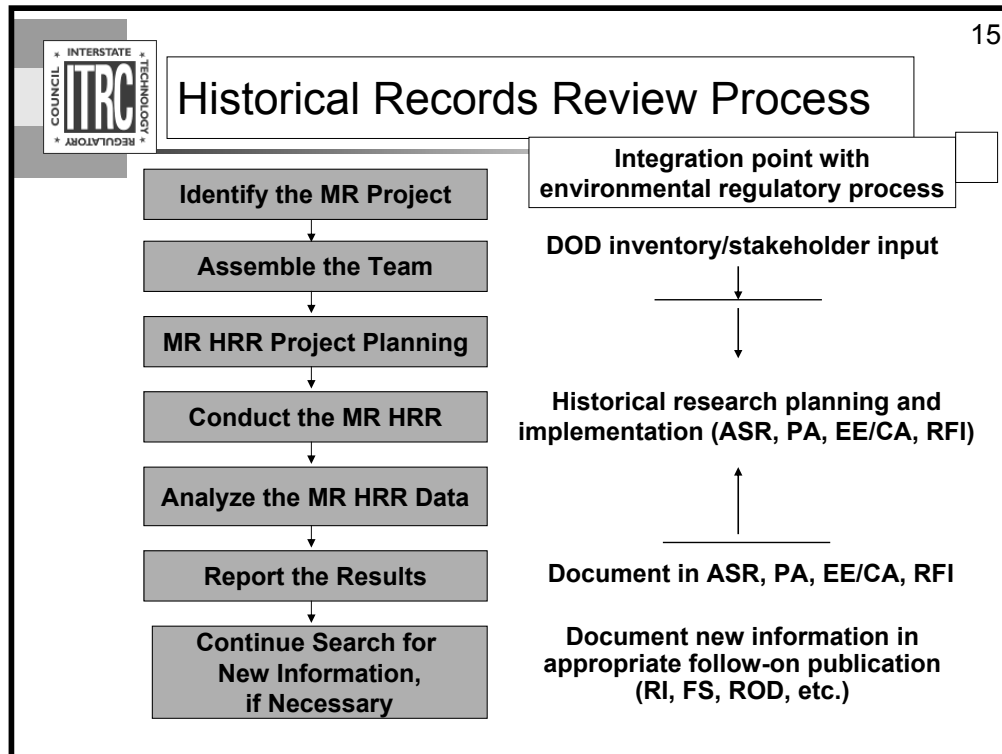
This is the general process for conducting and documenting MR HRR. Note that the Army Corps of Engineers uses ASRs and EE/CAs, whereas the Navy and USAF use PAs, RIs, and FSs. This is because the Army Corps performs work on FUDS sites and the Navy and Air Force do not.

Project planning and how the MR HRR is conducted are documented in the work plan.

Acronyms for this slide:

ASR – Archive Search Report

PA – Preliminary Assessment

EE/CA – Environmental Engineering and Cost Analysis

RFI – RCRA Facility Investigation

RI – Remedial Investigation

FS – Feasibility Study

ROD – Record of Decision

The MR HRR Team

Composed of project managers, technical experts, and a review team, each with the right combination of expertise and interest in the project

DoD should involve regulators, and, when appropriate, non-DoD federal land managers, in the MR HRR as early as possible so that they can help guide the MR HRR project, including building the MR HRR review team. Also, the state regulator becomes a key point of contact for local residences and businesses, local and state representatives, and community and environmental groups.

State regulators and stakeholders will be important on the review team, which provides feedback to the project management and technical team during the course of the project.

A "stakeholder" should be defined in the broadest terms possible, including everyone affected by the project or having a clear interest in it. If the project's stakeholders perceive that their interests were represented and that the process was technically sound, broad acceptance is likely. This acceptance by multiple perspectives will provide the defensibility necessary during regulatory review, political inquiry, and public scrutiny.

Building the MR HRR Team

Identifying potential team members
- Project managers
- Technical experts
- Review team

Project management is responsible for overall scoping of the project and direction of the technical team.

Technical experts conduct the research, analyze the data, and document the results.

The review team provides feedback to the project management and technical team during the project.

Technical Expertise and Support

Support Category	Example Expert	Technical Expertise
Military Historian	U.S. Army Ordnance Center and School ordnance historian	Knowledgeable in past military activities, including research, testing, and training activities over time
Local Historian	Historical Society Staff, local university staff	Knowledgeable on past activities in local area, which may include past military activities and access to useful historical documentation (e.g., newspapers)
Archivist	Librarian, museum or university research staff	Versed in records sources and record keeping for historical activities
Mapping/GIS Specialist	Various contractors	Important in integrating past records with current geographical tools to pinpoint areas of potential interest

No associated notes

Technical Expertise and Support (continued)

Support Category	Example Expert	Technical Expertise
Aerial Photo Specialist	**EPA's Environmental Photographic Interpretation Center, Topographic Engineer Center**	**Specialize in analyzing aerial photos for evidence of ground activities that may be associated with release of hazardous materials and UXO**
EOD/UXO Technician	**U.S. Army Tech Escort Unit, USACE UXO Qualified Safety Specialist, various contractors**	**Trained in identification of recovered munitions, also responsible for safe dispositions of such items**
Community Involvement	**Contractors and nonprofit groups**	**Specialize in conducting outreach to identify veterans and other individual for subsequent interviews**

EOD – Explosive Ordnance Disposal

Munitions Response Stakeholders

Stakeholder	Team Examples	Roles & Interest
DOD Representatives	Army, Air Force, Navy, Marines, Army Corps of Engineers	Leadership, project completion
State Agencies	State environmental agencies, State Historical Preservation Office	State laws and regulations
Federal Agencies	Environmental Protection Agency, Fish & Wildlife Service, Forest Service, Bureau of Land Mgt.	Manage federal lands, protect natural resources and enforce federal standards in protecting health and environment.
Tribal Government	Tribal chairman, governor, chief, Tribal Council; Tribal Historic Preservation Officer; environmental project manager	Federal laws mandate contacting the local tribal nation immediately when the planning process begins
Local City, County Agencies	Dept. of Public Works, Dept. of Health, Land Reuse Authority, etc.	Ensure safe water supplied, local public health, etc.

No associated notes

Munitions Response Stakeholders (continued)

Stakeholder	Team Examples	Roles & Interest
Land Owners	Industrial, commercial, residential	Concerned with property value, liability and health issues, control right of property access
Local Business	Transient utility workers, adjacent private schools, day care centers, etc.	Knowledgeable regarding occupational environment and activities of specific subpopulations
Community Advisory Boards	Restoration Advisory Boards (RABs), Citizen Advisory Boards (CABs)	Provide community perspectives
Nonprofits	Local environmental groups, churches, community organizations	Active in variety of health and environmental issues, often politically active
Individuals	Tenants and neighbors of property under investigation	May possess useful knowledge of past and/or current land use, recovered material, etc.

No associated notes

Partnering and Communication

Once the team members have been identified, a working partnership and a communication strategy are essential to success

Web site

Newsletter

Table 2-3 from the document: Developing a Road Map for MR HRR Process Development

1. Hold an initial team meeting.
   a. Discuss the scope of the project.
   b. Identify stakeholder concerns.
   c. Present the process for team function, work plan development, and research execution.
   d. Discuss other needed or interested members.
   e. Obtain feedback on above from participating stakeholders.
   f. Develop follow-up action items with names of individuals taking the leads and date and location of next meeting.
2. Circulate feedback and selected team structure, communication approaches, and next steps.
3. Develop MR HRR work plan, including clear decision matrices through identified team process and feedback loops.
4. Execute MR HRR research, data evaluation, and report development.
5. Provide a draft report for stakeholder review.
6. Address comments in collective process agreed to at the beginning of the process.
7. Provide final document in information repository.

Questions and Answers

No Associated Notes

The MR HRR Project Plan

- Initial site identification
- Project objectives
- Initial site visit, if necessary
- Project work plan
- Data quality objectives (DQOs)
- Preliminary conceptual site model (CSM)

Because Army Corps of Engineers FUDS perform preliminary MR HRR and document the findings in an ASR, they may use an abbreviated and standardized research plan. Navy and USAF projects, done on BRAC sites, for example, almost always have an MR HRR plan developed for each individual project.

Initial Site Identification

Any organization with credible evidence that military munitions were used can identify a potential MRS

- DoD programs
- State programs
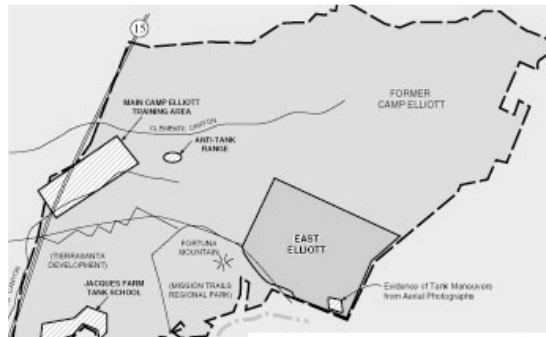
DoD programs include the formal MR Site Inventory Program currently under way. The inventory of munitions sites can be found on the Defense Environmental Network & Information Exchange (DENIX) Web site (https://www.denix.osd.mil/denix/denix.html).

This initial MRS identification can serve as the initiating input to put the MRS on the inventory list.

Some states have their own programs to identify and document previously identified MRS by conducting their own preliminary historical research and site inspections.

MR HRR Project Objectives

- Verify site and range boundaries
- List all site owners and users
- Determine whether immediate action is needed (such as warning signs)
- Establish dates of use
- Establish type of military munitions used, if possible

MEC warning sign

These are some examples of some common project objectives.

Plan for the Unknown

There is always the possibility that some types of munitions-related activity will not be identified during the MR HRR

3.5-inch rockets

Examples of unexpected findings:

1) At a National Guard site in Colorado, the historical site information indicated that the range was used for weekend training of local guardsmen on field artillery (155-mm and 8-inch guns). Historical records also included maps of the firing points and target areas, although no specific targets were identified.

During a field inspection of the site, several 3.5-inch rocket warheads and rocket motors were found, indicating the Guard also conducted some type of rocket training at the site. The area with rockets was added to the site conceptual model and plans made to investigate the remainder of the 24,000-acre site for other undocumented munitions contaminated areas. This use of the site (direct-fire antitank rockets) was not consistent with the existing CSM (indirect-fire artillery), and the project CSM was updated based on this finding.

2) Chemical Agent Identification Sets (CAIS) were not indicated on the inventory of expected MEC but were discovered on the Presidio of San Francisco after its closure.

In the case of Navy and Air Force BRAC projects, newly discovered information will be documented at the appropriate document.

Initial Site Visit

- An initial site visit is usually performed for FUDS

- Helps develop general understanding of the site; may also help determine whether a time-critical response is needed

- Should follow all safety precautions
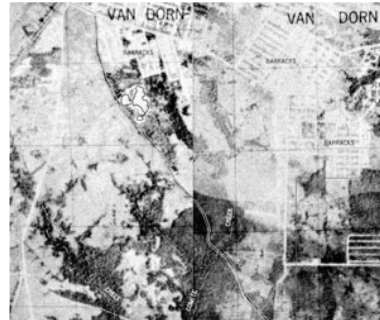
Because there may be so little known about the site and/or the surrounding area, a brief initial site visit can be helpful in developing a general understanding of the site and determining whether military munitions-related activities occurred at the site. The site visit may also help determine whether a time-critical response is needed.

If the site visit is to a FUDS on private property, the property owner must be contacted to provide permission prior to entering the site. If the FUDS is on public property, the appropriate official(s) should be notified.

Information to Be Collected on Initial Site Visit

- Obvious MEC areas of interest
- Location of buildings and old building foundations
- Current land use
- Local emergency support
- Terrain and vegetation conditions
- Photographs of areas of interest

The initial site visit not only looks for military munitions contamination, but also collects important site information, such as terrain, access and land use.

MR HRR Project Work Plan

- DoD Services approach planning for MR HRR somewhat differently
- Army Corps of Engineers
  - Uses a standardized MR HRR plan for FUDS initial ASR investigation followed by any additional MR HRR planning necessary as part of a later PA or EE/CA
- Army, Navy and Air Force
  - Initial MR HRR planning takes place as part of the planning for the PA
  - Follow-on information is documented in the appropriate document, such as the RI or FS

After the initial site visit, the DOD services take somewhat different approaches to planning historical research projects.

•The Corps typically works on FUDS sites and uses a standardized plan for the ASR investigation.

•Navy and Air Force typically work on active or BRAC sites; thus they already have the ASR level of information available on the base.

MR HRR Information Sources

- The MR HRR plan should identify potential data sources

- Should consider type of activities known or suspected at the site

- Should recognize that the site use may have changed over time when identifying information sources

- Appendix B of *Munitions Response Historical Records Review* lists potential sources of MR HRR data

Potential data sources should be agreed to by the MR HRR team.

In defining data sources, the team should consider types of activities conducted, both known and suspected.

Also, the team must recognize that the site use may have changed over time. For example, upon its closing, the former Fort Ord, California had a specific area designated as the Cantonment Area. No one expected to find MEC in this area that was used for administrative functions and personnel housing. However, this area was discovered to contain MEC because it had been used as a live-fire range prior to being designated as the Cantonment Area. This discovery resulted in a requirement for UXO support for all intrusive activities in the Cantonment Area (installing fence posts, environmental sampling, installing underground cables, etc.)

Team members may also identify additional sources of data. For example, the Marine Corps Museum in Quantico, Virginia has recently been identified by a stakeholder as possibly having detailed information on the training operations conducted on the Vieques Naval Training Range in Puerto Rico. This source had not been previously known to the Navy.

Appendix B of *Munitions Response Historical Records Review* lists some potential sources of historical records data.

Sample of MR HRR Information Sources (from Appendix B)

- U.S. National Archives and Records Administration
- Defense Visual Information Center
- Naval Historical Center
- U.S. Naval War College Archives
- The Library of Congress, Geography and Map, and Prints and Photographs Divisions
- Air Force Base Historical Research Agency
- U.S. Air Force Safety Center
- U.S. Army Center of Military History
- U.S. Army Corps of Engineers Topographic Engineering Center (TEC)

See complete list in Appendix B of *Munitions Response Historical Records Review*.

Aerial Photography Interpretation

- Army Corps of Engineer's Topographic Engineering Center has access to all government historical and current aerial photography
- EPA's Environmental Photographic Interpretation Center (EPIC) is located in Reston, Virginia, and performs remote sensing, R & D, and aerial photo analysis
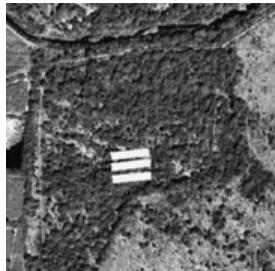
Aerial photos of the same location. The bars superimposed on the photo on the right show the site where the old landfill is located. Analysis conducted by TEC's Terrain Analysis Branch.

1951   **1995**

A valuable data source is the Corps' Topographic Engineering Center.

•Point of contact information is included in Appendix B of *Munitions Response Historical Records Review*.

•Currently TEC may be occupied with active duty support. However, contractors who can perform historical photo analysis can be found through an Internet search.

•EPA's Environmental Photographic Information Center is a field station of the Landscape Ecology Branch (LEB), Environmental Sciences Division - Las Vegas (ESD-LV), National Exposure Research Laboratory (NERL), Office of Research and Development (ORD).

Declassified Satellite Imagery

- Provided by the Earth Resources Observation Systems (EROS) Data Center of the U.S. Geological Survey – edc.usgs.gov

No Associated Notes

Developing Data Quality Objectives

EPA's process for developing data quality objectives (DQOs):

1. State the problem
2. Identify the decisions
3. Identify inputs to the decisions
4. Define the study boundary
5. Develop decision rules
6. Specify tolerance limits on error
7. Optimize sampling design

Planning a historical record search is similar to other environmental investigations.

We recommend following the EPA DQO process for developing data quality objectives. For more information on the DQO process, see EPA's *Handbook on the Management of Ordnance and Explosives at Closed, Transferring, and Transferred Ranges and Other Sites*, Interim Final, February 2002.

Quality Control

QC planning may include:

- Standardized data management form (see Appendix D in *Munitions Response Historical Records Review*)
- Develop rating system
  - High quality—Verifiable data source
  - Medium quality—Written records, without the original source, or personal interviews where several interviewees provide similar accounts
  - Low quality—Formerly verifiable data source, but original source no longer available; personal interviews without backup documentation or with contradictory documentation.
- Master log of all data items added to project archive
- Regular schedule of QC checks on data

Information on QC is in Section 3.5.1. of *Munitions Response Historical Records Review*.

Historical records research must meet same standards of known quality and usability as other environmental investigations.

QC of data gathering and analysis is critical to the project. Key components to ensuring QC are
- •Standard data management form
- •Develop rating system
- •Master log of all data items
- •Regular QC checks and audits of data

Data Archives

The GIS environment facilitates the integration of different spatial scales
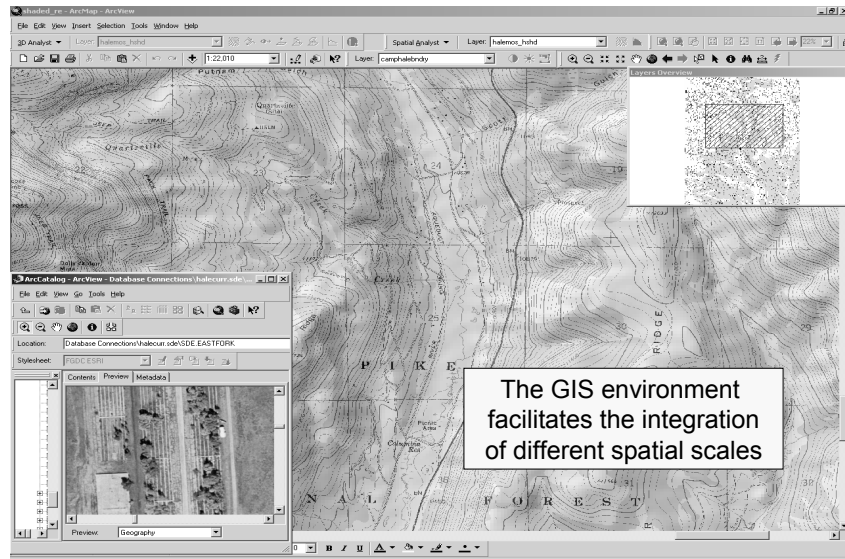
An example of data archiving is developing a GIS system. GIS can facilitate consolidation of information on the project. For example, at Camp Hale in Colorado, roads have been moved over time. Being able to georeference information is very important to the accurate understanding of the site.

Preliminary Graphic Conceptual Site Model
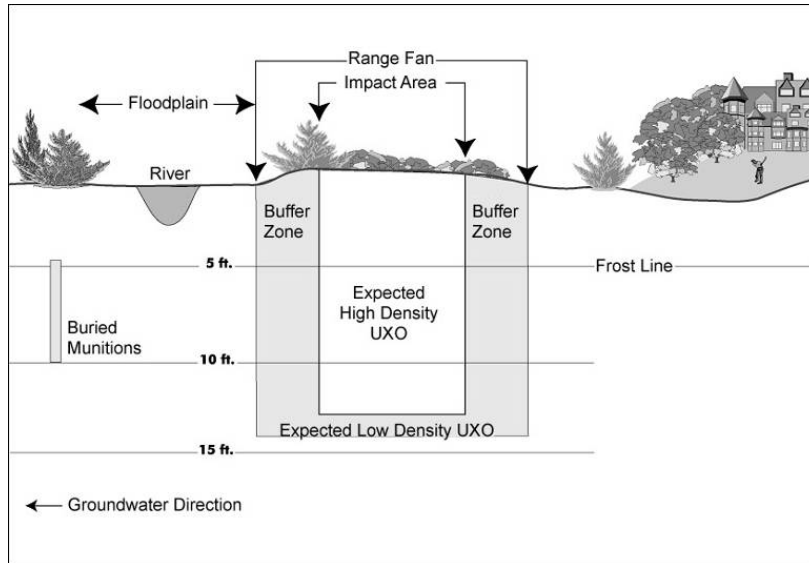
More information on CSMs for MRs can be found in the EPA *Handbook on the Management of Ordnance and Explosives at Closed, Transferring, and Transferred Ranges and Other Sites*, Interim Final, February 2002.

The goal of historical records research is to gain an understanding of the past use and potential munitions contamination of the site.

The best way to do this is with the conceptual site model (CSM). This slide is an example CSM diagram.

Preliminary Tabular Conceptual Site Model

MEC-Related Activity	Primary Source	Primary Release Mechanism	Expected MEC Contamination	Secondary Source
Artillery Range	**Firing Point**	**Mishandling/, loss or burial;** **Excess propellants burn area;** **Burial**	**Unfired (fuzed or unfuzed) munitions;** **Discarded military munitions**	**Munitions constituents (MC)**
	Buffer Zone	**Firing**	**UXO**	**MC**
		Burial	**UXO**	**MC**
	Impact Area	**Firing**	**UXO**	**MC**

The graphic and tabular representations of the CSM provide an overview of where the contamination is, how it got there, and what receptors are subject to coming in contact with it.

Preliminary Map-Based Conceptual Site Model
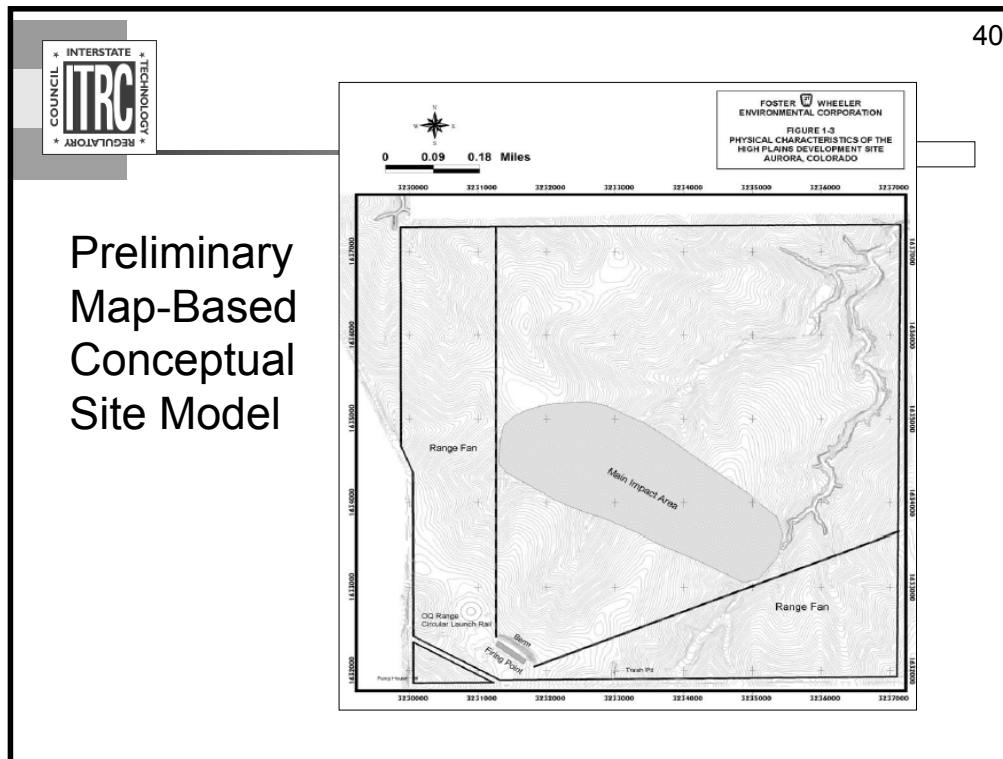
This CSM example is of the gunnery range at of Lowery Bombing and Gunnery Range discussed in an earlier slide.

On this example map, there is a high-density impact area which was the direct-fire nose and tail gun target. There is also a larger range fan going 3 miles downrange where the projectiles fired at the aerial drones landed.

This is an example of why a CSM is critical to an investigation. If you were to investigate areas inside and outside of the direct fire impact area, you would get drastically different results. Without the conceptual site model and knowledge of the two site uses, it would be difficult to accurately interpret and understand the results.

Conduct the Research

Considerations during the implementation of the historical records review:

- The mission of the researchers is to find all relevant data items
- Researchers should look for additional information leads
- Consider assigning an experienced researcher to oversee archive searches
- Track time spent investigating each information source
- Assign a person to perform personal interviews
- Consider conducting a second personal interview with potentially valuable interviewees
- Site maps and photos are helpful aids

Early stakeholder involvement (including state regulator involvement) can help save time and conflict in munitions response projects. As many of you have experienced, the more you know about a site up front, the better. Besides saving time, this allows you to plan a better site cleanup and allows for more confidence in making a No Further Action determination or other decisions about the site.

It is important to remember that DoD basically holds all the information about FUDs and other munitions sites, not only because DoD controls access to reports and information, some of which is classified, but also because of the safety issues related to munitions. At a typical hazardous waste site, state regulators enter the site, collect samples, and characterize the site, but most regulators do not have the training or desire to enter a munitions site without DoD experts. It is also hard for regulators to quantify risk at munitions sites because one munition can be a deadly hazard. These types of issues should be communicated to the researchers.

First bullet - What is relevant may depend on the person you ask. Additional information leads should include all parties, including regulators, safety experts, DoD, landowners, BLM, etc. Information needs of all parties should be identified for the researchers.

Second Bullet - Researchers should be directed to visit facilities that did tests or training or facilities that supplied the munitions, as well as the national archives. DoD carefully tracks movement of munitions. Local records may also be helpful.
Example: An Army site formerly used to store conventional munitions went through base closure (BRAC). The site was not reported to have been used for storage of certain types of munitions. Upon a visit to the site, regulators noted chemical symbols on some of the storage igloos. After looking over the historical storage records, regulators discovered that the igloos had been used to store smoke rounds and chemical rounds. This information was used to justify adding parameters to the sample list and provided information that was used in the investigation of the range located near the BRAC site.

Fourth Bullet - Use time wisely and focus on important items.

Fifth Bullet - Interviews with former employees and others are important. Retired employees are usually willing to share information about former disposal areas. Interviewers should be able to address concerns about liability and the classified/unclassified status of information. Preassigned topics and questions should be derived from the data quality objectives. **Example:** An Open Burn/Open Detonation area at a BRAC site was thought to have been cleared. A farmer that owned the land adjacent to the range was interviewed, and it was discovered that he personally had cleared his field of munitions many times. This information allowed the regulators to expand the investigation not only to the farmer's field, but also to an area thought to have been used as a range.

Seventh Bullet - Maps are very helpful and sometimes show cultural and other features that may have existed in the past. Air photos are even better. If taken at the right time, aerial photos may show firing points, targets, target or munitions scrap landfills, or other features that can be used to focus the investigation.

Conduct the Research (continued)

- Multiple sources of information may exist
  - Researchers should be alert to identify new sources of information during their review of the previously identified data sources.
- On active facilities, researchers should visit the facility to obtain records
  - The military inspects and tracks the movement of munitions. Inspection, management, and use of ordnance was frequently recorded on ammunition reports, magazine logs, and firing orders.

Review of facility records can sometimes provide a wealth of information on the use of facilities ranges.

Classified Information

Some of DoD's information is classified. The person conducting the research must have an appropriate security clearance.

Security clearance should be considered when selecting persons to conduct the MR HRR. It is also possible that classified information will not be included in the MR HRR report.

DoD classifies information for a variety of reasons. Some of these reasons may be unrelated to the site cleanup. For example, sometimes the gun or other equipment being used is classified, not the types and amounts of munitions fired. If the researcher can communicate these types of reasons to the project team, it builds credibility that DoD is not withholding information.

How classified information is to be addressed in the MR HRR process should be discussed early on with the Corps or DoD, and this information should be communicated to the project team in advance of the research being conducted.

Archive Searching at the U.S. National Archives and Records Administration

An experienced researcher can be assigned to oversee the archive searchers

Archive Searching at the US National Archives

If possible, ask for a person experienced in researching munitions, FUDS, BRAC, etc. A predetermined final conclusion about the site should not be communicated to the researchers.

Can also do research at nearby facilities or locations where munitions used at the site may have originated.

New Historical Information

View west across Lake Andrew to Mount Moffett. Mitchell Field airstrip remnants in foreground.

A historical military photo of Adak Island, Alaska

Adak

Many times, new information is found during the research or site investigation process. This information can be used to focus the investigation or possibly revise project DQOs.

For example, the Navy conducted an Archive Search Report for the Adak, Alaska base closure project and began field investigation. Discovery of new archival information at a previously unidentified source resulted in the decision to investigate this new information source. This information allowed the project team to devise specific sampling methods to locate small and unmarked targets in what were large uncontrolled maneuver areas in remote areas of Adak. The success of these sampling methods resulted in the signing of the Adak Record of Decision for Operable Unit B (OU-B was all ordnance sites).

New Historical Information

Finding new information may
- require modification of the conceptual site model and
- provide information about people to interview, locations of munitions use, or munition types

One of the main purposes of the MR HRR is to decide whether a site qualifies for a No Further Action determination or is a site where immediate action is needed. Analysis and evaluation of the data generated during the MR HRR process will help you make sure you have the information you need to make these kinds of decisions.

Analyze and Interpret the Data

Review the archived data to draw conclusions about the site:

- Data relevancy (See Table 5-1 in *Munitions Response Historical Records Review*)

- Gap analysis – data gaps should be identified and noted on the Data Management Forms as missing data

- Uncertainty analysis – estimate of confidences in the archived MR HRR data

- Peer review

- Updating the conceptual site model

The CSM should be continuously updated as new information in discovered.

Bullet 1 - The data gaps and uncertainties should be communicated to the researchers so they will know what is and is not relevant to the site investigation. As new information is discovered, the CSM should be updated.

Bullet 2 – With regard to data gaps, if sufficient information is not available, the military generally will not want to spend additional money to investigate a site. However, if regulators believe there is a possibility that munitions are present at a site, the regulators may want the military to continue an investigation. Most regulators view munitions differently than hazardous waste sites due to the nature of munitions – that is, one unexploded item can be a big problem.

Data gap issues will occur at almost every site. Each project manager needs to deal with these issues on a project-by-project basis. Sometimes these types of issues can be resolved by communicating what is known about the site, doing a site visit to identify any surface munitions, and if nothing is found, getting a commitment from the military to return to the site if new information becomes available.

An example of a typical data gap in dry western states is the occurrence of buried munitions. The military is generally able to clear surface munitions because of the lack of vegetation, but the amount and type of buried munitions and the rate at which the buried munitions come to the surface almost always constitutes a major data gap and uncertainty.

Another data gap is related to technologies used to find buried munitions. Ordnance scrap, rocks containing high amounts of iron, and other features may render the use of magnetometers and other instruments that can be used to detect UXO unusable. There many be so many false positives that it will not be economically feasible to dig all the anomalies.

If researchers can provide any data on the number of rounds used at a site and the number of duds, this information could be used to put limits on uncertainties related to buried munitions. If researchers can provide information about soil and rock types in the area, this may also prove useful in deciding which technologies to use. It is possible that no technology can be used reliably at a site.

Bullet 3 – Once you know what you don't know (what the uncertainties and data gaps are), you can use that information to decide if additional work is needed.

Bullet 4 – As in any scientific endeavor, independent validation and peer review play a critical role in adding credibility to the conclusions of any report. Peer review can be used as a way to identify data gaps and uncertainties. Before a peer review is completed, there should be sufficient information to make some conclusions about the site. In some cases that conclusion may be that no further action is needed. In this case, the peer review will need to include DoD-hired munitions experts and contractors, military and regulatory project managers, local landowners or users, and, in some cases, the general public. If air photos are available, air photo experts may also provide valuable input.

In cases where there is an obvious need for more work, the peer review is still important because different people have different areas of expertise and view the site from different perspectives. There will generally be several iterations of peer review in the process of evaluating a site.

An example of a good use of peer review is an old mining site in Utah used for target practice. The military believed that surface clearance was sufficient. BLM experts disagreed, pointing out the die-hard nature of some mineral collectors and their willingness to go into old mines. This data gap identified by BLM led the researchers to conduct further research at a nearby facility. In the library of this facility, the researchers found reports that identified the type and amount of munitions and tests done at the site, which showed that the mines probably contained munitions.

Bullet 5 – Once sufficient information is available, you can focus resources on filling data gaps so that uncertainties can be minimized and decisions about the site can be made. For example, if it is determined that buried munitions are present, the conceptual site model can be modified and further decisions can be made on how to collect data about the buried munitions. The final decision may be that there are buried munitions, but due to the geology of the site, not all munitions can ever be located, and therefore some type of land restriction will be needed.

Typical MR HRR Data Items

- ✓ EOD response reports
- ✓ Firing orders
- ✓ Munitions storage records
- ✓ Facility maps
- ✓ Command unit histories
- ✓ Aerial photographs
- ✓ Personal interviews
- ✓ Newspaper articles

- ✓ Land transfer records
- ✓ Weather records
- ✓ Topography and vegetation data
- ✓ Geology data
- ✓ Surface water, wetland, endangered species and cultural resources
- ✓ Groundwater data
- ✓ Local phone book

These forms are typical of the data items collected during an MR HRR. This list is not exhaustive. The project team should communicate with the researchers on the kinds of data items they are expecting.

Form 4508

This is just one of the forms DoD uses to track munitions. DOD records and tracks munitions upon leaving an igloo or, if they are not used, returning for storage. Like anything else, munitions have a shelf life that must be tracked. This form may help you determine the amount and types of munitions used at a site.

Destruction Certificate

Slides 51-54 show other forms used to track and record munitions use. The type of form may depend on the branch of the military, but each branch tracks use and disposition of the munitions.

Incident Report

EXPLOSIVE ORDNANCE INCIDENT REPORT
FOR USE OF THIS FORM SEE FM 9-15; THE PROPONENT AGENCY

UNIT NUMBER

CATEGORY

SECTION A: INITIAL INFORMATION

1. DATE/TIME GROUP
03 1530 DEC

4. ITEM(S) REPORTED
105MM PROJECTILLE

6. RESOURCES THREATENED

2 A. REPORTING ACTIVITY

7. IMPACT ON MISSION

B. LOCATION (GRID)
YELLOW JACKET

8. PROTECTIVE MEASURES

3. CONTACT METHOD

5. NBC CONTAMINATION
NONE

9. PRIORITY

SECTION B: EOD UNIT INFORMATION

10. PERSONNEL DISPATCHED
Personnel later dispached

11. DATE/TIME
DPRT: 031600DEC
ARR: 031645DEC
COMP: 201500JAN
12. TOTAL HOURS
ADJ 40

15. EXPLOSIVES EXPENDED
In conjunction with DPG 02-97 & DPG 05-97
1 EA M757 CHG Demo Kit   LOP-1-113
2 EA M130 Cap Blast Elect   HEP-1-23

13. CONFIRMED IDENTIFICATION / PUBLICATIONS
105MM Projectile, unfuzed
Characteristics of a chemical munition. Solid base plate and burster adapter. Munition did not slosh according to the person who initially moved it.
Munition was in a deformed state.

16. SIGNIFICANT DETAILS OR PROBLEMS
3 Dec 97 Team assessed munition visually and with MK 32 x-ray. Truck mounted generator could not handle load of the ANDREX.
4 Dec 97 Munition was assessed with ANDREX and PINS. ANDREX was inconclusive. PINS revealed chlorine content. Munition was packaged and transported to Mag. 42.
9 Dec 97 Munition was re-assessed with ANDREX and PINS. ANDREX revealed burster tube but no definite fill line. PINS revealed chlorine content. Munition was transferred to MAG 41 due to compatibility.

14. DISPOSITION
Disposed on OB/OD 20 Jan 98

17. POC
SSG

SECTION C: EOD UNIT AUTHENTICATION

18. NAME/GRADE/SIGNATURE

19. DATE
20 JAN

20. TELEPHONE NO.
(801)831-5211

DA FORM 3265-R, DEC 93
EDITION OF FEB 88 IS OBSOLETE

Used by Explosives Ordnance Disposal (EOD) teams to report responses to ordnance incidents. Can provide an indication of locations where MEC was discovered in the past.

Issue Turn-In

Used to record ammunition issue and return to and from an Ammunition Storage Point (ASP). Can provide a record of ammunition that was fired (assume that what was issued and not returned was fired or disposed of).

MAG Data Card

Records a running account of the contents of an ordnance magazine. Used to identify the type of ordnance stored at an ammunition storage point.

Reporting the Results

Though the final report for the site will depend on the branch of the military and regulatory authority (i.e., PA, ASR, EE/CA, etc.), each MR HRR should contain similar elements

Reporting the results is covered in Chapter 6 of the MR HRR document. As explained in Section 1, the reporting of MR HRR results can be expected to be different for Army (FUDS) projects and Navy and Air Force projects.

In reviewing the results, you are looking for site history, lists of types and amounts of munitions used, site visit, or other information that can be used to designate the site as No Further Action or can be used to refine the conceptual site model and outline new DQOs.

The MR HRR team can also specify how the information in the report is presented. Specify whether you want copies of all certain documents, all sources listed, summaries only, table format of owners and addresses, etc.

Typical Report Organization

- Introduction
  - Authority, subject, purpose, and scope
- Previous investigations
  - Responsible service investigations, other investigations
- Site description
  - Land use, climatic data, geology, soils, etc.
- Historic ordnance use
  - Historic site use summary, review of ordnance records, summary of interviews, aerial photo interpretation, and map analysis

No associated notes

Typical Report Organization (continued)

- Real estate
  - Confirmed DoD ownership, potential DoD ownership, past ownership other than DoD, present ownership
- Report of site visit inspection
- Evaluation of the presence of MEC
  - Evaluation, data gap analysis, data uncertainty analysis
- Technical data on suspected MEC
- Evaluation of site information
- Conclusions and recommendations

No associated notes

Checklist

- Use the *Munitions Response Historical Records Review* checklists (see Appendix E) and information to review the final report
- Checklist could include such questions as
  - Have the site's known operations and uses been correctly identified?
  - Based on the above, have the appropriate archived record sources been inspected? (see Appendix C)
  - Has an archive data management system been used to manage the individual archive data items?

See checklist items in the document (Appendix E). Make sure you get all the information you need to make an informed decision. This is particularly important for site where the DoD proposes No Further Action.

Checklist (continued)

- Does the review of the data management system indicate adequate evaluation and management of individual data items?

- Has there been adequate outreach to potentially knowledgeable individuals?

- Has a site historical photo analysis been conducted?

- Does the discussion of the site conditions seem accurate and adequate?

- Does the discussion of historical ordnance use adequately use the available archive data?

- Has a preliminary conceptual site model been developed?

- Are report's conclusions valid based on historical evidence?

See checklist items in the document (Appendix E). Make sure you get all the information you need to make an informed decision. This is particularly important for site where the DoD proposes No Further Action.

Summary

- Historic research provides the basis for further decision making
- The services' missions vary, and they will approach historical records research from different starting points
- Understanding the role of regulators and stakeholders in the historical records review will help increase the effectiveness of your participation

No associated notes

Summary (continued)

- Knowing how the historical records research is planned and conducted will help you to evaluate its accuracy and completeness
- Use the *Munitions Response Historical Records Review* checklists and information to review the final report

No associated notes

Questions and Answers

Document under development:
*Geophysical Prove-Outs for
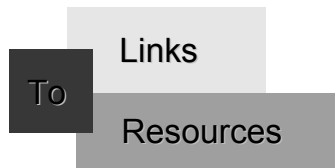Munitions Response Projects*

Thank you for participating in ITRC Internet-based training
For more information on ITRC, go to www.itrcweb.org

No associated notes

Thank You for Your Participation

Links

To

Resources

For more information on ITRC training opportunities and to provide feedback visit: **www.itrcweb.org**

Additional resources for this ITRC internet training event are available at:

http://clu-in.org/conf/itrc/mrhrr/ click on "links to additional resources"

Your feedback is important – please fill out the form at:

The benefits that ITRC offers to state regulators and technology developers, vendors, and consultants include:

•helping regulators build their knowledge base and raise their confidence about new environmental technologies

•helping regulators save time and money when evaluating environmental technologies

•guiding technology developers in the collection of performance data to satisfy the requirements of multiple states

•helping technology vendors avoid the time and expense of conducting duplicative and costly demonstrations

•providing a reliable network among members of the environmental community to focus on innovative environmental technologies

How you can get involved in ITRC:

•Join a team – with just 10% of your time you can have a positive impact on the regulatory process

•Sponsor ITRC's technical teams and other activities

•Be an official state member by appointing a POC (Point of Contact) to the State Engagement Team

•Use our products and attend our training courses

•Submit proposals for new technical teams and projects

•Be part of our annual conference where you can learn the most up-to-date information about regulatory issues surrounding innovative technologies