THE SELECTED REMEDY AND CLEANUP GOALS

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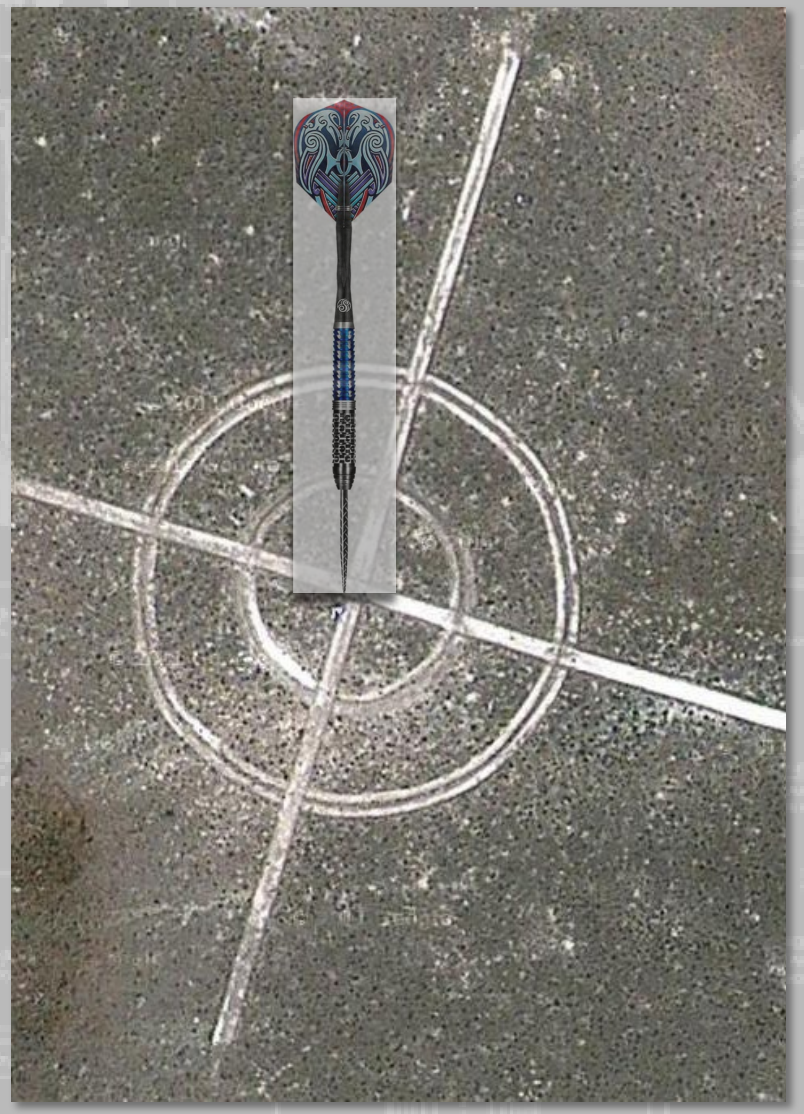

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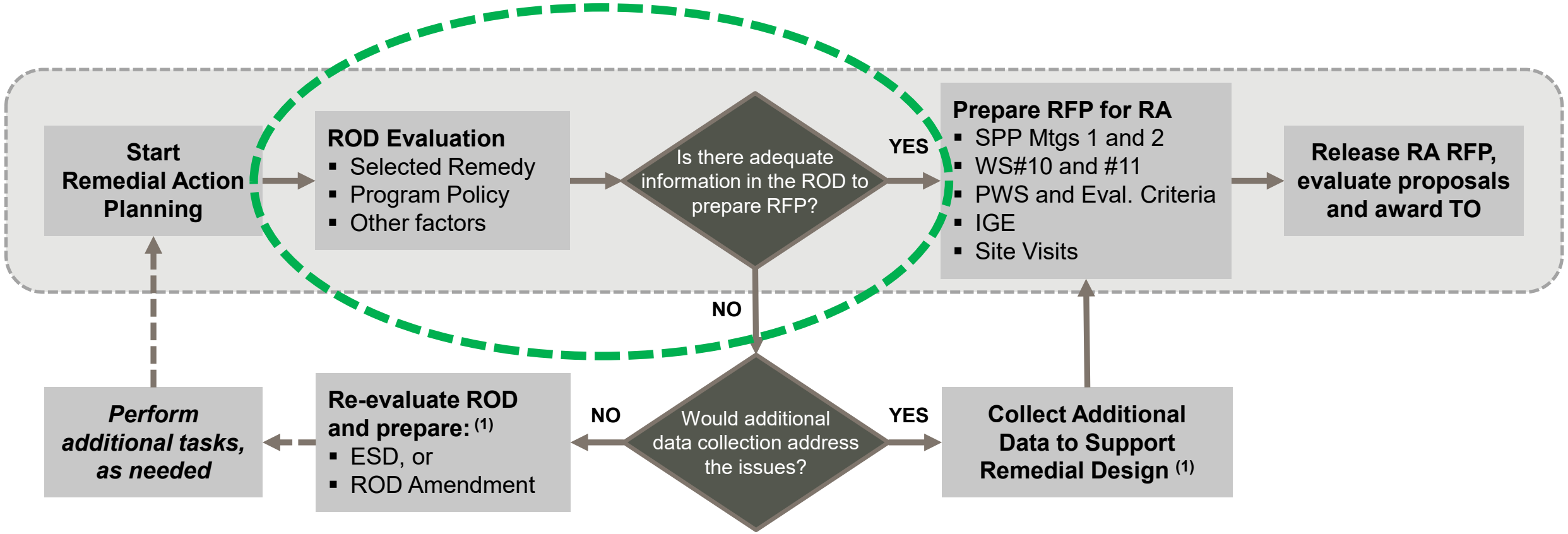
IS YOUR ROD READY FOR PRIMETIME?

Unpacking the Record Of Decision/Decision Document

PRELIMINARY STEPS – PROCESS OVERVIEW



1) May require additional contract action(s)

RECORD OF DECISION REFRESHER

Per DERP Manual (DoDM 4715.20)

- Identify legal authority for response
- Describe hazards and unacceptable risks
- Describe response alternatives and show how selected remedy was chosen
- State specific environmental restoration objectives for the selected remedy
  - Cleanup goals
    - Specific cleanup criteria to be achieved
      - » NOT the same as RAOs
    - Site-specific and appropriate residual concentrations for chemicals of concern
- List entities responsible for implementation and maintenance
- Document ARARs at time of signature
- Provide declaration, approval, and signature by DoD Component official with delegated authority

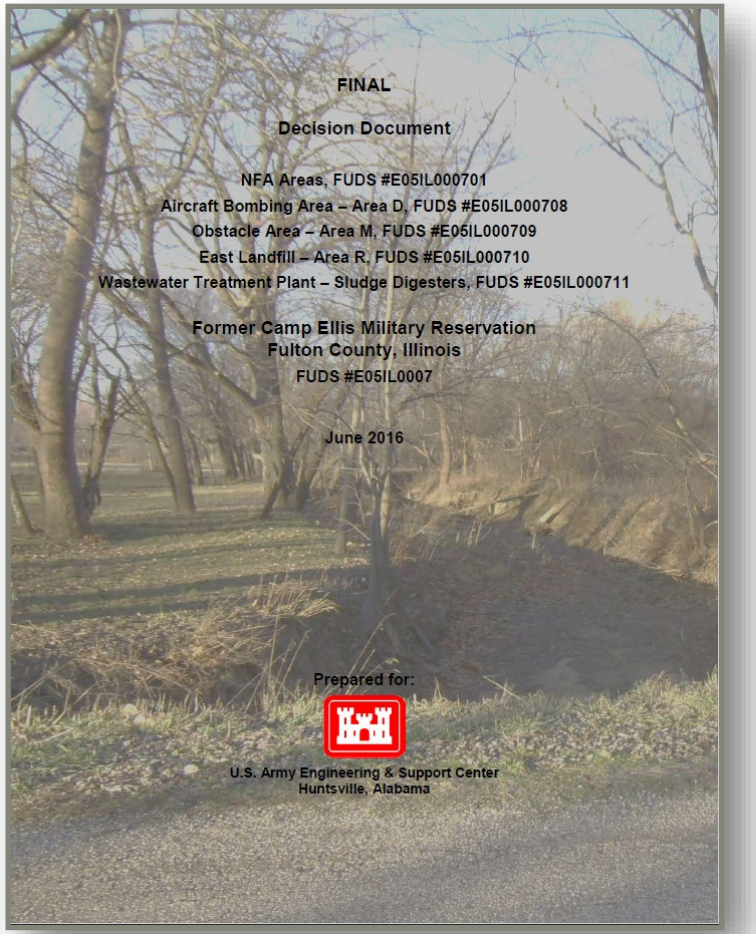
Record of Decision is a **legal document**

- Certifies remedy selection process was carried out in accordance with CERCLA
  - i.e., we have to do what it says!
    (*or prepare ESD/ROD Amendment*)

SELECTED REMEDY – MINIMUM CRITERIA

Selected remedy description MUST include

- Details of the remedy with
  - **Specific** cleanup criteria to be achieved
    - e.g., effectively search X volume of soil for specific MEC items and remove any you find, plus implement specific LUCs
  - Explanation of how we will tell remedy is in place
    - For example, using MPCs/MQOs to confirm
      - » MEC detection
      - » Footprint coverage
      - » Disposal of MEC
- Detailed remedial footprint description
  - i.e., where the remedy will be implemented, including coverage requirements and gaps
- Who, if other than the Lead Agent, will be responsible for implementation and O&M
  - Mostly applicable to LUCs



Need to understand what is required to implement the remedy and how we will tell when we have achieved RIP

RECORD OF DECISION – IMPORTANT QUESTIONS

Selected remedy description

– Are there **specific** cleanup criteria?
– Is there an explanation of **how** we will tell we have achieved Remedy-In-Place?
– Do we comply with policy for DGM/AGC?
– Are there minimum technology requirements?
– Are LUCs described adequately?

Detailed remedial footprint description

– Is it **clearly defined**?
– Are coverage issues addressed?
  - Buildings, paving, and infrastructure
  - "Previously cleared" areas
  - Sensitive terrain
    – Ecological, archaeological, etc.

Responsibilities for implementation/O&M

– Are these clearly explained?

EXAMPLE SELECTED REMEDY DESCRIPTION

Selected Remedy – Example

Remedy components

- What is being implemented?
- What will it look like when it is implemented?

Remedy footprint(s)

- Where is it being implemented?

Other questions?

2.4.2.1 Description of Selected Remedy

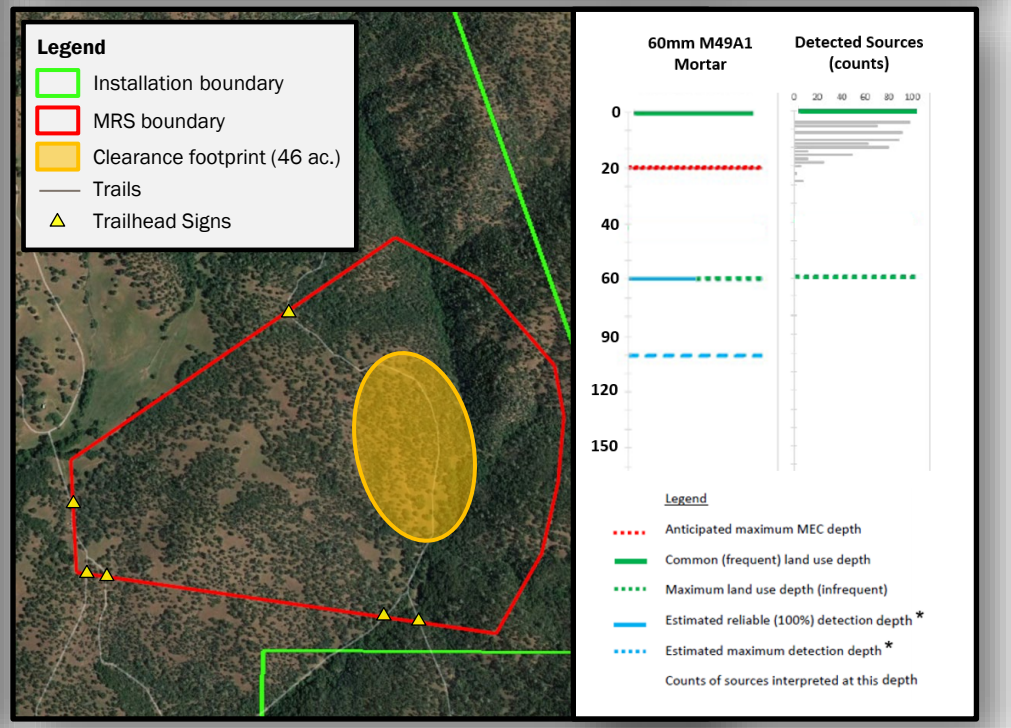
The selected remedy is completing a subsurface MEC clearance at the Mortar Range MRS and the implementation of LUCs. The footprint for the MEC clearance is shown in **Figure 2-4**. The clean-up goal for the MEC clearance component of the remedy is to detect and remove 60mm HE and practice mortars to 60cm bgs across the 46-acre clearance footprint with exceptions for inaccessible areas including under trees greater than 20cm in diameter ABH and under the existing building foundation. The removal of MEC from this volume of soil, with the addition of the LUCs described below, will protect site workers and the public under current and reasonably anticipated future conditions, based on continuing recreational land use. The LUCs component of the selected remedy will address any residual risks from explosive hazards potentially remaining after completion of the MEC clearance.

A subsurface MEC clearance will be completed by performing digital geophysical surveys across the 46-acre clearance footprint to detect and locate MEC to a minimum depth of 60cm bgs. The volume of soil in the clearance footprint will be searched for MEC using AGC sensors to detect and identify TOI that might indicate MEC. TOI deeper than 60cm will also be identified to the extent of the ability of the equipment used. AGC data will be collected, managed, and analyzed by qualified geophysical personnel working for a DAGCAP-accredited GCO. All identified TOI will be excavated by UXO-qualified personnel implementing safety protocols for public and worker protection. All MEC recovered will be treated onsite via thermal destruction. MPCs will be developed to achieve the clean-up goal as part of the RA QAPP, in compliance with EM 200-1-15. The effectiveness of MEC detection and removal will be evaluated against those MPCs and the MEC clearance will be considered complete once the MPCs have been achieved.

Following the MEC clearance, residual risks from MEC will be managed by implementing park worker training and hazard notification measures to keep park workers and the public informed about possible residual MEC hazards at the Mortar Range MRS. These notification measures will include warning signs at all trailheads and safety pamphlet distribution stations at all entry points to the park. The Army will provide safety pamphlets for these stations and for park personnel to hand out to cars arriving at the parking area. The Army will also provide annual training to park workers in conducting anomaly avoidance to mitigate possible residual hazards. Within one year from the signature date of this ROD, a LUCIP will be prepared to describe the specifics of hazard notification measures and worker training. Full implementation of the LUCs will follow finalization of the LUCIP and the remedy will be considered in place following (1) installation of the signs, (2) the initial delivery of safety pamphlets, and (3) completion of the first annual training session.

2.4.2.3 Expected Outcomes of Selected Remedy

Following implementation of the selected remedy, it is anticipated that all MEC within the 60cm volume of searched soil within the Mortar Range MRS will be treated via disposal. It is expected that the combination of this MEC source removal from this soil volume and the implementation of hazard notification measures and park worker training will prevent the potential for land users to interact with MEC. Because residual risks from explosive hazards will remain at the site following remedy implementation above levels that would allow UU/UE, five-year reviews will be required.



EXAMPLE SELECTED REMEDY DESCRIPTION

Selected Remedy – Example

Remedy components
- What is being implemented?
- What will it look like when it is implemented?

Remedy footprint(s)
- Where is it being implemented?

Other questions?

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60mm HE and practice mortars

Subsurface MEC removal using AGC

A subsurface MEC clearance will be completed by performing digital geophysical surveys across the 46-acre clearance footprint to detect and locate MEC to a minimum depth of 60cm bgs. The volume of soil in the clearance footprint will be searched for MEC using AGC sensors to detect and identify TOI that might indicate MEC. TOI deeper than 60cm will also be identified to the extent of the ability of the equipment used. AGC data will be collected, managed, and analyzed by qualified geophysical personnel working for a DAGCAP-accredited GCO. All identified TOI will be excavated by UXO-qualified personnel implementing safety protocols for public and worker protection. All MEC recovered will be treated [illegible] of the RA QAPP, in compliance with EM 200-1-15. The effectiveness of MEC detection and removal will be evaluated against those MPCs and the MEC clearance will be considered complete once the MPCs have been achieved.

Yes: digital surveys and AGC are specified

Following the MEC clearance, residual risks from MEC will be managed by implementing park worker training and hazard notification measures to keep park workers and the public informed about possible residual MEC hazards at the Mortar Range MRS. These notification measures will include warning signs at all trailheads and safety pamphlet distribution stations at all entry points to the park. The Army will provide safety pamphlets for these stations and for park personnel to hand out to cars arriving at the parking area. The Army will also provide annual training to park workers in conducting anomaly avoidance to mitigate possible residual hazards. Within one year from the signature date of this ROD, a LUCIP will be prepared to describe the specifics of hazard notification measures and worker training. Full implementation of the LUCs will follow finalization of the LUCIP and the [illegible] delivery of safety pamphlets, and (3) completion of the first annual training session.

Signs, pamphlets, and safety training

2.4.2.3 Expected Outcomes of Selected Remedy

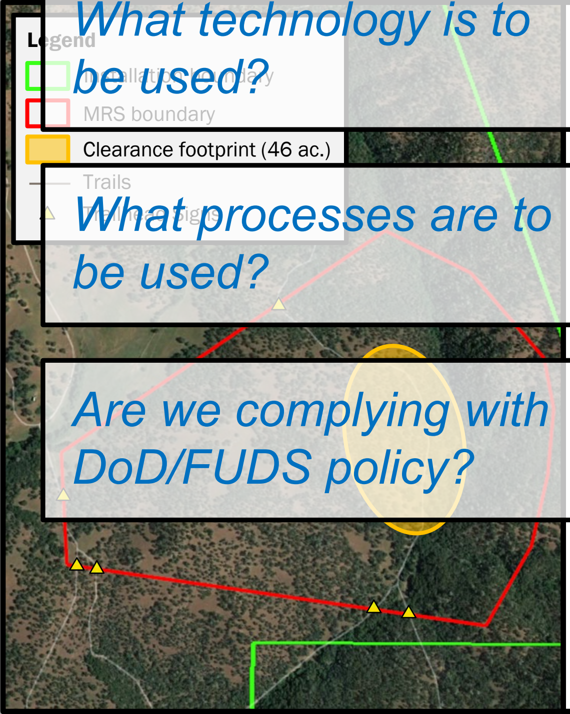
Fo[illegible] it is anticipated that all MEC within the 60cm volume of searched soil within the Mortar Range MRS will be treated via disposal. It is expected that the co[illegible] removal from this soil volume and the implementation of hazard notification measures and park worker training will prevent the potential for land users to interact with MEC. Because residual risks from explosive hazards will remain at the site following remedy implementation above levels that would allow UU/UE, five-year reviews will be required.

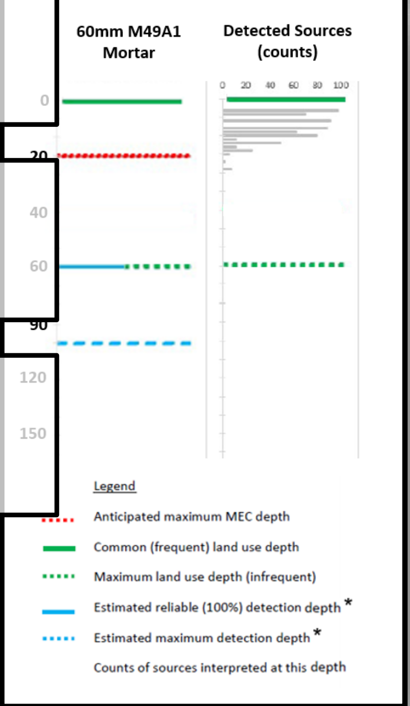
What are the target MEC items?

What technology is to be used?

What processes are to be used?

Are we complying with DoD/FUDS policy?





EXAMPLE SELECTED REMEDY DESCRIPTION

Selected Remedy – Example

Remedy components
- What is being implemented?
- **What will it look like when it is implemented?**

Remedy footprint(s)
- Where is it being implemented?

Other questions?

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MEC removal: MPCs have been achieved

Following the MEC clearance, residual risks from MEC will be managed by implementing park worker training and hazard notification measures to keep park workers and the public informed about possible residual MEC hazards at the Mortar Range MRS. Hazard notification measures will include warning signs at all trailheads and safety pamphlet distribution stations at all entry points to the park. The Army will provide safety pamphlets at these stations and for park personnel to hand out to cars arriving at the parking area. The Army will also provide annual training to park workers in conducting anomaly avoidance to mitigate possible residual hazards. Within one year from the signature date of this ROD, a LUCIP will be prepared to describe the specifics of hazard notification measures and worker training. Full implementation of the LUCs will follow finalization of the LUCIP and the remedy will be considered in place following (1) installation of the signs, (2) the initial delivery of safety pamphlets, and (3) completion of the first annual training session.

LUCs: following LUCIP, sign installation, 1st pamphlet issue, and 1st training session

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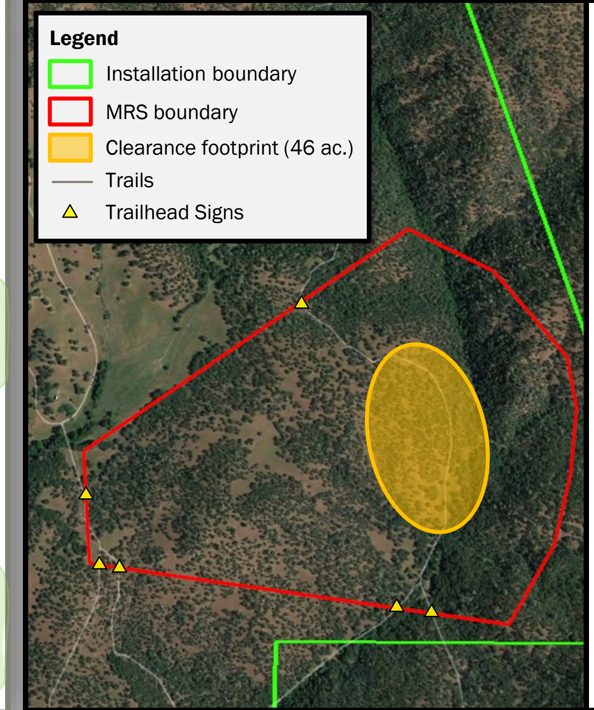
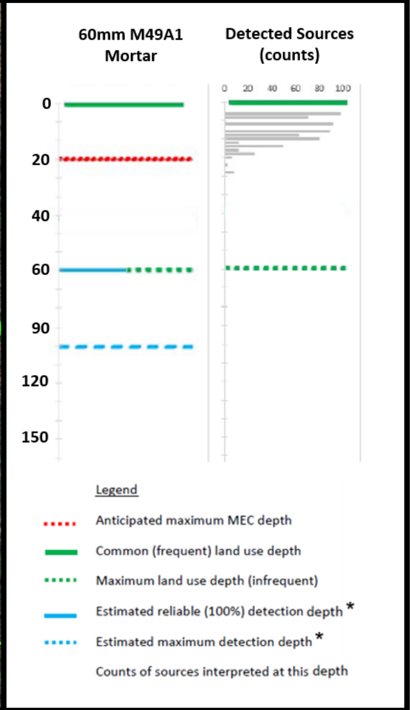
Following the implementation of the selected remedy, it is anticipated that all MEC within the 60cm volume of searched soil within the Mortar Range MRS will be treated via disposal. It is expected that the combination of this MEC clearance of this soil volume and the implementation of hazard notification measures and park worker training will prevent the potential for land users to interact with MEC. Because residual risks from explosive hazards will remain at the site following remedy implementation above levels that would allow UU/UE, five-year reviews will be required.

How would we know when we have RIP?





EXAMPLE SELECTED REMEDY DESCRIPTION

Selected Remedy – Example

Remedy components

- What is being implemented?
- What will it look like when it is implemented?

Remedy footprint(s)

- **Where is it being implemented?**

Other questions?

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Under trees and an existing foundation

A subsurface MEC clearance will be completed by performing digital geophysical surveys across the 46-acre clearance footprint to detect and locate MEC to a minimum depth of 60cm bgs. The volume of soil in the clearance footprint will be searched for MEC using AGC sensors to detect and identify TOI that might indicate MEC. TOI deeper than 60cm will also be identified to the extent of the ability of the equipment used. AGC data will be collected, managed, and analyzed by qualified geophysical personnel working for a DAGCAP-ac[illegible]redited GCO. All identified TOI will be excavated by UXO-qualified personnel implementing safety prot[illegible] [illegible]overed will be treated onsite via thermal destructi[illegible]. MPCs will be developed to achieve the clean-up goal as part of the RA QAPP, in compliance with [illegible]veness of MEC detection and removal will be evaluated against those MPCs and the MEC clearance will be considered complete once the MPCs have been achieved.

What is the remedial footprint?

Following the MEC clearance, residual risks from MEC will be managed by implementing park worker training and hazard notification measures to keep park workers and the public informed about possible residual MEC hazards at the [illegible]. These measures include warning signs at all trailheads and safety pamphlet distribution stations at all entry points to the park. The Army will provide safety p[illegible] [illegible] to hand out to cars arriving at the parking area. The Army will also provide annual training to park workers in conducting anomaly avoidance to mitigate possible residual hazards. Within one year from the signature date of this ROD, a LUCIP will be prepared to describe the specifics of hazard notification measures and worker training. Full implementation of the LUCs will follow finalization of the LUCIP and the remedy will be considered in place following (1) installation of the signs, (2) the initial delivery of safety pamphlets, and (3) completion of the first annual training session.

Are there any exception (inaccessible) areas?

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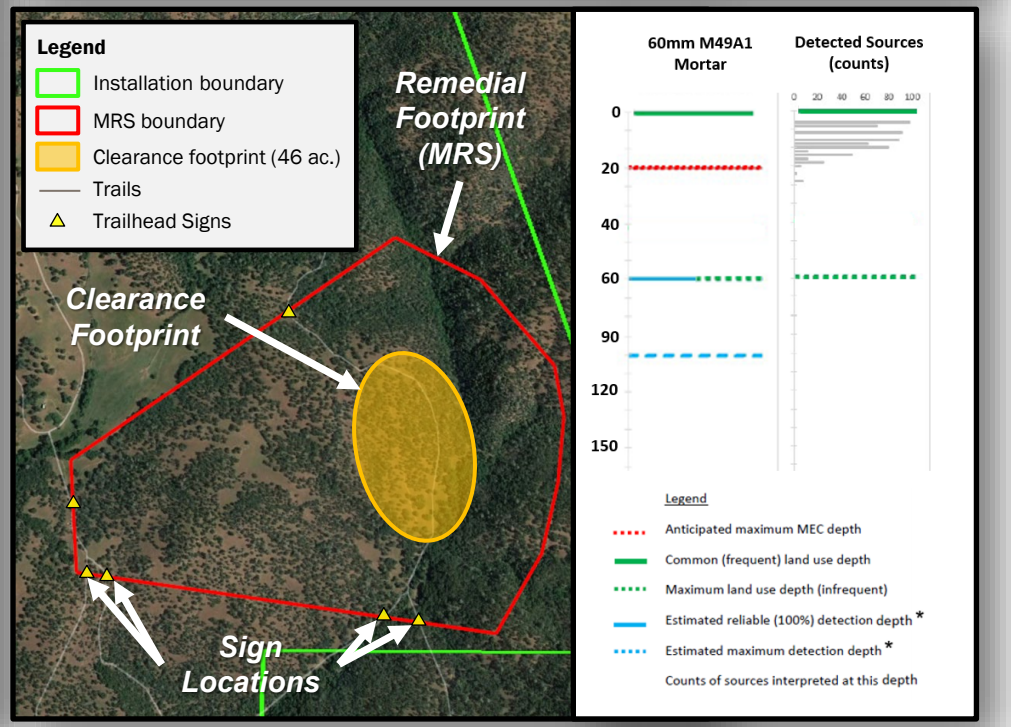

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- What will it look like when it is implemented?

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- Where is it being implemented?

Other questions?

- **Anyone?**

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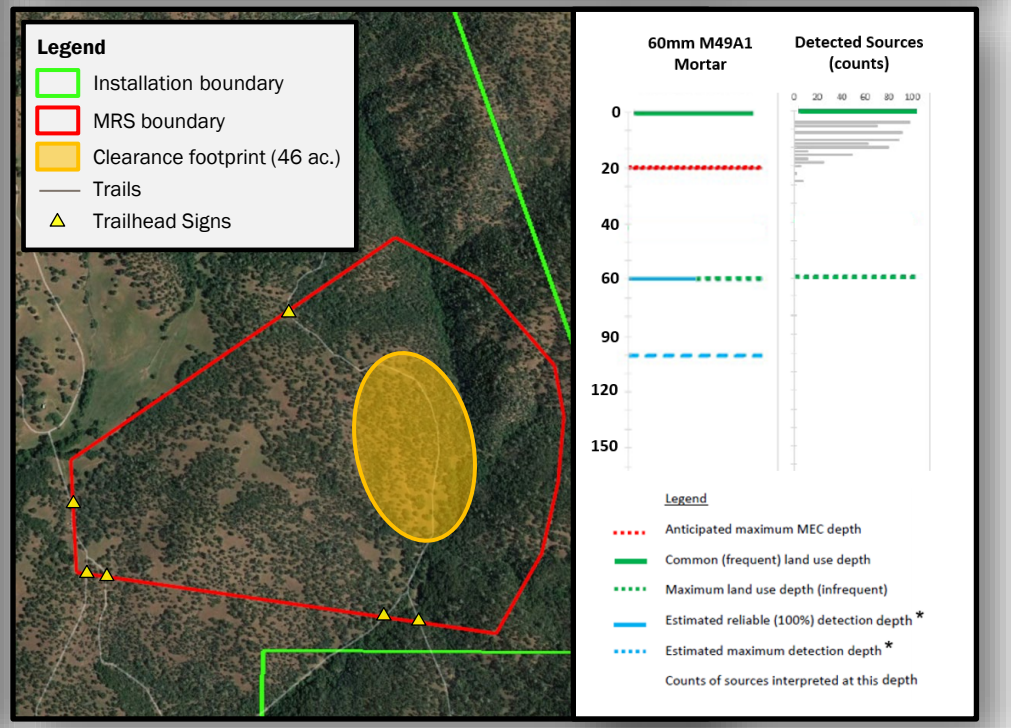


TYPICAL ISSUES WITH OLDER DECISION DOCUMENTS

Selected remedy issues

– Cleanup criteria vague, unattainable, or missing(!)
– No explanation of how we judge RIP
– Vague or non-existent LUCs descriptions
– Doesn't comply with
  • DoD policy for maximizing DGM
  • FUDS policy for using AGC

Remedial footprint issues

– Not clearly defined
– Doesn't address coverage beneath roads and buildings
  • That means we're treating the whole footprint!
– Doesn't account for sensitive habitats
– Assumes TCRA/NTCRA areas are "clean"

TWEAKING THE ROD – ALL IS NOT LOST!

"The wheels aren't coming off… we just need to tighten a few lug nuts…"

Examples of minor changes

- Clarifications through specifying
  - Technologies with the same or better detection/removal performance
  - What constitutes "sensitive habitat"
  - What constitutes "steep terrain"
  - DGM surveys must be done as final activity for SRAs
  - Locations or numbers of signs or kiosks
- Increases to
  - The number of signs or kiosks
  - The frequency of onsite training

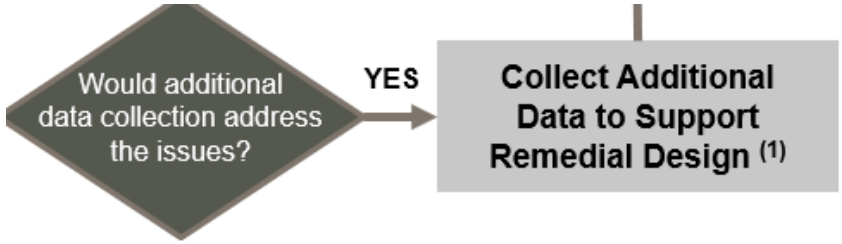
More examples of minor changes

- Upgrades
  - Using newer (to the ROD) technologies to search for MEC where it wasn't thought possible, e.g.,
    - Steeper slopes
    - Under trees or roads
  - More thorough search
    - e.g., steeper slopes, under trees, roads, etc.
  - Deeper search
    - e.g., lower detection thresholds to reduce LUCs specifications

Remember! Numerous "minor" changes might constitute a significant change!

A FEW RELATED THOUGHTS

REMEDIAL DESIGN (RD)



1) May require additional contract action(s)

Typically, RDs have been limited to aiding development of the RA QAPP.
However, there may be scenarios where field work during an RD would be beneficial:

– Anomaly densities from the RI are not trustworthy

– RI did not fully characterize the site

– Accessibility cannot be properly determined

– Primarily terrain, but may include other limitations (cultural, sensitive habitat, etc…)

– Unique site conditions require alternative or innovative approaches

VOLUME OF SOIL

We have been using a new term: Volume of Soil

- Represents the area to be searched for MEC down to the specified clearance depths

- Clearance depth specifications come from requirements in the:
  - ROD or AM,
  - PWS, or
  - DQOs specified in the Project QAPP

- The volume of soil required to be searched for MEC will often be the same as that described in the ROD
- In some scenarios, the volume of soil stated in the PWS will be greater than the ROD:
  - PWS states MEC detected deeper than interaction zone will be removed

- In some cases, the contracted volume may be less:
  - PWS action only covers a portion of the MRS
  - PWS action only addresses a depth shallower than the ROD

EXCEPTION AREAS

The ROD, AM, or PWS may exclude specific volumes of soil from requiring a search for the presence or absence of MEC. There are two general categories:

- Areas inaccessible to a search for MEC
- Accessible areas, or portions thereof, that are specifically excepted in the ROD from a search for MEC

If there are no exception areas noted in the ROD, AM, or PWS, special consideration should be given to:

- Within or under tree root balls (this has been demonstrated)
- Under hedges and other landscaped features (ditto)
- Under fences and fence posts (ditto)
- Under roads and/or under roadbeds (property owner's decision)
- Under driveways and foundations (ditto)
- Under power transmission lines and power poles (sensor dependent)
- Steep, uneven, or unstable terrain (alternative & innovative approaches)

DQO CONSIDERATIONS

The following factors should be considered while developing DQOs:

- Known access constraints, obstructions, or stakeholder limitations that limit or impede access for the search for MEC.
- Detection coverage requirements/specifications.
- Positioning precision and accuracy.
- Detection performance of each geophysical system for each TOI (using site-specific noise analyses and forward modeling).
- Classification performance of each AGC system for each TOI (using site-specific noise analyses and forward modeling).

DQOs should be designed such that if we meet all of them, we can say wherever MEC was present in the volume of soil, we found it and removed it.

SPECIAL CONSIDERATIONS

Saturated Response Areas

– Anomaly densities must be reduced and then mapped with DGM instruments

– Anomaly reduction can be done in advance (separate contract) or as part of the RA contract
  - Typically, by analog reduction or mechanized lifts

– Ideally, these were identified or acknowledged during the RI (or less ideally, the RD)
  - Identify: Large, contiguous areas (i.e., target center)
  - Acknowledge isolated, small pockets of high anomaly density may exist
  - Completely unexpected areas of high anomaly density may require a contract mod

Surface Removal Remedial Actions

– Similar to subsurface, requires specific MQOs and surface seeding

– Focus QAPP development on how the remedy's implementation will be documented

CLEANUP GOALS WITH DEPTH

It is easy to say, “all munitions to 45cm” and more difficult to say “60mm mortars to 45cm and other munitions to x depth” but many sites might fall under the second scenario

- Generally, this is when a decision is based primarily on estimated contamination depth rather than land use depth, or different munitions types with different land uses
- What are the other depths?
- What about items with unknown detection depths?

As before, cleanup goals should be documented clearly in the ROD

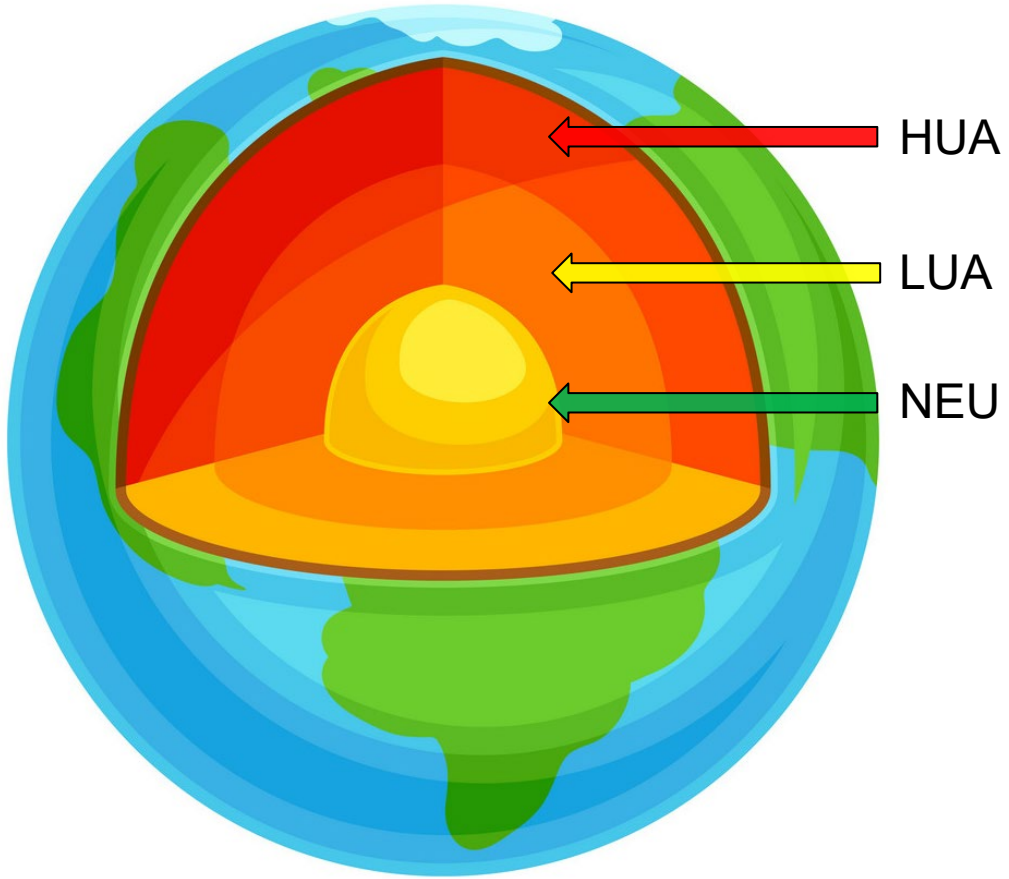
A clear statement of the cleanup goals regarding specific munitions at specific depths

- Example – “60mm mortars to 45cm and hand grenades to 15 cm over all accessible areas…”

A clear statement as to what LUCs will entail

- Specific to undetected or inaccessible munitions

Cross Section of a MMRP Site
– A Regulator’s Perspective



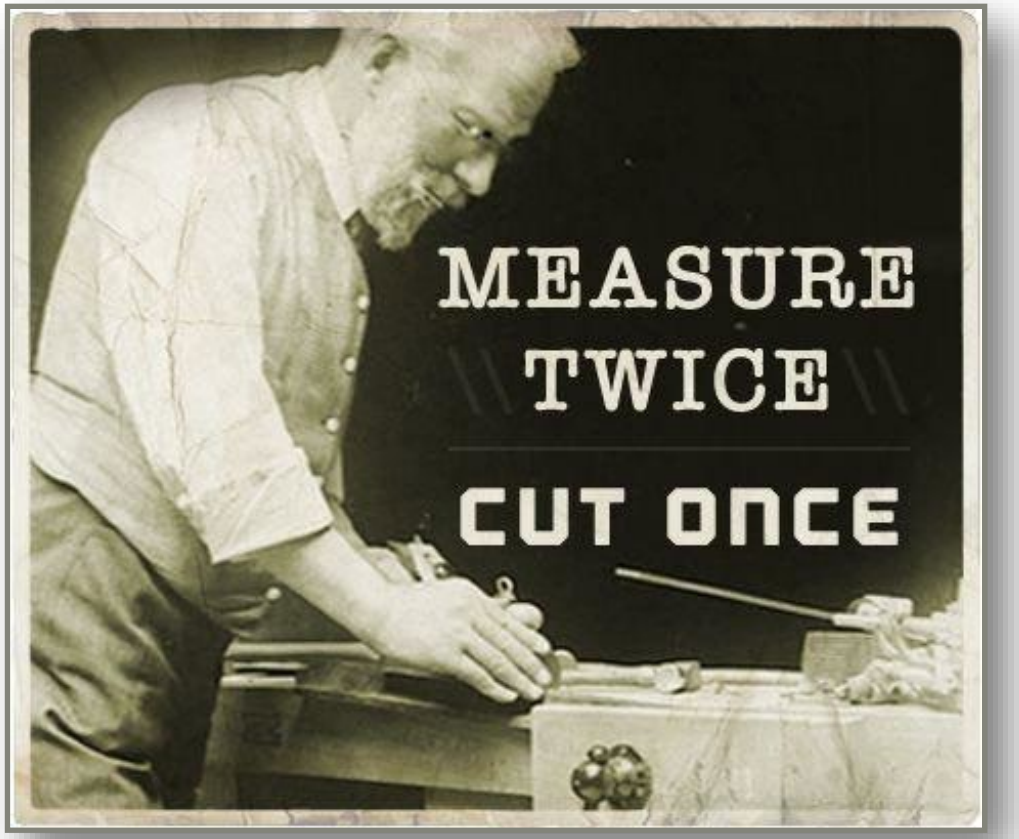
TAKEAWAYS

Review the selected remedy description **BEFORE** issuing the RFP and confirm

- It complies with policy
  - DoD policy for maximizing DGM
  - FUDS policy for using AGC
- You have a clear understanding of what Remedy-In-Place looks like

Ensure you have the necessary data for planning and costing the RA **BEFORE** issuing the RFP

- If not, plan to collect the data
  - May require an additional contract action



It's better to delay the project start and do it right than to have to repeat work later and deal with ESDs, ROD amendments, or REAs


ANY
QUESTIONS?