REGULATORY PERSPECTIVE ON RODS FOR MMRP SITES

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M2S2 Military Munitions Support Services
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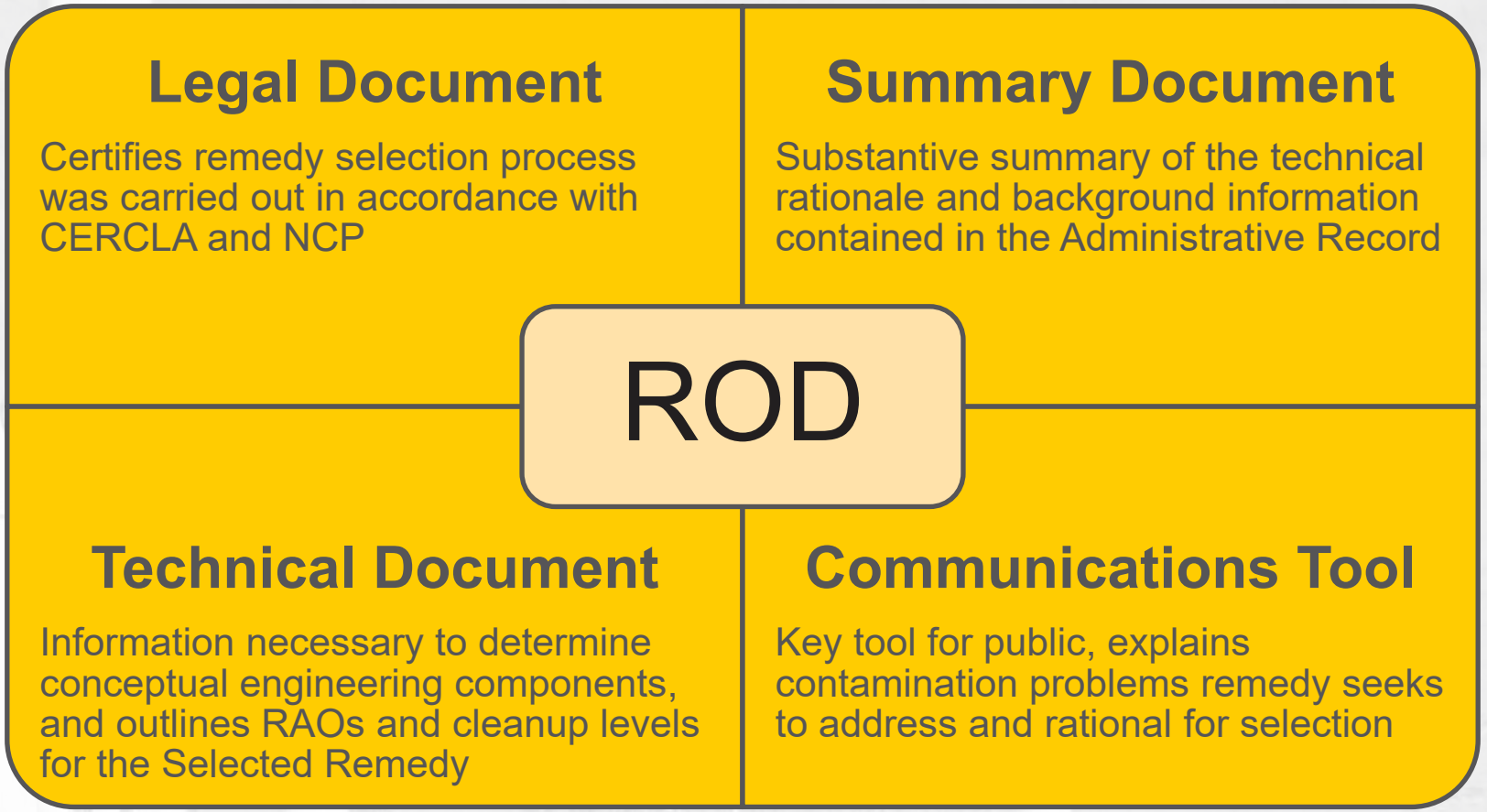
PURPOSE OF THE RECORD OF DECISION

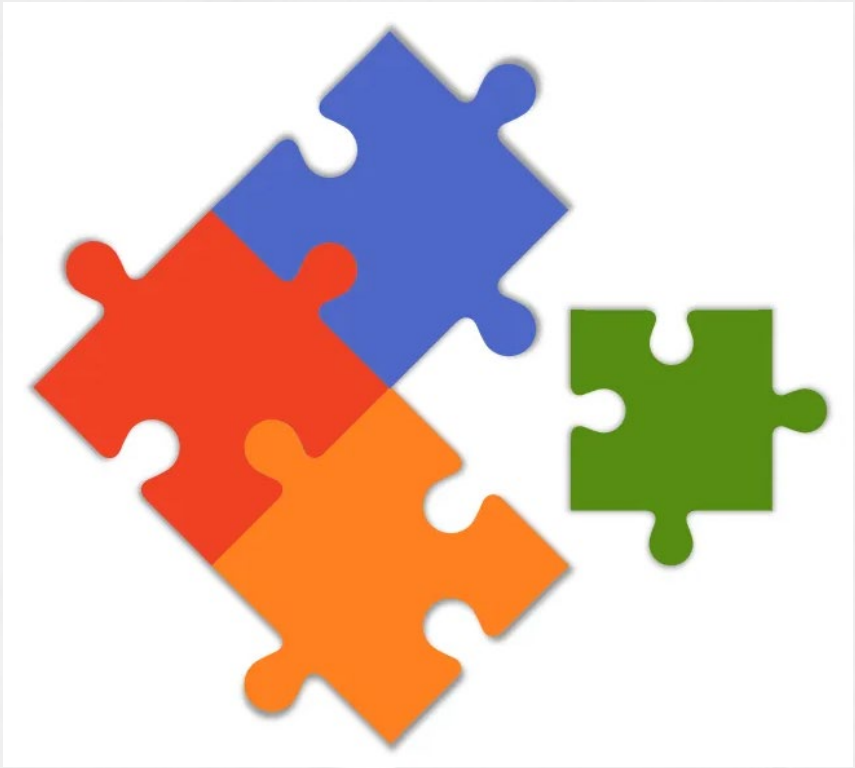
- ROD documents the selected remedial action for a site (or operable unit)
- ROD serves as:
  - Legal Document
  - Summary Document
  - Technical Document
  - Communications Tool



ROD AS A TECHNICAL DOCUMENT

Important Technical Pieces of a ROD

- Remedial Action Objectives (RAOs)
  - What the cleanup will accomplish
- Description of Alternatives
  - Description of remedy components
  - Common elements and distinguishing features of each alternative
  - Expected outcomes of each alternative
- Selected Remedy
  - Rational for the selected remedy
  - Description of the selected remedy
  - Summary of estimated remedy costs
  - Expected outcomes of the selected remedy



REMEDIAL ACTION OBJECTIVES

RAOs provide:

- General description of what the cleanup will accomplish (cleanup goals)
  - Design basis for remedial alternatives
  - Understanding how risks will be addressed
  - Evaluating cleanup options
  - Protectiveness determinations
  - Five-year reviews

ROD should discuss:

- Clear statement of specific RAOs
- RAOs for each remedy component
- Basis and rational for RAOs
- How RAOs address site risks

RAOs “set the bar” for each component of the remedy

DESCRIPTION OF ALTERNATIVES

- Brief descriptions of the remedial alternatives
  - Bulleted lists of major components
  - Descriptions of each remedy component
  - Enough information for comparative analysis
- Focus of Analysis of Alternatives
  - Common elements and distinguishing features
  - Evaluation of 9-criteria
- Expected outcomes of each alternative
  - Available uses of land upon
  - Media, metrics, outcomes
  - Other impacts or benefits associated with each alternative

TABLE 5 - REMEDIAL ALTERNATIVES

Alternative	Components	Description	Cost
Soil			
No Action *No action for contaminated soil with no restriction on activities*	-Existing soil	-No action	No cost
Biostimulation and Off-Site Disposal *Excavation and stockpiling of contaminated soil for on-site ex-situ treatment followed by backfilling and site restoration*	-Excavation of soil -On-site ex-situ biostimulation followed by off-site disposal -Site restoration -Engineering Controls	-Excavation of an estimated 1,333 yd³ of soil. On-site material will be evaluated for potential re-use for backfill (it is estimated that only 1/3 of excavated material is contaminated based on existing sample data) -Collection of confirmation samples from the excavation and of the uncontaminated soil for analysis of COCs to verify performance standards are met -Stockpiling of contaminated site soil and placement on a treatment pad with physical controls (fencing and signs) to prevent access and erosion and sediment controls (silt fencing) to prevent contaminant transport -Mixing stockpiled soil with amendments (e.g., commercial fertilizer) and bi-weekly aeration to stimulate biological degradation -Periodic sampling of stockpiled soil until performance standards are met followed by off-site disposal -Mixing clean fill and uncontaminated site soil for backfill and site restoration (repeating)	Capital Cost: $251,600 Annual O&M Cost: $0 Present-Worth Cost: $291,600 Federal Discount Rate: 3.5% Timeframe: 2 years
Excavation and Off-Site Disposal *Excavation of contaminated soil followed by off-site disposal, backfilling, and site restoration*	-Excavation of soil Off site disposal -Site restoration -Engineering Controls	-Excavation of an estimated 1,333 yd³ of soil. On-site material will be evaluated for potential re-use for backfill (it is estimated that only 1/3 of excavated material is contaminated based on existing sample data) -Collection of confirmation samples from the excavation and of the uncontaminated soil for analysis of COCs to verify performance standards are met	Capital Cost: $229,300 Annual O&M Cost: $0 Present-Worth Cost: $229,300 Federal Discount Rate: 3.5%

TABLE 2-5
Expected Outcomes of the Selected Remedy

Risk	Remedial Action Objective	Remedy Component	Metric	Expected Outcomes
Ingestion of VOCS in groundwater under potable use scenario	Restore groundwater quality based on the classification of the aquifer as a potential source of drinking water and to prevent human ingestion of water containing chemicals of concern at concentrations above NCGWQS or MCL standards, whichever is more stringent until cleanup levels have been obtained.	Air sparge system LTM for MNA LUCs/ICs	Operate system for up to 5 years or until groundwater cleanup levels within the radius of influence are met, whichever is the shortest period. Implement until each groundwater chemical of concern is at or below its respective cleanup level for four consecutive monitoring events.	Achieve unlimited use and unrestricted exposure
Direct exposure to arsenic in soil under residential use scenario and leaching potential to groundwater	Prevent future residential exposure to arsenic-contaminated soils above the NC HWS SSL and minimize transport to groundwater.	LUCs/ICs	Maintain LUCs/ICs until chemicals of concern in the soil are at such levels that allow for unlimited use and unrestricted exposure	Maintain industrial use
Transport of VOCs in groundwater to surface water	Minimize migration of chemicals of concern in groundwater to surface water	ERD biobarrier LTM LUCs/ICs	Maintain until chemicals of concern in groundwater meet cleanup levels Implement until each groundwater chemical of concern is at or below its respective cleanup level for four consecutive monitoring events.	Minimize migration of chemicals of concern in groundwater to surface water

Source: EPA Toolkit for preparing CERCLA Records of Decision

MMRP REMEDY COMPONENTS

Remedy Component Descriptions:

Treatment Technologies
- Describe the approach in general terms
- Technology categories (general)
- Materials technology will address

Land Use Controls
- Description of the specific control proposed
- Intended affect on human activities
- How LUC prevents or reduces exposure to hazards
- Entity responsible for implementing and maintaining

Operations & Maintenance (O&M)
- Activities required to maintain remedy integrity

Monitoring requirements
- Activities required to monitor remedy

Example MMRP Remedy Components

Removal of Explosives Hazards
- Surface clearance
- Subsurface clearance
- Bulk removal (excavate and separate)

Treatment of Explosives Hazards
- Open Detonation (BIP, consolidated)
- Alternative technology

Residual Exposure Management
- "Construction support"
- 3Rs Program

Land Use Controls (LUCs)
- Education & Awareness
- Safety Training
- Access Restrictions
- Use Restrictions

DESCRIPTION OF SELECTED REMEDY

Technical Document Lens

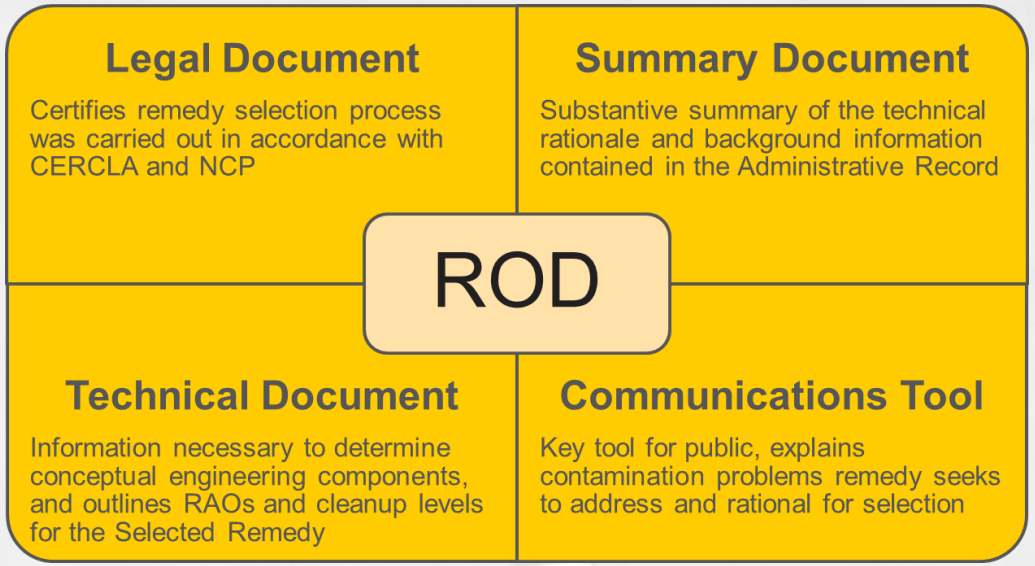
- Expands on major remedy components
  - Give a design engineer enough information to correctly interpret the technical intent of the ROD
  - Minimize likelihood of unanticipated changes to scope and intent of Selected Remedy
- Cleanup Levels
  - Documents cleanup levels by munitions and area
  - Present basis and rational for cleanup levels
  - Explain where and how levels will be applied
- Land Use Controls
  - Describe LUCs as explicitly as possible
  - Documents LUC intent and performance goals
  - Means of implementing the controls

Provide appropriate details to initiate the design phase (RA-QAPP & LUCIP)

MMRP ROD LESSONS LEARNED

What needs to be in a ROD for successful implementation?

- Technical Document
  - Remedial Action Components
    - What, Why, Where, How, Goals
  - Cleanup Levels
    - Media, Contaminants, Levels (depth)
  - Land Use Controls
    - What, Why, How, Who, Goals
- Summary Document
  - The other important stuff critical for success



LESSONS LEARNED – MEC REMOVAL DESIGN

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Removal of Explosives Hazards

Remedial Action QAPP – DQO Step 1 State the Problem

Selected Remedy	Remedial Action Objectives	Selected Remedy Components		
		MEC Removal	Treatment	LUCs
Alternative 2: MEC surface and subsurface removal using AGC single-pass detection and TOI selection with interim land use controls.	1) Remove MEC in the surface and subsurface 2) Achieve UU/UE <u>MEC Removal Remediation Goal:</u> • 60-mm mortar 0.45 m bgs • Practice hand grenades, signals, flares, pyrotechnics, 2.36" practice rockets, 0.30 m bgs • Any other munitions present on the site that are detectable at the anomaly selection criteria	• Anomaly detection and TOI selection using single-pass AGC • TOI investigation and source removal using manual and backhoe-assisted excavation	• All recovered MEC to be detonated in place or otherwise destroyed on-site	• Interim LUCs if specified in applicable decision document Upon successful remediation, LUCs will be removed

LESSONS LEARNED - ARARS

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The Hookless Cactus Won!

- Endangered Species Act (ESA) identified as ARAR
  - Uinta Hookless Cactus habitat (endangered)
- Comparative Analysis of Alternatives states all ARARs would be attained, including discussion of hookless cactus
- Remedy silent on how to attain this ARAR

Lesson Learned

- Document how remedy attains each ARAR
- Describe ARARs compliance as explicitly as possible

4.0 DESCRIPTION OF SELECTED REMEDY

The Selected Remedy for Delta Range Impact Areas MRS consists of 100 percent digital geophysical mapping (DGM) and surface and subsurface removal to full depth (expected to be 18 inches) with the aid of advanced classification technology (ACT), and Institutional Controls (ICs) with Five-Year Reviews. The Selected Remedy will involve:

- Completion of a surface and subsurface removal of DoD munitions in 100 percent of the accessible area (approximately 1,993-acres) of the Delta Range Impact area MRS.

10.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

An additional regulation of concern for Alternatives 4 and 5 is the Endangered Species Act of 1973. Ground-disturbing activities associated with these alternatives could impact important habitat for an endangered species or plant or animal species of special interest. To comply with this regulation, a current habitat survey for the Colorado hookless cactus would be reviewed, and protection or relocation of the species could be required before ground-disturbing activities could begin.

LESSONS LEARNED - ACCESSIBILITY

Inaccessible Areas on a Mountain?

- Subsurface removal component
  - “In areas inaccessible using AGC system due to steep terrain, other geophysical technologies will be utilized to the extent practical (e.g., analog).”
- How to define inaccessible terrain for AGC? For analog?
  - Field survey or GIS analysis
  - Understand the numbers: 40% slope is ~22 degrees

Lessons Learned

- Uncertainty in delineating inaccessible areas significantly impacts cost estimate and execution risks
- Don’t underestimate impacts of this uncertainty on costs
- Be cautious of GIS slope analysis

LESSONS LEARNED – LAND USE CONTROLS

Generic LUC descriptions

- Brief lists of broad LUC components
- Vague references to managing risks
- No implementation details

RODs with no LUC performance objectives

- No RAOs or cleanup goals
- No implementation strategy or intent
- No end state for achieving success

Lessons Learned

- Don't shortchange LUCs in the ROD
- Describe each LUC component with equally detail to other remedy components
- ROD document - What, Why, How, Who, Goals

Camp Hale East Fork Valley ROD

- Remaining hazards at the site would be managed through educational LUCs including USFS Permit system, warning signs, MEC awareness training, public communications, and advisories on intrusive activities.

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QUESTIONS?

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