
FINAL RECORD OF DECISION

Open Detonation Grounds Munitions Response Site

Seneca Army Depot Activity
Seneca County, New York

PREPARED FOR:

U.S. ARMY CORPS OF ENGINEERS, ENGINEERING
AND SUPPORT CENTER,
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HUNTSVILLE, ALABAMA

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NEW YORK, NEW YORK

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ACRONYMS AND ABBREVIATIONS

3Rs	Recognize, Retreat, Report
%	Percent
#	Number
\$	Dollar
µg/dL	micrograms per deciliter
AGC	Advanced Geophysical Classification
ALM	adult lead model
AOC	area of concern
ARAR	Applicable or Relevant and Appropriate Requirements
Army	U.S. Army
ASR	Archives Search Report
BERA	Baseline Ecological Risk Assessment
Bgs	below ground surface
BIP	blow-in-place
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethyl benzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	chemical of concern
COEC	chemical of ecological concern
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
CSM	Conceptual Site Model
DGM	Digital Geophysical Mapping
DMM	Discarded Military Munitions
DoD	Department of Defense
EPC	exposure point concentration
ESI	Expanded Site Investigation
FFA	Federal Facilities Agreement
FOST	Finding of Suitability to Transfer
ft	feet
FS	Feasibility Study
HA	Hazard Assessment

ACRONYMS AND ABBREVIATIONS (CONTINUED)

HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotients
IEUBK	Integrated Exposure Uptake Biokinetic
LOAEL	Lowest-Observable Adverse Effect Level
LTM	Long Term Monitoring
LUC	Land Use Control
MC	Munitions Constituents
MCPA	2-methyl-4-chlorophenoxyacetic acid
MDAS	material documented as safe
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
mg/kg	milligrams per kilogram
MPPEH	Material Potentially Presenting an Explosive Hazard
MRS	Munitions Response Site
MSL	Mean sea level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAEL	No Observed Adverse Effect Level
NYCRR	New York Code of Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation and Maintenance
OB	Open Burning
OD	Open Detonation
OE	Ordnance and Explosives
OMB	Office of Management and Budget
PAL	Project Action Limit
PCB	Polychlorinated Biphenyl
PDT	Project Delivery Team
PFAS	per and polyfluoroalkyl substances
PTW	Principal Threat Waste
RAO	Remedial Action Objectives

ACRONYMS AND ABBREVIATIONS (CONTINUED)

RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RfD	Reference Dose
RG	Remedial Goal
RI	Remedial Investigation
ROD	Record of Decision
RMM	Risk Management Method
RSL	Regional Screening Levels
SCIDA	Seneca County Industrial Development Agency
SCO	Soil Cleanup Objective
SEAD	Seneca Army Depot (used for designation of sites)
SEDA	Seneca Army Depot Activity
SI	Site Inspection
SSC	Supplemental Site Characterization
ss-ESCO	site specific ecological soil cleanup objective
SVOC	semi-volatile organic compound
SWMU	Solid Waste Management Unit
TBC	To Be Considered
TMV	toxicity, mobility, or volume
TOI	Targets of Interest
TPV	Total Present Value
UCL	upper confidence limit
U.S.	United States
USACE	United States Army Corps of Engineers
USEPA	United State Environmental Protection Agency
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound

GLOSSARY OF TERMS

3Rs (Recognize, Retreat, Report) – Military munitions, especially unexploded ordnance (UXO), should be considered extremely hazardous because if touched, moved or disturbed they may explode causing death, serious injury or damage. To protect yourself, your family, your friends and your community, it is important to follow the 3Rs of Explosives Safety should you know or suspect you have come across a military munition:

Recognize – when you may have encountered a munition, and that munitions are dangerous.

Retreat – do not approach, touch, move, or disturb it, but carefully leave the area.

Report – call 911 and advise the police of what you saw and where you saw it.

Administrative Record – A compilation of all documents used to determine the appropriate remedial action at the project site.

Anomaly – Any item that is seen as a subsurface irregularity after geophysical investigation. This irregularity should deviate from the expected subsurface ferrous and non-ferrous material at a site (i.e., pipes, power lines, etc.).

Applicable or relevant and appropriate requirements (ARAR) – The Federal and State environmental laws that a selected remedy will meet. These requirements may vary among sites and alternatives.

Blow-in-place (BIP) - Once a Munitions and Explosives of Concern (MEC) item has been exposed, it will be inspected, identified, and transported to a designated area for cataloging and eventual disposal. If a MEC item cannot be safely moved to an alternate location for destruction, it will be blown-in-place.

Base Realignment and Closures (BRAC) - is a process used by the United States Department of Defense (DoD) to reorganize its base structure for increased efficiency and cost savings. The BRAC process involves the closure of excess military installations and the realignment of remaining bases to better support military operations and readiness

Chemical of Concern (COC) – COCs are defined as the chemicals of potential concern (COPCs) that are present at sufficient concentrations to pose a risk to human health or the environment.

Chemical of Ecological Concern (COEC) – COECs are defined as the chemicals of potential ecological concern (COPECs) that are present at sufficient concentrations to pose a risk to ecological receptors.

Chemical of Potential Concern (COPC) – COPCs are defined as any Munitions Constituents (MC) that are present at elevated concentrations with regard to local conditions and human health screening levels. COPCs are carried forward for evaluation in the human health risk assessment.

Chemicals of Potential Ecological Concern (COPECs) – COPECs are defined as any MC that are present at elevated concentrations with regard to local conditions and ecological screening levels. COPECs are carried forward for evaluation in the ecological risk assessment.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly known as Superfund) – A federal law that addresses the funding for and remediation of abandoned or uncontrolled hazardous waste sites. This law also establishes criteria for the creation of key documents such as the Remedial Investigation, Feasibility Study, Proposed Plan, and Record of Decision.

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 UXO, 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.

Feasibility Study (FS) – The process during which potential remedial alternatives for a site are developed and evaluated to provide the basis of a rationale for remedy selection.

Hazard Index (HI) – The Hazard Index (HI) is generated by adding the Hazard Quotients (HQs) for all chemical(s) of concern that affect the same target organ (e.g., liver) or that act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An $HI > 1$ indicates that site related exposures may present a hazard to human health.

Hazard Quotient (HQ) – The ratio of exposure to toxicity. An $HQ < 1$ indicates that a receptor's dose of a single contaminant is less than the noncancer Reference Dose (RfD), and that toxic noncarcinogenic effects from that chemical are unlikely.

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

Munitions Debris (MD) – Remnants of munitions (e.g., penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization or disposal. Munitions debris is confirmed inert and free of explosive hazards by technically qualified personnel.

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

Munitions and Explosives of Concern (MEC) Construction Support – Support provided by qualified unexploded ordnance (UXO) personnel during construction activities at potential MEC sites to ensure the safety of construction personnel from the harmful effects of UXO. The level of MEC construction support required is determined based on the assessed probability of encountering UXO. For low probabilities of encounter, the UXO personnel will stand by (onsite or on-call) in case the construction contractor encounters MPPEH. For higher probabilities, UXO personnel may be required to conduct subsurface MEC removal in the construction footprint.

Military Munitions Response Program (MMRP) - The MMRP is one of two restoration programs under the Defense Environmental Restoration Program which was established to address hazardous substances, pollutants, contaminants and military munitions remaining from past activities at active military installations and formerly used defense sites (FUDS). The other program is the Installation Restoration Program (IRP). The MMRP provides a focused program to address the challenges presented at sites called munitions response sites. Munitions responses are response actions, including investigation, removal actions and remedial actions that address the explosives safety, human health or environmental risks presented by UXO, DMM, and MC.

Material Potentially Presenting an Explosive Hazard (MPPEH) - Material owned or controlled by the Department of Defense that, prior to determination of its explosives safety status, potentially contains explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris) or potentially contains a high enough concentration of explosives that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions).

Munitions Response Site (MRS) – A discrete location known to require a munitions response.

Preferred Alternative(s) – The alternative(s) that, when compared to other potential alternatives, was/were determined to best meet the CERCLA evaluation criteria and is proposed for implementation at an MRS.

Proposed Plan – A plan that identifies the preferred remedial alternative(s) for a site and is made available to the public for comment.

Record of Decision (ROD) – A report documenting the final action, approved by the regulatory agencies, that is required at CERCLA sites (USEPA, 1999).

Reference Dose (RfD) – An RfD represents a non-cancer level that an individual may be exposed to that is not expected to cause any adverse non-cancer health effects.

Remedial Action Objectives (RAOs) – RAOs provide a general description of what the cleanup will accomplish (e.g., restoration of groundwater to drinking water levels), the cleanup standard, and the area of cleanup for the purpose of protecting human health and the environment. These goals typically serve as the design basis for many of the remedial alternatives.

Remedial Goal (RG) – Analytical values that serve as the remediation target or cleanup level.

Remedial Investigation (RI) – The remedial investigation serves as the mechanism for collecting data to characterize site conditions, determine the nature of the waste, assess risk to human health and the environment, and conduct treatability testing to evaluate the potential performance and cost of the treatment technologies that are being considered.

Screening Level - A screening level is a preliminary estimate of the potential risk posed by a contaminant or substance in a specific environmental media. It is used to determine whether further investigation or action is needed to protect human health and the environment.

To Be Considered (TBC) – are non-promulgated criteria, advisories, etc., that can be consulted along with and in addition to ARARs.

Total Present Value (TPV) - The amount needed to be set aside at the initial point in time (the “base year,” or “Year 0”) to ensure funds will be available in the future as they are needed.

Unexploded Ordnance (UXO) – Military munitions that: (a) have been primed, fuzed, armed, or otherwise prepared for action; (b) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (c) remain unexploded either by malfunction, design, or any other cause.

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1 DECLARATION

1.1 SITE NAME AND LOCATION

Open Detonation (OD)¹ Grounds **Munitions Response Site (MRS)**, Seneca Army Depot Activity (SEDA), Seneca County, New York (**Figure 1**).

1.2 STATEMENT OF BASIS AND PURPOSE

This **Record of Decision**² is being presented by the United States (U.S.) Army (Army) to describe the Base Realignment and Closure (BRAC) Branch's selected remedy for the OD Grounds MRS at SEDA in Seneca County, New York. The selected remedy was chosen in accordance with the requirements of the **Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)** (42 U.S. Code § 9601 et seq), the Defense Environmental Restoration Program (10 U.S.C. §2701 et seq), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 Code of Federal Regulations Part 300 et seq. The Army and the United States Environmental Protection Agency (USEPA), with concurrence from the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH), have selected the remedy described herein.

This Record of Decision is based on the **Administrative Record** that was developed in accordance with Section 113(k) of CERCLA and 40 CFR 300.800. The Administrative Record is available for public review online at: <https://senecaarmydepotar.com>. The State of New York, through the NYSDEC, and the USEPA concurs with the selected remedy identified in this Record of Decision. The NYSDEC and USEPA concurrence letters are provided in **Appendix A**.

1.3 ASSESSMENT OF SITE

The Army has determined that **munitions and explosives of concern (MEC)** in the form of **unexploded ordnance (UXO)** and **discarded military munitions (DMM)** are present in the surface and subsurface to a depth of 36-inches, with 99 percent (%) of the Material Potentially Presenting an Explosive Hazard (MPPEH) and UXO/DMM being found in the top 24-inches of soil. Items may occur at depths greater than 36-inches in fill areas. A surface clearance was performed at the OD Hill, therefore UXO/DMM are not expected on the surface in this area. Also, the presence of **munitions constituents (MC)** and **chemicals of potential concern (COPCs)** in soil and groundwater may result in human receptors being exposed to unacceptable risks from exposure to MC/COPCs in soil via incidental ingestion, dermal contact, or inhalation of suspended particulates and in groundwater via ingestion as drinking water. The response action selected in this ROD is necessary to protect the public health or welfare from the explosive hazards of MEC and from unacceptable risks from MC/COPCs in groundwater; and to protect the public health or welfare and the environment from unacceptable risks from MC/COPCs in the soil.

¹ A list of acronyms and abbreviations is presented following the Glossary at the front of this document.

² The terminology used in this Record of Decision that first appears in bold letters is defined in the Glossary found at the front of this document.

1.4 DESCRIPTION OF SELECTED REMEDY

The Army and USEPA, with concurrence from NYSDEC and NYSDOH have selected a remedy (Alternative 4) for the OD Grounds that incorporates MEC excavation and mechanical separation, geophysics and subsequent intrusive investigation, land use controls, educational awareness measures, and construction support, and short-term groundwater restrictions. The total estimated cost for this selected remedy is \$15,929,063. The specific components of the selected remedy are:

- Land use and activity restrictions (i.e., prohibit residential use and intrusive activity to uncleared depths without construction support).
- Short-term groundwater use restrictions (i.e., prohibit use as potable source).
- Educational Awareness.
- One round of groundwater, surface water, and sediment sampling prior to any remedial action.
- Excavation of OD Hill (defined herein as the roughly 3-acre area of elevated topography at the center of the OD Grounds MRS where open detonation operations occurred, as shown in **Figure 2-1**) to grade and mechanical separation of UXO/DMM from excavated soil, creating a pile of UXO/DMM, a pile of **Munitions Debris** (MD), and pile of processed soil (e.g., loose debris-free soil).
 - In addition to the OD Hill itself, excavation and mechanical separation of UXO/DMM from excavated soil will be warranted for areas immediately outside of the OD Hill where elevated anomaly densities are such that AGC/DGM is not practical. This footprint is expected to extend 500 feet from the OD Hill; however, the extent will be refined during the Remedial Design.
- Confirmatory sampling to be conducted to evaluate whether soil remaining in place meets the remedial goals (RGs), or if additional excavation is required to achieve the RGs.
 - In the case where ecologically based RGs (site specific ecological soil cleanup objective [ss-ESCOs]) are exceeded but all other RGs are achieved, this alternative includes construction of 12-inch soil cover in discrete areas, as needed.
- Following UXO/DMM separation, soil sample collection will be conducted from the excavated and processed soils to determine the potential for the reuse of the soil within the OD Grounds MRS or to support a determination of appropriate disposition for off-site disposal.
- Digital geophysical mapping (DGM) using one-pass advanced geophysical classification (AGC) sensors and intrusive investigation to remove UXO/DMM to a depth of detection over the MRS as described below.
 - DGM with AGC will be utilized to the maximum extent practicable. In areas inaccessible to larger AGC instruments, such as along steeper slopes like stream embankments or near densely spaced trees, handheld AGC instruments may be utilized. If areas are inaccessible to all AGC instruments, then analog instruments may be used following submittal and acceptance of a technical justification. Based on the site characteristics, the use of analog instruments is expected to be limited. Analog instruments inherently have lower performance capabilities with respect to anomaly detection compared to AGC instruments and do not create a permanent record of measurement results. However, the use of analog instruments will still reduce risk in these difficult to access areas, and, when applied with the land use and activity restrictions to reduce the potential of intentional or unintentional interactions with UXO/DMM, will ultimately achieve an acceptable risk state.
 - Mechanical aids and manipulation of hydrologic conditions may be required to maximize the use of AGC and to conduct subsequent intrusive investigations in and around Reeder Creek (i.e., steep embankments and the creek bottom), ponded areas, and around the existing infrastructure on-site. These include, but are not limited to, utilizing winches and pulleys to raise and lower AGC equipment up and down steep embankments, diverting water to properly collect data on creek or riverbeds, or draining standing water from ponds and pools in order to collect data on pond beds.

- Post-remedial action groundwater, surface water, and sediment sampling to determine the impact of the remedial action on these media in Reeder Creek. Sampling will be performed prior to implementation of any other portion of the remedy.
 - If the results are in compliance with site applicable or relevant and appropriate requirements (ARARs) and/or to be considered (TBCs), no further Land Use Controls (LUC), and no long-term monitoring (LTM), for groundwater is required.
 - If the results exceed Federal or State health-based drinking water standards and impacts on groundwater are found during post-remedial action groundwater sampling, groundwater use restrictions will stay in place and long-term groundwater monitoring will be undertaken.
- Annual LUC inspections.

Based on the detailed and comparative analysis of remedial alternatives using the NCP nine criteria presented in the Proposed Plan (40 CFR 300.430(e)), the most effective alternative to achieve the remedial objectives for the Seneca OD Grounds MRS is Alternative 4 (Excavate OD Hill and perform surface/subsurface clearance over the entire site, and LUCs). Providing source removal of MEC as described above at the OD Hill and throughout the Kickout Area along with ongoing construction support for the entire MRS, land use and activity restrictions, and education awareness materials can effectively reduce the MEC hazards and be protective of human health for current and reasonably anticipated future land users. The soil cover (where needed) and LUCs can effectively reduce the MC risks present at the OD Grounds MRS. Additionally, Five-Year Reviews will be conducted, as statutorily required when remedies do not achieve Unlimited Use or Unrestricted Exposure, to ensure the remedy remains effective in perpetuity.

1.5 STATUTORY DETERMINATIONS

Based on the information currently available, the selected remedy for the OD Grounds MRS (combination of MEC removal through excavation and mechanical separation and sorting to remove MEC at the OD Hill, surface and subsurface MEC clearance over the entire MRS (including below the material removed at the OD Hill) utilizing DGM/AGC mapping/classification and intrusive investigation, land use controls, soil cover, and construction support) is protective of human health and the environment and satisfies the statutory requirements of CERCLA §121(b) with regards to the former use of the MRS by the Army. The selected remedy complies with Federal and State requirements that are applicable or relevant and appropriate (ARARs) to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable (40 CFR 300.430(a)(1)(iii)).

Because this remedy will not allow for unlimited use and unrestricted exposure at the MRS, a statutory review (i.e., five-year review) will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will remain, protective of human health and the environment (CERCLA §121(d)).

1.6 DATA CERTIFICATION CHECKLIST

The following information is included or otherwise addressed in this Record of Decision:

A summary of the characterization of MEC hazards and MC risks at the OD Grounds MRS (**Sections 2.5 and 2.7**).

Current and reasonably anticipated future land use assumptions for the MRS (**Section 2.6**).

Key factors that led to the selection of a combination of excavation, surface and subsurface MEC removal, soil cover, land use controls, construction support, and five-year reviews as the remedy for the OD Grounds MRS (**Section 2.7**).

Estimated costs related to the selected remedy (**Section 2.13.3**).

Chemicals of concern (COC) and baseline risks and hazards represented by the COCs (**Sections 2.5.3 and 2.7.2**).

Cleanup levels established for COC and the basis for these levels (**Table 2-13**).

How source materials constituting principal threats will be addressed (**Section 2.12**).

1.7 AUTHORIZING SIGNATURE

Pat Evangelista Digitally signed by Pat Evangelista
Date: 2026.07.08 16:56:16 -04'00'

July 8, 2026

.....

PAT EVANGELISTA, DIRECTOR DATE

SUPERFUND AND EMERGENCY MANAGEMENT DIVISION

U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 2

1.8 AUTHORIZING SIGNATURE

RAMSDELL.RICHARD.C.1161451408 Digitally signed by
RAMSDELL.RICHARD.C.1161451408
Date: 2026.06.02 14:37:07 -04'00'

.....

RICHARD C. RAMSDELL, DIRECTOR DATE

BASE REALIGNMENT AND CLOSURE DIRECTORATE

OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF THE

ARMY FOR ENVIRONMENT, SAFETY AND OCCUPATIONAL

HEALTH

2 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND BRIEF DESCRIPTION

The site addressed in this ROD is the OD Grounds MRS located at the SEDA in Seneca County, New York. The Army Environmental Database-Restoration MRS site number for the site is SEAD-006-R-01 (alias SEAD-45 and SEAD-115). The Army is the lead agency for investigating, reporting, making remedial decisions, and taking remedial actions at this MRS, while the USEPA is the lead supporting regulatory agency and NYSDEC is a supporting agency.

The SEDA is located approximately 40 miles south of Lake Ontario, in Seneca County, near Romulus, New York (**Figure 1-1**). The SEDA previously occupied approximately 10,600 acres of land located in the Towns of Varick and Romulus in Seneca County, New York. The former military facility was owned by the U.S. Government and operated by the Army between 1941 and approximately 2000, when the SEDA military mission ceased. The OD Grounds site is located in the northwestern corner of the Depot. The OD Grounds was used to perform open detonations of munitions. The retained parcel that contains the OD Grounds is 433.2 acres.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.2.1 Site History

The OD Grounds were used to destroy excess, obsolete, or unserviceable munitions. Operations at the OD Grounds began circa 1941 when the Depot was first constructed and continued at regular intervals until circa 2000 when the military mission of the Depot ceased. This facility operated under Interim Status as a Subpart X Miscellaneous Unit for Open Burning (OB) and OD of explosives, propellants and pyrotechnics and other unserviceable ammunition under 40 CFR Part 265 and New York Codes, Rules, and Regulations (NYCRR) 373-1. Due to the closure of the Base, the Resource Conservation and Recovery Act (RCRA) permit was not finalized as Final Status. RCRA Closure requirements and RCRA Corrective Action requirements were deferred to the CERCLA program through the Federal Facility Agreement (FFA) between the USEPA, NYSDEC, and the Army. Under this agreement and coordination with NYSDEC and USEPA, and after the closure of the ammunition mission in 1999, the Army was permitted to dispose of munitions via OB and OD for only those items recovered from site investigations and removals at this site.

During operations, munitions were placed in a hole created in the hill with additional demolition material, covered with a minimum of 8-feet of soil, and detonated remotely. After demolition was completed, explosively displaced portions of the mound were reconstructed by bulldozing displaced and native soils back into the central earthen mound.

The historic operations resulted in MEC (UXO and/or DMM) and **munitions debris (MD)** being expelled from the demolition location to the surrounding area. The investigations confirmed the area encompassing 1,000-feet to 2,500-feet from the OD Hill received "kickouts" from the demolition operation. UXO found on this range resulted from items moved to this range for destruction.

2.2.1.1 Investigations Conducted to Date

Several investigations and MEC removals have been completed at the OD Grounds. **Table 2-1** lists the previous investigations. This section summarizes the studies that were completed, and the general scope of the work performed. To assign specific work areas to each study, the OD Grounds site was divided into areas based on the radius around the center of the demolition berm. Over time the site was expanded to account for MD and UXO/DMM found outside the original 1,800-foot boundary (as defined in the Archives Search Report [ASR]). Each investigation covers a specific area of the site reported as a circle or ring with the inner and outer radius specified. Additional detail for each project including the results of the investigation or findings of the removal actions is presented in Section 2 of the **feasibility study (FS)** report (USACE, 2022b). More details concerning the results of previous investigations are provided in Subchapter 2E of this Record of Decision.

Table 2-1.
Summary of Previous Investigations and Response Actions

Previous Investigation	Year	Summary
United States Army Environmental Hygiene Agency Study (USACE, 1995)	1979-1982	Groundwater samples were analyzed for conventional pollutants and explosives and soil samples were analyzed for extraction procedure toxicity and explosives.
Expanded Site Inspection (ESI) (USACE, 1995)	1993-1994	Geophysics, test pitting, groundwater and surface water sampling conducted.
Archives Search Report (USACE, 1998)	1998	Site inspection, archives search and employee interviews to document previous military use and potential environmental contamination that could remain at the Seneca Army Depot.
Ordnance and Explosives Engineering Evaluation/Cost Analysis Report (USACE, 2004)	2000	Characterized the nature and extent of MEC at the OD Ground using geophysical survey techniques and intrusive investigations.
Phase I Geophysical Investigation (USACE, 2005)	2003	Geophysical surveys collected using EM61 MK2 towed-array system to identify 14,700 anomalies within open areas between the 1,000 ft. and 1,500 ft. radius of OD Hill.
Phase II Ordnance and Explosives (OE) Removal Activities (USACE, 2006)	2003-2005	Reacquired, removed, and disposed of approximately 8,500 MEC/UXO and MD items located between the 1,500 ft. and 2,500 ft. radius from the OD Hill to a depth of 4 ft.
Additional Munitions Response Site Investigation (USACE, 2010)	2010	Topographic and geophysical surveys of portions of the OD Grounds MRS and the collection and analysis of soil samples from test pits and surface locations.
Munitions Response Action (USACE, 2016)	2012-2014	Reacquired, and investigated 14,688 anomalies; used analog methods to remove UXO/DMM, and dispose of 15,885 munitions related items located between the 1,500 ft. and 2,500 ft. radius from the OD Hill to a depth of 4 ft.
MEC Clearance at OD Grounds (USACE, 2012)	2012	Prior to early termination of contract, DGM survey of inner 1,000 ft completed.
Perchlorate Sampling (USACE, 2019 and 2020a)	2018-2019	Perchlorate sampling in soil, groundwater, ditch soil, and surface water.
Feasibility Study (including Compilation Report) (USACE, 2022b)	2022	Compiled data from all previous investigations to compile a conceptual site model (CSM). A Human Health and a Baseline Ecological Risk Assessment was completed for MEC, Munitions Constituents (MC) and other analytes based on results of previous investigations. Feasibility study summarized the CSM and evaluated remedial alternatives to mitigate risk.
Addendum 1: Supplemental Site Characterization (SSC) (USACE, 2022a)	2022	Installed and sampled new deep and shallow wells to assess the potential presence of COPCs in shallow overburden and deeper bedrock groundwater and investigate groundwater flow direction and rate. Sampled and analyzed surface water and sediment/ditch soil samples in the vicinity of the OD Grounds MRS.
Errata Sheet	2022	An Errata to the FS provides a summary of, and presents a description of, all the elements of the Feasibility Study (FS) Report for the Open Detonation (OD) Grounds.

(1) The Seneca Administrative Record includes all of the documents listed in the table above.

2.2.2 CERCLA Enforcement Activities

To date, there have been no CERCLA-related enforcement activities at the OD Grounds MRS.

2.3 COMMUNITY PARTICIPATION

Community participation in the process leading to this ROD included dissemination of information to the community and a formal public comment period (40 CFR 300.430(f)(3)). The following activities were conducted to disseminate information to the community in the vicinity of the OD Grounds MRS:

- A public record repository was established at Seneca Army Depot Activity, Building 123, Romulus, New York 14541, and was later converted to an online administrative record at <https://senecaarmydepotar.com> which currently contains the previous investigation reports and **Proposed Plan**.
- Based on the consensus reached by the project planning team, a Proposed Plan was prepared for public review and comment. A newspaper announcement was offered on 02 October 2024 on www.fingerlakes1.com, and on 04 October 2024 in the Finger Lake Times, to solicit public comment on the Proposed Plan (**Appendix A**).

The Army made the Proposed Plan for the OD Grounds MRS available for public comment between 01 October 2024 and 01 November 2024. A public meeting was held at Seneca Army Depot on 09 October from 1pm to 7pm. Public comments were received via mail from the Town of Varick Planning Board and a private citizen. Those comments and their corresponding responses are discussed in **Section 3.1**.

2.4 SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

The scope of the response action at the OD Grounds MRS is to conduct remedial activities that will minimize current and future human and ecological exposure to MEC in soil and MC and other analytes in media present within the MRS. Upon completion of the ROD, the next contract action is a Remedial Design (RD) task, with the goal to provide sufficient data and information to support the Army when contracting the remedial action at the OD Grounds. The RD fieldwork is anticipated to include geophysics; MC sampling and analysis of soil, ditch soil, surface water, groundwater, and sediment; surface removal of MD and MEC; gathering information on the dimensions and volume of OD Hill; and vegetation removal. Upon completion of the RD, the selected remedy as presented in the ROD will be performed in the remedial action phase.

Subsequent to the remedial action, and with regulatory and Army approval, a Finding of Suitability to Transfer (FOST) will be filed with the deed of the OD Grounds parcel to identify any restrictions which are to run with the deed. The OD Grounds property via the deed and any associated easements, would then be transferred to private landowners. Following the transfer, the Army will still manage and oversee the remedial action and perform five-year reviews to evaluate whether the selected remedy remains protective of human health and the environment and recommend further steps to be taken if it does not.

The land at the OB Grounds was used for demilitarization of munitions for approximately forty years. The open burning procedure involved the preparation of combustible beds of pallets and wooden boxes on the pads followed by the placement of ammunition or the components to be demilitarized on the beds. A trail of propellant was placed on the ground leading to the combustible bed. Once ignited the energetic material was allowed to burn until only ash and casing residues remained. Items burned included various military munitions such as propellants and projectiles. The burning of munitions had been performed at designated burning pads, which ranged in size from approximately 100 by 100 feet to 300 by 800 feet. Designated munitions waste was open-burned on the nine separate burning pads until 1987. After 1987, munitions were destroyed by burning them within an above ground steel tray to minimize the impact of the burning on the environment.

A Remedial Action, as selected in the 1999 ROD for the OB Grounds, was conducted between 1998 and 2004 to achieve the remediation objectives for the OB Grounds. A munitions removal action conducted DGM and soil sifting to remove MEC contamination (USACE, 2001). A soil remedy included excavation and

disposal of soils with concentrations of lead greater than 500 mg/kg, removal of sediment from Reeder Creek in areas adjacent to the OB Grounds, application of 9 inches of clean soil cover to areas where lead concentrations exceed 60 mg/kg, and establishment of a vegetative cover to prevent soil erosion (Weston, 2005). Other actions underway at SEDA include LTM of chlorinated VOCs in groundwater at the Ash Landfill, LTM of metals in groundwater at SEAD-16, LTM of benzene, toluene, ethyl benzene and xylenes (BTEX) at SEAD-25; a site inspection (SI) for per and polyfluoroalkyl substances (PFAS) at 34 Areas of Concern (AOCs) including the OD Grounds; a PFAS remedial investigation (RI) at five AOCs – Firehouse, Building 103; SEAD-25, SEAD-26, and SEAD-122D/122E; and an optimization of LUCs at 42 AOCs within SEDA. Documents regarding other actions at SEDA are available at the Seneca Administrative Record website.

2.5 SITE CHARACTERISTICS

2.5.1 Site Overview

The SEDA previously occupied approximately 10,600-acres of land located in the Towns of Varick and Romulus in Seneca County, New York. The facility is located in an uplands area, at an elevation of approximately 600-foot mean sea level (MSL), that forms a divide separating two of the New York Finger Lakes; Cayuga Lake on the east and Seneca Lake on the west. Sparsely populated farmland covers most of the surrounding area. New York State (NYS) Highways 96 and 96A adjoin SEDA on the east and west boundaries, respectively.

The OD Grounds MRS is located in the northwestern corner of the Depot and is also known as SEAD-006-R-01 (alias SEAD-45 and SEAD-115). The MRS is largely meadow with wooded portions and areas of heavy brush. The OD Grounds was used to perform OD of munitions. The retained parcel that contains the OD Grounds is 433.2 acres. The general area (450.75 acres) of greatest impact is defined by the 2,500-foot radius from the OD Hill Center. For purposes of this ROD, two different portions of the OD Grounds site are identified: the “Kickout Area” and the “OD Hill.” The OD Hill comprises the immediate location of demolition activities (i.e., the elevated topography at the center of the OD Grounds). The Kickout Area is the area in which blast fragments emanating from the OD Hill activity might be found, which is estimated as a 2,500-foot radius from the demolition site. Note that the OB Grounds (also known as SEAD-23; 30.2 acres) is a separate site that lies within the OD Grounds MRS and will be included as part of the selected remedy. The OB Grounds is covered under a separate ROD (USACE, 1999).

2.5.2 Nature and Extent of MEC Contamination

The nature and extent of MEC at the OD Grounds MRS is summarized in the FS report (USACE, 2022b), which includes a compilation and evaluation of data from previous investigations and removals at the OD Grounds MRS. The evaluation includes previous DGM and analog geophysical surveys, as well as intrusive results to evaluate the nature and extent of MEC contamination. The data from the previous investigations was used to estimate the distribution of anomalies and MEC/Material Potentially Presenting an Explosive Hazard (MPPEH) over the MRS. For purposes of reporting, data at the OD Grounds MRS was divided into areas based on the distance from the center of the range (**Figure 2-1**).

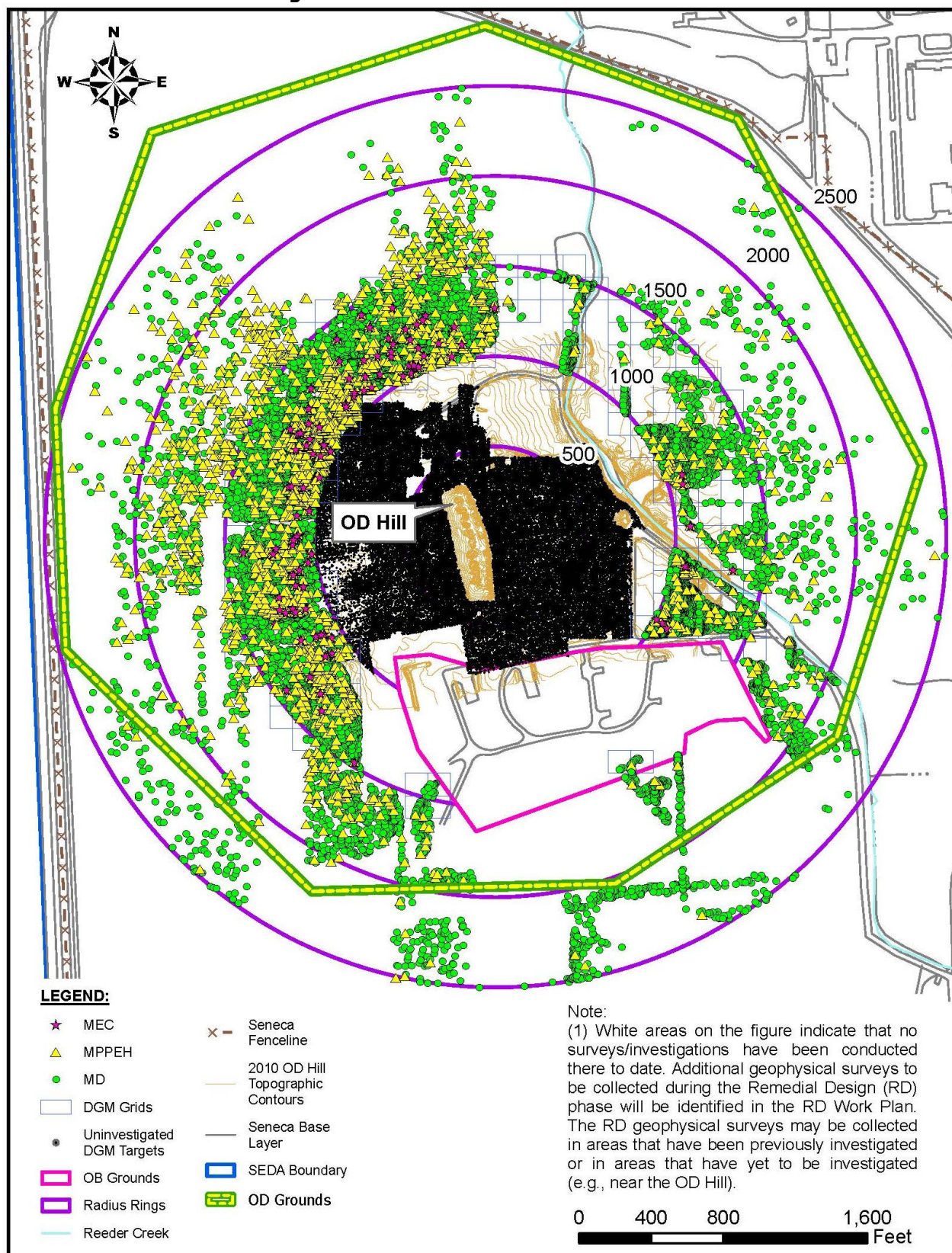
Table 2-2 summarizes the **anomaly** density and MEC/MPPEH densities for each area of the range based on the DGM data. Note, that the density of true metallic sources expected following collection of AGC data may far exceed the EM61 derived estimates shown in **Table 2-2** by a factor of 2-5x, or more in certain areas. Analog data was also collected during previous investigations; however, the density data was not in a format which could be quantitatively evaluated. **Table 2-3** summarizes the vertical distribution of MD, MEC/MPPEH at the OD Grounds MRS. A large variety of munitions were found during previous investigations and removals completed at the OD Grounds MRS. A full list of identified munitions is available in the FS Report.

Figure 2-1 shows the distribution and density of anomalies mapped within the MRS. As seen in **Figure 2-1** and **Table 2-2**, the density of anomalies decreases with distance from the OD Grounds center.

Anomalies within the center to 1,000-foot buffer were not intrusively investigated given the density of items detected. The anomalies in this area were not categorized.

Based on the investigations completed to date, MEC in the form of UXO and DMM are present in the surface and subsurface to a depth of 36-inches with 99% of the MPPEH and UXO/DMM being found in the top 24-inches of soil. Items may occur at depths greater than 36-inches in fill areas. A surface clearance was performed at the OD Hill, therefore UXO/DMM are not expected on the surface in this area.

Figure 2-1. Extent of MEC Contamination



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Table 2-2. Summary of Horizontal Distribution of MEC Contamination

Range Area	Estimated Anomalies per Acre ⁽²⁾	Estimated MEC/MPPEH per Acre
0-1,000 ft	Saturated ⁽¹⁾	Saturated ⁽¹⁾
1,000-1,250 ft	773	79
1,250-1,500 ft	484	43
1,500-1,750 ft	281	40
1,750-2,000 ft	182	12
2,000-2,250 ft	138	4.3
2,250-2,500 ft	125	2.7

- (1) During the data processing the high density of metal prevented anomaly selection at a normal background threshold. The method used required increasing the contouring range until individual anomalies could be selected, as such the anomaly density is likely biased low. The calculated estimated densities for this area were 102.8 anomalies per acre and 3.76 to 4.37 MEC/MPPEH per acre; however, the total per acre is likely much higher due to the saturation of metal, and methods used for anomaly selection.
- (2) Estimated anomaly densities presented are based on EM61-MK2 data. The quantity of true metallic sources expected following collection of AGC data may far exceed estimates shown in **Table 2-2** by a factor of 2-5x, or more in certain areas.

Table 2-3. Summary of Vertical Distribution of MEC Contamination

Depth (inches below ground surface [bgs])	Munitions Debris		MPPEH		Confirmed MEC		Cumulative percent of MPPEH and MEC at or above measured depth
	Total	Percent	Total	Percent	Total	Percent	
0	459	0.55%	23	0.74%	1	0.29%	0.70%
0.5 to 6	51,444	61.99%	1,575	50.97%	185	54.41%	52.01%
7 to 12	27,170	32.74%	914	29.58%	108	31.76%	81.81%
13 to 18	2,467	2.97%	57	1.84%	11	3.24%	83.79%
19 to 24	1,089	1.31%	514	16.63%	17	5.00%	99.27%
25 to 30	155	0.19%	5	0.16%	7	2.06%	99.62%
31 to 36	153	0.18%	2	0.06%	1	0.29%	99.71%
37 to 42	21	0.03%	0	0.00%	3	0.88%	99.80%
43 to 48	1	0.00%	0	0.00%	2	0.59%	99.85%
49 to 54	0	0.00%	0	0.00%	5	1.47%	100.00%
55 to 60	8	0.01%	0	0.00%	0	0.00%	100.00%
Total	82,981	100%	3,090	100%	340	100%	

Table 2-4. Munitions Categories and Related Maximum Depths Found

Munitions Category	Description	Maximum Depth of UXO/DMM (inches bgs)⁽²⁾	Maximum Depth of MPPEH⁽¹⁾ (inches bgs)⁽²⁾	Maximum Depth of MD (inches bgs)⁽²⁾
Bomb, B1	Butterfly Bomblets	--	8	8
Bomb, B2	20lb Fragmentation Bombs	--	2	3
Fuze, F1	Very Small – approx. 2"x3" or smaller (e.g., small base fuzes, small Russian projectile fuzes, rocket base fuses, some land mine fuzes, etc.)	12	26	8
Fuze, F2	Small - Between 2"x3" and 4"x6". (e.g., "T-bar" fuzes, artillery projectile fuzes, smaller rocket fuzes, etc.)	12	26	12
Fuze, F3	Medium - 100 series bomb fuzes, larger rocket fuzes, etc.	5	18	12
Fuze, F4	Large - M60 series base fuzes and similar very heavy, large fuzes.	7	9	--
Grenade, G1	Hand Grenades	9	12	12
Grenade, G2	Rifle Grenades	12	14	2
Mine, M1	M1 square mines and "Bouncing Betty" mines and flares.	9	12	12
Projectile, P1	20mm/25mm/1.1" projectiles and similar	10	36	24
Projectile, P2	30mm projectile without cartridge case	5	15	--
Projectile, P3	37mm/40mm projectiles without cartridge case. 20mm with cartridge case, 30mm with cartridge case, etc.	12	18	12
Projectile, P4	57mm projectiles, 2.36" rocket warheads, 2.36" rocket motors, etc.	12	24	16
Projectile, P5	75mm/76mm projectiles, 90mm AP projectiles	10	25	21
Projectile, P6	105mm projectiles, 3.5" rockets, etc.	--	18	10
Projectile, P7	155mm projectiles/6" projectiles, 4.2" mortars, 120mm projectiles, etc.	--	15	6

- (1) "MPPEH" here refers to a combination of MEC and MD that cannot be further differentiated based on the source information available.
- (2) The depths presented are based only on results from investigation of DGM anomalies during the Phase I Investigation (USACE, 2005), the Phase II Investigation (USACE, 2006), and the Munitions Response/Phase III (USACE, 2016). Some fill areas were observed at discrete locations within the MRS and these contained items down to 60-inches below ground surface (bgs).
- (3) Munitions categories are defined in the Final FS (USACE, 2022b), Appendix E, Section 4.1 Nature and Extent of MEC, Table 4.6.

2.5.3 Nature and Extent of Munitions Constituents and COPCs

MC contamination is defined as contamination, resulting from munitions use, in environmental media at concentrations above those allowed by state or federal regulations for unrestricted land use. Samples of soil, sediment, surface water, and groundwater were collected during several investigations at the OD Grounds (**Table 2-1**) (USACE, 1995, 2010, and 2020a).

Within the OD Grounds MRS, 52 surface soil and 31 subsurface soil samples were collected within the 500-foot OD Hill radius and 25 surface soil samples were collected at locations between 500 and 2,000 feet (ft) from the OD Hill to delineate the extent of any impacts to soil. Samples were collected from groundwater monitoring wells and surface water locations to evaluate groundwater and surface water quality. Samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), explosives, metals, perchlorate (surface soil and groundwater only), herbicides, pesticides, and polychlorinated biphenyls (PCBs). Concentrations of analytes from sampling investigations prior to 2019 were compared to human health and ecological screening criteria. Analytes present at concentrations greater than human health screening levels were retained as **Contaminants of Potential Concern (COPCs)** for further evaluation in the human health risk assessment (HHRA) (**Table 2-5**). Based on these data, initial COPCs were identified in soil, groundwater, and surface water (USACE, 2022b).

Based on agreement between USEPA, NYSDEC and the project delivery team (PDT), additional samples were collected in 2020 and 2021 for VOCs, SVOCs, perchlorate, metals, explosives, phosphorus, and orthophosphate in groundwater, surface water, and sediment at the OD Grounds (USACE, 2022a). Analysis of herbicides, pesticides and PCBs were not conducted in the latest sampling effort because they were not previously identified as COPCs. These newer data are not included in the risk assessments but are qualitatively evaluated and presented below. The purpose of the updated assessment is to provide new data collected using the latest methods to provide a better understanding of the current conditions of the groundwater, surface water and sediment.

The 2020/21 groundwater concentrations in the shallow water bearing zone were below the concentrations observed during the ESI sampling. Based on the updated evaluation of groundwater conducted in 2020/21, there are no COPCs in groundwater. Conclusions on the impacts to groundwater are based on the latest groundwater data, and this determination was agreed upon by the USEPA, NYSDEC and the PDT.

Analytes present at concentrations greater than ecological screening levels were retained as **Contaminants of Ecological Concern (COECs)** for further evaluation in the ecological risk assessment (**Table 2-5**). COECs were identified in soil and surface water.

A reevaluation of the MC contamination was conducted in 2020/2021 (USACE, 2022a). Three rounds of groundwater sampling were completed in 23 monitoring wells in the upper water bearing zone (glacial till / weathered bedrock) and 6 wells in the lower water bearing zone (shale bedrock). Additionally, two rounds of surface water and sediment sampling were conducted in Reeder Creek and from drainage ditches which drain surface water from OD Hill.

VOCs, SVOCs, explosives, and perchlorate are not COPCs in groundwater at the OD Grounds. The COPCs in the shallow water bearing zone at the OD Grounds are metals (iron and manganese). The concentrations of metals collected during the three rounds of groundwater data indicate a significant reduction in key metals concentrations since the 1994 ESI, including a reduction in the concentrations of metals that contributed to the unacceptable human health risk. The groundwater quality improvement is likely due to improved sampling methodology, installation of new well(s) and well construction, and natural processes over time.

The COPCs in the lower water bearing zone are metals (antimony, chromium, iron). Chromium VI was not detected within the lower water-bearing zone. Chromium was not persistently detected above its project action limit (PAL) onsite and had concentrations otherwise similar to background. Antimony was detected above its PAL in one well and was detected at other deep wells; however, at estimated concentrations that are equivalent to background concentrations. Given the low concentrations of metals detected in the recent sampling event, groundwater is not considered a medium of concern at the OD Grounds. This conclusion

was discussed by the Army, USEPA, and NYSDEC at a meeting held on 07 December 2021, and the concurrence by the PDT is documented in meeting minutes dated 24 January 2022.

The groundwater quality in both the upper and lower water bearing zones at OD Grounds is not practical for use as drinking water due to low well yield. Seasonal water levels are low and the recharge rates are very slow, which would make this water impractical to use for animal feeding, agriculture, or human consumption.

Surface water concentrations do not suggest major impacts downgradient of OD Grounds. Some typical natural elements (aluminum, iron, manganese) have also been detected at concentrations greater than screening levels. Single detections of SVOCs and mercury occurred above their screening levels, however, it is not believed that these observations are indicative of an environmental release related to historical use of the MRS. Additional sampling during the remedial design (RD) is anticipated to confirm that the single elevated detections of SVOCs and mercury are not pervasive or persistent within OD Grounds MRS surface water.

Sediment concentrations suggest elevated presence of metals, particularly at on-site drainage pathways, and these on-site sediment concentrations are consistent with data from previous studies.

Table 2-5. Summary of Chemicals of Concern

Media	COPCs Determined in the HHRA	COECs Determined in the Baseline Ecological Risk Assessment (BERA)	Analytes Detected Above Screening Levels (2020/2021 SSC)
Surface Soil (OD Hill)	- Aroclor-1254 - Cadmium	- Copper - Lead - Mercury - bis(2-ethylhexyl)phthalate - di-n-butylphthalate - Endosulfan I	Not Sampled
Surface Soil (Kickout Area)	2-methyl-4-chlorophenoxyacetic acid (MCPA) - Cobalt - Manganese	- Copper - Lead - bis(2-ethylhexyl)phthalate	Not Sampled
Combined Surface and Subsurface Soil (OD Hill)	- Aroclor-1254 - Cadmium	n/a	Not Sampled
Groundwater	- Arsenic - Cobalt - Manganese - Thallium	n/a	Upper water bearing zone - Iron - Manganese Lower water bearing zone - Antimony - Chromium - Iron
Surface Water	None	None	- Aluminum - Iron - Manganese - Mercury 2,4-Dimethylphenol (1 detect) - Benzoic Acid (1 detect) - Phenol (1 detect)
Sediment	Not evaluated	Not evaluated	- Copper - Mercury - Nickel - Zinc
Ditch Soil	Evaluated as surface soil	Evaluated as surface soil	- Chromium - Copper - Lead - Mercury - Nickel - Zinc

2.5.4 Migration and Exposure Routes

2.5.4.1 Munitions and Explosives of Concern

As described above, MEC contamination was identified at the OD Grounds MRS and therefore there is a potential for the receptors identified below to come into contact with surface or subsurface MEC.

Potential Receptors Present

The primary current receptors at the OD Grounds MRS are recreational users (hunters) and site workers. Future use of the MRS is planned to be conservation/recreation where there is limited activity and reduced potential for subsurface soil contact and users will include, site visitors/tour participants, recreational users, and conservation area workers.

Potential MEC Exposure Pathways

Potential exposure to MEC contamination in soil could occur via direct contact of receptors to MEC contamination present in surface or subsurface soil. As described above, potential receptors that could interact with these pathways include site visitors/tour participants, recreational users (e.g., digging shallow holes or inserting tent stakes for shelters/tents), and conservation area workers (e.g., site maintenance such as vegetation removal, fence installation, or plowing feed plots). It is possible that MEC in subsurface soil could also migrate via natural processes to the surface; however, this is not anticipated to be the case at the OD Grounds as there has been no visual indication of this occurring on-site.

2.5.4.2 Munitions Constituents

The primary current receptors at the OD Grounds MRS are recreational users (hunter) and installation personnel (site workers). Future use of the MRS is planned to be conservation/recreation where there is limited activity and reduced potential for subsurface soil contact and users will include, site visitors/tour participants, recreational users, and conservation area workers. Residential use is not anticipated in the future at the OD Grounds MRS; however, to fully evaluate potential risk to human receptors the human health risk assessment also evaluated, hypothetical future residents with and without excavation and hypothetical future construction workers. Ecological receptors are also considered to be present for MC exposure pathways in this MRS. A summary of the exposure scenario used to determine Remedial Action Objectives (RAOs) is provided in **Table 2-12**.

2.5.5 Conceptual Site Model

A conceptual site model (CSM) is a representation of a site and its environment that is used to facilitate understanding of the site and the potential contaminant exposure pathways that might be present. The CSM describes potential contamination sources and their known or suspected locations, human and/or ecological receptors present, and the possible interactions between the two. The CSM summarizes which potential receptor "exposure pathways" for MEC and MC are (or may be) "complete" and which are (and are likely to remain) "incomplete." An exposure pathway is considered incomplete unless all of the following elements are present: (a) MEC or MC contamination; (b) a receptor that might be affected by that contamination; and (c) a method for the receptor to be exposed to (*i.e.*, come into contact with) the contamination. If all of these elements are present, an exposure pathway is considered complete.

Based on the investigations and removal actions conducted to date, the FS evaluated contamination and potential exposure pathways described above, and the initial CSM for the OD Grounds MRS was updated to reflect the status of MEC, expected maximum receptor interaction depth, and MC/COPC exposure pathways. The MEC CSM for the OD Grounds MRS is shown in **Table 2-6**. **Figures 2-2** and **2-3** show the MC/COPC CSMs for Human Health for the OD Hill Area and the Kickout Area, respectively. The MEC and MC/COPC contamination detected during prior investigations at the MRS (**Sections 2.5.2** and **2.5.3**), show complete exposure pathways in the CSM for MC/COPCs in soil, surface water/sediment, and groundwater and MEC in surface and subsurface soil. The MEC pathway for surface soil at the OD Hill is considered

incomplete because a surface removal was completed within this portion of the site; however, the subsurface soil pathway is still complete in this area.

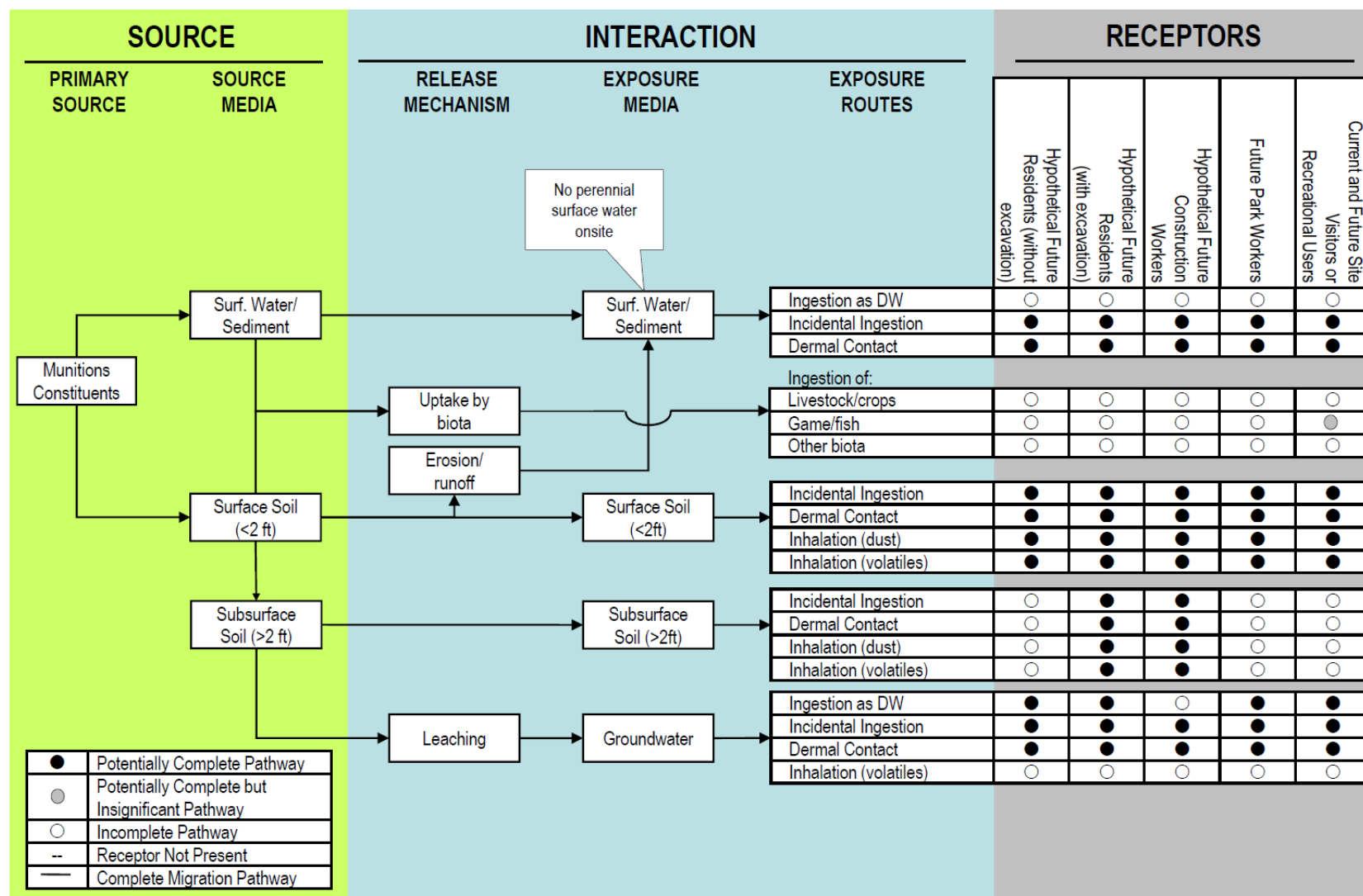
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Table 2-6.
MEC Conceptual Site Model Summary

Munitions Response Site	REVISED MEC CONCEPTUAL SITE MODEL SUMMARY							
	Known or Suspected Contamination Source(s)	Location	Confirmed or Suspected Contamination Source(s)	Confirmed Location and Distribution	Source or Exposure Media	Current and Future Receptors	Expected Maximum Receptor Interaction Depth	Complete Exposure Pathway
NAME: OD Grounds (SEAD 006-R-01) Acreage: 433.2 acres (450.75 acres inside the 2,500-foot buffer from OD Hill.). Suspected Past DoD Activities (<i>release mechanisms</i>): This MRS was used for open detonation (OD) to destroy munitions beginning in 1941 until 2000 as part of the military mission at the Former Seneca Army Depot. Current and Future Land Use: The OD Grounds are currently closed and the planned future use of the MRS is projected to be as conservation/recreation.	Known/Suspected MEC: MEC in the form of UXO and DMM have been confirmed and UXO/DMM are suspected to remain within the MRS. Various munitions and munitions component types have been identified including: • Projectiles ranging from 20mm to 155mm; • Bombs including 4-lbs and 20-lbs (also a single 250-lb inert concrete filled bomb identified) • Rockets ranging from 2.36-inch to 5-inch; • Mortars including 60mm, 81mm, and 4.2-inch. • Various Anti-personnel mines. • Anti- tank mines; • Hand and rifle grenades, including foreign rifle grenades. • Multiple types of fuzes, bursters, boosters, flares, smoke cannisters, and smoke pots. • Various munitions components and other related devices.	OD Hill	<i>Munitions and Explosives of Concern:</i> UXO and DMM has been identified. Munitions types found at the site are summarized in Table 2-4.	Confirmed UXO/DMM on the surface and the subsurface. MEC was cleared from surface; therefore, the current distribution is expected to only be in the subsurface, summarized in Table 2-3 and Table 2-4 .	Subsurface soil	Current Receptors: Recreational users (hunters) and installation personnel (site workers). Reasonably Anticipated Future Receptors: Future use of the MRS is planned to be conservation/recreation and users will include site visitors/tour participants, hunters, and conservation area workers.	<u>Site Workers:</u> Direct contact to 18-inches bgs conducting grounds and/or site maintenance, such as vegetation control, fence installation, or plowing feed plots. <u>Site Visitors/Recreational Users:</u> Direct contact to 12-inches bgs digging shallow holes or inserting stakes for shelters/tents.	YES Exposure to UXO/DMM in subsurface soil.
		Kickout Area		UXO/DMM are potentially present throughout the entire Kickout Area down to a depth of 36-inches bgs, with 99% of items being found within 24-inches of the surface. In addition, some fill areas are potentially present at discrete locations at the site and these might contain items down to 60-inches bgs (Table 2-3 and Table 2-4).	Surface or subsurface soil			YES Exposure to UXO/DMM in surface or subsurface soil.

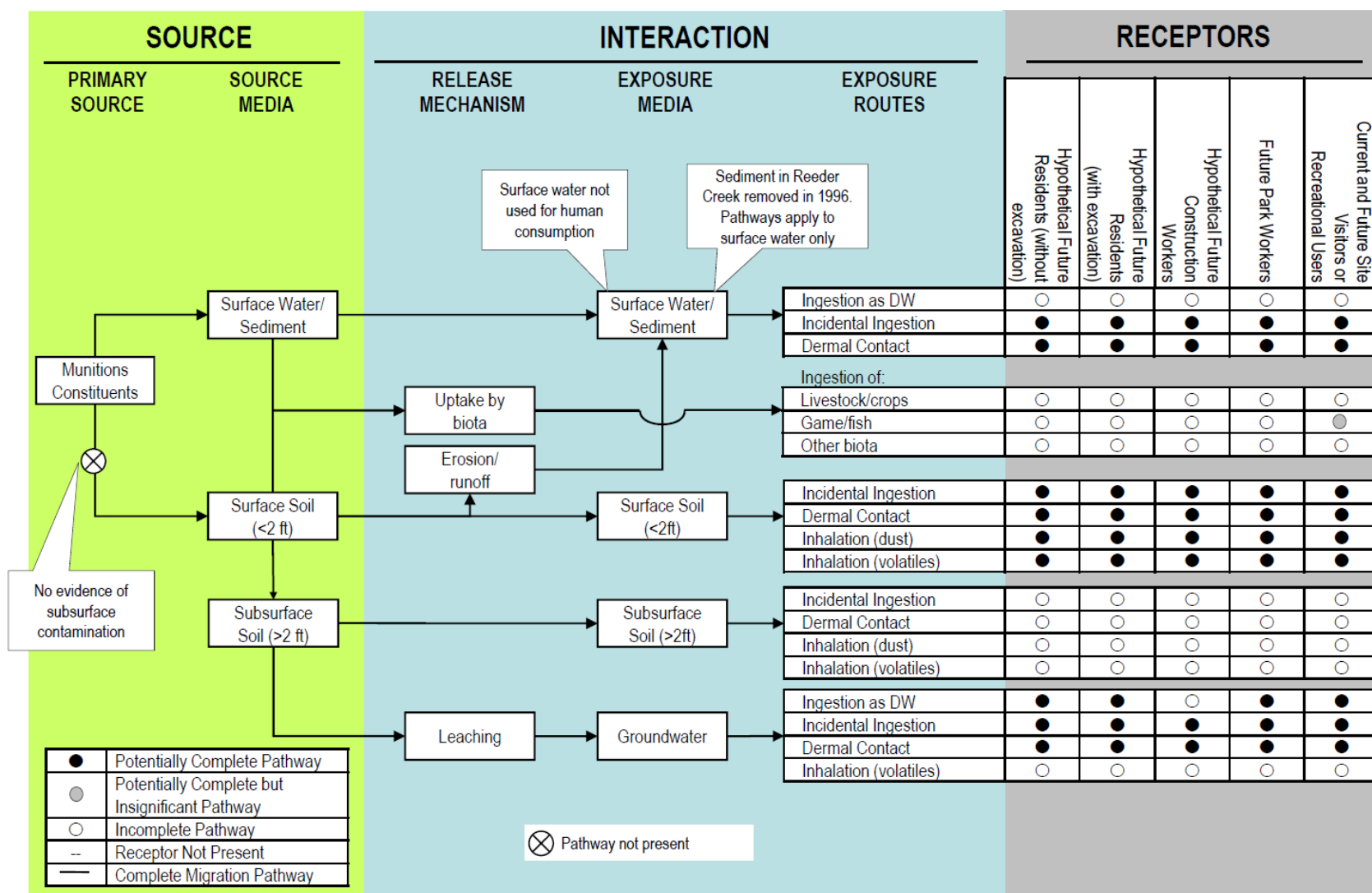
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Figure 2-2. Human Health Conceptual Site Model Diagram – Open Detonation Hill



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Figure 2-3. Human Health Conceptual Site Model Diagram – Kickout Area



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2.6 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCES USES

Currently, the OD Grounds MRS is within a portion of the former SEDA that has been retained under Army ownership. The Army retained parcel is planned to be turned over to Seneca County Industrial Development Agency (SCIDA) after the remedial action is complete at the OD Grounds. The planned future use of property within the former Depot is subdivided into areas based on their projected future use: Institutional Training, Data Storage / Communication, Conservation / Recreation, Farming, and an Office and Warehousing Area. Under this revised future use plan, the OD Grounds MRS is within the "Conservation/Recreation" parcel of the former Depot. The SCIDA has subsequently sold the property surrounding the Army-retained parcel to a private party for use as a conservation area.

The planned future use for OD Grounds MRS is for conservation and passive recreation. "Passive recreation" refers to a use of the land where there is a limited activity and reduced potential for subsurface soil contact (i.e., does not include playgrounds or ballparks, but may include seasonal hunting and hiking on nature trails). Anticipated future land use may include access for groundwater monitoring, solar power generation, hunting, planting, and access for maintenance (e.g., roads and mowing fire breaks). There are no known drinking water wells or industrial wells within the OD Grounds MRS.

2.7 SUMMARY OF SITE RISKS

2.7.1 Hazards from Munitions and Explosives of Concern

Based on the evidence of MEC and/or MD found, MEC hazards are present at the OD Grounds MRS. These MEC hazards are potentially present throughout the MRS, on either the surface or in the subsurface. MEC hazard assessments were performed to qualitatively evaluate the MEC hazards. The MEC hazard assessment method generates a score and a corresponding "Hazard Level" ranging from 1 (highest) to 4 (lowest) that provides a qualitative indication of the MEC hazard in each area (these are not quantitative measures of explosive hazard). The results of the MEC hazard assessment presented in the FS (USACE, 2022b) for the OD Hill and Kickout Area are summarized in **Table 2-7**.

Table 2-7.
Summary of Baseline MEC Hazard Assessment Results

Assessment Area	Baseline MEC Hazard Assessment Score	Hazard Level	Potential Explosive Hazard Conditions
OD Hill	845	1	Highest
Kickout Area	695	3	Moderate

The Army has developed another method for evaluating risks from explosive hazards. This qualitative risk assessment technique hereafter referred to as the "Risk Management Method" (RMM) is described in the study paper titled "Decision Logic to Assess Risks Associated with Explosive Hazards, and to Develop Remedial Action Objectives (RAOs) for MRSs" (USACE, 2017). The RMM provides an assessment of the explosive hazards associated with MEC at an MRS by evaluating MRS-specific conditions and human issues that affect the likelihood that a MEC accident will occur. The RMM was established as interim guidance by USACE on January 3, 2017, for a two-year trial period, which was extended to 2022 (USACE, 2020). The RMM is a DoD developed tool used to evaluate baseline risk at a site for current and reasonably anticipated future land use scenarios. An updated version was distributed in July 2023, but a previous version was used during the FS development at the OD Grounds MRS, which resulted in an unacceptable risk determination. The RMM, originally referred to in the FS as the "MEC Risk Assessment" evaluated the risk associated with MEC exposure considering both current land use conditions and planned future land use

conditions at the Kickout Area and the OD Hill. The results of the RMM are shown in **Table 2-8**. It should be noted that both MEC risk assessment methodologies (i.e., MEC HA and RMM) resulted in evaluations that had similar conclusions for baseline conditions. Both the OD Hill and Kickout Area in baseline conditions show moderate to high or unacceptable MEC hazard risks.

The findings from the baseline MEC risk assessments were critical to making informed decisions that protect public safety, guide remediation efforts, and allow for safe land management. The baseline risk conditions summarized above helped identify that a FS was warranted to evaluate several viable remedial alternatives to address unacceptable risk conditions. Following this evaluation, the **preferred alternative** was identified in the Proposed Plan, and then ultimately the selected remedy is documented within this ROD.

Table 2-8.
Summary of Baseline MEC Risk Management Method (RMM) Results

Assessment Area	RMM Conclusions ¹	
	Current Land Use Conditions	Planned Future Land Use Conditions
OD Hill	Unacceptable Risk	Unacceptable Risk
Kickout Area	Unacceptable Risk	Unacceptable Risk

(1) Note that the risk conclusions presented are associated with current and planned future land use scenarios under baseline conditions (i.e., prior to the selected remedy being implemented).

2.7.2 Risks from Munitions Constituents

The MC sampling results were evaluated in a baseline Human Health Risk Assessment (HHRA) and Baseline Ecological Risk Assessment (BERA). In accordance with the site-specific CSM, MC risk to humans was quantitatively or qualitatively evaluated for the following potential human exposure scenarios to contaminants found within the OD Hill and Kickout Area:

- Exposure of hypothetical future residents (including resident farmer);
- Exposure of hypothetical future excavation / construction workers;
- Exposure of future park workers; and
- Exposure of current and future recreational users.
- Exposure scenarios selected for evaluation are anticipated to account for the range of reasonably anticipated exposures under current and future conditions at SEDA.

2.7.2.1 Human Health Risk

The quantitative results of the HHRA are presented in the FS (Appendix B1, Table 2.80, USACE, 2022b). **Table 2-9** summarizes the results of the HHRA. Based on the conclusions of the risk assessment, there is an unacceptable non-carcinogenic hazard to the hypothetical child resident exposed to soil at the OD Hill within the OD Grounds MRS. This hazard is driven primarily by the concentrations of Aroclor-1254 and cadmium found in soil (Hazard Quotient [HQ]=1.78 and HQ=1.3, respectively, for the hypothetical child resident). Each of these analytes has an HQ greater than 1, indicating a potential hazard and were identified as COCs.

The conclusions of the risk assessment (USACE, 2022b) also indicate there is an unacceptable non-carcinogenic hazard to the hypothetical child resident associated with exposure to soil at the Kickout Area within the OD Grounds MRS. This hazard is driven by the concentrations of cobalt found in soil. Cobalt has an HQ greater than 1, indicating a potential hazard, and was identified as a COC.

The conclusions of the risk assessment (USACE, 2022b) indicate that there is unacceptable risk to a future resident due to exposure to groundwater (1.8×10^{-4}), along with unacceptable hazards to a future

adult/child resident (HI=30/51), future park worker (HI=19), and adult/child recreational user (HI=2.0/3.4).

Subsequent to the HHRA, the SSC was conducted, consisting of three rounds of groundwater sampling taking place in July 2020, September 2020, and March 2021 and two rounds of surface water and sediment/ditch soil sampling conducted in July 2020 and April 2021. Based on the results of the 2020/21 groundwater sampling and decisions made by the Army, USEPA, and NYSDEC during a 07 December 2021 meeting, groundwater is not a medium of concern. Based on 40 CFR 300.430(a)(1)(iii)(F), the USEPA expects to return usable groundwater to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site.

Potential risks associated with exposure to lead are evaluated using methods different from those used for carcinogens and noncarcinogens. The end point for lead evaluation is a blood lead level, rather than a carcinogenic risk or HQ. Therefore, lead is not included in the cumulative risk calculations. Lead is evaluated using the USEPA Integrated Exposure Uptake Biokinetic (IEUBK) model for children (USEPA, 2007) or the USEPA Adult Lead Model (ALM) (USEPA, 2003; 2009). These models estimate potential blood lead (Pb) concentrations (micrograms [µg]-Pb per deciliter [dL]-blood) based on assumed exposures to lead in environmental media.

The predicted blood-lead concentrations will be compared to the blood-lead level of concern of 10 µg/dL (USEPA, 2007). USEPA typically considers that action may be warranted if the 95th percentile predicted blood-lead concentration exceeds 10 µg/dL (i.e., action may be considered if there is greater than a 5% chance a receptor exposed to lead could have a blood-lead level greater than 10 µg/dL). However, based on USEPA's current approach, blood-lead concentrations less than 10 µg/dL do not require further management of the risk associated with exposure to lead.

Since the most sensitive adult receptor is an exposed pregnant adult, the ALM is used to determine the potential for unacceptable fetal blood lead levels following the mother's exposure to lead-contaminated soil. Exposure to lead in surface or subsurface soil is not expected to elevate fetal blood lead levels above the threshold of 10 µg/dL, based on the 95% upper confidence limit (UCL) on the mean soil lead concentration.

The IEUBK evaluates the potential for child exposure to result in blood lead levels greater than the threshold of 10 µg/dL. To do so, it evaluates lead exposure from all potential sources, including soil, water, diet, and air. To evaluate the potential lead concentrations observed in soil, groundwater, and surface water at the OD Grounds to result in elevated blood lead levels in children that may be present on the MRS, the IEUBK model was run using the 95% UCL on the mean lead concentrations for surface soil, the concentration for combined surface and subsurface soil, the concentration for each monitoring well, and the concentration for surface water at the MRS. Exposure to lead in soil and groundwater by hypothetical future child residents results in a predicted blood lead level greater than 10 µg/dL, in greater than 5% of the exposed children, only in well MW45-4, the well with the highest observed lead concentration.

Subsequent to the Risk Assessment conducted in the FS (USACE, 2022b), the USEPA updated residential soil lead guidance and revised the default blood lead level used in the IEUBK (v2) and ALM model risk estimates from 10 µg/dL to 5 µg/dL (USEPA, 2021; USEPA, 2024). Additional analytical sampling conducted during the RD will include a recalculation of the potential risks associated with exposure to lead using the revised blood level. As appropriate, concentrations from historical samples will be considered as part of the evaluation.

2.7.2.2 Ecological Risk

Table 2-10 summarizes the conclusions of the BERA. Based on the risk assessment, lowest-observable adverse effect level (LOAEL)-based HQs greater than one indicate that there may be a potential for unacceptable ecological risks within the OD Hill area from small mammal exposures to copper; and bird exposures to copper, lead, mercury, bis(2-ethylhexyl)phthalate and di-n-butylphthalate; The potential for adverse effects from exposure to bis(2-ethylhexyl)phthalate and di-n-butylphthalate may not be significant

given their limited spatial coverage and use of the maximum concentration to derive their dietary exposure values.

Plant and soil invertebrate exposures in the OD Hill Area resulted in no observed adverse effect level (NOAEL)-based HQs greater than one from exposures to copper, iron, manganese, mercury, nickel, selenium, thallium, zinc, di-n-butylphthalate, dieldrin, endosulfan I, endrin, endrin aldehyde, and methoxychlor. Elevated NOAEL-based HQs, greater than 10, were calculated only for direct exposure to copper, mercury, di-n-butylphthalate, and endosulfan I. Detected concentrations of copper and mercury may have a potential for adverse effects on soil invertebrates. The extent and likelihood of adverse effects, however, are highly dependent on site-specific soil conditions that determine bioavailability such as pH, redox potential, and the presence of binding compounds. Di-n-butylphthalate and endosulfan I, however, were evaluated based on maximum detected concentrations and had relatively limited spatial coverage which makes it unlikely that these compounds pose a significant risk to soil invertebrates throughout the OD Hill area.

There are no unacceptable risks to ecological receptors exposed to surface water in the OD Hill area. Sediment was not evaluated in the ecological risk assessment, because there was no sediment present within the MRS. Ditch soil was evaluated as surface soil in the ecological risk assessment.

In the Kickout Area, LOAEL-based HQs marginally greater than one indicate that there may be a potential for unacceptable ecological risks from bird exposures to copper, lead and bis(2-ethylhexyl) phthalate (LOAEL-based HQs of 1.1, 1.8 and 1.5, respectively). Exposure concentrations for those COECs may indicate a potential for adverse effects on omnivore and insectivore avian receptors. The extent and likelihood of adverse effects is highly dependent on site-specific soil conditions that determine their bioavailability. For bis(2-ethylhexyl) phthalate, the potential for unacceptable risks is likely not significant because of its limited spatial coverage and the use of the maximum detected concentration as the exposure point concentration (EPC). Therefore, exposure concentrations for copper and lead may indicate a potential for adverse effects on omnivore and insectivore avian receptors in surface soil.

Plant and soil invertebrate exposures in the Kickout Area resulted in NOAEL-based HQs for barium, cobalt, copper, iron, manganese, mercury, zinc, and endosulfan I. Because HQ calculations assumed a 100% metals bioavailability, exposure concentrations are not likely indicative of adverse effects on plants or soil invertebrates. Elevated NOAEL-based HQs, greater than 10, were calculated only for direct exposure to mercury and endosulfan I. Detected concentrations of mercury may have a potential for adverse effects on soil invertebrates. The extent and likelihood of adverse effects, however, are highly dependent on site-specific soil conditions that determine bioavailability such as pH, redox potential, and the presence of binding compounds. For endosulfan I, the potential for unacceptable risks is likely not significant because of its limited spatial coverage and the use of the maximum detected concentration as the EPC. Therefore, endosulfan I is unlikely to pose a significant risk to soil invertebrates throughout the Kickout Area.

There are no unacceptable risks to ecological receptors exposed to surface water. Sediment was not evaluated in the ecological risk assessment, because there was no sediment present within the MRS.

2.7.2.3 Risk Assessment Conclusions

Based on the results of the 2020/21 groundwater sampling and decisions made by the Army, USEPA, and NYSDEC during a 07 December 2021 meeting, groundwater is not a medium of concern. Based on 40 CFR 300.430(a)(1)(iii)(F), the USEPA expects to return usable groundwater to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site. **Table 2-9** summarizes the MC Human Health Risk Assessment results and **Table 2-10** summarizes the MC Ecological Risk Assessment Results. Based on the risk assessment there may be a potential for unacceptable ecological risk within the OD Hill area from exposure of small mammals to copper and bird species to copper, lead, mercury, bis(2-ethylhexyl)phthalate and di-n-butylphthalate. In the kickout area exposure concentrations for copper and lead may indicate a potential for adverse effects on omnivore and insectivore avian receptors.

Based on the conclusion that unacceptable risks from potential exposure to MEC and MC are present at the OD Grounds MRS, the FS evaluated potential further actions. It is the current judgment of the U.S. Army (lead agency) that the selected remedy identified in this ROD, is necessary to protect public health or welfare and the environment from actual or potential future interaction with MEC and MC and other analytes.

**Table 2-9.
Summary of MC Human Health Risk Assessment Results**

Receptor	Exposure Pathways	Summary of MC Risks
Hypothetical future resident (including resident farmer)	Surface soil, combined surface and subsurface soil, groundwater as potable water, and surface water	- Cumulative carcinogenic risks range from 1.8×10^{-4} to 6.7×10^{-7}. The highest, which is outside USEPA's acceptable carcinogenic risk range of 1×10^{-4} to 1×10^{-6}, is due to exposure to groundwater as potable water in the center of the OD Hill. - Cumulative noncarcinogenic hazards for a child range from 0.6 to 51. The highest cumulative hazard index greater than 1 is due to exposure to groundwater as potable water in the center of the OD Hill. - Cumulative noncarcinogenic hazards for an adult range from 0.2 to 30. The highest cumulative Hazard Index (HI) greater than 1 is due to exposure to groundwater as potable water in the center of the OD Hill.
Hypothetical construction workers	Surface soil, combined surface and subsurface soil, groundwater as potable water, and surface water:	- All carcinogenic risks are less than USEPA's acceptable carcinogenic risk range. - All noncarcinogenic hazard HIs are less than 1.
Future park workers	Surface soil, groundwater as potable water, and surface water	- All carcinogenic risks are within or less than USEPA's acceptable carcinogenic risk range. - The cumulative noncarcinogenic hazards for an adult range from 0.03 to 19. The highest cumulative Hazard Index (HI) greater than 1 is due to exposure to groundwater as potable water in the center of the OD Hill.
Current and future recreational users	Surface soil, groundwater as potable water, and surface water	- All carcinogenic risks are within or less than USEPA's acceptable carcinogenic risk range. - Cumulative noncarcinogenic hazards for a child range from 1.7×10^{-5} to 3. The highest cumulative HI greater than 1 is due to exposure to groundwater as potable water in the center of the OD Hill. - Cumulative noncarcinogenic hazards for an adult range from 1.6×10^{-5} to 2. The highest cumulative HI greater than 1 is due to exposure to groundwater as potable water in the center of the OD Hill.

Table 2-10.
Summary of Ecological Risk Assessment Results

Receptor	Exposure Pathways	Summary of MC Risks
Ecological Receptors in the OD Hill Area	Soil and surface water	• A potential for unacceptable ecological risks may be associated with COECs that have lowest-observable adverse effect level (LOAEL)-based HQs greater than or equal to 1 for birds and mammals and no observed adverse effect level (NOAEL)-based HQs greater than 10 for plants and invertebrates. These COECs are as follows: ○ Mammals: copper ○ Birds: copper, lead, mercury, bis(2-ethylhexyl) phthalate and di-n-butylphthalate ○ Plants/invertebrates: copper, di-n-butylphthalate, and endosulfan I.
Ecological Receptors in the Kickout Area	Soil and surface water	• A potential for unacceptable ecological risks may be associated with COECs that have LOAEL-based HQs greater than or equal to 1 for birds and mammals and NOAEL-based HQs greater than 10 for plants and invertebrates. These COECs are as follows: ○ Mammals: none ○ Birds: copper, lead, and bis(2-ethylhexyl) phthalate ○ Plants/invertebrates: mercury and endosulfan I.

2.7.3 Basis for Response Action

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in the ROD, may present an imminent and substantial endangerment to the public health, welfare, or the environment.

2.8 REMEDIAL ACTION OBJECTIVES

Site-specific RAOs were developed to address MEC and MC/COPCs based on the known current conditions, the explosive safety hazards, and the potential risks to human and ecological receptors. RAOs address the goals for reducing the explosive hazards from UXO/DMM and/or risks from exposure to soil contamination to ensure protection of human health, safety and the environment (USEPA, 1988). The RAOs are intended to be as specific as possible, but not so specific that the range of alternatives that can be developed is unduly limited.

Remedial action at the OD Grounds MRS is guided by the goal of protecting human health and the environment by reducing unacceptable risks to receptors resulting from exposure to UXO/DMM in soil and MC/COPCs in soil. The site-specific RAOs for the OD Grounds MRS, which are summarized in **Table 2-11** and associated **Table 2-12**, will have the effect of protecting human health and the environment and complying with **applicable or relevant and appropriate requirements** (ARARs). It should be noted that several of the smaller sized munition categories have estimated classification depths that are shallower than their respective RAO depths. In these instances, the LUCs component of the selected remedy will supplement the source removal by reducing the risk of intentional or unintentional interactions that would impart energy to a UXO/DMM item, which will ultimately achieve a protective end state for site receptors. The Cleanup goals for soil at the OD Grounds for human health receptors and ecological receptors are presented in **Table 2-13**.

To document compliance with Federal and State regulations and to determine the impact of the remedial action on the groundwater, the Army plans to collect groundwater samples as part of the soil remedy. This

monitoring will confirm that health-based drinking water standards that would cause unacceptable risk are not exceeded. In the interim, institutional controls to prevent the use of groundwater will be in place.

Table 2-11.
OD Grounds MRS Remedial Action Objectives

Medium	Contaminant	Receptors	Exposure Routes	Remedial Action Objective
Soil	UXO/DMM	Human (current and future site workers, site visitors, and recreational users)	Direct contact to 18-inches bgs (Site workers conducting grounds and/or site maintenance, such as vegetation maintenance, fence installation, or plowing feed plots) Direct contact to 12-inches bgs (Site visitors/recreational users digging shallow holes or inserting stakes for shelters/tents)	Prevent the exposure of human receptors to UXO/DMM (see Table 2-12) in soil to the associated bgs depths shown in Table 2-12 to address the likelihood of exposure based on current and anticipated future land use.
Soil	MC/COPCs	Human (hypothetical future child residents – unrestricted use scenario)	Direct contact (incidental ingestion or dermal contact) of surface and subsurface soil (Future unrestricted use scenario – children only)	Prevent the exposure of human receptors to contaminated soil above Remedial Goals (RGs) based on current and anticipated future land use. Prevent soil from contaminating groundwater above health-based standards that would result in unacceptable risk. Prevent soil from contaminating surface water
Soil	MC/COPCs	Ecological species	Dietary exposure of wildlife receptors and/or direct exposure of plants and soil invertebrates	Prevent the exposure of ecological receptors to soils above RGs.

- (1) See the "Decision Logic to Assess Risks Associated with Explosive Hazards, and to Develop RAOs for MRSs" (USACE, 2017 and 2020b).
- (2) It is assumed that removal of contaminated soil and UXO/DMM will result in an improvement of groundwater conditions. Monitoring of groundwater before and after implementation of the soil remedy will confirm that health-based drinking water standards that would cause unacceptable risk are not exceeded. In the interim, institutional controls to prevent the use of groundwater will be in place.

Table 2-12.
OD Grounds MRS Remedial Action Objective Depths

Munitions Category	Description	Estimated Classification Depth (inches bgs) ⁽¹⁾	Max. Depth of MEC/MPPEH (inches bgs) ⁽²⁾	Max. Intrusive Depth (inches bgs) ⁽³⁾	RAO Depth (inches bgs) ⁽⁴⁾
Bomb, B1	Butterfly Bomblets ⁶	11	8	18	8
Bomb, B2	20-lb. Fragmentation Bombs	45	2	18	2
Fuze, F1⁸	Very Small – approx. 2"x3" or smaller (e.g., small base fuzes ⁶ , small Russian projectile fuzes ⁶ , rocket base fuses ⁶ , some land mine fuzes ⁶ , etc.)	8	26	18	18
Fuze, F2⁸	Small – Between 2"x3" and 4"x6" (e.g., "T-bar" fuzes, artillery projectile fuzes, smaller rocket fuzes ⁷ , etc.)	11	26	18	18
Fuze, F3	Medium – 100 series bomb fuzes, larger rocket fuzes ⁶ , etc.	21	18	18	18
Fuze, F4	Large – M60 series base fuzes ⁶ and similar very heavy, large fuzes ⁷	25	9	18	9
Grenade, G1⁸	Hand Grenades ⁷	11	12	18	12
Grenade, G2⁸	Rifle Grenades ⁷	11	14	18	14
Mine, M1	M3 square AP mines ⁶ and "Bouncing Betty" mines ⁶ and flares ⁷	25	12	18	12
Proj., P1⁸	20mm/25mm/1.1" ⁶ projectiles and similar	4	36	18	18
Proj., P2⁸	30mm projectile without cartridge case	9	15	18	15
Proj., P3⁸	37mm/40mm projectiles without cartridge case, 20mm with cartridge case, 30mm with cartridge case, etc.	12	18	18	18
Proj., P4	57mm projectiles, 2.36" rocket warheads or motors, etc.	21	24	18	18
Proj., P5	75mm/76mm projectiles, 90mm AP projectiles	32	25	18	18
Proj., P6	105mm projectiles, 3.5" rockets, etc.	45	18	18	18
Proj., P7	155mm & 120mm projectiles, 6" projectiles ⁶ , 4.2" mortars, etc.	47	15	18	15

- (1) DGM detection depths were calculated using a 13.9mV threshold for the sum of EM61-MK2 time gates 1-3, based on the threshold required to detect a 37mm projectile at 12in bgs. All depths are for a horizontally oriented munition. For items without available response curve data, a munition of similar size was used to estimate detection depths.
- (2) Maximum depth of MEC/MPPEH based on **Table 2-4**. Note that the depths listed in this column are the depths that the respective items were recovered, not the maximum detection depth. Items may have been recovered while investigating burial pits or adjacent to other larger items.
- (3) Maximum intrusive depth based on current and future land uses.

- (4) RAO depth was selected as the lesser of the maximum receptor intrusive depth (i.e., 18 inches) or the maximum depth of MEC/MPPEH found during the Phase I and II Investigations and the Munitions Response Action (2012-2014).
- (5) Munitions categories are defined in the Final FS (USACE, 2022b), Appendix E, Section 4.1 Nature and Extent of MEC, Table 4.6.
- (6) Not in DoD classification library.
- (7) Some examples in DoD classification library but existing examples may not cover all marks/mods present on site.
- (8) Several of the smaller sized munition categories have estimated classification depths that are shallower than their respective RAO depths. In these instances, the LUCs component of the selected remedy will supplement the source removal by reducing the risk of intentional or unintentional interactions that would impart energy to a UXO/DMM item, which will ultimately achieve a protective end state for site receptors.

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**Table 2-13.
Site Specific Remedial Goals (RGs)**

Area	Medium	COC	Remedial Goal (RG) (mg/kg) ¹	Basis of RG ¹		
				USEPA Regional Screening Levels (RSL) (HQ=1) Industrial Soil	NYS Soil Cleanup Objective (SCO) Protection of Ecological Resources	Site-Specific Ecological Soil Cleanup Objectives (ss-ESCOs) ²
OD Hill	Surface Soil	Aroclor-1254	0.97	X		
		Cadmium	4		X	
		Copper	50		X	
		Lead	63		X	
		Mercury	0.18		X	
		Bis (2-ethylhexyl) phthalate	0.38			X
		Di-n-butylphthalate	0.17			X
		Endosulfan I	12.8			X
OD Hill	Combined Surface and Subsurface Soil (0 to <= 15ft bgs)	Aroclor-1254	0.97	X		
		Cadmium	4		X	
Kickout Area	Surface Soil	MCPA	410	X		
		Cobalt	350	X		
		Manganese	1,600		X	
		Copper	50		X	
		Lead	63		X	
		Mercury	0.18		X	
		Bis (2-ethylhexyl) phthalate	0.38			X
		Di-n-butylphthalate	0.17			X

- (1) RGs were selected to be the lowest of a) USEPA Regional Screening Levels (RSL) (HQ=1), Industrial Soil; b) NYS Soil Cleanup Objectives (SCO) Commercial (none selected) (NYSDEC, 2018a); c) NYS SCO Protection of Ecological Resources (NYSDEC, 2018b); d) Calculated ESCOs from the BERA (USACE, 2022b). USEPA RSLs and Calculated ESCOs from the BERA are also considered for comparison and in situations where there is not an SCO.
- (2) Site-specific Ecological Soil Cleanup Objectives (ss-ESCOs) were calculated in the BERA (USACE, 2022b, Appendix B2, Section 5.6.1) following the NYSDEC's methodology presented in the technical support document for development of Ecological Soil Cleanup Objectives (ESCOs) for the state's Brownfield Cleanup Program (NYSDEC, 2006).

2.9 DESCRIPTION OF ALTERNATIVES

A range of general response actions were identified, evaluated, and screened to develop a list of possible remedial alternatives for the OD Grounds MRS. These general response actions were (a) no action, (b) risk and hazard management (e.g., land use controls, access restrictions, fencing and signage, etc.), and

(c) remedial action (e.g., excavation, disposal, restoration). Various technology options for these general response actions were evaluated based on screening criteria that included effectiveness, implementability, and cost. Methods deemed to be viable were combined into possible remedial alternatives for the OD Grounds MRS. A No Action alternative was also evaluated (40 CFR 300.430(e)(6)). The No Action alternative refers to a remedy where no active remediation or enforceable land use controls are implemented. Under the NCP, evaluation of a no-action alternative is required to provide a baseline for comparison of other remedial technologies and alternatives. A detailed description of the alternative development process is provided in the FS report for the OD Grounds (USACE, 2022b). Six remedial alternatives were developed during the FS for the OD Grounds MRS. A description of each of the six alternatives developed for consideration is presented below:

Alternative 1: No Action

Alternative 1 is the no further action alternative. CERCLA requires the FS to evaluate a no-action alternative and to use it as a baseline for comparison against other alternatives (40 CFR 300.430(e)(1)). The no further action alternative would leave the OD Grounds MRS undisturbed with no change or continued maintenance to any preexisting site security measures, such as locked gates, to prevent unauthorized access and direct contact with contaminated soil and possible exposure to explosive hazards from potential UXO/DMM.

Estimated Capital Cost: \$0

Estimated Operation and Maintenance (O&M) Costs over 30 years: \$0

Estimated Periodic Costs over 30 years: \$0

Estimated Total Cost: \$0

Alternative 2: Land Use Controls (LUCs) Only, Including Groundwater Restrictions

- The major components of Alternative 2 include:
- Land use and activity restrictions (i.e., prohibit residential use and intrusive activity without MEC construction support).
- Educational Awareness.
- Annual LUC inspections.

LUCs would be implemented under Alternative 2. LUCs would include an environmental easement to prohibit unauthorized intrusive activities (requiring construction support, if necessary), and implement land use restrictions to prevent the future use of the OD Grounds MRS as a daycare facility, for playgrounds or camping, agriculture/farming, or for residential activities. As a part of this alternative, SEDA will implement public awareness measures that will involve briefings on explosive hazards to future site personnel to alert them to these issues and reinforce the “three Rs” of explosives safety (*Recognize, Retreat, and Report*). Note that the any current barriers do not eliminate access to the OD Grounds MRS, as the landowner (currently the Army) controls and can permit access to land users. The groundwater is not currently being used, and would not be used in the future, as a potable water source. Currently, a non-groundwater sourced municipal water supply is available for SEDA. Inspections would be performed annually to confirm that restrictions are being followed. In addition, as a part of this alternative SEDA would implement public educational awareness measures that would involve installation of signs, sign upkeep, and annual briefings on potential explosive hazards to future site personnel to alert them to these issues and reinforce the “3Rs” of explosives safety (recognize, retreat, and report). In accordance with Section 121(c) of CERCLA, this alternative is subject to five-year reviews to determine whether the remedy remains protective of human health and the environment.

Estimated Capital Cost: \$149,513

Estimated O&M Costs over 30 years: \$502,005

Estimated Periodic Costs over 30 years: \$174,587

Estimated Total Cost: \$826,105

Alternative 3: Consolidate and Cap with Surface and Subsurface Clearance Outside the Cap and LUCs

The major components of Alternative 3 include:

- Land use and activity restrictions (i.e., prohibit residential use and intrusive activity to uncleared depths without MEC construction support).
- Short-term groundwater use restrictions (i.e., prohibit use as potable source).
- Educational Awareness.
- One round of groundwater, surface water, and sediment sampling prior to any remedial action.
- Consolidating soil with high densities of metallic debris or soil concentrations above RGs in and around the OD Hill area and installing an engineered cap over the consolidated soil. The soils to be consolidated are expected to extend out 500 feet from the OD Hill, however the extent will be refined during the Remedial Design. Soils in which the anomaly densities are elevated beyond the point in which AGC/DGM is no longer practical would be consolidated and covered by the engineered cap.
- DGM/AGC mapping and intrusive investigation to remove UXO/DMM to a depth of detection outside the cap.
- Post-remedial action groundwater, surface water, and sediment sampling to determine the impact of the remedial action on these media in Reeder Creek.
 - If the results are in compliance with Federal and State health-based drinking water standards, no further LUC for groundwater is required.
 - If the results exceed Federal or State health-based drinking water standards and impacts on groundwater are found during post-remedial action groundwater sampling, Groundwater Use Restrictions will stay in place and long-term groundwater monitoring will be undertaken.
- Annual LUC inspections.

In addition to including the LUCs and educational awareness measures described under Alternative 2 (see above), Alternative 3 would involve consolidating soil with high densities of metallic debris and soil above RGs at the OD Hill and covering that soil with an engineered cap. This footprint is expected to extend 500 feet from the OD Hill; however, the extent will be refined during the Remedial Design. This alternative would also include DGM/AGC as the primary method of data collection and intrusive investigation of anomalies to complete a MEC clearance in areas of the MRS that were not covered by the engineered cap. If there are any areas where DGM/AGC is not feasible due to the steepness of terrain, presence of water, or other conditions within the MRS, then analog methods may be used. MEC (UXO/DMM) will be disposed of within the OD Grounds MRS by UXO-qualified personnel using explosive demolition techniques (i.e., blow-in-place [BIP] or consolidated shot procedures). MD resulting from demolition operations or found during the removal would be inspected, verified, and certified as material documented as safe (MDAS) by UXO-qualified personnel before being transported off-site for appropriate disposition.

To document compliance with Federal and State regulations, the Army proposes to collect groundwater samples before and after implementation of the soil remedy. This monitoring will confirm that health-based drinking water standards that would cause unacceptable risk are not exceeded. In the interim, institutional controls to prevent the use of groundwater will be in place. LTM for Alternative 3 would include inspections and maintenance of the engineered cap, groundwater monitoring (if applicable), and LUC inspections for the lifetime of the cap. In accordance with Section 121(c) of CERCLA, this alternative is subject to five-year reviews to determine whether the remedy remains protective of human health and the environment.

Estimated Total Cost: \$16.7M (Alternative screened out before detailed cost analysis)

Alternative 4: Excavate OD Hill and perform surface/subsurface clearance over the entire OD Grounds MRS, and LUCs

The major components of Alternative 4 include:

- Land use and activity restrictions (i.e., prohibit residential use and intrusive activity to uncleared depths without construction support).
- Short-term groundwater use restrictions (i.e., prohibit use as potable source).
- Educational Awareness.
- One round of groundwater, surface water, and sediment sampling prior to any remedial action.
- Excavation of OD Hill to grade and mechanical separation of UXO/DMM from excavated soil, creating a pile of UXO/DMM, a pile of MD, and pile of processed soil (e.g., loose debris-free soil).
 - In addition to the OD Hill itself, excavation and mechanical separation of UXO/DMM from excavated soil will be warranted for areas immediately outside of the OD Hill where elevated anomaly densities are such that AGC/DGM is not practical. This footprint is expected to extend 500 feet from the OD Hill; however, the extent will be refined during the Remedial Design.
- Confirmatory sampling to be conducted to evaluate whether soil remaining in place meets the RGs, or if additional excavation is required to achieve the RGs. In the case where ecologically based RGs (ss-ESCOs) are exceeded but all other RGs are achieved, this alternative includes construction of 12-inch soil cover in discrete areas, as needed.
- Following UXO/DMM separation, soil sample collection will be conducted from the excavated and processed soils to determine the potential for the reuse of the soil within the OD Grounds MRS or to support a determination of appropriate disposition for off-site disposal.
- DGM/AGC mapping and using one-pass AGC sensors and intrusive investigation to remove UXO/DMM to a depth of detection over the entire MRS as described below.
 - DGM with AGC will be utilized to the maximum extent practicable. In areas inaccessible to larger AGC instruments, such as along steeper slopes like stream embankments or near densely spaced trees, handheld AGC instruments may be utilized. If areas are inaccessible to all AGC instruments, then analog instruments may be used following submittal and acceptance of a technical justification. Based on the site characteristics, the use of analog instruments is expected to be limited. Analog instruments inherently have lower performance capabilities with respect to anomaly detection compared to AGC instruments and do not create a permanent record of measurement results. However, the use of analog instruments will still reduce risk in these difficult to access areas, and, when applied with the land use and activity restrictions to reduce the potential of intentional or unintentional interactions with UXO/DMM, will ultimately achieve an acceptable risk state.
 - Mechanical aids and manipulation of hydrologic conditions may be required to maximize the use of AGC and to conduct subsequent intrusive investigations in and around Reeder Creek (i.e., steep embankments and the creek bottom), ponded areas, and around the existing infrastructure on-site. These include, but are not limited to, utilizing winches and pulleys to raise and lower AGC equipment up and down steep embankments, diverting water to properly collect data on creek or riverbeds, or draining standing water from ponds and pools in order to collect data on pond beds.
- Post-remedial action groundwater, surface water, and sediment sampling to determine the impact of the remedial action on these media in Reeder Creek.
 - If the results are in compliance with site ARARs and/or TBCs, no further LUC, and no LTM, for groundwater is required.
 - If the results exceed Federal or State health-based drinking water standards and impacts on groundwater are found during post-remedial action groundwater sampling, groundwater use restrictions will stay in place and long-term groundwater monitoring will be undertaken.

- Annual LUC inspections.

Alternative 4 would include the same LUCs as described under Alternative 2 (see above). The geophysical mapping and intrusive investigation components of Alternative 4 are similar to those in Alternative 3 (see above), but instead of consolidating and capping soil at the OD Hill, Alternative 4 would involve the excavation and mechanical processing of the OD Hill to grade to remove UXO/DMM. Additional excavation below the natural grade of OD Hill may be conducted if the density of metallic debris remains high enough that DGM is not practical. All excavated soil will be mechanically processed to separate MEC. Following the excavation of the OD Hill and any surrounding high-density areas, this alternative would also involve DGM/AGC as the primary method of data collection and intrusive investigation of anomalies to complete MEC clearance in all areas of the MRS (similar to Alternative 3). If there are any areas where DGM/AGC is not feasible due to the steepness of terrain, presence of water, or other conditions within the MRS, then analog methods may be used.

Following the excavation work at the OD Hill and any surrounding high-density areas, confirmatory samples will be collected from the newly exposed surface soil in the footprint of the excavation and compared to the RGs. In the event that confirmatory sample(s) exceed the RGs, additional over-excavation may be performed, followed by additional confirmatory sampling until the OD Grounds MRS cleanup goals are met. If sampling within the OD Grounds MRS, in the remaining deeper soils following excavation and processing from the OD Hill and surrounding high-density areas (now surface soil), identifies portions of the remaining in-situ soils that exceed the ss-ESCOs, and that may present a risk to ecological receptors, a soil cover may be used to mitigate this risk. Alternatively, the soil will be excavated and sampled until confirmatory results achieve RGs, as described above). The soil cover will consist of at least 12-inches of compacted soil borrowed from a source within the OD Grounds MRS where analytes are either not present or at levels below ARARs and/or TBCs. The soil cover will be inspected as part of the annual LUCs inspections.

This alternative will result in three types of "piles": (1) UXO/DMM; (2) MD; and (3) excavated and processed soil free of debris.

- Type (1) UXO/DMM: Recovered MEC (UXO/DMM) will be disposed of within the OD Grounds MRS by UXO-qualified personnel using explosive demolition techniques (i.e., BIP or consolidated shot procedures).
- Type (2) MD: MD resulting from demolition operations or found during the removal would be inspected, verified, and certified as MDAS by UXO-qualified personnel before being transported off-site for appropriate disposition.
- Type (3) excavated and processed soil free of debris: Excavated soils deemed free from UXO/DMM will be sampled, and soil that meets the RGs would be left within the OD Grounds MRS for potential reuse as backfill to support the re-grading effort described below. The excavated and processed soils that do not meet the OD Grounds MRS RGs will be managed for off-site disposal. Waste characterization sampling will be conducted to determine appropriate off-site disposal. If any of the excavated/processed soil is determined to be hazardous, the hazardous soil will be stabilized within the OD Grounds MRS using Portland cement or similar to immobilize the contaminants and render the material as non-hazardous. The material will be sampled again to identify if the material is suitable for non-hazardous disposal. Trucks would be staged to haul the excavated soil off-site to an approved landfill, as needed.

Upon completion of excavation and confirmatory sampling at the OD Hill and any high-density areas, as well as installing any necessary soil covers as described above, the entire excavated area would be graded to restore a natural grade and re-vegetated to promote positive drainage. Pre- and post-RA groundwater monitoring will be conducted to ensure the remedy does not impact groundwater.

LTM for Alternative 4 would include inspections of soil covers, groundwater monitoring (if applicable), and LUC inspections. In accordance with Section 121(c) of CERCLA, this alternative is subject to five-year reviews to determine whether the remedy remains protective of human health and the environment.

Estimated Capital Cost: \$14,234,764
Estimated O&M Costs over 30 years: \$1,519,712
Estimated Periodic Costs over 30 years: \$174,587
Estimated Total Cost: \$15,929,063

Alternative 5: Excavate the entire OD Grounds MRS to 1-foot below grade and perform surface/subsurface clearance.

The major components of Alternative 5 include:

- Land use and activity restrictions (i.e., prohibit residential use and intrusive activity to uncleared depths without construction support).
- Short-term groundwater use restrictions (i.e., prohibit use as potable source).
- One round of groundwater, surface water, and sediment sampling prior to any remedial action.
- Excavation of soil with high densities of metallic debris at and around the OD Hill and to a depth of 1-foot bgs over the entire MRS and mechanical separation of UXO/DMM from that excavated soil.
- Confirmatory sampling to be conducted to evaluate whether soil remaining in place meets the RGs, or if additional excavation is required to achieve the RGs. In the case where ecologically based RGs (ss-ESCOs) are exceeded but all other RGs are achieved, this alternative includes construction of 12-inch soil cover in discrete areas, as needed.
- Following UXO/DMM separation, soil sample collection will be conducted from the excavated and processed soils to determine the potential for the reuse of the soil within the OD Grounds MRS or to support a determination of appropriate disposition for off-site disposal.
- DGM/AGC mapping and intrusive investigation to remove UXO/DMM over the entire MRS following the removal and mechanical separation of the top foot of soil.
- Post-remedial action groundwater, surface water, and sediment sampling to determine the impact of the remedial action on these media in Reeder Creek.
 - If the results are in compliance with site ARARs and/or TBCs, no further LUC, and no LTM, for groundwater is required.
 - If the results exceed Federal or State health-based drinking water standards and impacts on groundwater are found during post-remedial action groundwater sampling, groundwater use restrictions will stay in place and long-term groundwater monitoring will be undertaken.
- Annual LUC inspections.

Alternative 5 would include the same LUCs as described under Alternative 2 (see above). The geophysical mapping and intrusive investigation components of Alternative 5 are similar to those conducted under Alternative 4; however, in addition to excavation of the entire OD Hill, an MRS wide excavation to 1-foot bgs would be performed. Excavation and mechanical processing of soil would be conducted to remove UXO/DMM. The management of the UXO/DMM spoils pile; the MD spoils pile; and the excavated and processed soil (free of debris) spoils pile will be managed in the same manner as described in Alternative 4.

Upon completion of MEC clearance activities, as well as installing any necessary soil covers, the excavated areas would be graded to restore a natural grade and re-vegetated to promote positive drainage. Pre- and post-RA groundwater monitoring will be conducted to ensure the remedy does not impact groundwater.

LTM for Alternative 5 would include inspections of soil covers, LUC inspections, and potential groundwater monitoring. In accordance with Section 121(c) of CERCLA, this alternative is subject to five-year reviews to determine whether the remedy remains protective of human health and the environment.

Estimated Capital Cost: \$69,060,215

Estimated O&M Costs over 30 years: \$1,519,712

Estimated Periodic Costs over 30 years: \$174,587

Estimated Total Cost: \$70,754,515

Alternative 6: Excavate the entire site to 3-feet below grade and perform surface/subsurface clearance.

The major components of Alternative 6 include:

- Land use and activity restrictions (i.e., prohibit residential use and intrusive activity to uncleared depths without construction support).
- Short-term groundwater use restrictions (i.e., prohibit use as a potable source).
- One round of groundwater, surface water, and sediment sampling prior to any remedial action.
- Excavation of soil with high densities of metallic debris at and around the OD Hill and to a depth of 3-feet bgs over the entire MRS and mechanical separation of UXO/DMM from that excavated soil, generating a pile of UXO/DMM, a pile of MD, and pile of processed soil (e.g., loose debris-free soil).
- Confirmatory sampling to be conducted to evaluate whether soil remaining in place meets the RGs, or if additional excavation is required to achieve the RGs. In the case where ecologically based RGs (ss-ESCOs) are exceeded but all other RGs are achieved, this alternative includes construction of 12-inch soil cover in discrete areas, as needed.
- Following UXO/DMM separation, soil sample collection will be conducted from the excavated and processed soils to determine the potential for the reuse of the soil within the OD Grounds MRS or to support a determination of appropriate disposition for off-site disposal.
- DGM/AGC mapping and intrusive investigation to remove UXO/DMM over the entire MRS following the removal and mechanical separation of the top 3-feet of soil.
- Post-remedial action groundwater, surface water, and sediment sampling to determine the impact of the remedial action on these media in Reeder Creek.
 - If the results are in compliance with Federal and State health-based drinking water standards, and ARARs and/or TBCs, no further LUC, and no LTM, of the groundwater is required.
 - If impacts on groundwater are found during post-remedial action groundwater sampling, groundwater use restrictions will stay in place and long-term groundwater monitoring will be undertaken.
- Annual LUC inspections.

Alternative 6 would include the same LUCs as described under Alternative 2 (see above). The geophysical mapping and intrusive investigation components of Alternative 6 are similar to those conducted under Alternative 4; however, in addition to excavation of the entire OD Hill, an MRS wide excavation to 3-feet bgs would be performed. Excavation and mechanical processing of soil would be conducted to remove UXO/DMM. The management of the UXO/DMM spoils pile; the MD spoils pile; and the excavated and processed soil (free of debris) spoils pile will be managed in the same manner as described in Alternative 4.

Upon completion of MEC clearance activities, as well as installing any necessary soil covers, the excavated areas would be graded to restore a natural grade and re-vegetated to promote positive drainage. Pre- and post-RA groundwater monitoring will be conducted to ensure the remedy does not impact groundwater. LTM for Alternative 6 would include inspections of soil covers, LUC inspections, and potential groundwater monitoring. In accordance with Section 121(c) of CERCLA, this alternative is subject to five-year reviews to determine whether the remedy remains protective of human health and the environment.

Estimated Total Cost: Over \$200M (Alternative screened out before detailed cost analysis)

2.10 SCREENING OF ALTERNATIVES

The alternatives assembled above were screened for effectiveness, implementability, and cost before being analyzed in the detailed alternative evaluation. This screening process is used to select the most favorable alternatives for a detailed analysis (40 CFR 300.430(e)(9)). The screening determined that Alternative 1 is not protective of human health or the environment and Alternative 2 does not satisfy the statutory preference to reduce toxicity, mobility, or volume of the hazardous substances as their principal element. However, each alternative was retained for analysis to provide comparison with other alternatives. Screening of Alternative 3 determined that this alternative would not be feasible given the hazards of building a cap over MEC contaminated soil and would require a significant amount of maintenance over the long term. While Alternative 6 would be effective, it was not considered implementable due to the excavation of over 1.8 million cubic yards of soil, which would cause significant impacts to the OD Grounds MRS and the habitat at this planned conservation area. The estimated cost of this alternative (over \$200 million) was also considered excessive. For this reason, **Alternatives 3 and 6 were screened out at this stage and were not carried forward to the detailed analysis.**

2.11 COMPARATIVE ANALYSIS OF ALTERNATIVES

2.11.1.1 Evaluation Method

A detailed analysis was completed for the various remedial alternatives developed to address the MEC hazards and MC risks identified. The purpose of this detailed analysis was to evaluate and compare the range of remedial action alternatives against the baseline condition (no further action) and each other to select an alternative that was considered the most suitable to address the hazards and/or risks present. A detailed account of this analysis is provided in the FS report for the OD Grounds MRS (USACE, 2022b). A summary of this process is provided here.

- The detailed analysis involved evaluating each identified remedial alternative against nine criteria, as defined by the NCP (40 CFR 300.430(e)(9)(iii)(A)-(I)). These nine criteria fall into three groups: threshold criteria, primary balancing criteria, and modifying criteria. A description and purpose of the three groups of criteria follow: **Threshold criteria** are requirements that each alternative must meet in order to be eligible for selection and include (a) overall protectiveness of human health and the environment and (b) compliance with ARARs.
- **Primary balancing criteria** are used to weigh major trade-offs among alternatives and include (a) long-term effectiveness and permanence, (b) reduction of toxicity, mobility, or volume (TMV) of contaminants through treatment, (c) short-term effectiveness, (d) implementability, and (e) cost.
- **Modifying criteria** include (a) state/support agency acceptance and (b) community acceptance and require review of the remedial alternatives by stakeholders. For this reason, while these criteria may be considered to the extent that information is available during the FS, they can only be fully considered after public comment is received on the Proposed Plan. In the final balancing of trade-offs between alternatives upon which the final remedy selection is based, modifying criteria are equally important as the balancing criteria.

The details of the nine evaluation criteria are explained further in **Table 2-14**.

**Table 2-14.
Evaluation Criteria for Remedial Action Alternatives**

Threshold Criteria	Overall Protectiveness of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
	Compliance with ARARs evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
Primary Balancing Criteria	Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
	Reduction of TMV of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
	Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
	Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
	Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative overtime in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
Modifying Criteria	State/Support Agency Acceptance considers whether the State agrees with the analyses and recommendations, as described in the FS and Proposed Plan.
	Community Acceptance considers whether the local community agrees with the analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

2.11.1.2 Alternatives Evaluation

2.11.1.2.1 Overall Protection of Human Health and the Environment

Based on the evaluation of each alternative in the individual analysis of alternatives, Alternatives 1 and 2 do not achieve the Overall Protection of Human Health and the Environment because they do not achieve acceptable risk conditions with respect to the "Decision Logic to Assess Risks Associated with Explosive Hazards, and to Develop RAOs for MRSs" (USACE, 2017). All remedial alternatives identified to address MC/COPCs at the OD Grounds MRS protect human health and the environment, except for Alternative 1 (No Action), which does not include any remedial technologies and is only included in the FS to provide a baseline for comparison. Alternatives 4 and 5 are protective of human health and the environment. Remedial alternatives are either protective or not and, therefore, no comparison of overall protectiveness is possible.

2.11.1.2.2 Compliance with Applicable or Relevant and Appropriate Requirements

Alternatives 1 and 2 do not ensure that site media are in compliance with RGs therefore chemical-specific ARARs are not met by these two alternatives. Alternatives 4 and 5 identified to address UXO/DMM and MC/COPCs at the OD Grounds MRS comply with ARARs.

2.11.1.2.3 Long-term Effectiveness and Permanence

The permanence criterion evaluates the degree to which an alternative permanently reduces or eliminates unacceptable risks posed by UXO/DMM and MC/COPC contamination. LUCs under Alternative 2 do provide some long-term effectiveness because they restrict future use of the property and groundwater; however, the permanence is less than other alternatives that also remove explosive hazards and residual risks are not reduced significantly. Alternatives 4 and 5 both provide a very high degree of long-term effectiveness

and permanence, as they both reduce residual risks the most, with Alternative 5 reducing them to the greatest degree. Both remove a substantial portion of the source of contamination. While Alternative 5 does increase the depth of UXO/DMM removal in the Kickout Area, it is anticipated that 99% of UXO/DMM is located within the top 24-inches of soil, so the increased removal depth does not provide a significant increase in the permanence. With respect to protection of future residents from MC/COPCs in soil, Alternatives 2, 4, and 5 all provide the same permanence with implementation of land use restrictions.

The long-term effectiveness of each alternative can also be evaluated using the MEC Hazard Assessment (HA) method (**Section 2.7.1**). The MEC HAs conducted for the OD Hill and Kickout Area (Appendix C of the FS) supports the evaluation of long-term effectiveness described above. The evaluation demonstrates the greatest reduction in potential MEC hazards would be achieved by implementing Alternatives 4 and 5, because these alternatives result in the greatest MEC Hazard Assessment (HA) score and Hazard Level reductions. Note that these total MEC HA scores and the associated hazard levels are qualitative references only and should not be interpreted as quantitative measures of explosive hazard.

In summary, Alternatives 4 and 5 are both considered to provide the highest degree of long-term effectiveness. Alternative 2 provides some long-term effectiveness (less than Alternatives 4 and 5), while Alternative 1 is considered to have no long-term effectiveness.

2.11.1.2.4 Reduction of Toxicity, Mobility, or Volume through Treatment

Both Alternatives 1 and 2 provide no reduction in the toxicity, mobility, or volume of hazardous materials/substances. With respect to UXO/DMM, the largest volume of hazardous materials/substances is located at the OD Hill; therefore, alternatives detonating UXO/DMM at the OD Hill achieve the largest reduction of volume of hazardous materials/substances. Alternatives 4 and 5 both achieve a significant reduction in the toxicity, mobility, or volume of contaminants on site. Alternative 5 achieves a slightly greater reduction in toxicity, mobility, or volume because UXO/DMM is removed to a greater depth within the Kickout Area. This improved toxicity, mobility, or volume reduction is limited because 99% of the UXO/DMM would be anticipated to occur within the top 24-inches of soil which would also be addressed under Alternative 4.

With respect to MC/COPCs at the site. The only treatment that reduces the toxicity, mobility, or volume of MC/COPCs is the demolition of MEC which contain explosives that can become a source of MC that could eventually leach into the environment. Therefore, the demolition of UXO/DMM would also reduce the toxicity and volume of MC/COPCs. Detonation of UXO/DMM is not treatment, but for UXO/DMM that must be detonated for disposal, it is substantively similar to treatment, especially with respect to consideration of this evaluation criterion. The reduction of toxicity, mobility, or volume of MC/COPCs under each alternative is therefore the same as described above for reduction of UXO/DMM.

2.11.1.2.5 Short-term Effectiveness

No additional risk to the community, site workers, or the environment is caused by Alternative 1; however, Alternative 1 is determined to have the greatest risk and least short-term effectiveness because no action is taken to remove the UXO/DMM or mitigate contaminated soil risk therefore a continued impact for existing conditions would persist.

Locally, during implementation of Alternatives 4 and 5, a temporary increase in dust may be associated with excavation; however, the local community is generally buffered from these activities due to the location of the site within SEDA. Alternatives 4 and 5 would require UXO personnel who would be exposed to explosive hazards. However, these personnel are trained to handle items properly to reduce risk from explosive hazards during operations. Mechanical handling of soil with UXO/DMM present is considered more hazardous than hand digging due to the potential that heavy equipment could apply forces to a UXO/DMM item such that an unintended detonation could occur; however, armored equipment or remote operated equipment and appropriate evacuation zones would be applied to protect site workers. Due to the location on SEDA, exclusion zones would not interfere with the local community, because the mechanical handling of soil causes the greatest risk to site workers. Alternative 5 would involve the highest volume of mechanical handling so it is considered to have the least short-term effectiveness.

Alternative 4 only involves mechanical handling of soil at the OD Hill; therefore, it is ranked second least with respect to short-term effectiveness. Alternatives 1 and 2 provide no additional risk to site works or the community therefore they are ranked most favorable for short-term effectiveness.

Alternative 4 and 5 include significant earthworks and handling of soil containing potential MEC; therefore, they all provide some level of risk to site workers. Alternative 4 and 5, which includes off-site transportation and disposal, has a short-term negative impact of hauling materials on public roads outside of the Depot, which can impact traffic in the surrounding community. However, due to the low population density in the area, this impact is expected to be minimal. Alternative 2 is the most favorable for short-term effectiveness as there are no activities that provide an increased risk to site workers or the environment during implementation of this alternative.

Short-term effectiveness can also be evaluated by assessing the duration of time before which the RAO are achieved at the site. Alternative 2 includes LUCs only and has the shortest time period before RAOs are achieved. However, because the use of LUCs alone is not considered a viable option to achieve acceptable risk, this alternative has been ruled out. It is anticipated that LUCs under each of the alternative would be in place before the completion of the field work; therefore, the RAOs would be achieved for both Alternative 4, and 5 at the completion of field activities. Alternative 4 has an estimated field duration of 42 months. Alternative 5 has the longest duration before RAOs are achieved with a field duration of 115 months. Therefore, Alternative 5 has the least short-term effectiveness.

2.11.1.2.6 Implementability

Alternative 1 is the easiest to implement since it requires no action; however, it is not considered implementable as it is unlikely to gain approval from the public and the state. Alternative 2 is administratively difficult to implement, though technically feasible, because the need for UXO support for intrusive activity to any depth could result in a significant need for short notice support and funding. Implementability would require landowner cooperation to give proper advanced notice. Alternative 4 is technically and administratively feasible because it uses commonly implemented approaches, proven technologies and personnel that are readily available. While the technologies and methods involved in implementing Alternative 5 are well established, this alternative would be less implementable due to the massive scale of earthwork that would be required in addition to permitting and logistics requirements for the offsite disposal of the excavated material if soil were found with concentrations exceeding the SCO commercial levels. The DGM/AGC and intrusive investigations use standard techniques common to munitions work. LUCs implemented under these alternatives are similar to those that have been successfully applied at other sites at SEDA.

2.11.1.2.7 Cost

The cost criterion evaluates the financial cost to implement the alternative. The cost criterion includes direct, indirect, and long-term maintenance (i.e., O&M) costs. Direct costs are those associated with the implementation of the alternative. Indirect costs are those associated with administration, oversight, and contingencies. These costs were adapted from costs associated with similar activities at the Depot. These costs presented do not include costs for SEDA to administer and provide oversight for the respective activities.

The actual costs would depend on true labor rates, actual site conditions, final project scope, and other variable factors. The alternative with the lowest cost to implement would be Alternative 1, which requires no action; therefore, no costs are incurred. Alternative 2 has low costs compared to Alternatives 4 and Alternative 5.

Costs range from \$0 (Alternative 1) to approximately \$70.7M (Alternative 5). Alternative 5 has the highest cost because of the costs incurred for the excavation, transportation, and off-site disposal of the top foot of soil over the entire site.

2.11.1.2.8 State Acceptance

NYSDEC and USEPA have indicated their acceptance of the Selected Alternative by their formal concurrence with the FS Report and the Proposed Plan.

2.11.1.2.9 Community Acceptance

The Army made the Proposed Plan for the OD Grounds MRS available for public comment between 01 October 2024, and 01 November 2024. Public comments were received from the Town of Varick Planning Board and a private citizen, those comments and their corresponding responses are discussed in **Section 3.1**.

2.11.1.2.10 Evaluation Summary

The four alternatives were evaluated in terms of nine criteria. **Table 2-15** summarizes the alternatives and identifies the most practicable solution for reducing the risks from explosive hazards at the OD Grounds. In some cases, more than one alternative was identified within the same evaluation category, indicating that those alternatives have similar compliance with the criterion. Alternative 1 must be ruled out because it is ineffective in long-term permanence and does not achieve the RAOs. Both Alternative 1 and 2 do not achieve the ARARs. Only Alternatives 4 and 5 achieve the threshold criteria. While LUCs under Alternative 2 may be effective at limiting interactions, the potential presence of MEC on the surface means that this alternative may not provide appropriate protection of human health and the environment under the planned land use conditions. Alternatives 4 and 5 have similar levels of long-term effectiveness and implementability; however, Alternative 5 has the worst short-term effectiveness and highest cost. Based on a comparison of the criteria, the highest ranked remedy for the OD Grounds is Alternative 4, including excavation and mechanical processing of soil at OD Hill, surface and subsurface clearance over the entire site, and LUCs.

Table 2-15.
Detailed Analysis of Alternatives
OD Grounds Munitions Response Site

Remedial Action Alternative	Threshold Criteria ⁽⁵⁾		Primary Balancing Criteria ⁽⁵⁾					Total Score ⁽³⁾	Overall Ranking
	Overall Protection of Human Health and Environment	Compliance with ARARs	Long-Term Effectiveness	Reduction in toxicity, Mobility, or Volume of Wastes	Short-Term Effectiveness	Implementability	Cost ⁽¹⁾		
Alternative 1: No-Further Action	Not protective of human health or environment under planned land use conditions.	Does not comply with chemical specific ARARs.	Not effective over long-term. MEC Hazard Assessment Score: 845 / 695 ⁽⁴⁾	No reduction in toxicity, mobility, or volume of wastes (<i>no MEC removal</i>).	No short-term hazards to workers or the surrounding area.	Readily implementable (<i>no actions required</i>); however, highly unlikely to gain approval.	\$0	Does not Meet Threshold Criteria	Excluded
	Criterion Not Met	Criterion Not Met	0	0	3	0	3		
Alternative 2: LUCs Only	Does not achieve acceptable risk conditions per Matrix 4. ⁽²⁾	Does not comply with chemical specific ARARs.	Somewhat effective over long-term assuming LUCs are effective at controlling human behavior. MEC Hazard Assessment Score: 845 / 695 ⁽⁴⁾	No reduction in toxicity, mobility, or volume of wastes (<i>no MEC removal</i>).	No short-term hazards to workers or the surrounding area. Duration is 10 field days for five-year review visits.	Readily implementable.	\$826,105	Does not Meet Threshold Criteria	Excluded
	Criterion Not Met	Criterion Not Met	1	0	3	3	3		
Alternative 4: Excavate OD Hill and perform surface/subsurface clearance over the entire OD Grounds MRS, and LUCs	Protective of human health and environment under planned land use conditions.	Complies with ARARs through collection of post-detonation samples and waste samples.	Effective over long-term; assuming LUCs are maintained and effective; source removal and post-remedial action groundwater sampling reduces risk over the long term. MEC Hazard Assessment Score: 470 / 445 ⁽⁴⁾	Provides substantial reduction in toxicity, mobility, or volume of wastes (<i>MEC removal at OD Hill and in Kickout Area where 99% of UXO/DMM are anticipated</i>).	Moderate short-term hazards to workers and surrounding area (<i>mechanical handling of soil with UXO/DMM at the OD Hill</i>). Field duration is 40 Months. Scored as 2 due to having a shorter duration than Alternative 5.	Readily implementable (<i>uses well established technologies</i>).	\$15,929,063	12	#1
	Criterion Met	Criterion Met	3	2	2	3	2		
Alternative 5: Excavate entire OD Grounds MRS to 1-foot below grade and perform surface/subsurface clearance	Protective of human health and environment under planned land use conditions.	Complies with ARARs through collection of post-detonation samples and waste samples.	Effective over long-term; assuming LUCs are maintained and effective; source removal and post-remedial action groundwater sampling reduces risk over the long term. MEC Hazard Assessment Score: 470 / 445 ⁽⁴⁾	Provides greatest reduction in toxicity, mobility, or volume of wastes (<i>MEC removal at OD Hill and in Kickout Area to a greater depth; however, very few UXO/DMM would be expected at the greater depth</i>).	Moderate short-term hazards to workers and surrounding area (<i>mechanical handling of soil with UXO/DMM over the entire MRS</i>). Field duration is 115 Months. Scored as 0 based on the duration of exposure hours (nearly three times the duration of other alternatives).	Readily implementable (<i>uses well established technologies</i>).	\$70,754,515	9	#2
	Criterion Met	Criterion Met	3	3	0	3	0		

- (1) Costs shown are 30-year costs with a 20% contingency. The total present value (TPV) was calculated based on a discount rate of 0.6 percent (%). Details of the cost estimates and the development of the TPVs are provided in Appendix D of the FS Report.
- (2) See the "Decision Logic to Assess Risks Associated with Explosive Hazards, and to Develop RAOs for munitions response sites (MRSs)" [United States Army Corps of Engineers (USACE), 2017].
- (3) Alternatives were scored 0 to 3 for each screening criterion (0 = least favorable and 3 = most favorable. The total score of all subcategories is the basis for the overall ranking. The alternative with the highest total score represents the most favorable alternative.
- (4) MEC Hazard Assessment Scores are shown for the OD Hill and the Kickout Area (see **Table 2-8**).
- (5) Alternatives 3 and 6 were not carried forward to the detailed analysis; therefore, these alternatives are not included in the table.
- (6) Shading shows alternative desirability with respect to that criterion:

Most acceptable (3)	Significantly acceptable (2)	Moderately acceptable (1)	Least acceptable (0)
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2.12 PRINCIPAL THREAT WASTES

Munitions known or suspected to be present in the MRS may be categorized as UXO or DMM and may be determined by qualified personnel to pose an explosive hazard. If UXO or DMM are later encountered on surfaces in those areas originally addressed by the selected remedy, Department of Defense (DoD) explosive ordnance disposal personnel or similarly qualified personnel will evaluate it to determine if it poses an explosive hazard. UXO or DMM that is determined to pose an explosive hazard (may also be categorized as MEC) will normally be treated within the OD Grounds MRS or removed for destruction in accordance with applicable DoD explosives safety standards, and applicable environmental laws and regulations. The Army and the USEPA will consult, in accordance with the terms of the Seneca Army Depot Federal Facility Agreement (FFA), to make a determination as to whether the UXO or DMM encountered and determined to pose an explosive hazard should be classified as a Principal Threat Waste (PTW), as defined by CERCLA, the NCP, and USEPA guidance. In general, PTWs are those source materials considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. UXO or DMM, if any, that remain present may constitute a principal threat to human health at Seneca, due to the potential for the material to pose an explosive hazard if moved, handled, or disturbed. If the UXO or DMM are determined to be a PTW, the Army will take the necessary actions to ensure protectiveness of human health and the environment to address unacceptable risks posed by the UXO or DMM designated as a PTW.

2.13 SELECTED REMEDY

2.13.1 Rationale for the Selected Remedy

Based on the detailed and comparative analysis of remedial alternative using the NCP nine criteria presented in this Record of Decision, the most effective alternative to achieve the remedial objectives for the Seneca OD Grounds MRS is Alternative 4 (Excavate OD Hill and perform surface/subsurface clearance over the entire site, and LUCs).

When compared to the other alternatives, Alternative 4 has the lowest relative cost of the removal alternatives (\$15.9M TPV compared to the \$70.8M TPV of Alternative 5) and significantly reduces the UXO/DMM hazard versus LUCs alone, which meets the statutory preference to reduce toxicity, mobility, or volume of the hazardous substances by removing a significant volume of source material (i.e. UXO/DMM). This alternative is recommended because it provides an acceptable level of MEC reduction for the anticipated future land use, achieves the RAOs, does not require significant long-term maintenance, and is cost-effective. While Alternative 5 is likely to achieve a better reduction in UXO/DMM, the difference in reduction should not be substantially different because the vast majority of the UXO/DMM are expected in the shallow subsurface. Alternative 5 would also still require LUCs and thus would likely result in the same final state as Alternative 4.

Based on the information currently available, the lead agency believes the Selected Remedy meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to balancing and modifying criteria. BRAC expects the selected remedy to satisfy the following statutory requirement of CERCLA §121(b): (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost-effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principal element.

2.13.2 Description of the Selected Remedy

The major components of Alternative 4 include:

- Land use and activity restrictions (i.e., prohibit residential use and intrusive activity to uncleared depths without construction support).
- Short-term groundwater use restrictions (i.e., prohibit use as a potable source).

- Educational Awareness.
- One round of groundwater, surface water, and sediment sampling prior to any remedial action.
- Excavation of OD Hill to grade and mechanical separation of UXO/DMM from excavated soil, creating a pile of UXO/DMM, a pile of MD, and pile of processed soil (e.g., loose debris-free soil).
 - In addition to the OD Hill itself, excavation and mechanical separation of UXO/DMM from excavated soil will be warranted for areas immediately outside of the OD Hill where elevated anomaly densities are such that AGC/DGM is not practical. This footprint is expected to extend 500 feet from the OD Hill; however, the extent will be refined during the Remedial Design.
- Confirmatory sampling to be conducted to evaluate whether soil remaining in place meets the RGs, or if additional excavation is required to achieve the RGs. In the case where ecologically based RGs (ss-ESCOs) are exceeded but all other RGs are achieved, this alternative includes construction of 12-inch soil cover in discrete areas, as needed.
- Following UXO/DMM separation, soil sample collection will be conducted from the excavated and processed soils to determine the potential for the reuse of the soil within the OD Grounds MRS or to support a determination of appropriate disposition for off-site disposal.
- DGM/AGC mapping and using one-pass AGC sensors and intrusive investigation to remove UXO/DMM to a depth of detection over the entire MRS as described below.
 - DGM with AGC will be utilized to the maximum extent practicable. In areas inaccessible to larger AGC instruments, such as along steeper slopes like stream embankments or near densely spaced trees, handheld AGC instruments may be utilized. If areas are inaccessible to all AGC instruments, then analog instruments may be used following submittal and acceptance of a technical justification. Based on the site characteristics, the use of analog instruments is expected to be limited. Analog instruments inherently have lower performance capabilities with respect to anomaly detection compared to AGC instruments and do not create a permanent record of measurement results. However, the use of analog instruments will still reduce risk in these difficult to access areas, and, when applied with the land use and activity restrictions to reduce the potential of intentional or unintentional interactions with UXO/DMM, will ultimately achieve an acceptable risk state.
 - Mechanical aids and manipulation of hydrologic conditions may be required to maximize the use of AGC and to conduct subsequent intrusive investigations in and around Reeder Creek (i.e., steep embankments and the creek bottom), ponded areas, and around the existing infrastructure on-site. These include, but are not limited to, utilizing winches and pulleys to raise and lower AGC equipment up and down steep embankments, diverting water to properly collect data on creek or riverbeds, or draining standing water from ponds and pools in order to collect data on pond beds.
- Post-remedial action groundwater, surface water, and sediment sampling to determine the impact of the remedial action on these media in Reeder Creek.
 - If the results are in compliance with site ARARs and/or TBCs, no further LUC, and no LTM, for groundwater is required.
 - If the results exceed Federal or State health-based drinking water standards and impacts on groundwater are found during post-remedial action groundwater sampling, Groundwater Use Restrictions will stay in place and long-term groundwater monitoring will be undertaken
- Annual LUC inspections.

Alternative 4 will involve the excavation and mechanical processing of soil with high densities of metallic debris at and around the OD Hill to remove UXO/DMM. The depth of the excavation would be based on site conditions, ground surface elevation surrounding the OD Hill. This alternative will also involve DGM data collection and intrusive investigation of anomalies to complete MEC clearance in all areas of the MRS, including in the footprint of the OD Hill and any other excavations where soil with high densities of metallic debris is excavated for mechanical MEC removal.

Initially, dynamic DGM surveys will be conducted using one-pass AGC instruments over accessible areas of the MRS with the objective of detecting known or suspected MEC in the subsurface. The AGC data surrounding detected anomalies will then be processed to identify subsurface sources and classified to identify “targets of interest” (TOI) that potentially represent UXO/DMM. If classification is implemented, identified TOI will be intrusively investigated by qualified UXO technicians, while anomalies classified as non-TOI will be left in place. However, it has been noted on AGC projects at other OB/OD grounds that 1) classification may incorrectly identify partial or deformed munitions still considered UXO as non-TOI and 2) large numbers of fragments from larger munitions may be classified as TOI based on size/shape similarity to smaller munitions, reducing the effectiveness of classification in lowering the dig rate in the MRS. Additionally, several munitions listed in **Table 2-12** are not currently included in the DoD AGC library. If inert examples are available, munitions may be added to the DoD library; however, if the items cannot be added to the DoD library, there are strategies that will be used to correctly classify munitions not in the DoD library as TOI. Although, the lack of a comprehensive DoD AGC library for the site-specific munitions makes classification more difficult. These considerations may require the excavation of all detected anomalies exceeding an amplitude threshold to ensure UXO recovery or may make it more cost effective to excavate all detected anomalies than it would be to perform classification and leave only a small percentage of classified sources in the ground. The effectiveness of AGC for purposes of anomaly classification at the site will be evaluated as part of the Remedial Design. If AGC was not used for anomaly classification, then all anomalies identified by the dynamic DGM or AGC surveys will be intrusively investigated by qualified UXO technicians to complete the MEC clearance. Qualified UXO technicians will perform required demolition procedures. The demolition team will dispose of UXO/DMM. All recovered MD/MPPEH/MEC will be handled from recovery (i.e., dug out of the ground at identified anomaly location) through disposal in accordance with applicable DoD policies, requirements, and instructions.

Areas with soil with high densities of metallic debris, as delineated by the DGM surveys, will be excavated until all high-density metallic debris is removed (estimated 25,000 to 35,000 cy). The excavated soil will be mechanically processed to remove UXO/DMM and the overburden would be staged onsite for potential reuse and/or reincorporation to return the excavated surface to its original grade. A post-excavation confirmatory DGM survey will be conducted over the excavated area to confirm that all UXO/DMM is removed. Qualified UXO technicians will handle all recoveries and perform required demolition procedures as described above.

This alternative will result in three types of “piles”: (1) UXO/DMM; (2) MD; and (3) excavated and processed soil free of debris.

- Type (1) UXO/DMM: MEC (UXO/DMM) will be disposed of within the OD Grounds MRS by UXO-qualified personnel using explosive demolition techniques (i.e., BIP or consolidated shot procedures).
- Type (2) MD: MD resulting from demolition operations or found during the removal would be inspected, verified, and certified as MDAS by UXO-qualified personnel before being transported off-site for appropriate disposition.
- Type (3) excavated and processed soil free of debris: Excavated soils deemed free from UXO/DMM will be sampled, and soil that meets the RGs would be left within the OD Grounds MRS for potential reuse as backfill to support the re-grading effort described below. The excavated and processed soils that do not meet the OD Grounds MRS RGs will be managed for off-site disposal. Waste characterization sampling will be conducted to determine appropriate off-site disposal. If any of the excavated/processed soil is determined to be hazardous, the hazardous soil will be stabilized within the OD Grounds MRS using Portland cement or similar to immobilize the contaminants and render the material as non-hazardous. The material will be sampled again to identify if the material is suitable for non-hazardous disposal. Trucks would be staged to haul the excavated soil off-site to an approved landfill, as needed.

A sampling strategy for the soil, including sample locations, the number of samples, and analytical requirements, will be detailed in a follow-on document subsequent to MEC clearance activities as part of the RD. During implementation of the excavation work if sampling of the soils excavated for MEC removal

do not meet the site cleanup goals, then the remaining deeper soils (now surface soil) will be sampled (and excavated if necessary) until the site cleanup goals are met.

If site sampling identifies portions of the site that exceed the ss-ESCOs and may present a risk to ecological receptors, a soil cover will be placed to mitigate this risk. The cover will consist of at least 12-inches of compacted soil borrowed from an on-site source where MC/COPCs where analytes are either not present or at levels below ARARs and/or TBCs. The cover will be inspected as part of the annual LUCs inspections. Upon completion of excavation and confirmatory sampling, as well as any necessary covering as described above, the entire excavated area would be graded to restore a natural grade and re-vegetated to promote positive drainage.

Based on the results of the 2020/21 groundwater sampling, groundwater is not a medium of concern. To document compliance with Federal and State regulations and to determine the impact of the remedial action on the groundwater, the Army proposes to collect groundwater samples as part of the soil remedy. A round of groundwater samples will be collected prior to the remedial action, and then another round following the remedial action. This monitoring will confirm that health-based drinking water standards that would cause unacceptable risk are not exceeded. In the interim, institutional controls to prevent the use of groundwater will be in place. If the results are in compliance with Federal and State health-based drinking water standards and show that remedial action did not have negative impacts to groundwater, no further LUC for groundwater is required. If the results are not in compliance, long-term groundwater monitoring will be conducted.

As a part of this alternative SEDA will implement public awareness measures that will involve briefings on explosive hazards to future site personnel to alert them to these issues and reinforce the "three Rs" of explosives safety (***Recognize***, ***Retreat***, and ***Report***). A five-year review will be conducted to ensure that conditions have not changed in such a way that the RAOs are not being achieved or are no longer protective.

Table 2-16 summarizes and describes the purpose of each element of this alternative in achieving the RAOs. The associated costs for Alternative 4 are high. Implementation of this alternative will be highly effective in achieving the RAOs, long-term effectiveness, preventing exposure, and implementability. The estimated duration of the field effort is 40 months.

Table 2-16. Summary of Elements: Remedial Alternative 4

Remedial Action Objective	Exposure Routes	Remedy Component	How the Component Contributes to Achieving the Remedial Action Objective
Prevent the exposure of human receptors to UXO/DMM (see Table 2-12) in soil to the associated bgs depths shown in Table 2-12 to address the likelihood of exposure based on current and anticipated future land use.	Direct contact to 18-inches bgs (Site workers conducting grounds and/or site maintenance, such as vegetation maintenance, fence installation, or plowing feed plots) Direct contact to 12-inches bgs (Site visitors/recreational users digging shallow holes or inserting stakes for shelters/tents)	Excavate soil at the OD Hill and surrounding areas (i.e., estimated to be a radius of 500 feet) and conduct mechanical separation and sorting to remove UXO/DMM	This component will remove the source of explosive hazards from the excavated soil at the OD Hill and surrounding area, which will reduce unacceptable risks from explosive hazards in that area. However, residual UXO/DMM will likely remain below the excavation depth.
		Conduct surface and subsurface MEC clearance using DGM/AGC and intrusive investigation to remove UXO/DMM remaining outside the OD Hill	This component will remove most of the UXO/DMM in the Kickout Area to the depth of detection of the survey instrument (See Table 2-13). This will minimize the explosive hazards present in the soil zone that most receptors will potentially be in contact with, which will reduce unacceptable risks; however, residual UXO/DMM might remain below the removal depth. Note that the MEC clearance will be performed post excavation at the OD Hill and surrounding area; therefore, the depth of removal will be the OD Hill excavation depth plus the depth of detection of the geophysical sensors.
		Require MEC construction support for intrusive activities Note: The depth of intrusive activities requiring construction support will be determined based on the removal depth achieved during the Remedial Action.	This component will ensure intrusive activities where digging will occur in uncleared areas will only be conducted with the support of UXO professionals using MEC safety protocols for anomaly avoidance. This will minimize the risk of site receptors encountering residual UXO/DMM that might remain after the mechanical separation and MEC clearance, which in turn will reduce risks from explosive hazards.
		Implement educational awareness for workers and visitors	This component will increase the awareness of potential explosive hazards, which will decrease the likelihood for receptors to interact with residual UXO/DMM items that might remain after the mechanical separation and MEC clearance. Educational awareness will also increase the effectiveness of other use restrictions by minimizing the chance receptors will unintentionally perform prohibited activities.
		Restrict the site to non-residential land use	This component will minimize the number of people potentially interacting with potential UXO/DMM remaining at the OD Hill and Kickout Area by preventing residential construction and ensuring the site is restricted to site workers and conservation/recreational users. This will minimize the site receptors encountering residual UXO/DMM, which in turn will reduce risks from explosive hazards
		Annual LUC inspections	This component will confirm that LUCs for the site remain in place and are functioning effectively (e.g., education awareness measures are being implemented and are up-to-date).

Table 2-16. Summary of Elements: Remedial Alternative 4 (continued)

Remedial Action Objective	Exposure Routes	Remedy Component	How the Component Contributes to Achieving the Remedial Action Objective
Prevent the exposure of human receptors to contaminated soil above Remedial Goals (RGs) based on current and anticipated future land use. Prevent soil from contaminating groundwater above health-based standards that would result in unacceptable risk. Prevent soil from contaminating surface water	Direct contact (incidental ingestion or dermal contact) of surface and subsurface soil (Future unrestricted use scenario – children only)	Sample mechanically separated soil and remove from site if contaminated by MC/COPCs	This component will confirm that soil is suitable for reuse in accordance with the Remedial Design Plan and, therefore, will prevent contaminated soil from being returned to the site after excavation. This will help to prevent future child residents from being exposed to MC/COPCs in soil via direct contact, though it will not remove all contaminated soil from the site.
		Restrict the site to non-residential land use	This component will eliminate the residential exposure scenario and, therefore, prevent future child residents from being exposed to MC/COPCs in soil via direct contact.
		Groundwater use restrictions (i.e., prohibit use as potable source)	This component will eliminate the drinking water exposure scenario and therefore prevent hypothetical future residents, park workers, and recreational users from being exposed to MC/COPCs via ingestion as drinking water. Note that the mechanical separation and MEC clearance will remove the majority of UXO/DMM at the site, which will remove the primary source of MC/COPCs.
		Conduct one round of groundwater sampling prior to any remedial action and another round to determine the impact of the remedial action on the groundwater. Conduct long-term groundwater monitoring (if necessary).	This component will confirm that COPC source removal was successful in preventing on going contribution of contamination from the source area to groundwater. • If the results post-remedy are in compliance with Federal and State health-based drinking water standards, no further LUC for groundwater is required. • If the results exceed Federal and State health-based drinking water standards and impacts on groundwater are found during post-remedial action groundwater sampling, groundwater use restrictions will stay in place and long-term groundwater monitoring will be undertaken.
Minimize exposure of ecological receptors to contaminated surface soil (concentrations above ss-ESCOs)	Dietary exposure of wildlife and/or direct exposure of plants and soil invertebrates	Construct a 12-inch thick soil cover over soils presenting a risk to ecological receptors	This component will prevent terrestrial ecological receptors from being exposed to MC/COPCs in soil via direct contact and dietary exposure by establishing a 12-inch barrier of soil over the contaminated soil.

2.13.3 Cost Estimate for the Selected Remedy

The estimated total cost for the selected remedy is \$15,929,063 (**Table 2-17**). The TPV cost of the selected remedy is \$15,675,297 (**Table 2-18**). The cost includes a 20% contingency and the TPV is based on a discount rate of 0.6 percent. The discount rate of 0.6 TPV is based on the 2018 update (Office of Management and Budget [OMB], 2018) to the OMB Circular A-94 for benefit-cost analyses of proposed federal programs, policies, and regulations (OMB, 1992). The information in this cost estimate summary table is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Major changes may be documented in the form of a memorandum in the Administrative Record file, an ESD, or a Record of Decision amendment. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

Table 2-17.
Cost Estimate Summary for the Selected Remedy

Alternative 4: Partial Excavation with MPPEH Removal Excavate the OD Hill and perform surface/subsurface clearance over site and LUCs Initial Field Duration: 40 Months		
Controls	LUCs • Capital Cost: \$ 149,513 • Annual O&M: \$ 16,734 per year ⁽¹⁾ • Periodic Costs Total: \$ 174,587	\$ 826,105 ⁽²⁾
Support Tasks	Grubbing and Vegetation Clearance with UXO Technician Support	\$ 1,081,240
	Site Re-grading and Re-vegetation	\$ 1,041,267
	Remedial Design Sampling	\$ 194,001
LTM	Annual Groundwater Sampling and Reporting • Annual O&M: \$33,923 per year	\$ 1,017,707
	Post RA Groundwater Confirmation Sampling	\$ 354,174
Soil	9-inch Soil Cap for Eco Protection	\$ 619,539
MEC Detection/Removal	Excavate, Clear soil of MPPEH, and Return as Fill or Haz waste off-site disposal after Surface/Subsurface Clearance	\$ 4,800,039
	Surface/Subsurface Clearance	\$ 5,819,991
Reporting	Work Planning	\$ 100,000
	Final Reporting	\$ 75,000
Total		\$ 15,929,063

(1) O&M and periodic costs are total estimated costs over 30 years.

(2) All costs are capital costs unless otherwise noted.

Table 2-18.
Total Present Value Estimate for the Selected Remedy

Alt 4	Partial Excavation with MPPEH Removal					
Year	Capital Cost (\$)	Annual O&M Costs (\$)	Periodic Costs (\$)	Total Cost + 0% Tax (\$)	Discount Factor at 0.6%	Present Value at 3%
0	\$3,978,315.24	\$50,657.08		\$4,028,972.32	1.00	\$4,028,972.32
1	\$3,978,315.24	\$50,657.08		\$4,028,972.32	0.99	\$4,004,942.66
2	\$3,978,315.24	\$50,657.08		\$4,028,972.32	0.99	\$3,981,056.32
3	\$2,122,731.30	\$50,657.08		\$2,173,388.38	0.98	\$2,134,732.19
4	\$177,086.82	\$50,657.08	\$18,202	\$245,945.96	0.98	\$240,130.75
5	\$0.00	\$50,657.08		\$50,657.08	0.97	\$49,164.35
6	\$0.00	\$50,657.08		\$50,657.08	0.96	\$48,871.12
7	\$0.00	\$50,657.08	\$21,791	\$72,448.54	0.96	\$69,477.43
8	\$0.00	\$50,657.08		\$50,657.08	0.95	\$48,289.90
9	\$0.00	\$50,657.08	\$18,202	\$68,859.14	0.95	\$65,249.89
10	\$0.00	\$50,657.08		\$50,657.08	0.94	\$47,715.60
11	\$0.00	\$50,657.08		\$50,657.08	0.94	\$47,431.01
12	\$0.00	\$50,657.08		\$50,657.08	0.93	\$47,148.12
13	\$0.00	\$50,657.08		\$50,657.08	0.93	\$46,866.92
14	\$0.00	\$50,657.08	\$18,202	\$68,859.14	0.92	\$63,327.14
15	\$0.00	\$50,657.08		\$50,657.08	0.91	\$46,309.54
16	\$0.00	\$50,657.08		\$50,657.08	0.91	\$46,033.34
17	\$0.00	\$50,657.08	\$21,791	\$72,448.54	0.90	\$65,443.11
18	\$0.00	\$50,657.08		\$50,657.08	0.90	\$45,485.87
19	\$0.00	\$50,657.08	\$18,202	\$68,859.14	0.89	\$61,461.05
20	\$0.00	\$50,657.08		\$50,657.08	0.89	\$44,944.91
21	\$0.00	\$50,657.08		\$50,657.08	0.88	\$44,676.85
22	\$0.00	\$50,657.08		\$50,657.08	0.88	\$44,410.39
23	\$0.00	\$50,657.08		\$50,657.08	0.87	\$44,145.52
24	\$0.00	\$50,657.08	\$18,202	\$68,859.14	0.87	\$59,649.95
25	\$0.00	\$50,657.08		\$50,657.08	0.86	\$43,620.50
26	\$0.00	\$50,657.08		\$50,657.08	0.86	\$43,360.34
27	\$0.00	\$50,657.08	\$21,791	\$72,448.54	0.85	\$61,643.05
28	\$0.00	\$50,657.08		\$50,657.08	0.85	\$42,844.66
29	\$0.00	\$50,657.08	\$18,202	\$68,859.14	0.84	\$57,892.21
Total	\$14,234,764	\$1,519,712	\$174,587	\$15,929,063		\$15,675,297
				Total Cost + 0% Tax(\$)		\$15,929,063
				Lower end of TPV Range at -35%		\$10,188,943
				Upper end of TPV Range at +50%		\$23,512,946

2.13.4 Expected Outcomes of the Selected Remedy

Following the implementation of the selected remedy at the OD Grounds MRS, the land at the OD Grounds MRS will be available for its current planned use (conservation/recreation); however, land use will be restricted and future uses at the MRS may require construction support. Statutory reviews will also be required within five years after initiation of remedial action to ensure that the remedy is, or will remain, protective of human health and the environment. The clean-up goals for human health are achieved through LUCs. The ecological clean-up goal used to guide the soil remediation are presented in **Table 2-13** and are based on the NYSDEC's methodology for Ecological Soil Cleanup Objectives (ESCOs) for the state's Brownfield Cleanup Program (NYSDEC, 2006). It is expected that the LUCs for human receptors and soil remediation for ecological receptors will be protective of human health and the environment.

There are no socioeconomic or community revitalization impacts anticipated as a result of implementing the selected remedy. Environmental and ecological benefits are anticipated as a result of the excavation of MEC and MC at the MRS.

2.14 STATUTORY DETERMINATIONS

Based on the information currently available, the selected remedy for the OD Grounds MRS is protective of human health and the environment and satisfies the statutory requirements of CERCLA §121(b) with regards to the former use of the MRS by the DoD. The selected remedy complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action (**Table 2-19**), is cost-effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

Because this remedy will not allow for unlimited use and unrestricted exposure at the MRS, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

Table 2-19.
Summary of ARARs, "To-Be-Considered," or Other Guidance

<i>Chemical-Specific ARARs, TBCs, or other guidance</i>			
Medium/Action	Requirement	Prerequisite	Citation
Surface and subsurface Soil/Excavation of OD Hill	Shall Not Exceed USEPA RSLs for Industrial Soil Aroclor-1254: 0.97 mg/kg	Presence of COCs – To Be Considered	USEPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=1) November 2024
	Shall not exceed the NYS Subparts 375-6 Remedial Program Soil Cleanup Objectives for Protection of Ecological Resources Cadmium: 4.0 mg/kg	Presence of COCs – Relevant and Appropriate	6 CRR-NY Subpart 375-6, Table 375-6.8(b)
Surface Soil/Excavation of OD Hill	Shall not exceed the NYS Subparts 375-6 Remedial Program Soil Cleanup Objectives for Protection of Ecological Resources - Copper: 50 mg/kg - Lead: 63 mg/kg - Mercury: 0.18 mg/kg	Presence of COCs – Relevant and Appropriate	6 CRR-NY Subpart 375-6, Table 375-6.8(b)
	Shall not exceed New York State Brownfield Cleanup Program Development of Soil Cleanup Objectives Technical Support Document for the calculation of Ecological Soil Cleanup Objectives (ESCOs). - Bis (2-ethylhexyl) phthalate: 0.38 mg/kg - Di-n-butylphthalate: 0.17 mg/kg - Endosulfan I: 12.8 mg/kg	Presence of COCs – To Be Considered	New York State Brownfield Cleanup Program Development of Soil Cleanup Objectives Technical Support Document September 2006

Table 2-19. (continued)
Summary of ARARs, "To-Be-Considered," or Other Guidance

<i>Chemical-Specific ARARs, TBCs, or other guidance</i>			
Medium/Action	Requirement	Prerequisite	Citation
Surface Soil/Excavation of high-density Kickout Area	Shall Not Exceed USEPA RSLs for Industrial Soil - MCPA: 410 mg/kg - Cobalt: 350 mg/kg	Presence of COCs – To Be Considered	USEPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=1) November 2024
	Shall not exceed the NYS Subparts 375-6 Remedial Program Soil Cleanup Objectives for Protection of Ecological Resources - Manganese: 1,600 mg/kg - Copper: 50 mg/kg - Lead: 63 mg/kg - Mercury: 0.18 mg/kg	Presence of COCs – Relevant and Appropriate	6 CRR-NY Subpart 375-6, Table 375-6.8(b)
	Shall not exceed New York State Brownfield Cleanup Program Development of Soil Cleanup Objectives Technical Support Document for the calculation of Ecological Soil Cleanup Objectives (ESCOs). - Bis (2-ethylhexyl) phthalate: 0.38 mg/kg - Di-n-butylphthalate: 0.17 mg/kg	Presence of COCs – To Be Considered	New York State Brownfield Cleanup Program Development of Soil Cleanup Objectives Technical Support Document September 2006
Groundwater/Potential Impacts from Excavation of OD Hill and high-density Kickout Areas	COCs Shall Not Exceed USEPA RSLs for Tap Water (HQ=1)	Groundwater is not medium of concern at the OD Grounds MRS – To Be Considered	USEPA Regional Screening Level (RSL) Residential Tapwater Table (TR=1E-06, HQ=1) November 2024
Sediment/Potential Impacts from Excavation of OD Hill and high-density Kickout Areas	COCs Shall Not Exceed Class B Criteria	Sediment is not medium of concern at the OD Grounds MRS – To Be Considered	Screening and Assessment of Contaminated Sediment, Table 5. Div of Fish, Wildlife and Marine Resources, Bureau of Habitat June 2014

Table 2-19. (continued)
Summary of ARARs, "To-Be-Considered," or Other Guidance

<i>Location-Specific ARARs, TBCs, or other guidance</i>			
Medium/Action	Requirement	Prerequisite	Citation
N/A	None Identified	N/A	N/A
<i>Action-Specific ARARs, TBCs, or other guidance</i>			
Medium/Action	Requirement	Prerequisite	Citation
Installation of soil covers	Compliance for soil which exists at or is imported to a site	Regulations for soil to be used as soil cover for areas which exceed RGs – To Be Considered	NYS DER-10 (2010), Section 5.4 (e)
Installation of soil covers	Factors to consider when installing soil cover	Regulations for soil to be used as soil cover for areas which exceed RGs – To Be Considered	NYS DER-10 (2010), Section 4.1 (f)
Installation of soil covers	Factors to consider when bringing soil onsite for use as a cover or backfill	Regulations for soil to be used as soil cover or backfill – Relevant and Appropriate	6 CRR-NY 375-6.7

2.15 DOCUMENTATION OF SIGNIFICANT CHANGES FROM PREFERRED ALTERNATIVE OF PROPOSED PLAN

The selected remedy described in this Record of Decision is unchanged from that detailed in the Final Proposed Plan (USACE 2024).

3 RESPONSIVENESS SUMMARY

3.1 STAKEHOLDER ISSUES AND LEAD AGENCY RESPONSES

3.1.1 Regulatory Concurrence and Comment

The investigation/removal action reports and FS report (including the FS Addendum 1: Supplemental Site Characterization and Errata Sheet #1) relating to the evaluations at the OD Grounds MRS were submitted to NYSDEC and USEPA for review and comment. NYSDEC formally concurred with the recommendations in the FS report on 02 May 2022, via a letter with the subject *Re: Open Detonation Grounds Feasibility Study, Seneca Army Depot, NYSDEC Site 850006*. The USEPA formally concurred with the recommendations in the FS report and the Errata Sheet #1: on 07 April 2022 (**Appendix A**). The Proposed Plan that summarized the alternatives evaluation and recommended the Preferred Alternative for the OD Grounds MRS was also submitted to NYSDEC and USEPA for review and comment. NYSDEC and USEPA formally concurred with the recommendations in the Proposed Plan on 10 September 2024 and 24 September 2024 respectively (**Appendix A**).

3.1.2 Public Comments

The Army provided the Proposed Plan for the OD Grounds MRS available for public comment between 01 October 2024, and 01 November 2024. A public meeting was held at Seneca Army Depot on 09 October from 1pm to 7pm, a stenographer was present to record verbal questions but none were asked. This public comment period and public meeting were announced through a notice placed on www.fingerlakes1.com and in the Finger Lake Times (**Appendix B**). Public comments were received from the Town of Varick Planning Board and a private citizen, those comments and their corresponding responses from the Army are presented in **Appendix C**. The comments do not result in any changes to the selected remedy.

3.1.3 Decision Document Availability

After the Record of Decision (ROD) is signed, the Army will publish a notice of availability of the ROD and make the ROD available for public inspection and copying at the online Administrative Record website (<https://senecaarmydepotar.com>) prior to the beginning of any remedial action.

3.2 TECHNICAL AND LEGAL ISSUES

There were no significant technical or legal issues raised in the process of developing this Record of Decision.

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4 REFERENCES

- Office of Management and Budget (OMB), 1992. Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs. Circular No. A-94 Revised. October 29, 1992. Available at: http://www.whitehouse.gov/omb/circulars_a094.
- OMB, 2018. Memorandum for The Heads of Departments and Agencies. Circular No. A-94. Appendix C (Revised December 2013) Discount Rates for Cost-Effectiveness, Lease Purchase, and Related Analyses. Available at: <http://www.whitehouse.gov/sites/default/files/omb/memoranda/2017/m-14-09.pdf>.
- New York State Department of Environmental Conservation (NYSDEC), 2006. New York State Brownfield Cleanup Program, Development of Soil Cleanup Objectives, Technical Support Document. https://www.dec.ny.gov/docs/remediation_hudson_pdf/tech_suppdoc.pdf.
- NYSDEC, 2010a. DER-10 / Technical Guidance for Site Investigation and Remediation. May 3, 2010.
- NYSDEC, 2018a. Title 6, Department of Environmental Conservation Chapter IV, Quality Services, Subchapter B, Solid Wastes, Part 375, Environmental Remediation Programs, Subpart 375-6, Remedial Program Soil Cleanup Objectives (6 CRR-NY 375-6.8). Current through June 15, 2018.
- NYSDEC, 2018b. Title 6, Department of Environmental Conservation Chapter X. Division of Water Resources, Subchapter A. General. Article 2. Classifications and Standards of Quality and Purity. Part 703. Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations (6 CRR-NY 703.5). Current through June 15, 2018.
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- USACE, 2004. Final Ordnance and Explosives Engineering Evaluation/Cost Analysis Report (OE EE/CA), Seneca Army Depot. February 2004. Prepared by Parsons under contract to USACE.
- USACE, 2005. Final Site-Specific Project Report SEAD 45/115 Open Detonation Grounds Ordnance and Explosives Removal Phase I Geophysical Survey and Cost Estimate, Seneca Army Depot. March 2005. Prepared by Weston Solutions, Inc. under contract to USACE.
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- USACE, 2010. Additional Munitions Response Site Investigation Report, Seneca Army Depot. May 2010. Prepared by Parsons under contract to USACE.

- USACE, 2012. Draft Work Plan for MEC Clearance at Open Detonation (OD) Grounds, Seneca Army Depot Activity, New York. March 2012. Prepared by Shaw Environmental & Infrastructure, Inc. under contract to USACE.
- USACE, 2016. Draft Completion Report Munitions Response Action at the Open Detonation Grounds (SEAD-45) Seneca Army Depot Activity. November 2016. Prepared by Parsons under contract to USACE.
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- USACE, 2019. Letter Report for the OD Grounds Perchlorate Sampling. 02 April 2019. Prepared by Parsons under contract to USACE.
- USACE, 2020a. Letter Report for the OD Grounds Perchlorate Sampling. 01 April 2020. Prepared by Parsons under contract to USACE.
- USACE, 2020b. Trial Period Extension for Risk Management Methodology (RMM) at Formerly Used Defense Sites (FUDS) Military Munitions Response Program (MMRP) Projects. March.
- USACE, 2022a. Revised Final, Addendum 1: Supplemental Site Characterization. Open Detonation Grounds. Seneca Army Depot Activity. April 2022. Prepared by Parsons under contract to USACE.
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- USEPA, 2007. User's Guide for the Integrated Exposure Uptake Biokinetic Model for lead in Children (IEUBK), Window. Office of Superfund Remediation, 9285.7-42. May. (<http://www.epa.gov/superfund/lead/products/ugieubk32.pdf>)
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APPENDIX A USEPA AND NYSDEC CONCURRENCE LETTERS

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[REDACTED]

[REDACTED]

From: Morse, Bob <Morse.Bob@epa.gov>

Sent: Thursday, April 07, 2022 11:53 AM

To: Gallo, Christopher T CIV USARMY CENAN (USA) <Christopher.T.Gallo@usace.army.mil>

Cc: Moore, James T CIV USARMY CEHQ (USA) <James.T.Moore@usace.army.mil>; [REDACTED]
[REDACTED]; Sweet, Melissa L (DEC) <melissa.sweet@dec.ny.gov>

Subject: [EXTERNAL] Seneca OD Grounds FS

Chris,

EPA has reviewed each of the elements of the Feasibility Study (FS) for the Open Detonation (OD) Grounds Site as described in the attached Errata # 1 to the FS, dated March 2, 2022.

EPA hereby approves the FS as described in the Errata Sheet, along with the information in the emails below.

Please let me know if you have any questions. Thank you.

Bob

Bob Morse
Remedial Project Manager
USEPA Region 2
Superfund and Emergency Management Division
Federal Facilities Section
290 Broadway 18th Floor
New York, NY 10007-1866
Phone: Office (212) 637-4331
Cell: 908-581-3791

From: Gallo, Christopher T CIV USARMY CENAN (USA) <Christopher.T.Gallo@usace.army.mil>

Sent: Wednesday, April 6, 2022 11:44 AM

To: Morse, Bob <Morse.Bob@epa.gov>

Cc: Moore, James T CIV USARMY CEHQ (USA) <James.T.Moore@usace.army.mil>; [REDACTED]
[REDACTED]; Sweet, Melissa L (DEC) <melissa.sweet@dec.ny.gov>

Subject: RE: EPA Review of Seneca OD Grounds Revised Site Characterization Report and RTC

Thanks Bob,

Army is ok with this approach but would like to discuss sampling options during the RD as we would like to be on the same page as to what would be the most beneficial for EPA's evaluation.

Can the EPA provide a simple email/letter attesting to their "approval" of the FS/Errata?

If you would like to discuss more, please let me know and I will set up a call.

Thanks again Bob!

-Chris

Christopher T. Gallo
Project Manager
Environmental, InterAgency &
International Services Branch
US Army Corps of Engineers New York District
26 Federal Plaza, Room 17-401
New York, NY 10278-0090
917.790.8230 (Office)
917.575.1819 (Mobile)

From: Morse, Bob <Morse.Bob@epa.gov>

Sent: Thursday, March 31, 2022 3:45 PM

To: Gallo, Christopher T CIV USARMY CENAN (USA) <Christopher.T.Gallo@usace.army.mil>

Cc: Moore, James T CIV USARMY CEHQ (USA) <James.T.Moore@usace.army.mil>; [REDACTED]
[REDACTED]; Sweet, Melissa L (DEC) <melissa.sweet@dec.ny.gov>

Subject: [Non-DoD Source] EPA Review of Seneca OD Grounds Revised Site Characterization Report and RTC

Chris,

EPA has reviewed the revised Site Characterization Report and RTC for the OD Grounds. We have one comment, related to the surface water evaluation and Response #7 in the RTC:

Despite SVOC exceedances at this location in only one of two sampling events, the results at ODSW-10 indicate potential limited site-related SVOC-impacted surface water at this location. The conclusion section states "Further evaluation of the impacts to surface water and sediment will be considered as part of the remedial design," and we recommend that this include an evaluation of phenol, 2,4-dimethylphenol, and benzoic acid at this location.

Let me know if you have any questions or want to discuss.

Thanks,

Bob

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau A

625 Broadway, 12th Floor, Albany, NY 12233-7015

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www.dec.ny.gov

May 2, 2022

Christopher Gallo
Environmental, InterAgency &
International Services Branch
US Army Corps of Engineers
New York District
26 Federal Plaza, Room 17-401
New York, NY 10278-0090
Christopher.T.Gallo@usace.army.mil

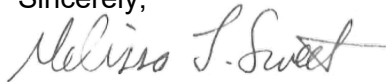
Re: Open Detonation Grounds Feasibility Study
Seneca Army Depot, NYSDEC Site 850006

Dear Chris Gallo:

The New York State Department of Environmental Conservation (referred to as the "State") has reviewed the Addendum 1: Supplemental Site Characterization for the Open Detonation Grounds at the Seneca Army Depot, dated March 2022, the Errata #1: OD Grounds Feasibility Study Report, Seneca Army Depot, New York dated March 2, 2022, and all the documents referenced therein. We have no further comments and accept these documents.

If you have any questions on the matter, please contact me at (518) 402-9614 or melissa.sweet@dec.ny.gov.

Sincerely,



Melissa L. Sweet, PE
Project Manager

ec: J. Swartwout – NYSDEC
D. Pratt, D. Miles – NYSDEC, R8
M. Sergott, J. Deming – NYSDOH
B. Morse – USEPA
J. Moore, C. Heaton, B. Hodges – USACE
B. Badik – Parsons



Department of
Environmental
Conservation

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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Transmitted via Email

September 10, 2024

Christopher Gallo
US Army Corps of Engineers - New York District
26 Federal Plaza, Room 17-401
New York, NY 10278-0090
christopher.t.gallo@usace.army.mil

**Re: Proposed Plan for Open Detonation Grounds Munition Response Site
Seneca Army Depot
NYSDEC Site No. 850006**

Dear Chris Gallo:

The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) have reviewed the Proposed Plan (dated July 2024) for the Open Detonation Grounds (OD Grounds) Munition Response Site (MRS) at the Seneca Army Depot located in Seneca County. NYSDEC and NYSDOH understand the Proposed Plan addresses the remaining munitions and munitions constituents within this area.

The United State Army's proposed remedy includes excavation of the OD Hill, performance of surface/subsurface clearance over entire OD Grounds MRS, and Land Use Controls (LUCs). The major components of the remedy include the following:

- Excavation of the OD Hill to grade and mechanical separation of munitions and explosives of concern (MEC) from excavated soil, creating three piles: unexploded ordnance/discarded military munition (UXO/DMM), munitions debris (MD), and processed soil (debris-free soil).
- Confirmatory sampling at the post-excavation grade to evaluate whether preliminary remediation goals (PRGs), in this case NYSDEC commercial soil cleanup objective (SCOs), have been met or if further excavation is necessary.
- If ecological SCOs are exceeded, but commercial SCOs are met, construct a 12-inch soil cover in discrete areas as necessary.
- Soil sampling of processed soils to determine the potential for reuse within the OD Grounds if the soil meets or is below PRGs or support appropriate off-site disposition or treatment (if above PRGs).
- Surface/subsurface clearance using digital geophysical mapping/advanced geophysical classification (DGM/AGC) mapping to a depth of detection over the entire MRS.



Department of
Environmental
Conservation

- Groundwater, surface water, and sediment sampling to determine the impact of the remedial action on groundwater and Reeder Creek surface waters and sediments. If ARARs/TBCs are met no LUCs or Long-term monitoring (LTM) for groundwater are required. If ARARs/TBCs are not met, groundwater use restrictions will be put in place with LTM and LUCs.
- LUCs include: prohibition of residential use, daycare facilities, playgrounds, camping, and agriculture/farming; LUCs would include an environmental easement to prohibit unauthorized intrusive activities (requiring construction support, if necessary); maintenance/upkeep of the perimeter fence controlled by the landowner; educational awareness of the 3Rs (Recognize, Retreat, Report) for property users; and public educational awareness through signs and annual briefings to site personnel.
- Annual inspections include soil cover inspection, potentially groundwater monitoring, and LUC inspections.
- Five-Year Reviews.

Based upon this information, the State concurs with the proposed remedy for the OD Grounds MRS in the Proposed Plan for Seneca Army Depot.

If you have questions regarding this letter, please contact the NYSDEC project manager, Melissa Sweet, at (518) 402-9614 or melissa.sweet@dec.ny.gov.

Sincerely,

Andrew Guglielmi

Andrew O. Guglielmi

Director

Division of Environmental Remediation

cc: J. Brown
R. Mustico
J. Swartwout
M. Sweet
D. Pratt
C. Vooris, NYSDOH
J. Deming, NYSDOH
M. Sergott, NYSDOH
T. Heins, USACE



REGION 2

NEW YORK, N.Y. 10007

September 24, 2024

Mr. Christopher Gallo
U. S. Army Corps of Engineers – New York District
26 Federal Plaza, Room 17-401
New York, NY 10278-0090

Re: Proposed Plan for Operable Unit 17 – Open Detonation Grounds Munitions Response Site,
Seneca Army Depot Activity, Romulus, New York

Dear Mr. Gallo:

Based on the U. S. Environmental Protection Agency's (EPA) review of the U. S. Army Corps of Engineers' (USACE) Remedial Investigation Report, Feasibility Study, and Proposed Plan, EPA concurs with the release of the Proposed Plan for the Open Detonation Grounds (OD Grounds) Munitions Response Site (MRS), dated September 2024 for public comment. The Proposed Plan proposes a remedial action consistent with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §9601 et seq., and with the National Oil and Hazardous Substances Pollution Contingency Plan. The preferred alternative identified in the Proposed Plan calls for the following:

- Land use and activity restrictions (*i.e.*, prohibit residential use and intrusive activity to uncleared depths without construction support).
- Short-term groundwater use restrictions (*i.e.*, prohibit use as potable source).
- Maintenance/upkeep of the perimeter fence.
- Educational Awareness.
- One round of groundwater, surface water, and sediment sampling prior to any remedial action.
- Excavation of OD Hill to grade and mechanical separation of Unexploded Ordinance (UXO)/Discarded Military Munitions (DMM) from excavated soil, creating a pile of UXO/DMM, a pile of Munitions Debris (MD), and pile of processed soil (*e.g.*, loose debris-free soil).
- Confirmatory sampling to be conducted to evaluate whether soil remaining in place meets the Preliminary Remediation Goals (PRGs), or if additional excavation is required to achieve the PRGs. In the case where ecologically based PRGs (ss-ESCOs) are exceeded but all other PRGs are achieved, this alternative includes construction of 12-inch soil cover in discrete areas, as needed.

- Following UXO/DMM separation, soil sample collection will be conducted from the excavated and processed soils to determine the potential for the reuse of the soil within the OD Grounds MRS or to support a determination of appropriate disposition for off-site disposal.
- Digital Geophysical Mapping/Advanced Geophysical Classification mapping and intrusive investigation to remove UXO/DMM to a depth of detection over the entire MRS.
- Post-remedial action groundwater, surface water, and sediment sampling to determine the impact of the remedial action on these media in Reeder Creek.
- If the results are in compliance with site applicable or relevant and appropriate requirements and/or “to-be considered” standards or other guidance, no further land use control (LUC), and no long-term monitoring (LTM), for groundwater is required.
- If the results exceed Federal or State health-based drinking water standards and impacts on groundwater are found during post-remedial action groundwater sampling, Groundwater Use Restrictions will stay in place and long-term groundwater monitoring will be under-taken.
- Annual LUC inspections.

This Proposed Plan addresses only the above site. Other areas of concern have been or will be addressed through removal actions or remedial actions.

If you have any questions regarding the subject of this letter, please contact me at (212) 637-4447 or have your staff contact Karyn Treinen, EPA Project Manager, at (212) 637-4436.

Sincerely,

Evangelista, Pat

Digitally signed by
Evangelista, Pat
Date: 2024.09.24
21:46:24 -04'00'

Pat Evangelista, Director

Superfund & Emergency Management Division

cc: T. Heins, USACE
A. Guglielmi, NYSDEC

APPENDIX B
ANNOUNCEMENT OF PUBLIC NOTICE

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PUBLIC NOTICE

U.S. Army, USEPA, and NYSDEC Invite Public Comments

on the Proposed Plan for the Open Detonation (OD) Grounds Munitions Response Site

at the Former Seneca Army Depot Romulus, NY

The public is invited to attend an in-person meeting on 9 October 2024 about the planned remedial action alternatives at the Former Seneca Army Depot OD Grounds Munitions Response Site (MRS), located in the Towns of Romulus and Varick, Seneca County, New York. The OD Grounds MRS consists of approximately 403 acres in the northwest corner of the Former Seneca Army Depot boundary and contains two areas, the "OD Hill", an area of elevated topography at the center of the OD Grounds MRS where open detonation operations occurred and the "Kickout Area" which is the portion of the MRS surrounding the OD Hill in which blast fragments emanating from open detonation operations might be found. The Kickout Area extends out approximately 2,500 feet (ft) from the center of the OD Grounds MRS.

Geophysical surveys and intrusive investigations, and munitions constituent (MC) sampling events have taken place at the OD Grounds MRS during previous investigations. Based on these previous investigations, the Army believes that unacceptable risks from potential exposure to munitions and explosives of concern (MEC) and MC are present at the OD Grounds MRS. MEC risk assessments have identified that unacceptable risk under current and reasonably anticipated future land use conditions. A risk assessment conducted on the MC sampling results found unacceptable carcinogenic and non-carcinogenic risks from consumption of groundwater.

The U.S. Army has completed the investigation stage and will be discussing the planned remedial alternatives. Implementation of the proposed remedy (Alternative 4, listed below) will reduce the risk associated with MEC or MC potentially remaining on-site by reducing the likelihood of exposure, and the proposed remedy includes educating potential receptors on the risk associated with the potential presence of MEC. The alternatives discussed below were screened for effectiveness, implementability, and cost before being analyzed in a detailed alternative evaluation. This screening process is used to select the most favorable alternatives for a detailed analysis.

Based on previous investigation and removal actions at the OD Grounds MRS, the Army evaluated six remedial alternatives to address the potential remaining explosive hazards:

1. No Action (serves only as a baseline to which to compare the other alternatives; it is not a viable option considered for the MRS)
2. Land Use Controls (LUCs)
3. Consolidate and cap with surface and subsurface clearance outside the cap and LUCs
4. Excavate OD Hill to grade and perform surface/subsurface clearance over the entire OD Grounds MRS and LUCs
5. Excavate the entire OD Grounds MRS to 1 foot below grade and perform surface/subsurface clearance
6. Excavate the entire OD Grounds MRS and process for off-site disposal

Based on the current and future anticipated land use, the results of the previous investigations and response actions, and results of the MEC and MC risk assessments, the Army and the U.S. Environmental Protection Agency (EPA), in consultation with the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health, agree that the preferred alternative for the OD Grounds MRS is Alternative 4: Excavate OD Hill to grade, perform surface/subsurface clearance over the entire OD Grounds MRS and LUCs. This alternative is recommended because it provides an acceptable level of MEC reduction for the anticipated future land use, achieves the remedial action objectives (RAOs), does not require significant long-term maintenance, and is cost-effective. This alternative prohibits daycare facilities, playgrounds, agriculture/farming, and camping and requires the Army (or Army contractor) to conduct an annual 3R (i.e., Recognize, Retreat, Report) Explosives Safety Education Program for future site personnel of the Seneca Army Depot OD Grounds MRS.

Public Meeting

9 October 2024 at 1:00 to 7:00pm

Former Seneca Army Depot,
5786 State Route 96, Building 125
Romulus, NY 14541

At this public meeting, the Army will present and discuss the proposed alternative for the OD Grounds MRS. Members of the public are encouraged to ask questions and provide oral or written comments at the meeting. The Proposed Plan is available for public comment at the following link: <https://www.nan.usace.army.mil/Missions/Environmental/Environmental-Remediation/BRAC/Seneca-Army-Depot/> The entire Seneca Army Depot Administrative Record is available for review at <https://senecaarmydepotar.com/>. The Army welcomes public comment concerning this site and the proposed remedy. Comments should be provided before 1 November 2024. Upon completion of the review, the findings will be available at the Administrative Record.

If you wish to submit comments, please submit them to:

Chris Gallo, New York District Project Manager and BRAC Environmental Coordinator (BEC)

Office Phone: 917-790-8230

Email: Christopher.T.Gallo@usace.army.mil

Karyn Treinen, Remedial Project Manager, U.S. Environmental Protection Agency, Region 2

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PUBLIC NOTICE: Public Comments and in-person meeting for Proposed Plan at Seneca Army Depot

October 2, 2024 4:07 PM / Updated: October 2, 2024 4:07 PM / [1 Digital Team](#)

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APPENDIX C

PUBLIC COMMENTS RECEIVED ON PROPOSED PLAN

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Comments from Private Citizen Received on November 1, 2024

Comment 1: Did the Army determine, via digital geophysical methods and soil sampling, how deep the MEC is at the Hill (i.e., kickout and contaminants above explosive and residential or other action levels)? In the outlying "kickout" area?

Response: All data has been considered and evaluated in developing the Remedial Action Objectives (RAOs), which were developed to protect receptors (i.e. people). The Remedial Action Objectives (RAOs) define the depth to which the removal action will be conducted. RAO depth is based on the maximum depth of munitions and explosives or concern (MEC) as well as all material potentially presenting and explosive hazard (MPPEH).

Comment 2: This is a RCRA OD unit. The RCRA regulations require the owner/operator to remove all waste and equipment and to seek to clean close the units since these are classified by the regulations as treatment units, not disposal units. RCRA requires all explosive material/residuals/chunks be removed or treated to below explosive levels, and that the owner/operator seek to remove contamination to safe levels before the unit can be reclassified, after a concerted effort to clean close, as a disposal unit (i.e., go to post-closure care). [See: "Risk-Based Clean Closure" memo, Elizabeth Cotsworth, Acting Director, Office of Solid Waste to RCRA Senior Policy Advisors Regions I-X, 3/16/98].

Response: The OD Grounds Munitions Response Site (MRS) is located within the Former Seneca Army Depot and is a closed facility with waste in place with no active waste generation. The Federal Facility Agreement (FFA) directs that the OD Grounds be handled under the CERCLA regulations. Due to the closure of the Base, the Resource Conservation and Recovery Act (RCRA) permit was not finalized as Final Status and the site is not considered a RCRA regulated unit. RCRA Closure requirements and RCRA Corrective Action requirements were deferred to the CERCLA program through the Federal Facility Agreement between the USEPA, NYSDEC, and the Army. Consistent with the FFA, with respect to releases of hazardous waste, some RCRA regulations shall be considered as Applicable or Relevant and Appropriate Regulations (ARARs) pursuant to Section 121 of CERCLA, 42 U.S.C. §9621. Therefore, the OD Grounds MRS Proposed Plan is compliant with the CERCLA program requirements.

Comment 3: Are the MEC/MCs of concern (metals (e.g., Pb, As) and explosives (e.g., RDX, HMX, TNT, RDT, perchlorate) being remediated in soils, surface water, and groundwater to safe levels? Have sediments been remediated to safe levels? Has there been any soil sifting for removal of kickout, frag, and chunks of explosives?

Response: If Preliminary Remediation Goals (PRGs) are exceeded for MEC/MC of concern, the soil and sediment will be addressed with additional excavation. As described on page 31, second paragraph in the Proposed Plan, "Following the excavation work at the OD Hill and any surrounding high-density areas, confirmatory samples will be collected from the newly exposed surface soil in the footprint of the excavation and compared to the PRGs. If confirmatory sample(s) exceed the PRGs, additional over-excavation may be performed, followed by additional confirmatory sampling until the OD Grounds MRS cleanup goals are met. If sampling within the OD Grounds MRS, in the remaining deeper soils following excavation and processing from the OD Hill and surrounding high-density areas (now surface soil), identifies portions of the remaining in-situ soils that exceed the ss-ESCOs, and that may present a risk to ecological receptors, a soil cover may be used to mitigate this risk. Alternatively, the soil will be excavated and sampled until confirmatory results achieve PRGs, as described above). The soil cover will consist of at least 12-inches of compacted soil borrowed from a source within the OD Grounds MRS where analytes are either not present or at levels below ARARs and/or TBCs. The soil cover will be inspected as part of the annual LUCs inspections."

Response Continued: Soil sifting has not previously been conducted at the OD Grounds. Per the Proposed Plan, soil sifting will be conducted for the material excavated from the OD Hill area and the immediately surrounding area with a high density of anomalies as described in Alternative 4 on page 31 of the Proposed Plan, "Excavation of OD Hill to grade and mechanical separation of UXO/DMM from excavated soil, creating a pile of UXO/DMM, a pile of MD, and pile of processed soil (e.g., loose debris-free soil)." Soil sifting will not be necessary in less dense areas where Advanced Geophysical Classification (AGC) will be implemented.

Sediment, surface water, and groundwater are not current media of concern. Additional sampling of media will be conducted after the completion of the remedial action to reassess if sediment, surface water, and groundwater continue to not pose a potential risk to human health and the environment. As described in the Proposed Plan, the remedy includes "Post-remedial action groundwater, surface water, and sediment sampling to determine the impact of the remedial action on these media in Reeder Creek."

Comment 4: Is groundwater being remediated? Is pump and treat being used? Have drinking water wells in the area been identified and assessed?

Response: Groundwater is currently not a medium of concern, meaning that concentrations do not cause a risk to human health or the environment. Part of the Proposed Plan remedy is to assess groundwater again after the remedial action to confirm that groundwater continues to not be a medium of concern. "If the results exceed Federal or State health-based drinking water standards and impacts on groundwater are found during post-remedial action groundwater sampling, groundwater use restrictions will stay in place and long-term groundwater monitoring will commence." A drinking water well inventory was conducted, and no drinking water wells were identified within the MRS. Drinking water wells within one mile of the MRS are screened within the bedrock aquifer, which due to geology, is unlikely to be impacted from vertical migration.

Comment 5: Does option 4 include capping the Hill? Capping any of the rest beyond the Hill? Scraping contaminated soil and replacing with clean soil in either of these areas?

Response: As described in the Proposed Plan under Alternative 4 on page 31, "Excavation of OD Hill to grade and mechanical separation of UXO/DMM from excavated soil, creating a pile of UXO/DMM, a pile of MD, and pile of processed soil (e.g., loose debris-free soil). Confirmatory sampling to be conducted to evaluate whether soil remaining in place meets the PRGs, or if additional excavation is required to achieve the PRGs. In the case where ecologically based PRGs (ss-ESCOs) are exceeded but all other PRGs are achieved, this alternative includes construction of 12-inch soil cover in discrete areas, as needed."

The OD Hill will be removed, and so it will not be capped. Soil that meets the PRGs will be placed over disturbed areas.

Comment 6: Two similar Army OD facilities (Ft. Wingate, NM and Umatilla, OR) are both pursuing more extensive cleanup to the tune of \$200m each, the cost estimated for similar cleanup at Seneca. Why this inconsistency in cleanup?

Response: The scale of the work being completed at Fort Wingate, NM and Umatilla, OR is different from what is proposed at the OD Grounds at the Former Seneca Army Depot. The acreage requiring excavation and mechanical separation at Ft. Wingate and Umatilla is larger than at the OD Grounds. In addition, the depth of excavation for a majority of the area at those sites is greater than at the OD Grounds, resulting in significantly more volume and higher associated costs.

Comment 7: The proposal "prohibits daycare facilities, playgrounds, agriculture/farming, and camping." Shouldn't schools, hospitals, and residences; biking and hiking, including walking dogs; picnics; and sports (e.g., soccer, baseball, volleyball, and football) also be specifically prohibited? Is this to be accomplished through land use/zoning controls and land access restrictions (e.g., fences and signs)? It should be. Will the Army retain ownership and responsibility for post-closure care, such as access controls, runoff controls, and monitoring, according to the RCRA disposal facility long term post-closure care maintenance and controls requirements? The Army should. Do these prohibitions apply to the whole OD area, or just the Hill? They should apply to all areas that are not cleaned to residential standards.

Response: The Proposed Plan covers a variety of suggested activities that would be prohibited under land use restrictions on the OD Grounds MRS to limit activity and reduce potential for subsurface soil contact. The list of prohibited activities does not include every possible activity with the potential for subsurface soil contact in the area. In addition, prohibited activities do not include conservation / recreational activities that may include seasonal hunting and hiking. As stated in the Proposed Plan on page 5, paragraph one, "The planned future uses of the broader property within the former SEDA includes institutional training, data storage / communication, conservation / recreation, farming / agriculture, and an office and warehousing area, whereas under this revised future use plan, the anticipated future use of the OD Grounds MRS is "conservation/recreation" , which refers to a use of the land where there is limited activity and reduced potential for subsurface soil contact (i.e., does not include playgrounds or ballparks, but may include seasonal hunting and hiking on nature trails). Five-year reviews of the remedy will also be completed as described in the Proposed Plan on page 32, "In accordance with Section 121(c) of CERCLA, [the] alternative[s] [are] subject to five year reviews to determine whether the remedy remains protective of human health and the environment." In addition to five-year reviews, fencing is currently present on the OD Grounds MRS. The Proposed Plan describes the fence and maintenance on page 30 as described, "A fence currently exists around a larger area that contains the OD Grounds MRS. The fence will be maintained in order to identify the OD Grounds MRS as a former OB/OD area and to help educate users about the potential for munitions debris and to alert all users to the 3Rs (Recognize, Retreat, Report). Note that the fence does not eliminate access to the OD Grounds MRS, as the landowner controls and can permit access to land users...In addition, as a part of this alternative SEDA would implement public educational awareness measures that would involve installation of signs, sign upkeep, and annual briefings on potential explosive hazards to future site personnel to alert them to these issues." Under CERCLA regulations, the Army will retain ownership during the remedial activity and retains responsibility for remedy integrity post-transfer. The prohibitions apply to the entire OD Grounds Munitions Response Site (MRS). As stated on page 30, paragraph 1 in Alternative 2 of the Proposed Plan, "... implement land use restrictions to prevent the future use of the OD Grounds MRS as a daycare facility, for playgrounds or camping, agriculture/farming, or for residential activities."

Comment 8: Since this is a RCRA-regulated facility, even though closure and remediation is being addressed under the Superfund program, the RCRA cleanup, closure, and post-closure standards are not just ARARs, they are requirements. A post-closure permit or permit modification to cover post-closure is required.

Response: The Former Seneca Army Depot and OD Grounds MRS is a closed facility with waste in place. A Federal Facility Agreement (FFA) signed between the Army, USEPA, and NYSDEC governs investigation and cleanup of the site, which deferred RCRA closure when the site was proposed for the National Priorities List (NPL). Due to the closure of the Base, the Resource Conservation and Recovery Act (RCRA) permit was not finalized as Final Status and the OD Grounds are not considered a RCRA regulated unit. RCRA Closure requirements and RCRA Corrective Action requirements were deferred to the CERCLA program through the Federal Facility Agreement

157 between the USEPA, NYSDEC, and the Army. Consistent with the FFA, with respect to releases of
158 hazardous waste, RCRA shall be considered an ARAR pursuant to Section 121 of CERCLA, 42 U.S.C.
159 §9621.

Comments from Town of Varick Planning Board Received on October 25, 2024

Comment 1: Regarding the four alternatives in the proposed plan, the Varick Planning Board prefers the cleanest end result that has the best prospects for future conservation habitat. Alternatives 4 and 5 both meet these goals, but we prefer Alternative 4 is because it leaves more functional soil for future plant growth.

Response: Alternative 4 is the preferred and designated more effective alternative analyzed in the Proposed plan as described in the Proposed Plan on page 40, " Based on the detailed and comparative analysis of remedial alternatives using the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) nine criteria presented in this Proposed Plan, the most effective alternative to achieve the remedial objectives for the Seneca OD Grounds MRS is Alternative 4 (Excavate OD Hill to grade, perform surface/subsurface clearance over the entire OD Grounds MRS, and LUCs)."

Comment 2: The Varick Planning Board prefers reforestation as the final treatment because that provides many of the conservation outcomes we value. Most of this the ordinance-disposal area was originally forested, so this cover is the natural succession. The cost of reforestation is not particularly high relative to other restorations because the trees can be purchased at low cost from the New York State Department of Environmental Conservation nursery, and they can be mechanically planted.

We especially value the conservation objective of protecting waterways, and water quality in Seneca Lake. Waterways leading to Seneca Lake benefit from a riparian zone that limits runoff and nutrient leaching. Reeder's Creek is a notable Seneca-Lake tributary that is impacted by phosphorus and that passes through the OD area, so that creek needs appropriate riparian vegetation. Management can profitably be informed by the DEC's newly issued strategy to manage Total Maximum Daily Load of phosphorus for Cayuga Lake* because the strategy applies equally to Seneca Lake. The most effective, and least expensive, measure is increasing tree cover, especially in the riparian zone.

The New York State Department of Environmental Conservation has great support for reforestation. We recommend following their guidance for this parcel. In particular, the DEC Forester responsible for Seneca County is Brice June. He would be an excellent contact for developing the project specifications.

The area to be remediated contains areas of three distinct types, each benefitting from a distinct planting plan. These are dry forest, wet forest and riparian zone. Mr. June recommends the following species for planting in the three zones.

In dry areas, it is advisable to use conifers such as Norway spruce, larch or red pine. DEC recommends planting 860 trees per acre. Seedlings from the DEC nursery cost \$250 per thousand. There are nearby contractors who can mechanically plant tens to hundreds of acres at reasonable cost.

In areas that are wet for significant parts of most years, it is advisable to use lowland species, such as Swamp White Oak, Burr Oak, Hackberry, Button Bush and Red Osier Dogwood. These are more expensive to establish, but are necessary where it is too wet for the conifers to thrive.

In riparian areas along Reeder's Creek, the goal is to stabilize the streambanks, promote phosphorus uptake from upstream and slow the stormwater flow. Appendix D of the ACE study provides excellent information on the phosphorus sources and loads in this area. Riparian plantings typically extend 100 feet on either side of the waterway, divided in three zones. The two outer zones have the lowland species listed previously. The 15 feet closest to the creek also has sandbar willow and a higher density of buttonbush and red osier dogwood. <https://dec.ny.gov/environmental-protection/water/water-quality/nps-program/riparian-buffers>

Comment 2 (Continued): The USDA Natural Resources Conservation Service also has helpful Practice Standards for Riparian Forest Management that can be incorporated into the Corps' restoration expectations.

In addition, the areas between the trees should be planted with an herbaceous cover that includes legumes to provide nitrogen to the trees and suppress the many invasive species that would take over if vegetative cover is not established. Soil nitrogen is necessary to support tree growth when the soil has been worked as extensively as proposed in the preferred alternatives. Red and white clover are well suited to this site and are inexpensive. A nurse crop of a fast growing but short-lived grass, such as annual ryegrass, is helpful. Cornell University recommendations on their use can be found at covercrop.org.

Response: Thank you for the information on the preferred reforestation planning specific to the OD Grounds. Planting trees/reforestation for habitat management is included as an anticipated future land use that the Army may utilize.

Comment 3: Collaboration with the DEC would be additionally valuable in that it could facilitate the property's ultimate sale by the Seneca County Industrial Development Agencies to New York State for conservation. That would be a desirable outcome from the perspective of meeting the Town of Varick's goals in the Conservation district.

Response: Thank you for the comment and consideration. Future sales would be completed after consultation with appropriate local and federal agencies.

Conservation and recreation use is included in the Proposed Plan as planned future uses of the OD Grounds. As described in the Proposed Plan, page 5 (Land Use section), "The planned Proposed Plan, Open Detonation Grounds, Seneca Army Depot Seneca Army Depot Activity -5- November 2024 OD Grounds Proposed Plan future uses of the broader property within the former SEDA includes institutional training, data storage / communication, conservation / recreation, farming / agriculture, and an office and warehousing area, whereas under this revised future use plan, the anticipated future use of the OD Grounds MRS is "conservation/recreation", which refers to a use of the land where there is limited activity and reduced potential for subsurface soil contact (i.e., does not include playgrounds or ballparks, but may include seasonal hunting and hiking on nature trails). Anticipated future land use may include the Army retaining access for groundwater monitoring, solar power generation, hunting, planting (for habitat management), and access for maintenance (e.g., roads and mowing fire breaks). The SCIDA has subsequently sold the property surrounding the Army-retained parcel to a private party for use as a conservation area."