FINAL

Site Specific Work Plan Addendum to the FUDS MMRP Programmatic Work Plan for the Site Inspection of the Mitchel Field, Garden City, New York

FUDS Project # **C02NY064503**

Prepared Under: **Contract No. W912DY-04-D-0017**
Delivery Order # 00170001

Prepared for:

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January 2009

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01/9/2009
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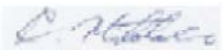

01/9/2009
Curtis Mitchell — Date
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January 2009

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LIST OF ACRONYMS AND ABBREVIATIONS

ABIH	American Board of Industrial Hygienists
Alion	Alion Science and Technology Corporation
ADC	Air Defense Command
ADR	Automated Data Review
AN	Army and Navy
APP	Accident Prevention Plan
ASR	Archive Search Report
bgs	Below Ground Surface
BG	Background
°C	Degrees Celsius
CAIS	Chemical Agent Identification Sets
CENAB	Corps of Engineers North Atlantic Baltimore
CENAN	Corps of Engineers New York District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CN	Chloroacetophenone
CONUS	Continental United States
CSM	Conceptual Site Model
CTT	Closed Transferring and Transferred
CX	Center of Expertise
CWM	Chemical Warfare Materiel
DC	Design Center

DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DNT	Dinitrotoluene
DoA	Department of the Army
DoD	Department of Defense
DQO	Data Quality Objective
EDD	Electronic Data Deliverable
EDS	Environmental Data Services, Inc.
EM	Engineering Manual
EM-CX	Environmental and Munitions Center of Expertise
EOD	Explosive Ordnance Disposal
ER	Engineering Regulation
ESRI	Environmental Systems Research Institute
FD	Field Duplicate
FNH	Flashless Nonhygroscopic
Ft	Foot (or Feet)
FS	sulfur trioxide-chlorsulfonic acid
FTL	Field Team Leader
FUDS	Formerly Used Defense Site(s)
GIS	Geographic Information Systems
GPL	GPL Laboratories, LLLP
GPS	Global Positioning System
GW	Groundwater
HE	High Explosive

HEI	High-Explosive Incendiary
HFA	Human Factors Applications, Inc.
HHE	Health Hazard Evaluation
HHRA	Human Health Risk Assessment
HRS	Hazard Ranking System
HTRW	Hazardous Toxic and Radiological Waste
ID	Identification
IDW	Investigative-Derived Waste
IGD	Interim Guidance Document
IMR	Improved Military Rifle
INPR	Inventory Project Report
LLLP	Limited Liability Limited Partnership
m	meter
M	Model
MC	Munitions Constituent
MD	Munitions Debris
MDL	Method Detection Limits
MEC	Munitions and Explosives of Concern
MFR	Memorandum for Record
mg/kg	milligram per kilogram
MK	Mark
MPPEH	Material Potentially Presenting an Explosive Hazard
MMRP	Military Munitions Response Program
MQO	Measurement Quality Objective
MRA	Munitions Response Area

MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
MS/MSD	Matrix Spike/Matrix Spike Duplicate
msl	Mean Sea Level
NAD	North American Datum
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDAI	No Department of Defense Action Indicated
NG	Nitroglycerine
NTCRA	Non-Time Critical Removal Action
NYSDEC	New York State Department of Environmental Conservation
NYSOPRHP	New York State Office of Parks, Recreation and Historical Preservation
oz	ounce
PAOI	Potential Area (s) of Interest
PETN	Pentaerythritol tetranitrate
PFSP	Programmatic Field Sampling Plan
PGM	Program Manager
PM	Project Manager
PMMQL	Preferred Maximum Method Quantitation Limits
PPE	Personal Protective Equipment
PQAPP	Programmatic Quality Assurance Project Plan
PSAP	Programmatic Sampling and Analysis Plan
PWP	Programmatic Work Plan
QA	Quality Assurance
QAPP	Quality Assurance Project Plan

QC	Quality Control
QSM	Quality Systems Manual
RAC	Risk Assessment Code
RBC	Risk Based Concentration
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RCWM	Recovered Chemical Warfare Materiel
RI/FS	Remedial Investigation and Feasibility Study
RMIS	Restoration Management Information System
ROE	Right of Entry
ROTC	Reserve Officers' Training Corps
SI	Site Inspection
SB	Subsurface Soil
SS	Surface Soil
SSHASP	Site-Specific Health and Safety Plan
SSHO	Site Safety and Health Officer
SS-SAP	Site-Specific Sampling and Analysis Plan
SS-WP	Site-Specific Work Plan Addendum
SUXOS	Senior Unexploded Ordnance Supervisor
T&E	Threatened and Endangered
Tetryl	Methyl-2,4,6-trinitrophenylnitramine
TCRA	Time Critical Removal Action
TNT	Trinitrotoluene
TP	Training/Practice
TPP	Technical Project Planning

USACE	U.S. Army Corps of Engineers
USAESCH	U. S. Army Engineering and Support Center, Huntsville
USDA	U. S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U. S. Geological Survey
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance
WWI	World War I
WWII	World War II

GLOSSARY OF TERMS

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) – Congress enacted CERCLA, commonly known as Superfund, on 11 December 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment (USACE 2004b).

Discarded Military Munitions (DMM) – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of, consistent with applicable environmental laws and regulations. (10 U.S.C.2710(e)(2))

Explosive Ordnance Disposal (EOD) – The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded ordnance and of other munitions that have become an imposing danger, for example, by damage or deterioration (USACE 2000).

Explosives Safety – A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects or risks of potential mishaps involving military munitions (DoA 2005).

Formerly Used Defense Site (FUDS) – A FUDS is defined as a facility or site (property) that was under the jurisdiction of the Secretary of Defense and owned by, leased to, or otherwise possessed by the United States at the time of actions leading to contamination by hazardous substances. By the Department of Defense Environmental Restoration Program (DERP) policy, the FUDS program is limited to those real properties that were transferred from DoD control prior to 17 October 1986. FUDS properties can be located within the 50 States, District of Columbia, Territories, Commonwealths, and possessions of the United States (USACE 2004b).

Material Potentially Presenting an Explosive Hazard (MPPEH) – Material potentially containing explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or material potentially containing a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization or disposal operations). Excluded from MPPEH are munitions within DoD's established munitions management system and other hazardous items that may present explosion hazards (e.g., gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions (DoA 2005).

Military Munitions – All ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including

bulk explosives, and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges; and devices and components thereof. The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components, other then non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) have been completed. (10 U.S.C 101(e)(4)(A) through (C)).

Munitions Response Site Prioritization Protocol (MRSPP) – The MRSPP was published as a rule on October 5, 2005. This rule implements the requirement established in section 311(b) of the National Defense Authorization Act for Fiscal Year 2002 for the Department to assign a relative priority for munitions responses to each location (hereinafter MRS) in the Department's inventory of defense sites known or suspected of containing unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC). The DoD adopted the MRSPP under the authority of 10 USC 2710(b). Provisions of 10 USC 2710(b) require that the DOD assign to each defense site in the inventory a relative priority for response activities based on the overall conditions at each location taking into consideration various factors related to safety and environmental hazards.

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 (UXO),as defined in 10 U.S.C. 101(e)(5); (B) Discarded military munitions (DMM), as defined in 10 U.S.C. 2710(e)(2); or (C) Munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. 2710(e)(3), present in high enough concentrations to pose an explosive hazard (10 USC 2710(e)(2)).

Munitions Constituents (MC) – Materials originating from unexploded ordnance (UXO), discarded military munitions (DMM), or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 U.S.C. 2710(e)(3)).

Munitions Debris (MD) – Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal (10 USC 2710(e)(2)).

Munitions Response Area (MRA) – An area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former range and munitions burial areas. A munitions response area is comprised of one or more munitions response sites (32 CFR 179.3).

Munitions Response Site (MRS) – A discrete location within an MRA that is known to require a munitions response (32 CFR 179.3)..

Non-Time Critical Removal Action (NTCRA) – Actions initiated in response to a release or threat of a release that poses a risk to human health or the environment where more than six months planning time is available (USACE 2007).

Range – A designated land or water area that is set aside, managed, and used for range activities of the Department of Defense. The term includes firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access and exclusionary areas. The term also includes airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration (10 U.S.C. 101(e)(1)(A) and (B)).

Range Activities – Research, development, testing, and evaluation of military munitions, other ordnance, and weapons systems; and the training of members of the armed forces in the use and handling of military munitions, other ordnance, and weapons systems. (10 U.S.C. 101(e)(2)(A) and (B)).

Range-Related Debris – Debris, other than munitions debris, collected from operational ranges or from former ranges (*e.g.* target debris, military munitions packaging and crating material).

Time Critical Removal Action (TCRA) – Removal actions conducted to respond to an imminent danger posed by the release or threat of a release, where cleanup or stabilization actions must be initiated within six months to reduce risk to public health or the environment (USACE 2007).

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 whether by malfunction, design, or any other cause. (10 U.S.C 101(e)(5)(A) through (C)).

1.0 INTRODUCTION

This Site-Specific Work Plan (SS-WP) Addendum has been prepared to document the Site Inspection (SI) activities to be conducted at the site known as Mitchel Field in accordance with the Military Munitions Response Program (MMRP). The SI at Mitchel Field falls under the purview of the Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS). The specific FUDS project number for Mitchel Field is C02NY064503. This SS-WP is an addendum to the Programmatic Work Plan (PWP) for the DERP FUDS MMRP SIs (entitled *Programmatic Work Plan for Formerly Used Defense Sites Military Munitions Response Program Site Inspections at Multiple Sites in the Northeast Region*, referred to throughout this document as the PWP) (Alion 2005). The U.S. Army Corps of Engineers (USACE) approved the final PWP, dated October 2005, for use in conducting SIs at multiple sites located throughout the Northeastern United States. The reader is directed to the PWP (Alion 2005) for additional programmatic details regarding general SI plans and procedures. This addendum provides site-specific plans, objectives, and procedures for conducting the SI at the FUDS known as Mitchel Field.

1.1 Project Authorization

The U. S. Army Engineering and Support Center Huntsville (USAESCH) contracted with Alion Science and Technology Corporation (Alion) to perform a SI at Mitchel Field, Garden City, Nassau County, New York. The SI is located in the Northeast Region of the Continental United States (CONUS) under contract W912DY-04-D-0017, Task Order 00170001, and falls under the purview of DERP FUDS. USAESCH transferred management of the contract to the U.S. Army Corps of Engineers North Atlantic Division Baltimore (CENAB). CENAB works with USAESCH on this project. As the local USACE Geographic District, the USACE North Atlantic New York District (CENAN) completes the USACE Project Team by providing project management and technical support to work with the regulators and all stakeholders in execution of the SI.

The work under this task order is being completed by Alion, along with Alion's subcontractors: GPL Laboratories LLLP, Integral Consulting, Inc. and Environmental Data Services (EDS) Data Validation Services, Inc.

1.2 Project Scope and Objectives

The goal of this SI is to determine whether the site warrants further response or No Department of Defense Action Indicated (NDAI) designation with respect to MMRP (Alion 2005). To make this determination, investigations for Munitions and Explosives of Concern (MEC) and

Munitions Constituents (MC) will be performed in accordance with Engineering Regulation (ER) 200-3-1 (USACE 2004b), the Department of Defense (DoD) Management Guidance for DERP (DoD 2001), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). In accordance with ER 200-3-1 (USACE 2004b), this SI is a screening level assessment to determine presence/absence of MEC and MC, and is not intended as a full-scale study of the nature and extent of MEC or MC hazards. Further project response actions, if required, will be conducted under the CERCLA process (to include RI/FS, TCRA, NTCRA, or other investigations/actions).

The project objectives of this SI are as follows:

- Determine if the FUDS requires additional investigation through a Remedial Investigation/Feasibility Study (RI/FS) or if the site may be recommended for NDAI designation based on the presence or absence of MEC and MC.

- Determine the potential need for a Time-Critical Removal Action (TCRA) or Non-Time-Critical Removal Action (NTCRA) for MEC and MC by compiling data from previous investigations/reports, conducting site visits, performing qualitative reconnaissance (using visual observations and analog geophysics), and collecting MC samples.

- Collect or develop additional data, as appropriate, in support of potential Hazard Ranking System (HRS) scoring by the U.S. Environmental Protection Agency (USEPA).

- Collect the additional data necessary to complete the Munitions Response Site Prioritization Protocol (MRSPP).

The following describes the site-specific process used to complete the project objectives:

- Conduct a site visit and contact facility personnel at Mitchel Field, as necessary, to obtain additional site-specific data (associated reports and documents).

- Review available reports/data for Mitchel Field to identify potential MEC/MC sources, pathways, receptors, and associated data gaps.

- Prepare a read-ahead package for stakeholder review to clarify the MMRP process, discuss historical site operations, and present potential MEC/MC hazards.

- Initiate the Technical Project Planning (TPP) process to involve site owners and regulators (stakeholders) in a meeting to establish/confirm project objectives and data

needs required to: (1) screen the property for releases that, if present, would trigger the RI/FS phase of the CERCLA process, or if releases are not found to be present, determine the data required to reach project closeout; (2) define Data Quality Objective (DQO) worksheets; (3) prepare a conceptual site model (CSM); and; (4) obtain stakeholder consensus on the SI approach and planned field activities. The results of the TPP meeting are documented in a TPP Memorandum.

- Prepare a SS-WP (this document) to document site history and field investigation and analysis plans.

- Conduct fieldwork activities to include qualitative reconnaissance for MEC and sampling for MC.

- Complete a comprehensive SI Report to document findings, conclusions, and recommendations.

This MMRP SI does not require MEC intrusive/clearing activities (Alion 2005). Furthermore, initiation or completion of a TCRA/NTCRA or emergency response action is not within the SI scope. Refer to Section 2.6.1 for additional detail on the munitions response approach.

A determination of NDAI designation or RI/FS for an MMRP project will only address MEC/MC issues at a site; *i.e.* this determination does not address potential Hazardous, Toxic, and Radioactive Waste (HTRW) issues at the property. Potential HTRW concerns identified during SI activities will be documented and this information will be provided to USACE for determination of future action under the HTRW program. In addition, if an NDAI designation is given, and MEC/MC contamination is discovered at a later date, USACE may reopen the MMRP project.

1.3 Technical Project Planning Summary

The TPP Meeting for Mitchel Field was conducted on 17 July 2008 at Nassau Community College, Garden City, New York. The New York State Department of Environmental Conservation, USACE New York District, USACE Baltimore, Nassau County Parks and Recreation, Nassau County Department of Health, Nassau Community College, Cradle of Aviation Museum, Hofstra University, Nassau Coliseum, and Alion Science and Technology representatives participated in this meeting. The TPP participants concurred with the technical approach for the planned SI activities discussed as documented in the TPP Memorandum (Alion 2008) and summarized below:

- **SI Objectives and Approach**. Stakeholders understood limited scope study and supported the general approach presented.

- **Munitions Response Sites / Potential Areas of Interest (MRS/PAOI).** Identified Stakeholders agreed to Munitions Response Site (MRS) 1 (Landscape 1000-inch range), MRS 2 (Skeet Range), MRS 3 (Demonstration Bombing Range), MRS 4 (Firing-in Butt), MRS 5 (Machine Gun Range), MRS 6 (Unknown Mortar Range) as being the focus of the SI. There were no additional Potential Areas of Interest identified at the site. MRS 6 was incorrectly identified as PAOI 1 in the TPP meeting handouts. This confusion arose from the unknown location and naming nomenclature used during the development of the historical documents. Throughout this SS-WP, and in subsequent reports being generated in support of this SI, this area will be identified as MRS 6 Unknown Mortar Range.

- **CSMs (MEC and MC).** Stakeholders agreed to the CSMs presented for MEC and CSMs for MC, as modified during the TPP:

    - MRS 1 CSM: No Changes
    - MRS 2 CSM: No Changes
    - MRS 3 CSM: No Changes
    - MRS 4 CSM: No Changes
    - MRS 5 CSM: No Changes
    - MRS 6 CSM: No media of concern due to redevelopment of MRS- 6 and absence of munitions items (removed during construction). Based on comments on the Draft SS-WP received from NYSDEC, surface and subsurface soil are now media of concern at MRS 6.

- **DQOs.** Stakeholders agreed to the DQOs.

TPP actions item (Alion 2008) and its respective status is noted below:

- Alion will revise the sample map in the site specific work plan (SS-WP) to reflect the revised background sample locations just south of the eastern end of the existing runway per agreements at the TPP meeting.
  [***Follow-up***: *Updated sample maps showing revised background sample locations are included in the Draft SS-WP*.]
- Mr. DeFranco may send the GIS data for the existing wells within the Mitchel Field FUDS to Helen Edge, USACE-NY. Although groundwater is not a medium of concern at this FUDS, identification of wells within the FUDS may be helpful.
  [***Follow-up***: *The location of several existing monitoring wells and groundwater level gauging wells within the FUDS were identified using an USGS website database/search engine (http://www.epa.gov/enviro/wme/).The majority of these wells are used for determining groundwater flow direction by the USGS and are screened within the shallow glacial aquifer. As stated during the TPP meeting and within this Draft SS-WP, the surficial glacial aquifer is not an adequate potable water source. Groundwater is not*

a medium of concern, therefore, given that there is no feasible pathway from groundwater to receptors (i.e., extensive commercial/industrial development throughout the former FUDS and receptor use of groundwater in the deeper aquifer, Magothy or Lloyd Aquifer, only). However, based on comments on the Draft SS-WP, groundwater was added as a media of concern. Two groundwater samples will be collected from preexisting groundwater wells screened in the surficial aquifer].

1.4 Decision Rules

Site-specific DQOs were developed for the Mitchel Field FUDS and are presented in Worksheets 1-4 (Appendix C). These DQOs and the decision rules to support decision-making for this SI are presented below:

- DQO 1 - Determine if the site requires additional investigation through an RI/FS or if the site may be recommended for NDAI designation based on the presence or absence of MEC and MC.

  The basis for an RI/FS recommendation related to the presence/absence of MEC includes:

  - Historic data that indicates the presence of MEC or Munitions Debris (MD)
  - Visual evidence or anomalies classified as MEC, MD or Material Potentially Presenting an Explosives Hazard (MPPEH)
  - One or more anomalies in a target area near historic or current MEC/MD finds or within an impact crater
  - Physical evidence indicating the presence of MEC (e.g. ground scarring, bomb craters, burial pits, MD, etc.)

  The basis for an RI/FS recommendation related to the presence/absence of MC includes:

  - Maximum concentrations at the FUDS exceed USEPA Regional Screening Values based on current and future land use
  - Maximum concentrations at the site exceed USEPA interim ecological risk screening values
  - Maximum concentrations at the site exceed site-specific background levels

If none of these aforementioned scenarios occur, then the recommendation for a NDAI designation will be given.

- DQO 2 - Determine the potential need for a TCRA for MEC and MC by compiling data from previous investigations/reports, conducting site visits, performing qualitative

reconnaissance, and by collecting MC samples. The basis for recommendations are specified below:

- A TCRA or an emergency response - If there is a complete pathway between source and receptor and if the MEC presence is viewed as an "imminent danger" posed by the release or threat of a release. Cleanup or stabilization actions must be initiated within six months to reduce risk to public health.

- A non-TCRA (NTCRA) - If a release or threat of release that poses a risk where more than six months planning time is available.

- DQO 3 – Collect or develop additional data, as appropriate, in support of a potential HRS scoring by the USEPA.

- DQO 4 - Collect the additional data necessary to complete the MRSPP.

1.5 Work Plan Organization

This SS-WP covers the inspection and all associated preparations necessary for SI activities at Mitchel Field. Refer to the PWP (Alion 2005) for additional detail regarding general SI plans and procedures.

1.6 Project Organization

Technical, ordnance, and managerial personnel required to support the SI activities are provided from a pool of Alion professionals. Key positions include the Program Manager (PGM), Site-Specific Project Manager (PM), Task Managers, Field Team Leaders (FTLs), Chemical Quality Control (QC) Officer, Certified Industrial Hygienist (CIH), Unexploded Ordnance (UXO) Technician II/III, and Geographic Information Systems (GIS) Manager. The key positions, qualification requirements, and assigned personnel are identified in the PWP (Alion 2005).

Project points of contact for Mitchel Field are identified in Table 1-1. Project communication and reporting is conducted in accordance with the procedures outlined in the PWP (Alion 2005).

The Alion SI Field Team for Mitchel Field will include a three-person team with each person qualified in his/her area of expertise. The FTL leads the field sampling activities. For this site, the FTL is the Task Manager and he/she is knowledgeable of the historical and logistical details regarding Mitchel Field. The FTL will manage the field team and make decisions in coordination with the Alion PM. A Sampling Technician assigned to perform the MC sampling will support the FTL. The Field Team will include a UXO Technician (II or III) tasked with ensuring all aspects of field safety, including the inspection of any MPPEH encountered and the certification

of items as UXO, discarded military munitions (DMM), MC (explosive concentrations), MD, range-related debris, or cultural debris. The UXO Technician will conduct the geophysical reconnaissance and ensure safe pathways to allocated sampling locations. The use of one UXO Technician is a deviation from the PWP (Alion 2005), which states that two UXO Technicians will be used during any field activities. Deviation from the PWP is a result of past SI experience that indicates that the use of two UXO Technicians is not required to perform the field activities. One UXO Tech per environmental sampling team is sufficient to conduct field activities in a safe manner.

The Mitchel Field SI field team will be comprised of the following individuals:

- FTL, Benjamin Claus
- UXO Technician, Stuart Carr
- Sampling Technician, Todd Belanger

Table 1-1. Project Points of Contact

NAME	ORGANIZATION	PHONE	ADDRESS	E-MAIL	PROJECT ROLE
Bradford McCowan	U.S. Army Corps of Engineers (USACE), Directorate of Environmental & Munitions Center of Expertise (EM-CX)	256-426-4214	P. O. Box 1600 4820 University Square Huntsville, AL 35816	Brad.McCowan@usace.army.mil	MMRP SI Program Manager
Julie Kaiser	U.S Army Corps of Engineers North Atlantic Baltimore (CENAB) MM Design Center (DC)	410-962-2227	City Crescent Building 10 S. Howard St. Baltimore, MD 21201	Julie.E.Kaiser@usace.army.mil	MMRP SI Regional Program Manager
Helen Edge	U.S Army Corps of Engineers New York (CENAN) Geographic District	917-790-8332	2890 Woodbridge Ave, Edison, NJ 08818	helen.k.edge@usace.army.mil	MMRP SI Geographic District Project Manager
Larry Cain	USACE - NAE	978-318-8236	City Crescent Building 10 S. Howard St. Baltimore, MD 21201	larry.cain@usace.army.mil	USACE Risk Assessor
Alan Warminski	USACE - NAB	410-962-2179	City Crescent Building 10 S. Howard St. 10th floor Baltimore, MD 21201	alan.s.warminski @usace.army.mil	DC Design Team Leader
Daniel Eaton	NYSDEC	578-402-9620	NYSDEC 625 Broadway, Albany, NY 12233	djeaton@gw.dec.state.ny.us	State Regulator
Masoom Ali	Nassau Community College Assistant Vice President	516-573-7113	One Education Drive Garden City, NY 11530	alim@ncc.edu	Stakeholder
Tracy Kay	Nassau County Department of Parks, Recreation & Museum Deputy Commissioner	516-572-0254	Administration Bldg. Eisenhower Park East Meadow, NY 11554	tkay@nassaucountyny.gov	Stakeholder
Gary Monti	Director of Visitor Services Museum at Mitchel Cradle of Aviation	516-572-4017	Cradle of Aviation One Davis Avenue Garden City, NY 11530	gmonti@cradleofaviation.org	Stakeholder
Teresa A. Greis	Energy, Environmental Health and Safety Manager	516-463-5062	Physical Plant 132 Hofstra University Hemstead, NY 11549	Teresa.A.Greis@hofstra.edu	Stakeholder
Roger Azar	Alion Science and Technology	301-399-7304	1000 Park Forty Plaza Suite 200 Durham, NC 27713	razar@alionscience.com	Program Manager

Table 1-1. Project Points of Contact

NAME	ORGANIZATION	PHONE	ADDRESS	E-MAIL	PROJECT ROLE
Corinne Shia	Alion Science and Technology	703-259-5147	3975 Fair Ridge Drive Suite 125 South Fairfax, VA 22033	cshia@alionscience.com	Deputy Program Manager
Bonnie Herring	Alion Science and Technology	919-406-2138 919-558-9218 (fax)	1000 Park Forty Plaza Suite 200 Durham, NC 27713	bherring@alionscience.com	Contracts Administration
Scott Hemstreet	Alion Science and Technology	301-705-5044 919-549-0611	1000 Park Forty Plaza Suite 200 Durham, NC 27713	shemstreet@hfactors.com	Operations Manager-Munitions and Explosives of Concern
Curtis Mitchell	Alion Science and Technology	301-399-7152	7730 Harborview Drive, Charlotte Hall MD, 20622	rmitchell@hfactors.com	Senior UXO Supervisor (SUXOS) and/or Quality/Safety Manager
Rick Swahn	Alion Science and Technology	703-259-5286	3975 Fair Ridge Drive Suite 125 South Fairfax, VA 22033	fswahn@alionscience.com	Project Manager
Benjamin Claus	Alion Science and Technology	703-259-5264	3975 Fair Ridge Drive Suite 125 South Fairfax, VA 22033	bclaus@alionscience.com	Project Manager/Field Team Leader
Robert Scheitlin	Alion Science and Technology	919-406-2101	3975 Fair Ridge Drive Suite 125 South Fairfax, VA 22033	rscheilin@alionscience.com	GIS Specialist
Bill Beckett	Alion Science and Technology	908-852-4887	1750 Tysons Blvd. McLean, VA 22102	wbeckett@alionscience.com	Certified Industrial Hygienist
Dreas Nielsen	Integral, Inc.	206-957-0311	7900 SE 28th St. Ste 410 Mercer Island, WA. 98040	dnielsoen@integral-corp.com	Contractor -Chemical Quality Control Officer
Douglas Weaver	EDS, Inc.	757-564-0090	1156 Jamestown Road Suite A Williamsburg, VA 23185	dweaver@env-data.com	Data Validation Lead
Paul Ioannides	GPL Laboratories, LLLP	301-694-5310	7210A Corporate Court Frederick, MD 21703-8386	ioannides@gplab.com	Analytical Laboratory General Manager

1.7 Project Schedule

The Mitchel Field SI project schedule presented in Figure 1 (Appendix A), includes proposed submittal dates, review times for stakeholders, expected fieldwork dates, and reporting dates. This revised project schedule supersedes the project schedule originally presented in the Final TPP Memorandum (Alion 2008). The current SI schedule, planned for completion in December 2009, will be updated as necessary to reflect current progress and anticipated activities.

2.0 PROJECT DESCRIPTION

2.1 Project Location

Mitchel Field is located in Nassau County, New York (Figure 2, Appendix A). The North American Datum (NAD) 1983 Universal Transverse Mercator (UTM), zone 18N, easting (X) and northing (Y) coordinates for the approximate center of the FUDS are 618801 meters (m) and 4509300 m, respectively. This property falls under the geographical jurisdiction of the USACE, New York (CENAN).

2.2 Site Description

The Mitchel Field FUDS originally consisted of approximately 1,436 acres and was used as a training base (Figure 2). Mitchel Field is situated in a relatively flat area with significant portions of the FUDS overlain with parking lots, roads, and buildings. The Atlantic Ocean lies approximately five miles to the south of the former Mitchel Field FUDS. The site was used during the Revolutionary War as an Army enlistment center eventually becoming formally leased in 1917 when it became the Aeronautical General Supply Depot. After World War I (WWI) and until the end of World War II (WWII), the property was used as a tactical air unit training base. In the early 1940s, the former FUDS was used by Army Air Force planes in anti-sub patrol missions. After WWII, the FUDS became the site of the Air Defense Command (ADC). The FUDS was officially deactivated in 1961. With the exception of a few small buildings and portions of the former runway, no military structures remain at the former Mitchel Field FUDS (USACE 1993).

2.2.1 Topography

The former Mitchel Field FUDS is located in an area that has a relatively even surface with occasional shallow valleys that interrupt the surface. The FUDS has elevations that range from approximately 92 feet above mean sea level (msl) in the northern portion of the site to 75 feet msl in the southern portion of the site (ESRI 2007). The regional topography is gently rolling hills with southward sloping plains (USACE 1993). A topographic map of the project site is included as Figure 4 in Appendix A of this report.

2.2.2 Vegetation

Mitchel Field has been redeveloped and the vegetation that is present is common to urban and developed settings. The area is comprised predominantly of landscaped trees, shrubs, bushes, and maintained grass (USACE 1993).

2.2.3 Geology and Soils

The entire FUDS is located within the glaciated part of the Atlantic Coastal Plain physiographic province. There are two terminal moraines located north of Mitchel Field. South of the moraines is topography that is characteristic of a glacial outwash plain. The outwash plain slopes gently to the south towards the Atlantic Ocean. The area is underlain by crystalline bedrock that dips in a southeastern direction. Late Cretaceous and Pleistocene sands, gravels, and clays (glacial deposits) cover the bedrock and have a combined thickness of approximately 1700 feet. The oldest unit overlying the local bedrock is the Lloyd Sand, a member of the Raritan formation, which is composed of gray and white sand and gravel ranging in size from fine to coarse. The Lloyd sand unit increases in thickness to the southeast from 150 feet (ft.) to 300 ft. Overlying the Lloyd sand is a clay member of the Raritan Formation. The clay member consists of silt and clay and in some parts sand, sandy clay, and sand and gravel. The consistency of the clay varies within the member. The thickness of the clay member near Long Island Sound is approximately 100 ft. and increases to 300 ft. along the southern coast of Long Island. The Magothy Formation is Late Cretaceous in age and is composed of alternating beds of sand and clay. The sand is predominantly gray or tan, fine to medium grained quartz particles. The clays are white, shades of gray, yellow, tan or black and composed of predominantly muscovite and quartz. The Magothy Formation overlies the sand and clay members of the Raritan Formation and is increasingly thicker towards the southeast. The Late Cretaceous Magothy Formation is a non-marine sequence of complexly intercalated beds and lenses of sand and clay. The quartzes sands are typically gray or tan and fine to medium grained. The clay units are white, light and dark gray, yellow, tan or black in color. Upper Pleistocene deposits unconformably overlie the Magothy Formation and thicken to the north to a maximum thickens of 120 ft. The Pleistocene deposits are predominantly stratified sand and gravel deposited as glacial outwash. The outwash is yellow, brown, and gray; the sand and gravel consist of mainly iron-stained quartz (USACE 1993).

As shown on Figure 5 in Appendix A the surface soil in many places has been covered or reworked by development and buildings and is now considered urban land by the U.S. Department of Agriculture (USDA) soil survey. The soils located at the SI sampling locations are from two units, the Hempstead silt loam and the Mineola complex. The Hempstead silt loam was derived from a silty mantle overlying highly siliceous stratified sandy and gravelly glaciofluvial deposits. The typical soil profile is silt loam from 0 to 29 inches, very gravelly loamy sand from 29 to 33 in, and stratified very gravelly sand from 33 to 60 inches. The Hempstead soil is well drained with no flooding or ponding frequency. The available water capacity is moderate (approximately 7.7 in) and the depth to the water table is more than 80 inches. The Mineola complex soil was derived from a similar parent material as the Hempstead

soil, but with greater loam content. The typical profile is sandy loam from the surface to 11 inches, very gravelly loamy sand from 11 to 18 inches, and stratified very gravelly sand from 18 to 60 inches. The soil is moderately well drained with no frequency of flooding or ponding. The available water capacity is low (~3.4 in) and the depth to the water table is approximately 24 to 48 inches (USACE 1993 and USDA 2008).

2.2.4 Hydrology and Hydrogeology

There are two terminal moraines north of the FUDS. South of the moraines, outwash plains slope south to tidal marshes, mud flats and partly interconnected shallow bays. Streams drain the area and carry runoff to the estuaries of the south shore. The permanent streams in the area are Valley Stream, Mill River, East Meadow Brook, Bellmore Creek, Massapequa Creek, Hook Creek, Motts Creek, Powel Creek, and Seafood Creek (USACE 1993).

The groundwater at Mitchel Field moves through different geological units composed of unconsolidated gravel, clay, and sand from the Late Cretaceous and Pleistocene age. The underlying crystalline basement rocks typically do not act as aquifers. Downward leaking from confined water in the northern parts of the area and underflow from the north recharge deep artesian aquifers in the area (USACE 1993). Depth to groundwater in the FUDS vicinity ranges from 25 feet to 35 feet below ground surface (USGS 2000).

2.2.5 Threatened and Endangered (T&E) Species

Threatened or endangered (T&E) species may be present at the former Mitchel Field (USACE 1993). According to information contained in the ASR, Nassau County has a species that is federally listed, the sandplain gerardia (*Agalinis acuta*). There are multiples species that inhabit Nassau County that are state listed. State or federally-listed species may be present in the vicinity of the FUDS; therefore, a complete list of the T&E species for the State of New York is presented in Appendix G. The New York State Department of Environmental Conservation (NYSDEC) was contacted to confirm the accuracy and completeness of this information and will be provided a description of the proposed sampling activities. USACE and Alion contacted the USFWS to determine if any T&E species are present and likely to be adversely effected by the sampling activities. The proposed work tasks presented in this SS-WP are not anticipated to cause adverse impact to any of the listed species or habitats; however, if additional T&E species are identified, every effort will be made to avoid disturbances to T&E species and their sensitive habitats during the SI field activities.

2.2.6 Wetlands

According to the U.S. Department of the Interior there is a small freshwater forested/shrub wetland present on the eastern part of the Mitchel Field FUDS partly within the eastern part of MRS 1 as shown in Figure 6, Appendix A (DoI 1998). The field sampling activities proposed for this SI are considered to be minimally intrusive in nature and will have no impact to the wetland areas at Mitchel Field.

2.2.7 Cultural, Archaeological, and Water Resources

No information regarding archeological or cultural resources is contained in the ASR Findings for Mitchel Field. Alion and USACE are currently consulting with the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) and the New York Landmarks Commission to ensure cultural, archaeological and water resources are not present at Mitchel Field and/or will not be disturbed during field activities. In the event that cultural, archeological, and/or water resources are identified in these areas, any disturbances will be avoided or mitigated in accordance with State requirements. Any adjustments required to the sampling design, to avoid impacts on cultural resources, will be documented in the Final SS-WP, prior to commencement of field activities. A majority of the water in Nassau County area is obtained from the Magothy and Lloyd (deep) aquifers (USGS 1982).

2.2.8 Coastal Zone

The FUDS is not located within the New York Coastal Zone. The site is located approximately five miles from the coast which is beyond the 1000 foot requirement to be considered a Coastal Zone (NYDOS 2004).

2.3 Site History

The use of Mitchel Field as a troop encampment began during the Revolutionary War and continued to be used during each war the U.S participated in through the Korean War. At the time of the Revolutionary War, Mitchel Field was known as Hempstead Plains, an Army enlistment center. During the War of 1812 and the Mexican War, the property was used as an infantry training center. Mitchel Field was alternatively named Camp Black during the Spanish American War. In 1917, the property was known as Camp Mills and the land was formally leased by the Government in July as an Aeronautical General Supply Depot. In 1918, the area was renamed for Major J.P. Mitchel and became an active flying field. During the 1930's and World War II, Mitchel Field was used as a training base. Training facilities included small arms firing ranges, aircraft firing-in butt, skeet range, gas chamber, and practice demonstration

bombing target. The firing range and gas chamber were constructed in the southeast corner of the site. The gas chambers were used to fit test soldier's gas masks. At the southwest corner of the FUDS a pistol and machine gun range was constructed and then abandoned during runway construction. In 1938, a practice and demonstration bombing target was constructed in the center of the FUDS. A skeet range was located on the eastern side of Mitchel Field. The site was also used as a base for anti-sub patrol missions operated by Army Air Force planes. After WWII, Mitchel Field became the site for the Air Defense Command (ADC). After the Korean War, the site became an Air Force Reserve base for the 2233rd Air Reserve Flying Center, the 514th Troop Carrier Wing, as well as other Reserve organizations. In April 1961, Mitchel Field was officially deactivated and released to private and public entities (USACE 1993).

2.4 Current Use and Projected Land Use

The Mitchel Field FUDS is heavily developed and used for a variety of purposes (i.e., commercial, industrial, educational, residential and recreational uses). The primary stakeholders are Hofstra University, Nassau Community College, the New York Islanders Coliseum, various residential homes in the eastern portion of the FUDS and the Mitchel Sports Complex for amateur athletics. The site is also used for highway/parkway and the rest is open to public access (USACE 1993). During the TPP meeting, stakeholders brought to Alion's attention that there would be further development at Nassau Community College. The development would include a science building to be constructed in the northern portion of the campus (Alion 2008).

2.5 Previous Investigations of the Site

2.5.1 Inventory Project Report (INPR)

USACE issued the Inventory Project Report (INPR) for the Mitchel Field FUDS in 1992. The INPR demonstrated that the present condition of the project site was the result of prior DoD ownership, utilization, or activity. Moreover, the INPR determined that an environmental restoration project is an appropriate undertaking within the purview of the DERP for FUDS.

2.5.2 Archives Search Report (ASR)

The USACE St. Louis District prepared the Archives Search Report (ASR) Findings for Mitchel Field FUDS in October 1993. The ASR investigation included previous investigations at the site, property description and physical characteristics of the site, the historical property ownership summary, an evaluation of ordnance presence at the site, property MEC/ Recovered Chemical Warfare Materiel (RCWM) technical data, and recommendations. Also included in this report were interviews that commented on munitions related incidents or finds reported at Mitchel

Field. An interview with Mr. John Waltz, Acting Commissioner of Public Works for Nassau County, illustrated that munitions were found since the closure of Mitchel Field. He mentioned that there was a rumor that in 1960s some unidentified bombs were found during campus construction though there is no documentation to confirm this find (USACE 1993).

During the 1930's and 1940's chemical warfare materiel (CWM) was shipped and used for training purposes at Mitchel Field, the materials used were chemical weapon simulants such as chloroacetophenone (CN) tear gas grenades, gas identification kits, sulfur trioxide-chlorsulfonic acid mixture (FS) smoke agents, smoke pots, smoke producing materials (petroleum wax) and irritant smoke used for gas training exercises. These materials were dispersed and/or expended during training exercises. Excess agent would have been shipped off base to an appropriate facility for disposal. There is nothing in the records that would indicate any CWM contamination of the former FUDS from any of the operations conducted at the Mitchel Field FUDS (USACE 1993).

A clarification of the definition has recently been promulgated by the USACE. CWM is defined as an item configured as a munitions item containing a substance that is intended to kill, seriously injure or incapacitate a person through its physiological effects. CWM also includes V- and G- series nerve agent. Due to their hazards, prevalence, and military-unique application, chemical agent identification sets (CAIS) are also considered CWM. CWM does not include riot control agents, chemical herbicides, smoke and flame producing items; or soil, water, debris or other media contaminated with chemical agent (USACE 2008).

Unsubstantiated reports indicate that between 1980 and 1982 four suspected mortars were found at Mitchel Field; three 81mm mortar shells and one 60mm mortar round all believed to be inert (USACE 1993). According to the ASR Supplement the mortar rounds may have been misidentified and could instead be 3-lb. miniature practice bombs (USACE 2004a). Additional discussion of the misidentification of the mortar rounds is discussed in Section 2.6.1.

2.5.3 ASR Supplement

The ASR Supplement was prepared for the FUDS in 2004 (USACE 2004a). RAC score indicates the level of ME risk associated with the area. RAC scores range from 1, being the highest category of risk, to 5, being the lowest. The ASR Supplement designated six MRSs including the Landscape 1000-inch range, Skeet Range, Demonstration Bombing Range, Firing-in Butt, Machine Gun Range, and Unknown Mortar Range. MRS 1 – the Landscape 1000-inch range has a RAC score of 5; MRS 2 – Skeet Range has a RAC score of 5; MRS 3 – Demonstration Bombing Range has a RAC score of 4; MRS 4 – Firing-in Butt has a RAC score of 3; Machine Gun Range has a RAC score of 5, and MRS 6 – Unknown Mortar Range has a RAC score of 3

(USACE 2004a). A RAC score of 3 was assigned to the Mitchel Field FUDS. The ASR Supplement also provided information on munitions found between 1980 and 1982 while the area was being developed. Four mortars were found in Mitchel Field; three 81mm mortar shell and one 60mm mortar round (inert) (USACE 1993). According to the ASR Supplement the munitions may have been misidentified as mortars but were actually 3-lb. miniature practice bombs (USACE 2004a).

Table 2-1. Potential Risk from Munitions and Explosives of Concern (USACE 2004a)

Site Name	Range Name	RMIS ID	Acreage	RAC Score	Type Of Munitions	Munitions ID
Mitchel Field	MRS 1 – Landscape 1000-inch Range	C02NY064503R01	260	5	*Small Arms:* Small Arms, General	Small Arms (CTT01)
	MRS 2- Skeet Range	C02NY064503R02	30	5	*Small Arms:* Smalls Arms General	Small Arms (CTT01)
	MRS 3- Demonstration Bombing Range	C02NY064503R03	72	4	*Practice Bomb*: AN-MK 5, AN-MK 23, AN-MK 43	Bombs, Practice (CTT10)
	MRS 4 - Firing-in Butt	C02NY064503R04	1043	3	*Small Arms:* .50 cal. Machine Gun, Small Arms, General; *Medium Caliber HE:* 20mm HEI, MKI; *Medium Caliber Practice;* 20mm, Ball, MKI; *Large Caliber Practice:* 37mm, TP, M63	Small Arms (CTT01); Medium Caliber (20mm, 25mm, 30mm), HE (CTT16); Medium Caliber (20mm, 25mm, 30mm), Practice (CTT17); Large Caliber (37 mm and larger), practice (CTT21)
	MRS 5 - Machine Gun Range	C02NY064503R05	891	5	*Small Arms:* Small Arms, general	Small Arms (CTT01)
	MRS 6 - Unknown Mortar Range	C02NY064503R06	3	3	*Mortars, HE:* 60mm, 81mm, HE, M49, M43; *Practice Ordnance:* 60mm, Training, M69	Mortars HE (CTT22); Practice Ordnance (without spotting charges) (CTT46)

AN= Army and Navy
CTT = Closed, Transferring, or Transferred
RMIS = Restoration Management Information System
MK = Mark

Table 2-1. Potential Risk from Munitions and Explosives of Concern (USACE 2004a)						
Site Name	**Range Name**	**RMIS ID**	**Acreage**	**RAC Score**	**Type Of Munitions**	**Munitions ID**
HE = High Explosive RAC = Risk Assessment Code RMIS= Restoration Management Information System ID = Identification MRS = Munitions Response Site TP= Training/Practice						

2.6 Site Inspection Approach and Rationale

Small arms munitions, practice bombs, medium caliber high-explosive incendiary (HEI), medium caliber practice, large caliber practice and high explosive (HE) mortars were used at Mitchel Field. Table 2-1 lists the areas of evaluation, the acreage associated with each area, the RAC score given to reach area and munitions time. As previously stated, the 60 mm and 81mm mortars discovered at the FUDS were likely to have been misidentified and the munitions items found were in fact either MK-23 or MK-43 practice bombs. Additionally, it was not common practice to use HE, or HEI projectiles during test firing or sighting operations at a firing-in butt because of the fire and explosive dangers associated with these munitions.

2.6.1 Approach to Munitions Response Activities

The overall approach to munitions response activities is presented in the PWP (Alion 2005). As discussed in Section 2.5.3 of this SS-WP, three mortar shells and one inert mortar round were discovered in the early 1980s by construction workers. A figure in the ASR presented approximate locations (ASR, Map/Drawings Section Pane M10). The locations of these items are the basis for the MRS 6 boundary. There is the possibility that the 60mm and 81mm mortars could have been misidentified (USACE 2004). Physical similarities exist between the 60 and 81mm mortars and the 3 lb MK 23 or MK-43 practice bombs. The dimensions, specifically the length, of the MK-23 and MK-43 practice bombs (8.25 inches) are similar to that of the mortars (9.5 inches to 13 inches). As evidenced in the munitions data sheets presented in Appendix D, the overall construction of the practice bombs and mortars are similar. Both munitions types are generally teardrop shaped and would have originally possessed similar stabilizing fins. Additionally, the munitions were most likely used or deposited in the 1940's or 1950's and were found approximately 30 to 40 years later. The munitions were likely highly corroded when they were found making it difficult to discern the differences between a mortar and a practice bomb. The stakeholders generally agreed with this assessment as presented in the TPP meeting (Alion 2008). Comments received from NYSDEC on the Draft SS-WP dispute the claim that the munitions items in question were misidentified as mortars due to the length of an 81 mm mortar (approximately 13.5 inches). Additionally, NYSDEC requested further geophysical

reconnaissance and sampling within MRS 6. In response to NYSDEC's concerns Alion will complete additional reconnaissance and soil sampling in the vicinity of MRS 6 in accordance with NYSDEC's request.

The technical approach, as defined during the TPP Meeting (Alion 2008), will focus on biased screening for the presence of MEC/MC in range areas (referred to as MRSs) most likely to be impacted from former munitions-related activities.

The Mitchel Field SI, as defined in the ASR Supplement, includes six MRSs with a potential presence of MEC and/or MC based on the site use and history. The six MRSs are the focus of this SI as identified below:

- **MRS 1 (Landscape – 1000 inch range).** This area is identified as Restoration Management Information System (RMIS) C02NY064503R01 and includes approximately 260 acres of land.

- **MRS 2 (Skeet Range).** This area is identified as Restoration Management Information System (RMIS) C02NY064503R02 and includes approximately 30 acres of land.

- **MRS 3 (Demonstration Bombing Range).** This area is identified as RMIS C02NY064503R03 and includes approximately 72 acres of land.

- **MRS 4 (Firing-in Butt).** This area is identified as RMIS C02NY064503R04 and includes approximately 1043 acres of land.

- **MRS 5 (Machine Gun Range).** This area is identified as RMIS C02NY064503R05 and includes approximately 891 acres of land.

- **MRS 6 (Unknown Mortar Range).** This area is identified as RMIS C02NY064503R06 and includes approximately 3 acres of land. The acreage and location of this MRS was based on the approximate locations of the discovered munitions items as presented in the 1993 ASR.

No additional Potential Area (s) of Interest (PAOIs) were identified at Mitchel Field by stakeholders during the TPP meeting (Alion 2008). The SI will assess and provide recommendations for areas identified in the ASR Supplement. MRSPPs are completed only for MRS in accordance with USACE guidance. The MRS boundaries are shown in Figure 3 (Appendix A).

2.6.2 Munitions and Explosives of Concern Exposure Analysis

2.6.2.1 Munitions Type and Composition

Table 2-2 lists the types of MEC historically used at the FUDS. The associated MC analysis (also listed in Table 2-2) was developed based on the munitions used at each MRS at the Mitchel Field FUDS. MC data were gathered from munitions data sheets, historical documents, and other munitions reference documents. Appendix D (Munitions Data Sheet) was prepared and included in this SS-WP to serve as a visual guide for the SI field team to ensure accurate identification should suspect MEC be located on site. Additionally, the MC associated with each munitions type used at the FUDS is documented and used to determine the analytes of concern for the SI.

Table 2-2. Military Munitions Type and Composition (USACE 1993 and other sources)

Range ID (MRS)/ Sub-range	Munitions ID	Munitions Type	Composition (explosives and metallic components)	Associated MC Analysis
MRS 1-Landscape 1000-inch Range	Small Arms (CTT01)	Small Arms, General (.22 and .50 caliber)	***Projectile:*** Small arms and .50 caliber (ball): lead, antimony, cupro-nickel, and soft steel (iron) ***Propellant:*** Single- or double-base smokeless powder (nitrocellulose[2], nitroglycerine [NG], dinitrotoluene [DNT], potassium sulfate, graphite) ***Tracer (unlikely to have been used):*** strontium nitrate, potassium perchlorate, calcium resinate, strontium oxalate, magnesium	Explosives: - DNT[1] - NG Metals: - Antimony - Copper - Iron[5] - Lead - Nickel Note: The MRS 1 area has been partially redeveloped; therefore, it is impossible to distinguish the firing point and impact area. As a conservative measure, metals and explosives will be analyzed for in all samples
MRS 2 – Skeet Range	Small Arms (CTT01)	Small Arms, General	***Projectile:*** Lead-antimony shot or lead shot ***Propellant:*** Single- or double-base smokeless powder (nitrocellulose[2], NG, DNT, potassium sulfate, graphite) ***Primer***[3]***:*** Lead Styphnate, barium nitrate, antimony sulfide, aluminum powder, PETN, tetracene	Explosives: - DNT[1] - NG Metals: - Antimony - Lead Note: The skeet range area has most likely been re-graded; therefore, it is impossible to distinguish the firing point and impact area. As a conservative measure, metals and explosives will be analyzed for in all samples.

MRS 3 – Demonstration Bombing Range	Bomb, Practice (CTT10)	AN-MK 5, AN-MK 23, AN-MK 43	***Body:*** AN-MK 43 lead-antimony alloy; AN-MK 23- cast iron; AN-MK 5 zinc alloy with steel ***Filler:*** none ***Signal:*** 3 grams black powder[4] (sodium nitrate or potassium nitrate plus charcoal and sulfur) or 3 grams smokeless powder (nitrocellulose[2], NG, DNT, potassium sulfate, graphite)	Explosives: - DNT[1] - NG Metals: - Antimony - Iron [5] - Lead - Zinc
MRS 4 – Firing-in Butt	Small Arms (CTT01)	.50 Caliber Machine Gun, Small Arms General	***Projectile:*** .50 cal: Lead, antimony, cupro-nickel, and soft steel (iron) ***Propellant:*** Single or double-base smokeless powder (nitrocellulose[2], NG, DNT, potassium sulfate, graphite) ***Tracer (Not likely to have been used at a Firing-In Butt):*** Magnesium-aluminum alloy, potassium perchlorate, calcium resinate	Note: As discussed during the TPP meeting, the land in vicinity of MRS 4 is completely developed and the land is either currently in the footprint of a building or under a paved parking lot. Per stakeholder agreement, no samples will be collected at MRS 4 due to the absence of sample media (e.g., soil). Additionally, historically there have not been any munitions finds at MRS 4. Explosive (Firing Point): - DNT[1] - NG Metals (Impact Area): - Antimony[5] - Iron[5] - Lead - Nickel
	Medium Caliber (20mm, 25mm, 30mm), HE (CTT16)	20mm HEI, MKI	***Projectile:*** Steel (no HE filler when used at Firing-in Butt range) ***Propellant:*** IMR 4895 (Nitrocellulose smokeless powder); nitrocellulose[2], DNT, diphenylamine, potassium sulfate, graphite ***Primer***[3]***:*** Potassium chlorate, lead thiocyanate, antimony sulfide, PETN	
	Medium Caliber (20mm, 25mm, 30mm), Practice (CTT17)	20mm, Ball, MKI	***Projectile:*** Steel (iron and carbon) ***Propellant:*** IMR 4895 (Nitrocellulose smokeless powder); nitrocellulose[2], DNT, diphenylamine, potassium sulfate, graphite ***Primer***[3]***:*** Potassium chlorate, lead thiocyanate, antimony sulfide, PETN	

	Large Caliber (37mm and larger), practice (CTT21)	37mm, TP, M63	***Projectile:*** Steel ***Propellant:*** Nitrocellulose[2], NG, barium nitrate, potassium nitrate, ethyl centralite, graphite or flashless non-hygroscopic (FNH) nitrocellulose ***Primer[3]:*** Potassium chlorate, lead thiocyanate, TNT, antimony sulfide, gum solution, black powder (sodium nitrate or potassium nitrate plus charcoal and sulfur)	
MRS 5 – Machine Gun Range	Small Arms (CTT01)	Small Arms, General	***Projectile:*** Small arms and .50 caliber (ball): Lead, antimony, cupro-nickel, and soft steel (iron) ***Propellant:*** Single or double-base powders (nitrocellulose[2], NG, DNT, potassium sulfate, graphite) ***Tracer (unlikely to have been used):*** strontium nitrate, potassium perchlorate, calcium resinate, strontium oxalate, magnesium	Explosives: - DNT[1] - NG Metals: - Antimony - Copper - Lead - Iron[5] - Nickel Note: The area around MRS 5 has been re-graded and redeveloped into an athletic field. Therefore, the firing point and impact area can not be identified. As a conservative measure, metals and explosives will be analyzed at all sample locations.
MRS 6 - Unknown Mortar Range	Mortars HE (CTT22) Practice Ordnance (without spotting charges) (CTT46)	60mm, 81mm, HE, M49, M43 60mm, Training, M69	***Body:*** Aluminum and Steel ***Filler:*** 60mm (TNT), 81mm (TNT)- unlikely to have been used due to training nature of facility. Most likely practice (sand or inert filler) ***Booster:*** Tetryl ***Propellant:*** 60 mm and 81mm (nitrocellulose[2], NG, diethylphhalate, potassium nitrate, ethyl centralite) ***Practice Spotting Charges:*** 60mm/81mm black powder (sodium nitrate or potassium nitrate, charcoal and sulfur) and/or possibly NG, DNT.	Noted: As discussed during the TPP meeting as well as in Section 2.6.1, the munitions finds at MRS 6 are presumed to have been misidentified as mortars and likely to have been practice bombs (MK-23 or MK-43). Furthermore, mortars were not known to have been used at Mitchel Field. Explosives: - NG - DNT[1] Metals: - Aluminum -

				Iron[5]

AN= Army and Navy CTT=Closed, Transferring, and Transferred DNT=dinitrotoluene FNH= flashless non-hygroscopic HE = High Explosive IMR- Improved Military Rifle Mk=Mark M=Model MRS=Munitions Response Site	NG = nitroglycerine PETN= Pentaerythritol tetranitrate Tetryl = Methyl-2,4,6-trinitrophenylnitramine TNT = Trinitrotoluene TP = Training Practice

[1] DNT Breakdown products include: 2,4- and 2,6-dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2- and 3-nitrotoluene; 4-Amno-2,6-dinitrotoluene; 4-nitrotoluene.

[2] Simple single-based nitrocellulose readily breaks down in the environment and is not expected to persist while more complex nitrocellulose may persist longer in the environment (Journal of Waste Management 1994). Nitrocellulose is not considered toxic, and consequently no risk-based screening values have been developed for the compound. Furthermore, there are no chemical analysis techniques that quantify nitrocellulose separately from the natural common essential nutrient nitrate. Based on this rationale, no sampling for nitrocellulose is proposed.

[3] Primer comprises 5% or less of the total ammunition weight, also it is combusted when fired and expended while in flight. MC related to the primer will not be analyzed in soil samples.

[4] Black powder is a rapidly burning material that, when fired, leaves little residue as either decomposition products or un-combusted compounds and the constituents of black powder are not expected to persist in the environment above background concentrations for a significant period of time after initial exposure. Black powder is not anticipated to be present or detected after the operations ceased over 50 years ago, therefore no constituents of black powder will be analyzed. (Interstate Technology and Regulatory Council [ITRC], 2003).

[5] Chemicals that are not CERCLA hazardous substances (e.g., aluminum, barium, iron) can be reported in the SI; however, the SI risk evaluation and conclusions will include a discussion of the limitations of the FUDS program to respond to such chemicals. Non-CERCLA chemical concentrations will not provide the basis for a RI/FS recommendation for MC in the SI report.

Available historical information indicates that munitions were used/fired at the former Mitchel Field FUDS. Explosives and metals associated with the propellant, spotting charge, practice bomb body and projectile will be analyzed for at MRS 1, 2, 3, 5 and 6. During the 2008 TPP meeting, a Nassau County Parks and Recreation employee stated that during the construction of new athletic fields near MRS 5 (Machine Gun Range) unidentified projectile shell casings were discovered. The location of the shell casings was near the firing point of MRS 5; therefore, samples were selected near this area. Metals and explosives may be present at the Firing-in Butt

(MRS 4); however, this portion of the FUDS is highly developed and no sample media can be identified. The area within MRS 4 is occupied by buildings, warehouses, and paved parking lots. There is no indication of the presence of sample media (e.g., soil) based on a review of current aerial photography, therefore no samples are proposed for MRS 4. Additionally, as discussed in Table 2-2 MC sampling/analysis will focus on constituents present in both propellant and projectile at MRS 1, 2, and 5. Similarly, MC sampling/analysis will focus on the constituents present in the spotting charge and practice bomb body at MRS 3 and MRS 6.

Below is a brief description of each MRS and the MC sample analysis scheme for each site or area.

MRS 1 (Landscape – 1000-inch Range). Prior to 1957, the site was used for small bore shooting practice (.22 caliber rifle). Paper landscape targets, with features recognizable at a distance of 1,000-inches, were attached to vertical posts located on a range approximately 450 ft. wide by 100 ft. long. Personnel fired .22- caliber rifles from a single firing line that was the length of the range. Two subsurface soil samples will be collected. The samples will be analyzed for a reduced list of explosives (NG, DNT and DNT breakdown products [2,4-Dinitrotoluene; 2,6-Dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2-Nitrotoluene; 3-Nitrotoluene; 4-Amino-2,6-dinitrotoluene; 4- Nitrotoluene]) and a reduced list of metals (antimony, copper, iron, lead, nickel) based on the MC associated with the munitions historical used at MRS 1 (Table 2-2).

MRS 2 (Skeet Range). The Skeet Range was used for training and recreation during WWII. The range consisted of a shooting field and safety fan. Two surface soil samples and two subsurface soil samples will be collected at MRS 2. Based on historical documentation of munitions used, surface soil and subsurface soil samples will be analyzed for a reduced list of explosives (NG, DNT and DNT breakdown products [2,4-Dinitrotoluene; 2,6-Dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2-Nitrotoluene; 3-Nitrotoluene; 4-Amino-2,6-dinitrotoluene, 4- Nitrotoluene]) and a reduced list of metals (antimony and lead) (Table 2-2).

MRS 3 (Demonstration Bombing Range). The Demonstration Bombing Range was used as a circular bomb target and 3-pound miniature practice bombs were presumed to have been used (MK-5, MK-23, and MK-43). The targets were located next to the only runway that was present in 1938. One surface soil sample and two subsurface soil samples will be collected at MRS 3. Based on historical documentation of munitions used, surface soil and subsurface soil samples will be analyzed for a reduced list of explosives (NG, DNT and DNT breakdown products) and metals antimony, iron, lead, and zinc (Table 2-2).

MRS 4 (Firing-in Butt). At MRS 4, a target butt was constructed for test firing and sighting purposes. Initially, the target butt was constructed of timber but was later rebuilt with concrete

and earth. The target butt consisted of a berm constructed in front of an aircraft that was parked on a concrete taxiway. Although larger caliber weapons may have been used at MRS 4, the range fan was calculated based on the use of .50 caliber weapons at the firing-in-butt. The MRS 4 range fan extends outside the FUDS boundary, but there is little chance that munitions would have extended beyond the impact berm. The site was also used as a rifle and carbine firing range. Based on the heavy redeveloped, lack of sampling media (e.g., soil) and urban nature of present site conditions, an appropriate sample location could not be identified. Therefore, samples will not be collected within MRS 4.

MRS 5 (Machine Gun Range). The Machine Gun Range was built in 1922 and used by Reserve Officers' Training Corps (ROTC) cadets for training. A wooden structure served as a firing point for machine gun and pistols. Two subsurface soil samples will be collected at MRS 5. As stated previously, there have been finds of shell casings near the former firing point at MRS 5. Therefore, metals MC associated with the shell casings will be analyzed. Based on historical documentation of the munitions used at MRS 5, subsurface soil samples will be analyzed for a reduced list of explosives (NG, DNT and DNT breakdown products [2,4-Dinitrotoluene; 2,6-Dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2-Nitrotoluene; 3-Nitrotoluene; 4-Amino-2,6-dinitrotoluene, 4- Nitrotoluene]) and a reduced list of metals (antimony, copper, iron, lead and nickel).

MRS 6 (Unknown Mortar Range). The presumed mortars were found during excavation work in 1982. There is no historical evidence stating that mortars were used at Mitchel Field. It is also possible that the mortars were misidentified and actually may have been practice bombs (MK-23 or MK-43) which were known to have been used at Mitchel Field. The items were removed in 1982 and no further evidence of munitions was found in these areas. However, based on comments received on the Draft SS-WP by NYSDEC, two surface and subsurface samples (collocated) will be collected in the least disturbed or developed areas near the historical munitions finds. The samples will be analyzed for a reduced list of explosives (NG, DNT and DNT breakdown products [2,4-Dinitrotoluene; 2,6-Dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2-Nitrotoluene; 3-Nitrotoluene; 4-Amino-2,6-dinitrotoluene; 4- Nitrotoluene]) and a reduced list of metals (aluminum, iron).

Background Samples. Five background surface soil samples will be collected from areas that are within or adjacent to the FUDS boundary and exhibit a similar soil composition. Background subsurface soil samples will not be collected due to the similar geologic conditions present between the surface and subsurface soils within the project site. All background soil samples will be analyzed for the following metals: aluminum, antimony, copper, iron, lead, nickel and zinc.

In addition to the MC sampling activities described above, a qualitative reconnaissance will be performed at various locations within the former Mitchel Field FUDS. This reconnaissance will include visual observations and the use of analog geophysics to perform avoidance of potential surface and/or subsurface MEC/MD and to support anomaly avoidance activities. The DQO for the determination of MEC risk will be achieved by completing the reconnaissance within and around each MRS which are considered to be the most likely accessible areas to verify the presence of MEC, MD, or MC.

2.6.2.2 Munitions and Explosives of Concern and Munitions Constituents Exposure Routes

MRS 1 (Landscape – 1000-inch Range), MRS 2 (Skeet Range), MRS 3 (Demonstration Bombing Range), MRS 5 (Machine Gun Range) and MRS 6 (Unknown Mortar Range).

As shown in the CSM for MRS 1, 2, 3, 5 and 6 (Figure 7a, Appendix A), there are potentially complete exposure pathways for receptors including visitors/trespassers/students, construction worker and employees in surface and subsurface soil. Although the area is heavily redeveloped, portions of these MRSs may still contain surface soil from the era when Mitchel Field was an active installation. Surface water is not a medium of concern because although it exists adjacent to the MRS the surface topography in this area is unlikely to transport potential MC to the water body. Similarly, sediment, even though it occurs in the MRS, is not a medium of concern because the potential impact from the range is unlikely. Groundwater is not a medium of concern given that there is no feasible pathway from groundwater to receptors (i.e., extensive commercial/industrial development throughout the former FUDS and receptor use of groundwater in the deeper aquifer (Magothy or Lloyd Aquifers) only. However, based on comments on the Draft SS-WP from NYSDEC groundwater is considered a potentially complete pathway for the construction worker exposure scenario. The potential presence of MEC/MD to all receptors is presented as a complete pathway for surface and a potentially complete pathway for subsurface soil.

MRS 4 (Firing-in Butt)

Based on the heavy redeveloped (buildings and paved parking lots), lack of an exposure scenarios and lack of a media (e.g., soil) for exposure, pathways to surface and subsurface soil are incomplete as shown in the CSM for MRS 4 (Figure 7b, Appendix A). Similarly, surface water and sediment are not media of concern at MRS 4 given the lack of surface water or sediment at the MRSs. Groundwater is not a medium of concern given that there is no feasible pathway from groundwater to receptors (i.e., extensive commercial/industrial development throughout the former FUDS and receptor use of groundwater in the deeper aquifer (Magothy or

Lloyd Aquifers) only. However, as discussed above groundwater throughout the FUDS is a potentially complete pathway for the construction worker receptor. The potential presence of MEC/MD to all receptors is an incomplete pathway for surface and a potentially complete pathway for subsurface soil.

The proposed MEC reconnaissance and MC sampling areas at the former Mitchel Field were selected by assessing the potential pathways and receptors and then choosing biased sample locations based on historical and other site-specific information. Biasing MEC screening/sampling to these areas will achieve the MEC DQOs and permit completion of the MRSPP. MC sampling is further discussed in Section 3.

Site-specific DQOs define a complete MEC/MC exposure analysis. The programmatic DQOs outlined in Section 3.1.2 of the PWP were reviewed and modified to address the site-specific needs of the SI at the former Mitchel Field (Alion 2005). The DQOs were discussed and agreed upon during the July 2008 TPP meeting and Final TPP Memorandum (Alion 2008). The DQO's are included in Appendix C of this SS-WP.

USACE and Alion obtained agreement during the TPP to collect surface and subsurface soil samples to assess presence of MC, associated with the munitions used/fired at the FUDS (see Table 2-2). The MC associated with known munitions used at Mitchel Field and the MC analysis list was further refined and reduced using the MC screening process shown in Table 2-2.

The sampling approach presented below is based on the MRS specific CSMs and current understanding of the sources and pathways for MEC/MC through the environment to the potential receptors (see Section 2.6.3). See Figure 8 in Appendix A for the proposed sampling locations discussed below.

2.6.3 Conceptual Site Model

Based on the discussion in 2.6.2.2, the current version of the CSMs is provided in Figure 7a and 7b in Appendix A of this SS-WP. The CSM is limited to those areas potentially impacted by MEC and/or MC based on the site use and history. The CSM is a dynamic model that will be updated throughout the SI process as additional site information is collected. Figure 7a represents MRS 1, 2, 3, 5 and 6, Figure 7b shows the CSM for MRS 4.

3.0 FIELD INVESTIGATION PLAN

3.1 Pre-Field Activities

USACE North Atlantic Division New York (CENAN) will complete the Right-Of-Entry (ROE) prior to conducting the field sampling activities at Mitchel Field. As of the writing of this report, ROEs will need to be obtained from the following stakeholders; Nassau Community College, Hofstra University, Nassau County, future ROE will be added when they become evident. USACE will notify site owners of actual fieldwork dates in advance of site entry to ensure no access problems are encountered. The Alion Team will contact DigSafe to have underground utilities marked out near the subsurface sample locations prior to conducting field work.

3.2 Environmental Protection Program

Potential environmental resources associated with the FUDS (including T&E species, wetlands, Cultural, Archaeological, and Water Resources) are presented in Section 2 along with avoidance procedures for minimizing potential adverse effects to the environment occurring as result of the planned SI activities at Mitchel Field. Furthermore, in accordance with the PWP, each sampling location will be evaluated individually to avoid tree and shrub removal during SI activities. As a result of these procedures, tree and shrub removals are not anticipated during the field sampling activities.

3.3 Munitions and Explosives of Concern Avoidance Design and Rationale

A UXO Technician II/III will be present to perform MEC avoidance during all SI on-site activities. Prior to conducting site reconnaissance or field sampling operations, the UXO Technician and field personnel will be knowledgeable of the site specific health and safety documents and the types of military munitions used at the site. In addition, the UXO Technician will provide the Alion field personnel, as well as onsite contractors or other non-Alion personnel accompanying the Alion Team, a daily safety briefing to highlight the potential hazards associated with the site.

3.3.1 Site Reconnaissance Field Procedures

Field procedures are described below for areas where the field team will be conducting SI related activities.

3.3.1.1 Land Areas

The qualitative site reconnaissance[1] and field sampling activities require the use of analog geophysical equipment to identify access routes to environmental sampling locations that are free of anomalies. Figure 8, Appendix A includes representative qualitative reconnaissance paths planned for the site. The UXO Technician II/III will ensure an anomaly-free location at or in the vicinity of sample locations. The UXO Technician II/III will document surface or subsurface anomalies at or in the vicinity of the sample collection location, if encountered. Surface and subsurface anomaly locations will be surveyed using a Global Positioning System (GPS) unit, and a description of the surface anomalies (to include type, details, etc.) will be documented in the daily field notes for later inclusion into the SI Report.

In the event that MPPEH is observed and Alion is unable to identify and certify that the MPPEH is (1) Munitions Debris (MD) remaining after munitions use, demilitarization, or disposal; (2) range-related debris, or (3) cultural debris, then Alion shall consult with USACE, for guidance on whether the site or area where the item was found should be considered for a potential emergency response. An emergency response action may be initiated if there is a complete pathway between receptor and the source and the situation is viewed as an "immediate and unacceptable hazard" to the local populace or site personnel. Alion will adhere to the requirements of Engineer Pamphlet 1110-1-18 (USACE 2007) and the USACE Interim Guidance Document (IGD), *Procedure for Preliminary Assessment and Site Inspection Teams That Encounter UXO While Gathering Non-UXO Field Data* (USACE 2006) for initiating an emergency response.

[1] Meandering path refers to the route the field team will follow to navigate through, in, or around a range or Potential Area of Interest. It is not a pre-designed transect at a preset interval, but rather refers to wandering in a zig-zag fashion through an area to identify additional locations of interest, observe site conditions, and present visual observations related to MEC in potentially impacted areas. Qualitative reconnaissance describes the process whereby the field team completes a reconnaissance of certain areas around the site using analog geophysics and visual surveys in a meandering path to avoid MEC, evaluate/confirm proposed sampling locations and collect additional data on anomalies and site conditions to be used in completion of the data quality objectives. The results of the qualitative reconnaissance including surface observations and surface/subsurface anomaly counts related to past DoD operations involving military munitions will be documented in the field books and the SI Report.

If the UXO Technician determines that an item may present an explosives hazard that poses an imminent threat to human health, the following steps of the USACE IGD will be implemented:

- The area will be flagged and GPS coordinates will be obtained.
- The property owner will be notified of the hazard and advised to call the local emergency response authority. The USACE Geographic District PM and CENAB will be notified.
- The property owner will be informed that if they do not call the local response authority within 1 hour, the UXO Technician will notify the local emergency response authority.
- The local response authority will decide on how to respond to the reported incident, including a decision not to respond. Neither USACE personnel nor Alion personnel have the authority to call Explosive Ordnance Disposal (EOD) to respond to an explosives hazard.
- If local response authority decides to respond, the UXO Technician or his designee will mark the location of the item, wait for the arrival of local response personnel, and provide accurate location information to the emergency response authority.

Once the UXO Technician II/III identifies an area as anomaly-free, the MC sampling team will collect the samples for analysis. Samples will be collected from areas identified by the CSMs or the MEC survey to be suspected of containing high concentrations of MEC and/or MC.

If suspected MPPEH subsequently is confirmed to be MEC, and there is a complete pathway between receptor and the source (confirmed MEC), but the situation is not viewed as immediate but rather an "imminent danger posed by the release or threat of a release", USACE, in consultation with Alion, may consider implementing a TCRA. A TCRA is implemented where cleanup or stabilization actions must be initiated within six months to reduce risk to public health or the environment. Alternatively, a NTCRA may be initiated by USACE if more than six months is available for planning. Alion will immediately notify the Geographic District PM at CENAN and the Military Munitions Design Center (DC) Technical Manager at CENAB and provide the necessary detail for USACE to discuss and plan any future actions (TCRA, NTCRA, or other). Alion will follow similar procedures of using a GPS unit to document the location for USACE and providing documentation (including photographs of the scene) as part of the field records.

3.3.1.2 Aquatic Areas

As discussed in Sections 2.2.7 and 2.2.8, no aquatic areas are present within the Mitchel Field FUDS, therefore the SI sampling will focus on accessible land areas where military operations were directed (ranges), and where MEC, if present, is most likely to be detected.

3.3.2 Equipment Calibration and Method Testing

The UXO Technician will utilize hand-held analog metal detection instruments to aid in the identification of potential surface and subsurface MEC locations. A Schonstedt 52CX and/or a Whites All-Metal detector will be used for the purpose of anomaly avoidance during sampling activities at the Mitchel Field FUDS. The Schonstedt will detect ferrous metals while the Whites detector will detect ferrous and non-ferrous metals and will be used to detect small arms materials from MRS 1, 2 and 5. The instruments provide ample detection considering the munitions, geology, and potential interferences expected at the FUDS.

The UXO Technician II/III is trained in the art of both the Schonstedt and Whites detectors and other analog instruments and will check these instruments daily, prior to the start of field work. Schonstedt metal detectors do not require calibration; they have a simple "Go/No Go" field operational check. This function test requires the instruments be used on objects that are representative of the smallest munitions item known or suspected on the FUDS. The UXO Technician II/III will determine the depth of detection for the test items and test the instrument (and spare) close to that limit for everyday testing. If the depth of a soil sample to be taken is deeper than the determined detection depth of the equipment being used (*e.g.*, subsurface samples), then the sample depth screening for UXO will be achieved in steps so that any anomalies deeper than the established detection depth can be detected. If the instrument does not detect the test object, being used to ensure the equipment is in proper functioning condition, the UXO Technician II/III will replace the batteries and retest the instrument. If the instrument fails twice, the instrument will be replaced with a spare that has undergone the daily testing described above. The UXO Technician II/III will check his instruments periodically throughout the day on objects known to contain ferrous metals such as boot eyelets, belt buckles, or other readily available items.

Handheld GPS equipment will be used to log the locations of MPPEH items encountered, adjusted sampling locations, and other items of interest. A Trimble ProXRS, specified in the PWP (Alion 2005), and/or a Trimble GeoXH will be used as a primary GPS unit. A handheld GPS unit will be used as a secondary GPS unit and, if used, will be documented in the SI report as a variance to the PWP. Operator(s) will receive appropriate training on use of the GPS prior to their arrival at the site. GPS locations will be transferred from the data logger at the end of each

field day for inclusion in the FUDS GIS. GPS waypoints will be logged and the Alion member will take measurements at known locations. In the event the GPS does not function because of interference, the field team will use both the data provided in Table 3-1 (coordinates and site descriptions) and sampling maps to visually identify sample locations. The sample locations will be marked and Alion will measure off from available known locations to obtain coordinates. If MPPEH is encountered, the field team will photograph (digital) the item and mark its location using GPS.

GPS performance will be documented through the use of a control point. During the mobilization of the field sampling efforts, a surveyed point with a known location (third order or better) will be identified. The surveyed point will be occupied by the GPS unit each field day. The GPS location will be recorded and compared to the known value, validating the unit's accuracy. The surveyed test point will be in similar vegetation (if possible) to most of the area where the GPS will be used (if wooded, test point should be in woods). The pass/fail GPS performance test will require that the GPS unit to register within 3 feet of the established surveyed/control point.

3.4 Munitions Constituents Field Sampling Activities

Field activities will follow the procedures outlined in the PWP (Alion 2005), Programmatic Sampling and Analysis Plan (PSAP) and Addendum (Appendix E.1 and E.2 of the PWP [Alion 2005]) except that the soil samples will be homogenized in a one-gallon plastic bag rather then in a stainless steel mixing bowls. Information pertaining to the specific samples that will be collected at Mitchel Field is detailed below.

Field sampling identification designations, GPS location coordinates, and the sampling rationale for each sample location are presented in Table 3-1. The actual coordinates (listed below) established for the sample locations were taken from a review of aerial photographs and historical information. These sample locations may require adjustments in the field due to site-specific conditions (i.e. access issues, MEC avoidance, etc.). During the Mitchel Field SI field event, a total of three surface soil samples, eight subsurface soil samples and five background soil samples will be collected. The proposed sampling locations, shown in Figures 8, Appendix A, are areas where MEC/MC were historically used/fired and, if present, are most likely to be detected. Sampling methods for each medium are described in Table 3-3.

Table 3-1. Mitchel Field Sample Location Descriptions

Location	Sampling ID	Coordinate System: NAD 1983 UTM Zone 18N		Area of Interest / Rationale of Sampling Locations
		Easting(ft)	Northing(ft)	
Landscape – 1000-inch Range (MRS 1)	MF-LDSC-SS/SB-02-01	619949.8724	4508568.1335	Near the firing point in a less disturbed area in the southern part of the MRS.
	MF-LDSC-SS/SB-02-02	619954.8646	4508477.5611	Near the firing point in a less disturbed area in the southern part of the MRS.
Skeet Range (MRS 2)	MF-SR-SS/SB-01-01	619442.4410	4509206.4919	Eastern part of the MRS.
	MF-SR-SS/SB-01-02	619493.6924	4509055.6386	Southeastern part of the MRS.
	MF-SR-SS/SB-02-01	619375.7174	4509261.6114	Center part of the MRS.
	MF-SR-SS/SB-02-02	619430.8369	4509101.0880	Center part of the MRS.
Demonstration Bombing Range (MRS 3)	MF-DBR-SS/SB-01-01	618987.6207	4509311.0859	Southeastern portion of the MRS in a less developed area.
	MF-DBR-SS/SB-02-01	618802.8255	4509330.3777	Southeastern portion of the MRS in a less developed area.
	MF-DBR-SS/SB-02-02	618941.4219	4509365.9153	Southeastern portion of the MRS in a less developed area.
Machine Gun Range (MRS 5)	MF-MGR-SS/SB-02-01	618137.2335	4508644.5955	Western part of the MRS.
Unknown Mortar Range (MRS 6)	MF-UKM-SS/SB-02-01	618059.5212	4508530.5423	Near the location of a historical munitions find in the eastern portion of the FUDS.
	MF-UKM-SS/SB-02-02	619338.4532	4508566.0914	Near the location of a historical munitions find in the southern portion of the FUDS.
Overall Site Groundwater	MF-OS-GW-00-01	619030.9802	4509207.6407	Per-existing well south of MRS 3.
	MF-OS-GW-00-02	619642.0303	4509249.1512	Per-existing well within MRS 2.
Background samples	MF-BG-SS-01-01	619404.7216	4509626.6086	Background sample for metals at FUDS boundary
	MF-BG-SS-01-02	619476.8120	4509594.1171	Background sample for metals at FUDS boundary
	MF-BG-SS-01-03	619497.1192	4509657.0694	Background sample for metals at FUDS boundary
	MF-BG-SS-01-04	619515.3957	4509732.2059	Background sample for metals at FUDS boundary
	MF-BG-SS-01-05	619520.4725	4509789.0660	Background sample for metals at FUDS boundary

FUDS= Formerly Used Defense Site MF= Mitchel Field LDSC- Landscape 1000-inch range SR= Skeet Range DBR= Demolition Bombing Range MGR= Machine Gun Range OS = Overall Site MRS= Munitions Response Site	BG=Background SS= Surface Soil Sample SB= Subsurface Soil GW = Groundwater UTM= Universal Transverse Mercator

3.4.1 Background Samples

As stated in section 2.6.2.1 five background soil samples will be analyzed for aluminum, antimony, copper, lead, iron, nickel, and zinc at Mitchel Field.

3.4.2 Surface/Subsurface Soil

Soil samples proposed for collection at the FUDS are surface and subsurface samples. A total of 14 surface samples will be collected from 0 – 6 inches below ground surface (bgs) from MRS 1 (two samples), MRS 2 (four samples), MRS 3 (three samples), MRS 5 (three samples) and MRS 6 (two samples). Soil samples will be collected utilizing dedicated, disposable plastic trowels and homogenized in a one-gallon dedicated plastic bag.

A total of 14 subsurface soil samples will be collected at Mitchel Field by digging with a plastic disposable shovel and then collecting the subsurface soil samples with a disposable trowel to the desired depth. Subsurface soil samples will be collected at depths of approximately 6-12 inches bgs and homogenized in a one-gallon dedicated plastic bag.

Below are the proposed analyses to be performed at the MRSs. As previously discussed in Section 2.6.2.1 and Table 2-2 no environmental samples will be collected at MRS 4 (Firing-in Butt) due to heavy development in this area and a lack of suitable sampling media.

MRS 1 (Landscape 1000-inch Range). Two surface and subsurface soil samples will be collected from MRS 1 in areas that are most likely to be impacted by MC and analyzed for NG using method 8330A (mod), DNT and DNT breakdown products (2,4-Dinitrotoluene; 2,6-Dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2-Nitrotoluene; 3-Nitrotoluene; 4-Amino-2,6-dinitrotoluene; 4-Nitrotoluene) using method 8330A, and antimony, copper, iron, lead, and nickel using extraction method 3050B and analysis method 6010B.

MRS 2 (Skeet Range). Four surface and subsurface soil samples will be collected from the skeet range area and analyzed for NG using method 8330A (mod), DNT and DNT breakdown products (2,4-Dinitrotoluene; 2,6-Dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2-Nitrotoluene; 3-

Nitrotoluene; 4-Amino-2,6-dinitrotoluene; 4-Nitrotoluene) using method 8330A, and antimony and lead using extraction method 3050B and analysis method 6010B.

MRS 3 (Demonstration Bombing Range). Three surface and subsurface soil samples will be collected from the least developed areas within MRS 3 and analyzed for NG using method 8330A (mod), DNT and DNT breakdown products (2,4-Dinitrotoluene; 2,6-Dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2-Nitrotoluene; 3-Nitrotoluene; 4-Amino-2,6-dinitrotoluene; 4-Nitrotoluene) using method 8330A, and antimony, iron, lead, and zinc using extraction method 3050B and analysis method 6010B.

MRS 5 (Machine Gun Range). Three surface and subsurface soil samples will be collected from the area and analyzed for NG using method 8330A (mod), DNT breakdown products (2,4-Dinitrotoluene; 2,6-Dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2-Nitrotoluene; 3-Nitrotoluene; 4-Amino-2,6-dinitrotoluene; 4-Nitrotoluene) using method 8330A, and antimony, copper, iron, lead, and nickel using extraction method 3050B and analysis method 6010B.

MRS 6 (Unknown Mortar Range). Two surface and subsurface soil samples will be collected from the least developed areas within MRS 6 and analyzed for NG using method 8330A (mod), DNT breakdown products (2,4-Dinitrotoluene; 2,6-Dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2-Nitrotoluene; 3-Nitrotoluene; 4-Amino-2,6-dinitrotoluene; 4-Nitrotoluene) using method 8330A, and aluminum and iron using extraction method 3050B and analysis method 6010B.

3.4.3 Surface Water/Sediment

There are areas of surface water/sediment within MRS 1 and 5 but since the areas are unlikely to be impacted during the FUDS use surface water and sediment samples will not be collected during the SI.

3.4.4 Groundwater

Although the potable water in the vicinity of the FUDS is supplied by the municipal water supply authority, groundwater in the shallow, unconsolidated aquifer may be a potentially complete pathway for the construction worker exposure scenario. Therefore, groundwater samples will be collected at Mitchel Field.

Groundwater within the upper, unconfined aquifer at the site is expected to be encountered at approximately 5 - 37 feet bgs. The unconsolidated subsurface material is anticipated to have a relatively high hydraulic conductivity and as such should yield a sufficient volume of water for each analysis.

Numerous preexisting groundwater monitoring wells are present at various locations throughout the project site. Two groundwater samples will be collected from wells located near MRS 3 and within MRS 2. The procedure to be used when extracting groundwater samples from a preexisting well is as follows.

1. Sample will be obtained using a peristaltic pump with dedicated tubing. New nitrile gloves will be worn during sampling activities.

2. Groundwater will be removed under low-flow conditions utilizing a peristaltic pump to minimize turbidity. The groundwater at the sampling location will be purged, as practicable, in order to reduce turbidity and ensure formation water is being extracted.

3. After the sample bottle is filled, the cap will be placed on the bottle and the bottle will be placed in an ice cooler at 4^{o} C for proper preservation and packaged for shipment.

4. QA/QC samples will be collected as specified in Table 3-2.

5. Conductivity, pH, turbidity, and temperature will be measured prior to sample collection while using EPA low-flow techniques. The measurements will be recorded in the field logbook.

Two groundwater samples will be collected within the FUDS boundary and will be analyzed for NG using method 8330A-Mod and DNT and DNT breakdown products (2,4-Dinitrotoluene; 2,6-Dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2-Nitrotoluene; 3-Nitrotoluene; 4-Amino-2,6-dinitrotoluene, 4- Nitrotoluene).

3.4.5 Quality Control/Quality Assurance Samples

Quality control (QC) samples will be collected as specified and described in the PWP and as indicated in Tables 3-2, 3-3 and 3-4. QC samples will include field duplicates, matrix spike and matrix spike duplicates. Note: no equipment (rinsate) blanks are anticipated since only dedicated disposable equipment will be used during sample collection. Per direction from the USACE CENAB chemist, no quality assurance (QA) samples will be collected at Mitchel Field.

Table 3-2. Sample Identification Table

Location	Sampling ID	Media[1]		MC Sampled[2]			Quality Control Samples[3]	
		Surface and subsurface soil	Groundwater	Explosives (reduced 8330A list of DNT breakdown products)	Explosives (reduced 8330A mod for NG)	Reduced Metals (reduced 6010B soil and 6020 for GW)	Field Duplicate[4]	MS/MSD[5]
Landscape 1000" Range (MRS 1)	MF-LDSP-SS/SB-02-01	X		X	X	X		
	MF-LDSP-SS/SB-02-02	X		X	X	X		
Skeet Range (MRS 2)	MF-SR-SS/SB-02-01	X		X	X	X	X	
	MF-SR-SS/SB-02-02	X		X	X	X		
	MF-SR-SS/SB-02-03	X		X	X	X		
	MF-SR-SS/SB-02-04	X		X	X	X		
Demonstration Bombing Range (MRS 3)	MF-DBR-SS/SB-02-01	X		X	X	X		
	MF-DBR-SS/SB-02-02	X		X	X	X		X
	MF-DBR-SS/SB-02-03	X		X	X	X	X	
Machine Gun Range (MRS 5)	MF-MGR-SS/SB-02-01	X		X	X	X		
	MF-MGR-SS/SB-02-02	X		X	X	X		
	MF-MGR-SS/SB-02-03	X		X	X	X		
Unknown Mortar Range (MRS 6)	MF-UKM-SS/SB-02-01	X		X	X	X		
	MF-UKM-SS/SB-02-02	X		X	X	X		
Overall Site Groundwater	MF-OS-GW-00-01		X	X	X		X	
	MF-OS-GW-00-02		X	X	X			X
Background Samples	MF-BG-SS-01-01	X				X		
	MF-BG-SS-01-02	X				X		
	MF-BG-SS-01-03	X				X		
	MF-BG-SS-01-04	X				X		
	MF-BG-SS-01-05	X				X		
Totals		19	2	16	16	19	3	2

1. The reduced list of explosives and/or metals will vary depending on the location of the samples being collected (MRS 1,2, 3, 5, or background)
2. For each QC sample, the marked sample type will be gathered for every MC category that is being sampled. Dedicated equipment will be used. Proposed QC sample locations may change depending on sampling conditions and sampling media available (i.e. may change if adequate media is not available to collect additional volume).
3. FD# will replace sample ID (the sample ID and its corresponding FD# will be indicated in the field notebook); 10%. The soil profile at each sampling location is expected to be a consistent soil type from the surface to a depth of 12 inches, therefore one FD will be collected to be representative of surface and subsurface soil conditions.
4. MS/MSD samples will be analyzed at a frequency of 5%. The Field Team will add the following note on the field Chain of Custody: Additional volume collected for MS/MSD

analysis. 1 MS and 1 MSD will be collected for explosives and 1 MS and 1 MSD will be collected for metals.	
MF: Mitchel Field LDSP: Landscape 1000-inch range (MRS1) SR: Skeet Range DBR: Demolition Bombing Range MGR: Machine Gun Range OS = Overall Site BG: Background FD#: Field Duplicate Number ID: Identification	MC: Munition Constituent MS/MSD Matrix Spike/Matrix Spike Duplicate PWP: Programmatic Work Plan for Formerly Used Defense Sites Military Munitions Response Program Site Inspections in the Northeast Region QC: Quality Control SS: Surface Soil SB: Subsurface Soil

Table 3-3. Analytical Parameters, Methods, Standards, and Total Number of Soil Analyses

Compound	Analytical/ Preparation Method	Preservative	Sample Container Type[1]	Holding Times[2]	Number of Samples	Field Duplicate[3]	QA Splits[4]	MS[5]	MSD[5]	Equipment Blanks[6]	Total Analyses
Explosives											
2,4-Dinitrotoluene 2,6-Dinitrotoluene 2-Amino-4,6-dinitrotoluene 2-Nitrotoluene 3-Nitrotoluene 4-Amino-2,6-dinitrotoluene 4- Nitrotoluene	SW8330A	Cool to 4°C	1- 8 oz wide-mouth glass jar w/ Teflon-lined cap (250 grams)	14/40 days	14	2	0	1	1	N/A	18
Nitroglycerin	SW8330A (mod)	Cool to 4°C	1- 8 oz wide-mouth glass jar w/ Teflon-lined cap (250 grams)	14/40 days	14	2	0	1	1	N/A	18
Metals											
Antimony Copper Lead Iron Nickel Zinc	6010B/ 3050B	Cool to 4°C	1 4-oz. wide-mouth glass jar w/ Teflon-lined cap (125 grams)	180/28 days	19	2	0	1	1	N/A	23

[1] Indicates number of bottles
[2] Number of days between sample collection and extraction/number of days between extraction and analysis
[3] Field Duplicates, 1 per 10 (10%)
[4] QA Splits, none per CENAB direction
[5] MS/MSD, 1:20 (5%) – To be selected at the laboratory by GPL Laboratories LLLP
[6] Temperature Blank, 1 per cooler; Equipment Blank, 1 per FUDS (if necessary); No reusable equipment anticipated

N/A = Not Applicable
QA = Quality Assurance
MS/MSD = Matrix Spike/Matrix Spike Duplicate

Table 3-4. Analytical Parameters, Methods, Standards, and Total Number of Groundwater Analyses

Compound	Analytical/ Preparation Method	Preservative	Sample Container Type[1]	Holding Times[2]	Number of Samples	Field Duplicates[3]	QA Splits[4]	MS[5]	MSD[5]	Equipment Blanks[6]	Total Analyses
Explosives [7]											
2,4-Dinitrotoluene; 2,6-Dinitrotoluene; 2-Amino-4,6-dinitrotoluene; 2-Nitrotoluene; 3-Nitrotoluene; 4-Amino-2,6-dinitrotoluene, 4- Nitrotoluene (DNT and breakdown products)	SW8330A	Cool to 4°C	2 1- Liter Amber glass bottle w/ Teflon lined cap	7 days	2	1	0	1	1	N/A	5
Nitroglycerin	SW8330A (mod)	Cool to 4°C	Same as above	7 days	2	1	0	1	1	N/A	5

[1] Indicates number of bottles
[2] Number of days between sample collection and extraction/number of days between extraction and analysis
[3] Field Duplicates, 1 per 10 (10%)
[4] QA Splits, none per CENAB direction.
[5] MS/MSD, 1 per 20 (5%) – To be selected at the laboratory by GPL Laboratories LLLP
[6] Temperature Blank, 1/cooler; Equipment Blank, 1/ FUDS (if necessary); No reusable equipment anticipated
[7] Samples will be collected and analyzed for a reduced list of explosives analysis based on the munitions used at Mitchel Field.

N/A = Not applicable
QA = Quality Assurance
MS/MSD = Matrix Spike/Matrix Spike Duplicate

3.5 Sample Handling

Samples collected during the SI activities at the former Mitchel Field will be handled as outlined in the Programmatic Field Sampling Plan (PFSP) located in Appendix E of the PWP, with the exception that soil samples will be homogenized in a one-gallon plastic bag rather than in a stainless steel mixing bowls. Disposable scoops will be used to collect the surface soil and sediment samples. Due to the relatively shallow depth of the subsurface samples a new disposable trowel will be used to collect the subsurface soil sample. Table 3-3 and Table 3-4 provide additional information regarding preservatives, sample container types, and allowable sample holding times. Table 3-2 details the location, matrix sampled, sampling ID, types of analyses, and number of samples to be collected, including those for QC purposes. Adjustments to these plans may be necessary in the field due to unforeseen site conditions. Deviations from the PFSP during fieldwork will be documented in the field notebook along with an explanation for each modification. Examples of the logs and forms used to document field activities are provided in Appendix F.

3.6 Data Collection, Assessment and Analytical Procedures

Both field and non-measurement data will be used to support this SI. Non-direct measurement refers to data and other information that have been previously collected or generated under some effort outside the specific project being addressed by the QA Project Plan. Potential non-direct measurement sources to be used during the SIs include, but are not limited to:

- Site-specific USACE information (i.e., INPR, ASR. ASR Supplemental, etc.)
- Site-specific information from stakeholders or knowledgeable individuals associated with the FUDS collected during the TPP or SS-WP development process
- Site-specific demographic and climatic data from the U.S. Census Bureau
- Site-specific geology, hydrology, and soil information from the U.S. Geological Survey (USGS)
- Site-specific aerial maps, topography, and land use from the U.S. Department of Agriculture (USDA)
- Site-specific information on T&E Species from the NYDEC and the U.S. Fish & Wildlife Service (USFWS)

- Site-specific information pertaining to cultural and archeological resources associated with the site collected from the New York State Office of Parks, Recreation and Historical Preservation (NYSOPRHP).

Field data collected will be analyzed in accordance with the procedures and protocol defined in the PWP and this SS-WP. In particular, the following organizations have responsibilities for sample analysis, data validation, and QA Requirements:

- Sample Analysis – GPL Laboratories, LLLP is responsible for the data analysis and for following applicable protocols for pertaining to analytical methods (outlined in the Programmatic Quality Assurance Project Plan [PQAPP] located in Appendix E of the PWP). Analytical results will be used by all stakeholders during the SI process.

- Review/validation of SI Analytical Results – EDS Inc. is responsible for reviewing and validating the data acquired during the SI.

- Review/validation of SI Analytical Results – EDS Inc. is responsible for reviewing and validating the data acquired during the SI.
- QA Requirements - QA split samples will not be collected per CENAB direction since laboratory QA samples have been tested for two years and the results have verified that the laboratory quality assurance is satisfactory.

Table 3-3 identifies the analytical methods for each media for which samples are planned. The tables also provide details on preserving samples, sample containers, hold times, and numbers of quality control samples that will be collected.

The DQO worksheets were developed using the TPP process (USACE 1998) and the Guidance on Systematic Planning using the Data Quality Objectives Process (USEPA 2006). The DQO worksheets define the performance criteria that limit the probabilities of making decision errors by considering the intended data uses, defining the appropriate type of data needed, and specifying the appropriate sampling and analysis methods. The site-specific DQOs will be evaluated throughout the SI Process to determine if the DQOs are achieved during the SI. A DQO attainment verification worksheet will be included in the SI Report.

3.7 Investigative Derived Waste

The only Investigative Derived Waste (IDW) anticipated will be from dedicated sampling equipment and sampling materials (gloves, disposable trowels, paper towels etc.). This material

will be disposed of as general refuse off-site. Excess soil will be placed back in the sampling locations in accordance with the approved PWP.

4.0 QUALITY ASSURANCE

The PQAPP, prepared by USACE and included in Appendix E.1 of the PWP along with the programmatic addendum to the PQAPP (Appendix E.2 to the PWP), provides guidance for QA procedures (Alion 2005). The PQAPP addresses the following topics:

- Project organization and responsibilities (related to project QA and QC)
- Data assessment organization and responsibilities. Alion reviews the electronic data deliverables (EDDs) of GPL's Automated Data Review (ADR) data to ensure the EDDs are free of the ADR conformance errors.
- DQOs
- Sample receipt, handling, custody, and holding time requirements
- Analytical procedures (related to operations of laboratory and field equipment)
- Data reduction/calculation of data quality indicators. Alion reviews and confirms the final data qualifiers of chemical data validated by Alion's third party team member, EDS, are in compliance with the DoD Quality Systems Manual (QSM) (DoD 2006) and the USEPA Region Criteria and Standards[2].
- Laboratory operations documentation
- Data assessment procedures

Based on the history of munitions used at Mitchel Field (Table 2-2) and the sampling rationale, the chemical-specific MQOs include selected metals and selected explosives (Appendix C). The analytes of concern are presented in Table 3-3 and 3-4. Federal human health and ecological screening values will be used for comparison of sampling results in the human health and ecological risk screening. In addition, the Preferred Maximum Method Quantitation Limits (PMMQL) (half of the most stringent criteria) was identified to verify laboratory reporting limits will achieve the project goals. Since the metal analytes are naturally occurring in soil, site metals data will be compared with background sample data. The range of metal concentrations found in site samples will be compared qualitatively to site-specific background levels (highest value and

[2] The most recent USEPA Regional Screening Values will be used in the human health screening for this SI.

mean value) found in the site background samples. In summary, all lines of evidence including secondary lines of evidence, such as historic data, field data, and comparison to regional background concentration ranges for metals, (if available) will be used to make a final decision for an NDAI designation or RI/FS.

This site-specific Quality Assurance Project Plan (QAPP) (Alion 2005) (e.g., see Sections 1 and 3) provides project specific information and operating procedures applicable to sampling and analytical activities to be performed as part of the SI at the Mitchel Field FUDS. Specifically this QAPP provides site-specific DQOs developed for the former Mitchel Field and provides insight into the DQO process. The reader is referred to the PWP (Alion 2005) for discussions relating to the other PQAPP topics.

5.0 REFERENCES

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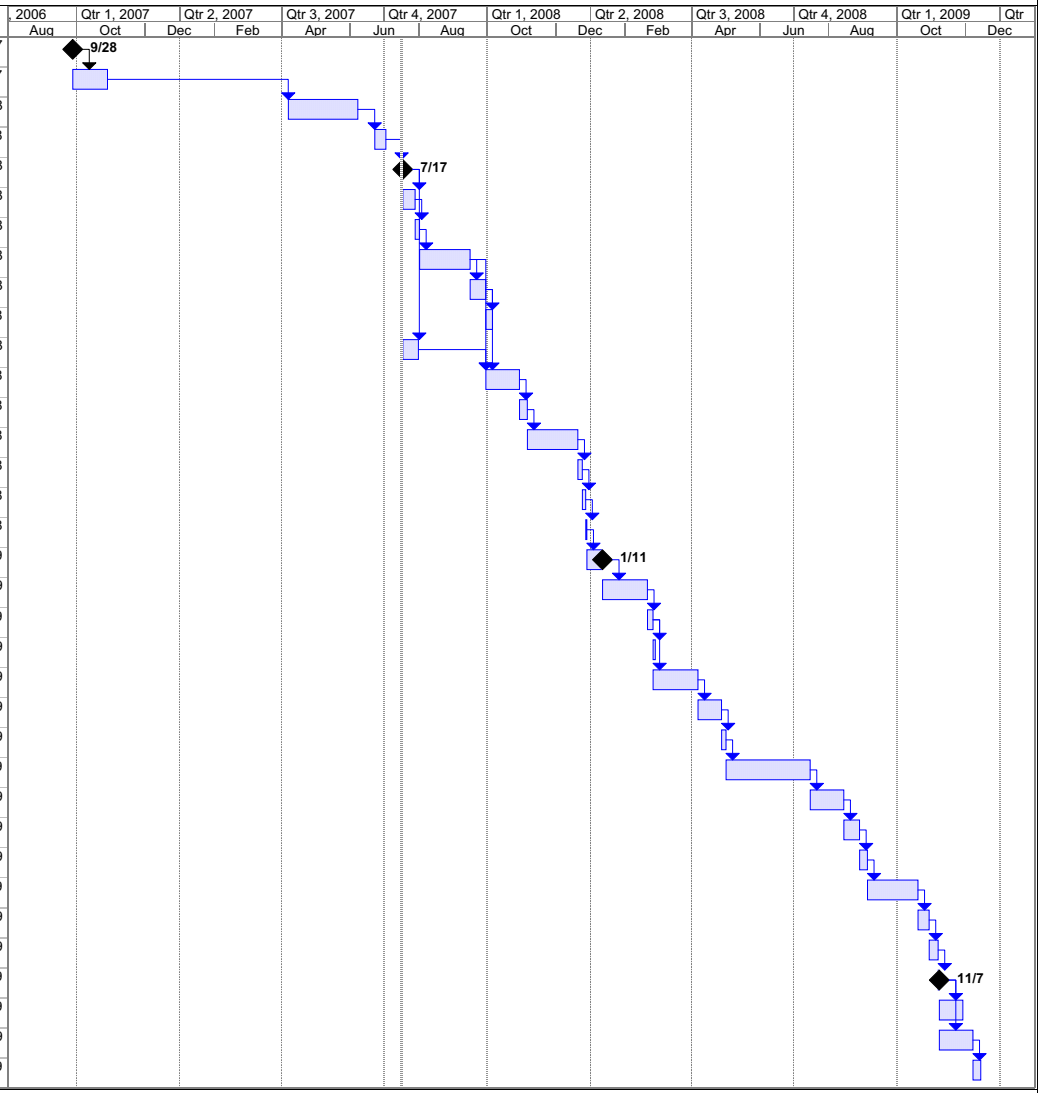
APPENDIX A – FIGURES

Mitchel Field

ID	Task Name	Duration	Start	Finish
1	SITE AWARD	0 days	Fri 9/28/07	Fri 9/28/07
2	ADDITIONAL HISTORICAL DATA RESEARCH	31 days	Fri 9/28/07	Sun 10/28/07
3	PREPARE 'READ AHEAD' PACKAGE, DRAFT CSM, & DRAFT TPP SLIDES	62 days	Mon 4/7/08	Sat 6/7/08
4	USACE SUBMITS READ AHEAD FOR STAKEHOLDERS REVIEW	10 days	Mon 6/23/08	Wed 7/2/08
5	TPP # 1	1 day	Thu 7/17/08	Thu 7/17/08
6	TPP # 1 MEMORANDUM (DRAFT) PREPARATION	11 days	Fri 7/18/08	Mon 7/28/08
7	TPP # 1 MEMO SUBMITTED TO USACE FOR DISTRIBUTION TO STAKEHOLDERS	4 days	Tue 7/29/08	Fri 8/1/08
8	TPP # 1 MEMO STAKEHOLDER & USACE REVIEW & COMMENT PERIOD	45 days	Sat 8/2/08	Mon 9/15/08
9	TPP # 1 MEMO ALION RESPOND TO COMMENTS & PREPARATION OF FINAL TPP	14 days	Tue 9/16/08	Mon 9/29/08
10	TPP # 1 RESPONSE TO COMMENTS REVIEW / MEMORANDUM CONCURRENCE	6 days	Tue 9/30/08	Sun 10/5/08
11	COLLECTION OF ADDITIONAL DATA FROM SITE OWNERS FOLLOWING TPP #1	14 days	Fri 7/18/08	Thu 7/31/08
12	PREPARE DRAFT SS-WP w/ADDITIONAL SITE OWNER DATA	30 days	Tue 9/30/08	Wed 10/29/08
13	DRAFT SS-WP SUBMITTED TO USACE FOR DISTRIBUTION TO STAKEHOLDERS	7 days	Thu 10/30/08	Wed 11/5/08
14	REVIEW & COMMENT PERIOD FOR DRAFT SS-WP BY USACE & STAKEHOLDERS	45 days	Thu 11/6/08	Sat 12/20/08
15	RESPOND TO COMMENTS ON SS-WP	4 days	Sun 12/21/08	Wed 12/24/08
16	USACE & STAKEHOLDERS REVIEW RESPONSES	3 days	Thu 12/25/08	Sat 12/27/08
17	CONFERENCE CALL (IF NEEDED) WITH COMMENTERS TO FINALIZE SS-WP	1 day	Sun 12/28/08	Sun 12/28/08
18	PRODUCE FINAL SS-WP	14 days	Mon 12/29/08	Sun 1/11/09
19	FIELDWORK PREPERATION AND MOBILIZATION TO SITE	40 days	Mon 1/12/09	Fri 2/20/09
20	FIELD WORK - MEC SURVEY, GEOPHYSICS, AND MC SAMPLING	5 days	Sat 2/21/09	Wed 2/25/09
21	DEMOBILIZATION FROM SITE	2 days	Thu 2/26/09	Fri 2/27/09
22	DATA TO LABORATORY	40 days	Thu 2/26/09	Mon 4/6/09
23	DATA TO VALIDATOR	21 days	Tue 4/7/09	Mon 4/27/09
24	DATA TO ALION TEAM	4 days	Tue 4/28/09	Fri 5/1/09
25	DRAFT SI REPORT	75 days	Sat 5/2/09	Wed 7/15/09
26	REVIEW PERIOD OF DRAFT SI REPORT BY USACE	30 days	Thu 7/16/09	Fri 8/14/09
27	RESPOND TO USACE COMMENT & PRODUCE DRAFT FINAL SI REPORT	14 days	Sat 8/15/09	Fri 8/28/09
28	DRAFT FINAL REPORT SUBMITTED TO USACE FOR DISTRIBUTION TO STAKEHOLDERS	7 days	Sat 8/29/09	Fri 9/4/09
29	REVIEW & COMMENT PERIOD FOR DRAFT FINAL REPORT BY USACE & STAKEHOLDERS	45 days	Sat 9/5/09	Mon 10/19/09
30	RESPOND TO COMMENTS ON DRAFT FINAL REPORT	10 days	Tue 10/20/09	Thu 10/29/09
31	USACE & STAKEHOLDER REVIEW RESPONSES	8 days	Fri 10/30/09	Fri 11/6/09
32	TPP #2 (IF NEEDED) WITH STAKEHOLDERS/COMMENTERS TO FINALIZE SI REPORT	1 day	Sat 11/7/09	Sat 11/7/09
33	TPP #2 MEMORANDUM PREPARATION	21 days	Sun 11/8/09	Sat 11/28/09
34	PRODUCE FINAL SI REPORT	30 days	Sun 11/8/09	Mon 12/7/09
35	USACE ACCEPTANCE OF FINAL SI REPORT	7 days	Tue 12/8/09	Mon 12/14/09



11_Mitchel_Field_Schedule_071608
Date: Wed 7/16/08

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

FIGURE 1: SCHEDULE FOR SITE INSPECTION OF MITCHEL FIELD NO. C02NY064503

Mitchel Field

Garden City, New York
Nassau County

Legend

FUDS Boundary

Imagery Source: NYS
GIS Clearinghouse (2004)

N
W E
S

Feet
0 750 1,500 3,000

Figure 2. Aerial Map

Mitchel Field

Garden City, New York
Nassau County

Legend

- MRS 1 - Landscape 1000"
- MRS 2 - Skeet Range
- MRS 3 - Demonstration Bombing Range
- MRS 4 - Firing-in Butt
- MRS 5 - Machine Gun Range
- MRS 6 - Approximate Location of 60mm or 81mm Mortar Find
- FUDS Boundary

Imagery Source: NYS GIS Clearinghouse (2004)

N
W E
S

0 750 1,500 3,000 Feet

Figure 3. Site Layout

Mitchel Field

Garden City, New York
Nassau County

Legend

- MRS 1 - Landscape 1000"
- MRS 2 - Skeet Range
- MRS 3 - Demonstration Bombing Range
- MRS 4 - Firing-in Butt
- MRS 5 - Machine Gun Range
- MRS 6 - Approximate Location of 60mm or 81mm Mortar Find
- FUDS Boundary

Imagery Source: ESRI NGS Topo US 2D

N
W E
S

Feet
0 1,600 3,200 6,400

Figure 4. Topography Map

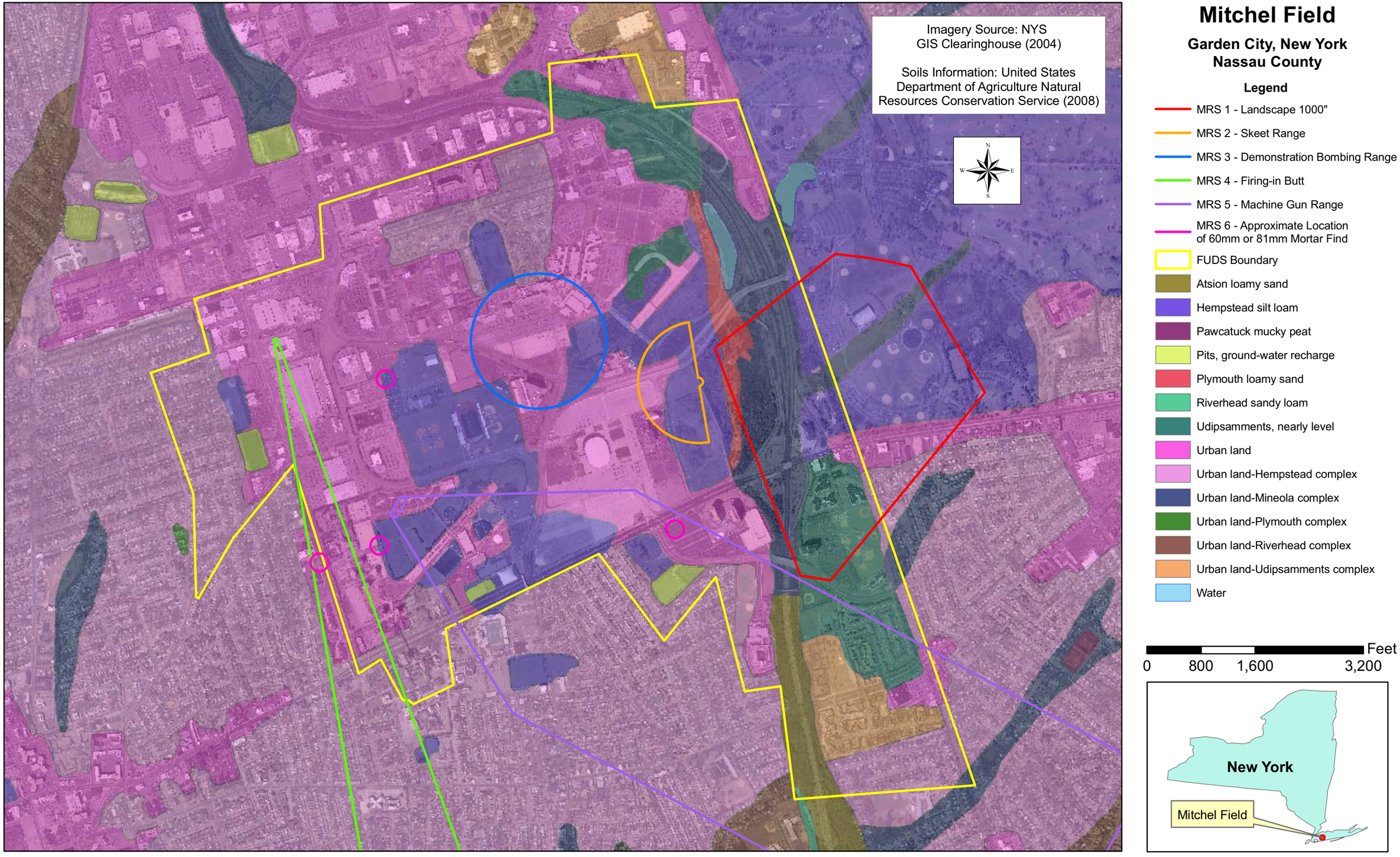
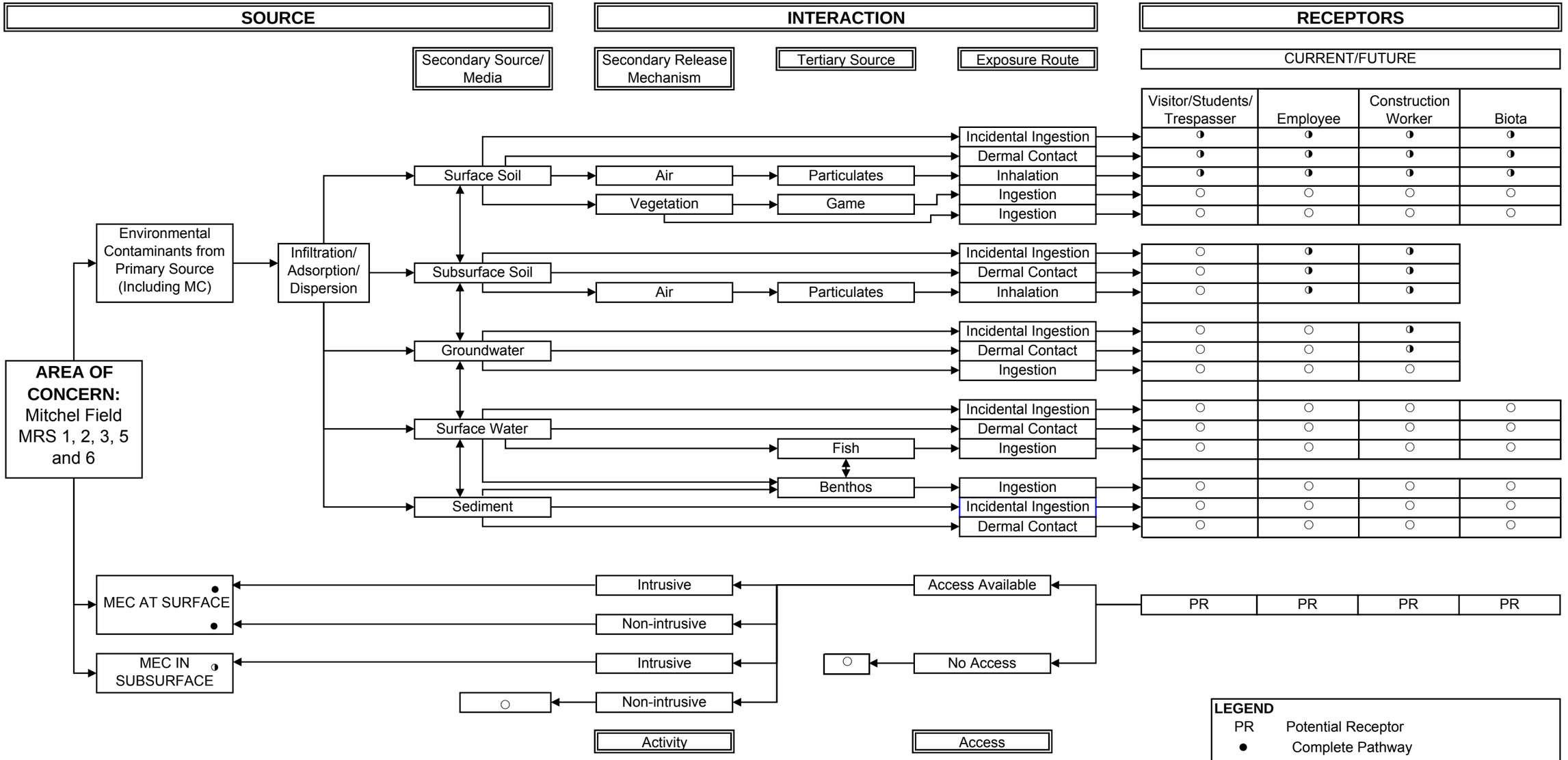


Figure 5. Soils

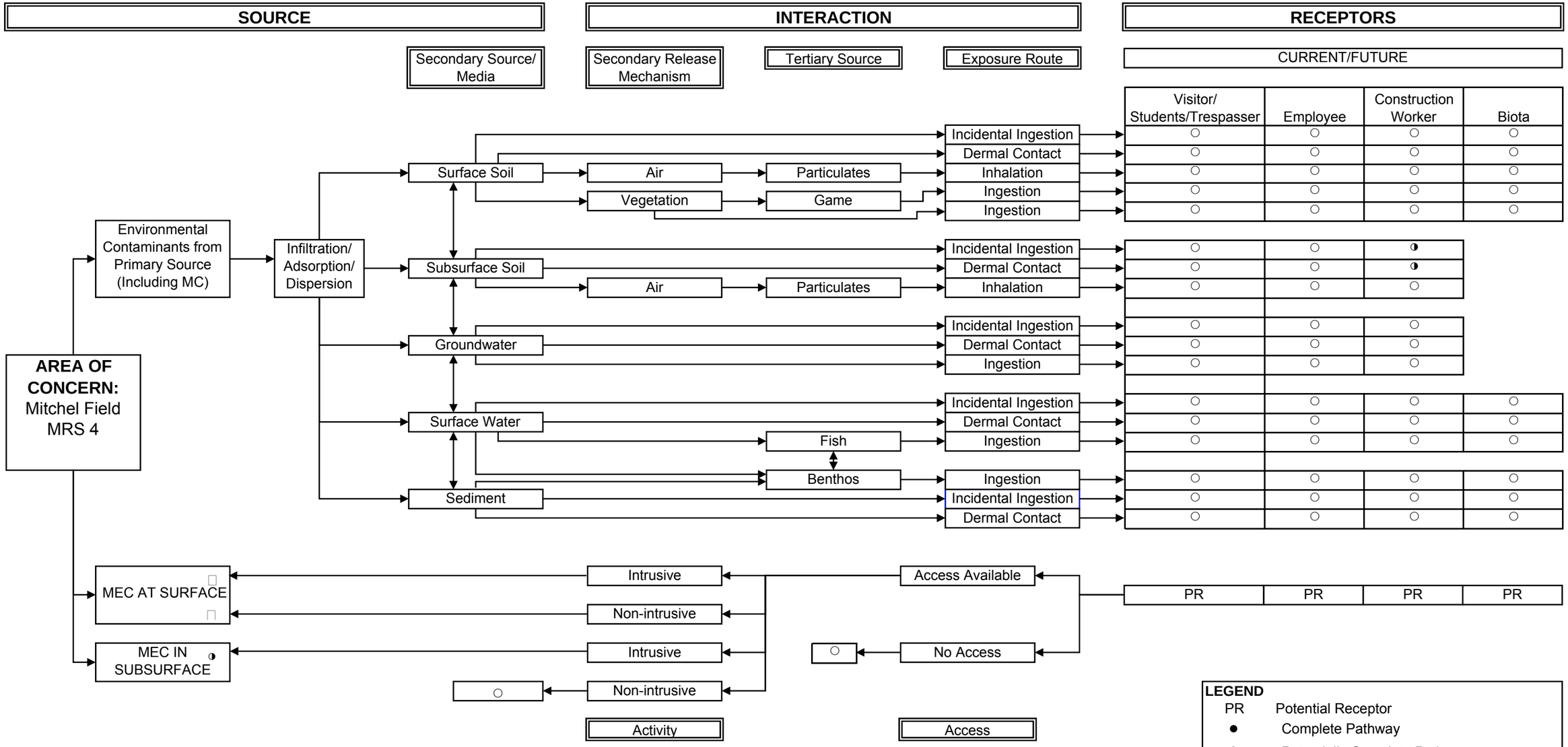
Figure 6. Wetlands



NOTES:
1. For the MMRP SI at Mitchel Field, this CSM summarizes the potential risk exposure scenarios for MRS 1, 2, 3, 5 and 6. For a pathway to be complete, it must include a source, an exposure medium, an exposure route, and a receptor. A complete pathway may also include a release mechanism and a transport medium. Interaction between a potential receptor and MEC has two components: access and activity.
2. Primary sources will vary but will include the MRS 1, 2, 3, 5 and 6 range areas where historical MEC activities occurred. Permanent surface water bodies or wetlands are present in the vicinity of MRS 1, 2, 3, 5 and 6, but due to their location and surface topography the potential impact in those areas are very limited. Groundwater is considered a medium of concern, although potable water is provided by Suffolk County via deep wells drawing water from the Magothy Aquifer construction workers may be exposed to groundwater during construction activities.
3. CSM will be refined as more data is obtained and finalized in the Site Inspection Report.

DIAGRAM OF THE INTEGRATED CONCEPTUAL SITE MODEL FOR
Mitchel Field[1, 2 and 3]
MRS 1, 2, 3, 5 and 6
(WORKING DRAFT)
Revised January 2009 Figure 7a

Source: U.S. Army Corps of Engineers (USACE). 2003. *Conceptual Site Models for Ordnance and Explosives (OE) and Hazardous, Toxic, and Radioactive Wastes (HTRW) Projects.* EM 1110-1-1200.



NOTES:

1. For the MMRP SI at Mitchel Field, this CSM summarizes the potential risk exposure scenarios for MRS 4. For a pathway to be complete, it must include a source, an exposure medium, an exposure route, and a receptor. A complete pathway may also include a release mechanism and a transport medium. Interaction between a potential receptor and MEC has two components: access and activity.
2. Primary sources will vary but will include the MRS 4 range areas where historical MEC activities occurred. No permanent surface water bodies are present within the MRSs therefore sediment and surface water are not media of concern. There is little to no surface soil exposed within MRS 4 due to heavy development at both MRSs additionally there are substantial barriers to subsurface soil exposure (pavement, buildings) therefore neither surface or subsurface soil are potentially complete pathways. Groundwater is considered a medium of concern, although potable water is provided by Suffolk County via deep wells drawing water from the Magothy Aquifer construction workers may be exposed to groundwater during construction activities.
3. CSM will be refined as more data is obtained and finalized in the Site Inspection Report.
4. Surface soil in the area of both MRS 4 is paved or inaccessible due to building development therefore the only potentially complete pathway for MEC is during intrusive subsurface activities.

DIAGRAM OF THE INTEGRATED CONCEPTUAL SITE MODEL FOR

Mitchel Field[1, 2 and 3]

MRS 4

(WORKING DRAFT)

Revised January 2009 Figure 7b

Source: U.S. Army Corps of Engineers (USACE). 2003. *Conceptual Site Models for Ordnance and Explosives (OE) and Hazardous, Toxic, and Radioactive Wastes (HTRW) Projects.* EM 1110-1-

Figure 8. Proposed Geophysical Reconnaissance and Sampling Locations

APPENDIX B – DRAFT PHASE I MFR WORK SHEET

Technical Project Planning

Draft Phase I MFR Worksheet

Author(s): Alion Team
Latest Revision Date: 4 November 2008
Reviewer: Corinne Shia
Review Date: 4 November 2008

Location: Garden City, NY
Site(s): **Mitchel Field, New York**
Project: MMRP Project Number C02NY064503

(Attach Phase I MFR to PMP)

TPP Team	**EM 200-1-2, Paragraph 1.1.1**	
Decision Maker		
Customer	U.S. Army Corps of Engineers (USACE)	
Project Manager	Helen Edge, CENAN	
Design Team Leader	Julie Kaiser, Program Manager, USACE Baltimore District (CENAB) Alan Warminski, Design Team Lead, CENAB	
Team Leaders	Benjamin Claus (Project Manager)/Todd Belanger (Task Lead) — Alion Team	
Regulators	New York State Department of Environmental Conversation (NYSDEC) U.S. Environmental Protection Agency (USEPA), Region II	
Stakeholders	Government agencies/regulators (USACE, USEPA, NYSDEC, etc.) Property owners • Nassau County • State of New York • Hofstra University, Nassau College Other potential stakeholders • Public interest groups • User groups & community interests • Local, state & federal elected officials • External technical resources (technical experts)	
Data Types	**Data User**	**Data Gatherer**
Compliance / Regulatory (CR)	RISK (Risk Assessors) – CENAB/CENAN/USACE Huntsville Districts; NYSDEC; USEPA Region II	Alion Team
	COMPLIANCE (Regulatory Specialists, Chemists) - NYSDEC; USEPA Region II	
	REMEDY (Engineers, Chemists) – CENAB/CENAN/USACE Huntsville Districts	
	SAFETY (UXO Technician) – CENAB/CENAN/USACE Huntsville Districts	

Demographics/Land Use (LU)	RISK (Risk Assessors) – CENAB/CENAN/USACE Huntsville Districts; NYSDEC; USEPA Region II	Alion Team
	COMPLIANCE (Regulatory Specialists, Chemists) - NYSDEC; USEPA Region II	
	REMEDY (Engineers, Chemists) – CENAB/CENAN/USACE Huntsville Districts	
	SAFETY (UXO Technician) – CENAB/CENAN/USACE Huntsville Districts	
Site Conditions (SC)	RISK (Risk Assessors) – CENAB/CENAN/USACE Huntsville Districts; NYSDEC; USEPA Region II	Alion Team
	COMPLIANCE (Regulatory Specialists, Chemists) – NYSDEC; USEPA Region II	
	REMEDY (Engineers, Chemists) – CENAB/CENAN/USACE Huntsville Districts	
	SAFETY (UXO Technician) – CENAB/CENAN/USACE Huntsville Districts	
Munitions and Explosives of Concern (MEC)	RISK (Risk Assessors) – CENAB/CENAN/USACE Huntsville Districts; NYSDEC; USEPA Region II	Alion Team
	COMPLIANCE (Regulatory Specialists, Chemists) – NYSDEC; USEPA Region II	
	REMEDY (Engineers, Chemists) – CENAB/CENAN/USACE Huntsville Districts	
	SAFETY (UXO Technician) – CENAB/CENAN/USACE Huntsville Districts	

CUSTOMER'S GOALS	**EM 200-1-1, Paragraph 1.1.2**	
Future Land Use(s) @ Site	**Issues and Regulatory Compliance Status**	**Site-specific Closeout Goal (if applicable)**
The site has been redeveloped and is used by Hofstra University, Nassau College, NY Islanders coliseum, a sport complex, and other light industrial structures.	Potential for select Munitions Constituents in certain media as well as munitions and explosives of concern (MEC)	See Site Specific Closeout Goal
Site Closeout Statement		
Achieving the walk-away goal, or final condition of the site, as envisioned by the customer. The final condition of the site includes safe use following any remediation, maintenance, and monitoring for activities that are consistent with the current/future use of the site.		
Customer's Schedule Requirements		
See schedule.		
Customer's Site Budget		
N/A		

IDENTIFY SITE APPROACH		
EXISTING SITE INFORMATION & DATA EM 200-1-2, Paragraph 1.1.3 and 1.2.1		
Attachment(s) to Phase I MFR	**Located at Repository**	**Preliminary Conceptual Site Model**
1992 –Inventory Project Report (INPR)	CENAN	Yes
1993 - Archive Search Report (ASR)	CENAN	Yes
2004 - Supplemental ASR	CENAN	Yes
POTENTIAL POINTS OF COMPLIANCE EM 200-1-2, Paragraph 1.2.1.3		
NYSDEC (within boundaries of areas of concern)		
USEPA (within boundaries of areas of concern)		
MEDIA OF POTENTIAL CONCERN EM 200-1-2, Paragraph 1.2.1.4		
Surface, Subsurface Soil and Groundwater		
SITE OBJECTIVES EM 200-1-2, Paragraph 1.2.2		
See attached Project Objectives worksheets.		
REGULATOR AND STAKEHOLDER PERSPECTIVES EM 200-1-1, Paragraph 1.2.3		
Regulators	Community Interests	Others
NYSDEC – Daniel Eaton	TBD	Continued use as open area, private developments, residential and various Suffolk County land uses.
USEPA – TBD		
PROBABLE REMEDIES EM 200-1-2, Paragraph 1.2.4		
Detonation or removal of suspect MEC if found during the site investigation.		
Removal of residual MEC from the site, treatment of MC via removal, onsite treatment, and engineering/institutional controls as appropriate to reduce the risk to future site users.		
EXECUTABLE STAGES TO SITE CLOSEOUT EM 200-1-2, Paragraph 1.2.5		
Site Inspection (SI)		
Remedial Investigation/Feasibility Study (RI/FS)		
Proposed Plan		
Record of Decision (ROD)/Decision Document		
Remedial Design		
Remedial Action		
Removal Action (if necessary)		
Long-Term Monitoring (if necessary)		

IDENTIFY CURRENT PROJECT		
SITE CONSTRAINTS AND DEPENDENCIES **EM 200-1-2, Paragraph 1.3.1**		
Administrative Constraints and Dependencies		
SI needs to be completed by December 2009 to meet program needs.		
Acceptance of Programmatic Work Plan and Site Specific Work Plan Addendum prior to field sampling.		
Access agreements need to be in place prior to the start of field sampling activities.		
Technical Constraints and Dependencies		
Need MEC avoidance for sampling.		
Need to abide by Health and Safety Plan.		
Legal and Regulatory Milestones and Requirements		
Need Right of Entry agreement.		
Regulatory evaluations of SI work plan and reporting of SI results and recommendations.		
Section 106 Consultation		
Threatened and endangered (T&E) species determination		
CURRENT EXECUTABLE STAGE **EM 200-1-2, Paragraph 1.3.3**		
Site Inspection		
Basic (For Current Projects)	**Optimum** (For Future Projects)	**Excessive** (Objectives that do not lead to site closeout)
SI (MC Sample collection and MEC qualitative reconnaissance)	NDAI or RI/FS	

Acronyms

ASR – Archive Search Report
EM – Engineer Manual (see www.usace.army.mil/inet/usace-docs/)
INPR – Inventory Project Report
MC – Munitions Constituents
MEC – Munitions and Explosives of Concern
NDAI – No Department of Defense Action Indicated
RA – Removal Action
RAC – Risk Assessment Code type impact analysis conducted during INPR, ASR, and Supplemental ASR
SI – Site Inspection
TPP – Technical Project Planning
USEPA – U.S Environmental Protection Agency

PROJECT OBJECTIVES WORKSHEET

SITE: **Mitchel Field, New York**
PROJECT: Project Number - C02NY064503

Site Objective [a]					Data Needs [d]	Data Collection Methods	Project Objective Classification [e]
Number	Executable Stage [b]		Description [c]	Source			
	Current	Future					
1	Yes		Determine if the site requires additional investigation through an RI/FS or if the site may be recommended for No Department of Defense Action Indicated (NDAI) based on the presence or absence of MEC and MC.	ASR, Public	CR, LU, SC, UXO	MEC visual inspection, analog geophysics, MC sampling	Basic
2	Yes		Determine the potential need for a Time-Critical Removal Action (TCRA) for MEC and MC by collecting data from previous investigations/reports, conducting site visits, performing analog geophysical activities, and by collecting MC samples.	ASR, Public	CR, LU, SC, UXO	MEC visual inspection, analog geophysics, MC sampling	Basic
3	Yes		Collect, or develop, additional data, as appropriate, in support of potential Hazard Ranking System (HRS) scoring by Environmental Protection Agency (EPA).	ASR, Public	LU, SC, UXO	MEC visual inspection, analog geophysics, MC sampling	Basic
4	Yes		Collect the additional data necessary to the complete the Munitions Response Site Prioritization Protocol (MRSPP).	ASR, Public	CR, LU, SC, UXO	MEC visual inspection, analog geophysics, MC sampling	Basic

a. Refer to EM 200-1-2, Paragraph 1.2.2
b. Refer to EM 200-1-2, Paragraph 1.2.5
c. For example, Meeting with Customer/stakeholder/Regulator, State Regulations
d. Data Needs: **CR**-Compliance/Regulatory, **LU**-Land Use/Demographics, **SC**-Site Conditions, and **UXO**-OE UXO
e. Classification of project objectives can only occur after the current project has been identified. Refer to EM 200-1-2, Paragraph 1.3.3.

Acronyms
ASR–Archive Search Report
EM–Engineer Manual (see www.usace.army.mil/inet/usace-docs/)

APPENDIX C – DATA QUALITY OBJECTIVE (DQO) WORKSHEETS AND MEASUREMENT QUALITY OBJECTIVES (MQO) TABLES

Data Quality Objective Worksheet

Site: **Mitchel Field, New York**
Project: FUDS MMRP SI Project Number **C02NY064503**
DQO Statement Number: **1 of 4**

DQO Element Description	Site-Specific DQO Statement
Intended Data Use(s):	
Project Objective(s) Satisfied	Determine if the site requires additional investigation through a remedial investigation/feasibility study (RI/FS) or if the site may be recommended for No Department of Defense Action Indicated (NDAI) based on the presence or absence of munitions and explosives of concern (MEC) and munitions constituents (MC).
Data Needs Requirements:	
Data User Perspective(s)	Risk – MEC and MC, Compliance
Contaminant or Characteristic of Interest	MEC or Material Potentially Presenting an Explosive Hazard (MPPEH) and MC
Media of Interest	MEC – Surface and subsurface soil MC – Surface, subsurface soil and groundwater
Required Sampling Locations or Areas	MEC and MC: Areas where military munitions-related operations occurred and/or where MEC or MPPEH has been identified historically based on existing documentation and interviews.
Number of Samples Required	**MEC –** Analog geophysical and visual reconnaissance data, rather than discrete sampling data, will be collected to accomplish this objective. These data will be collected using "meandering path" to and from the sampling points. The UXO Technician will collect data on an approximate 6-ft wide path using the geophysical equipment. The visual reach of observations is approximately 12 ft, and may be limited by the presence of vegetation. Once at the individual sampling point, the geophysical equipment will be used to assess an approximately 25 ft radius circle for anomalies around the sampling point as site conditions permit. In some areas, there may be limitations to the ability to complete geophysical and visual observations. The total estimated area on the paths to/from the sampling locations is approximately 72,500 ft^2, and the area around the sampling locations is approximately 5,400 ft^2. **MC** – A total of 14 subsurface soil samples and 14 surface soil samples will be collected. Two groundwater samples will be collected from existing wells. Five background samples also will be collected for comparative analysis.
Reference Concentration of Interest or Other Performance Criteria	**MEC:** If historic data indicate the presence of MEC and one anomaly classified as of MPPEH, or confirmed MEC is found with the magnetometer, or if physical evidence indicating the presence of MEC is found during the visual inspection, then an RI/FS may be recommended. If no anomalies, MPPEH, or confirmed MEC are found, or if the UXO Technician indicates that there is no potential hazard from past use of munitions or MEC discoveries, then an NDAI may be recommended. In each of these instances, all lines of evidence (*e.g.*,

Data Quality Objective Worksheet

Site: **Mitchel Field, New York**
Project: FUDS MMRP SI Project Number **C02NY064503**
DQO Statement Number: **1 of 4**

DQO Element Description	Site-Specific DQO Statement
	historic data, field data, etc.) will be used to make a final decision for an NDAI or RI/FS. In both instances (RI/FS or NDAI), all lines of evidence (*e.g.*, historic data, field data, etc. for both MEC and MC) will be used to make a final decision for an NDAI or RI/FS. **MC:** If the maximum concentrations measured at the site exceed EPA Regional Screening Levels based on current and future land use, or EPA interim ecological risk screening values, or site-specific background levels (highest value and mean value), then an RI/FS may be recommended for the site. If the maximum concentrations measured at the site do not exceed EPA Regional Screening Levels or ecological risk screening values, then an NDAI designation may be recommended. In summary, all lines of evidence including secondary lines of evidence, such as historic data, field data, and comparison to regional background concentration ranges for metals (if available), and, will be used to make a final decision for an NDAI designation or RI/FS. Screening values selected for comparison at this site are specified in the chemical-specific measurement quality objective (MQO) tables.
Appropriate Sampling and Analysis Methods:	
Sampling Method and Depths	**MEC:** Geophysics with a handheld analog magnetometer, which will be used to collect related data, is accurate to an approximate depth of 2 ft. Global Positioning System (GPS) equipment will be used to log locations of MEC items encountered by the magnetometer. Visual observations will provide a continuous source of additional information which will be noted in the field log book with GPS coordinates. Photographs also will be used as an additional documentation method. Geophysical methods/procedures will be described in detail in Section 3 of the SS-WP, and the Field Activities section of the programmatic field sampling plan (PFSP). **MC:** Sampling methods for MC will be described in detail in Section 4 of the SS-WP, and Field Activities section of the PFSP.
Analytical Method	**MEC:** Analytical methods are not used with analog magnetometry. However, trained UXO professionals, engineers, and scientists will review all data to determine whether evidence gathered indicates the presence or absence of MEC. This analysis will be subject to an independent review within the Alion Team, by the USACE North Atlantic New York (CENAN), USACE Baltimore District Design Center (CENAB), and USACE Center of Expertise.

Data Quality Objective Worksheet	
Site: **Mitchel Field, New York** Project: FUDS MMRP SI Project Number **C02NY064503** DQO Statement Number: **1 of 4**	
DQO Element Description	**Site-Specific DQO Statement**
	MC: The methods that can be used for analysis include the following: Explosives Methods–8330A, 8330A (mod) for nitroglycerine; Metals Methods–6010B (reduced); Explosives Prep Methods - 8330A, 8330A (mod) for nitroglycerine; Metals Prep Method – 3050B, 3050 (mod).

Data Quality Objective Worksheet	
Site: **Mitchel Field, New York** Project: FUDS MMRP SI Project Number **C02NY064503** DQO Statement Number: **2 of 4**	
DQO Element Description	**Site-Specific DQO Statement**
Intended Data Use(s):	
Project Objective(s) Satisfied	Determine the potential need for a Time-Critical Removal Action (TCRA) for MEC and MC by collecting data from previous investigations/reports, conducting site visits, performing analog geophysical activities, and by collecting MC samples.
Data Needs Requirements:	
Data User Perspective(s)	Risk-MEC/MC, Compliance
Contaminant or Characteristic of Interest	MEC and/or MC on the surface
Media of Interest	MEC – Surface and subsurface soil MC – Surface, subsurface soil and groundwater
Required Sampling Locations or Areas	Areas where military munitions-related operations occurred and/or where MEC or MMPEH has been identified historically based on existing documentation and interviews *[figure provided in the SS-WP]*.
Number of Samples Required	Refer to DQO 1 for MC/MEC sampling parameters.
Reference Concentration of Interest or Other Performance Criteria	If MC is reported in samples collected at the FUDS at concentrations exceeding screening criteria and those exceedances result in unacceptable risk and an imminent threat to receptors as identified through human health and ecological risk assessments or if one piece of confirmed MEC is found with the magnetometer or if physical evidence indicating the presence of MEC is found during the visual inspection, and if the item(s) is determined by a UXO-qualified Technician, explosive ordnance disposal (EOD) unit, and/or the USACE to be an immediate or imminent threat, then one of two actions may be initiated: ***TCRA*-** If there is a complete pathway between source and receptor and the MEC and the situation is viewed as an "imminent danger threat posed by the release or threat of a release, where cleanup or stabilization actions must be initiated within six months to reduce risk to public health or the environment", the Alion Team will immediately notify the Military Munitions Design Center Project Manager at USACE and the property owner. USACE will determine, with input from the Alion Team and stakeholders, whether or not a TCRA will be implemented. ***Non-TCRA*** **-** A non-TCRA (NTCRA) may be initiated in response to a release or threat of release that poses a risk where more than six months planning time is available.

Data Quality Objective Worksheet	
Site: **Mitchel Field, New York** Project: FUDS MMRP SI Project Number **C02NY064503** DQO Statement Number: **2 of 4**	
DQO Element Description	**Site-Specific DQO Statement**
Appropriate Sampling and Analysis Methods:	
Sampling Method and Depths	**MEC:** Geophysical methods/procedures will be described in detail in Section 3 of the SS-WP, and the Field Activities section of the programmatic field sampling plan (PFSP). **MC:** Sampling methods for MC will be described in detail in Section 4 of the SS-WP, and Field Activities section of the PFSP.
Analytical Method	Refer to DQO 1 for MEC and MC analytical methods to be incorporated.

Data Quality Objective Worksheet

Site: **Mitchel Field, New York**
Project: FUDS MMRP SI Project Number **C02NY064503**
DQO Statement Number: **3 of 4**

DQO Element Description	Site-Specific DQO Statement
Intended Data Use(s):	
Project Objective(s) Satisfied	Collect, or develop, additional data, as appropriate, in support of a potential Hazard Ranking System (HRS) scoring by Environmental Protection Agency (EPA).
Data Needs Requirements:	
Data User Perspective(s)	Risk-MC, Compliance.
Contaminant or Characteristic of Interest	Data for HRS worksheet parameters will be compiled by gathering basic identifying information, general site description, site type, waste description, demographics, water use, sensitive environments, and response actions.
Media of Interest	Surface, subsurface soil and groundwater
Required Sampling Locations or Areas	Areas where MEC has been historically found, used, or disposed as documented in interviews or existing documentation.
Number of Samples Required	Refer to DQOs 1and 2.
Reference Concentration of Interest or Other Performance Criteria	The HRS levels of contamination are Level I (concentrations that meet the criteria for actual contamination and are at or above media-specific benchmark levels), Level II (concentrations that either meet the criteria for actual contamination but are less than media-specific benchmarks, or meet the criteria for actual contamination based on direct observation), and Potential (no observed release is required but targets must be within the target distance limit). These levels are weighted for each target by EPA (Level I carries the greatest weight) and scores of 28.5 or above are then eligible for listing on the National Priorities List (NPL).
Appropriate Sampling and Analysis Methods:	
Sampling Method and Depths	Methods associated with historic data field reconnaissance and sampling (see DQOs 1 and 2). Refer to NPL Characteristics Data Collection Form, Version 3.0 (EPA 2001).
Analytical Method	Refer to DQOs 1and 2 for associated methods.

Data Quality Objective Worksheet

Site: **Mitchel Field, New York**
Project: FUDS MMRP SI Project Number **C02NY064503**
DQO Statement Number: **4 of 4**

DQO Element Description	Site-Specific DQO Statement
Intended Data Use(s):	
Project Objective(s) Satisfied	Collect the additional data necessary to the complete the Munitions Response Site Prioritization Protocol (MRSPP).
Data Needs Requirements:	
Data User Perspective(s)	Risk-MEC and MC, Compliance
Contaminant or Characteristic of Interest	Explosive Hazard Evaluation (EHE), Chemical Warfare Materiel Hazard Evaluation (CHE), and Health Hazard Evaluation (HHE). For the EHE and CHE modules, factors evaluated include the details of the hazard, accessibility to the Munitions Response Site (MRS), and receptor information. HHE factors include an evaluation of MC and any non-munitions-related incidental contaminants present, receptor information, and details pertaining to environmental migration pathways. Typical information compiled includes details pertaining to historical use, current/future use and ownership, cultural/ecological resources, and structures.
Media of Interest	Surface, subsurface soil and groundwater
Required Sampling Locations or Areas	Areas where MEC has been identified historically and where sampling is recommended.
Number of Samples Required	Refer to DQOs 1and 2 for related sampling required.
Reference Concentration of Interest or Other Performance Criteria	An MRS priority is determined by USACE based on integrating the ratings from the EHE, CHE, and HHE modules. Refer to Federal Register/Vol. 70, No. 192/Wednesday, October 5, 2005/Rules and Regulations.
Appropriate Sampling and Analysis Methods:	
Sampling Method and Depths	Data gathering prior to field activities as well as additional data gathered during field reconnaissance and sampling (DoD 2005).
Analytical Method	Refer to DQOs 1and 2 for associated methods.

Table 1. Evaluation of Potential Chemical-Specific Measurement Quality Objectives for Soil (Surface and Subsurface)

Analyte	Abbreviation	CAS #	EPA Regional Screening Levels, Human Health, Residential Soil (1) (mg/kg)	EPA Interim Ecological Soil Screening Levels (mg/kg)	Lowest Value (mg/kg)	Preferred Maximum Method Quantitation Limit, Soil (2) (mg/kg)	Lab Method Detection Limit (MDL) (mg/kg)	Lab Reporting Limit (mg/kg)
Explosives (Analysis Methods 8330A and 8330A-Mod)								
2,4-Dinitrotoluene	2,4-DNT	121-14-2	12	30 [a]	12	6.0	0.0036	0.04
2,6-Dinitrotoluene	2,6-DNT	606-20-2	6.1	30 [a]	6.1	3.05	0.0097	0.04
2-Amino-4,6-dinitrotoluene	2-Am-DNT	35572-78-2	12	80 [a]	12	6.0	0.0056	0.04
2-Nitrotoluene	2-NT	88-72-2	78	30 [a]	30	15	0.0120	0.08
3-Nitrotoluene	3-NT	99-08-1	160	30 [a]	30	15	0.012	0.08
4-Amino-2,6-dinitrotoluene	4-Am-DNT	19406-51-0	12	80 [a]	12	6	0.0077	0.04
4-Nitrotoluene	4-NT	99-99-0	30	30 [a]	30	15	0.017	0.08
Nitroglycerin	**NG**	**55-63-0**	**0.61**	**-**	**0.61**	**.305**	**0.65**	**4.0**
Metals (Analysis Method 6010B)								
Antimony	***Sb***	***7440-36-0***	***3.1***	***.27*** [b]	***.27***	***.135***	***0.024***	***2.0***
Aluminum	Al	7429-90-5	-	- [g]	-	-	-	-
Copper	Cu	7440-50-8	310	28 [c]	28	14	0.014	1.0
Iron	Fe	7439-89-6	5500	-	5500	2750	1.91	15.0
Lead	Pb	7439-92-1	400	11 [d]	11	5.5	0.17	1.0
Nickel	Ni	7440-02-0	160	38 [e]	38	19	0.11	1.0
Zinc	Zn	7440-66-6	2300	46 [f]	46	23	0.21	2.0

Notes:
- = No Standard
CAS# = Chemical Abstracts Service Number
EPA = Environmental Protection Agency
MDL = Method Detection Limit
mg/kg = milligrams per kilogram

(1) EPA Regional Screening Levels Human Health Residential Soil. Dated 2008. Accessed via http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/ index.htm. Values of non-cancerous compounds were divided by 10.
(2) Preferred Method Maximum Quantitation Limit is one half of the Lowest Value unless the Method Detection Limit or Laboratory Reporting Limit is higher than the Lowest Value.
Bolded rows indicate occurrences when the Preferred Maximum Method Quantitation Limit is less than the Method Detection Limit
Bolded italicized rows indicate occurrences when the Preferred Maximum Method Quantitation Limit is less than the Reporting Limit

Note: Chemicals that are not CERCLA hazardous substances (e.g., iron, aluminum, barium, magnesium) can be reported in the SI; however, the SI risk evaluation and conclusions will include a discussion of the limitations of the FUDS program to respond to such chemicals. Non-CERCLA chemical concentrations will not provide the basis for a RI/FS recommendation for MCs in the SI report.

Note: Federal benchmarks to be used in a risk screening.

[a] Talmage et al., 1999; values are based on 2,4,6-TNT, except for 2-Amino-4,6-dinitrotoluene and 4-Amino-2,6-dinitrotoluene
Value of Noncancerous compounds were divided by 10
[b] EPA. 2005a. *Ecological Soil Screening Level for Antimony.* Available from http://www.epa.gov/ecotox/ecossl/pdf/eco-ssl_antimony.pdf. Accessed 01 July 2008.
[c] EPA. 2007a. *Ecological Soil Screening Level for Copper.* Available from http://www.epa.gov/ecotox/ecossl/pdf/eco-ssl_copper.pdf. Accessed 01 July 2008.
[d] EPA. 2005d. *Ecological Soil Screening Level for Lead.* Available from http://www.epa.gov/ecotox/ecossl/pdf/eco-ssl_lead.pdf. Accessed 01 July 2008.
[e] EPA. 2007b. *Ecological Soil Screening Level for Nickel.* Available from http://www.epa.gov/ecotox/ecossl/pdf/eco-ssl_nickel.pdf. Accessed 01 July 2008.
[f] EPA. 2007c. Ecological Soil Screening Level for Zinc. Available from http://www.epa.gov/ecotox/ecossl/pdf/eco-ssl_zinc.pdf. Accessed 20 March 2008.
[g] Aluminum is identified as a COPC only at sites where the soil pH is less than 5.5, this is not anticipated at Suffolk County AAF&B&C.

Table 2. Potential Chemical-Specific Measurement Quality Objectives and Preferred Maximum Method Quantitation Limits for Groundwater							
Analyte	**Abbreviation**	**CAS #**	**EPA Regional Screening Level, Human Health, Residential Water (1) (µg/L)**	**Lowest Value (µg/L)**	**Preferred Maximum Method Quantitation Limit Groundwater (2) (µg/L)**	**Lab Method Detection Limit (µg/L)**	**Lab Reporting Limit (µg/L)**
Explosives (Analysis Methods 8330A and 8330A-Mod)							
2,4-Dinitrotoluene	2,4-DNT	121-14-2	73	73	36.5	0.037	0.20
2,6-Dinitrotoluene	2,6-DNT	606-20-2	37	37	18.5	0.054	0.20
2-Amino-4,6-dinitrotoluene	2-Am-DNT	35572-78-2	73	73	36.5	0.053	0.20
2-Nitrotoluene	2-NT	88-72-2	370	370	185	0.11	0.40
3-Nitrotoluene	3-NT	99-08-1	120 [a]	120	60	0.18	0.40
4-Amino-2,6-dinitrotoluene	4-Am-DNT	19406-51-0	73	73	36.5	0.058	0.20
4-Nitrotoluene	4-NT	99-99-0	42	42	21	0.095	0.40
Nitroglycerin	**NG**	**55-63-0**	**3.7**	**3.7**	**1.85**	**8.7**	**26**

Notes:
- = No Standard
CAS# = Chemical Abstracts Service Number
EPA = Environmental Protection Agency
µg/L = micrograms per liter

(1) EPA Regional Screening Levels, Human Health, Residential Water. Dated 2008. http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/ index.htm. Values of non-cancerous compounds were divided by 10.
(2) Preferred Method Maximum Quantitation Limit is 1/2 of the Lowest Value unless the Method Detection Limit or Laboratory Reporting Limit is higher than the Lowest Value.

Bolded rows indicate occurrences when the Preferred Maximum Method Quantitation Limit is less than the Method Detection Limit
Bolded italicized rows indicate occurrences when the Preferred Maximum Method Quantitation Limit is less than the Reporting Limit

Note: Chemicals that are not CERCLA hazardous substances (e.g., aluminum, barium, and iron) can be reported in the SI; however, the SI risk evaluation and conclusions will include a discussion of the limitations of the FUDS program to respond to such chemicals. Non-CERCLA chemical concentrations will not provide the basis for a RI/FS recommendation for MCs in the SI report.

[a] Since no values were available from EPA Regional Screening Levels, values from EPA Region 6 Medium-Specific Screening Levels (MSSLs) were used.

[b] USEPA National Drinking Water Criteria, List of Contaminants and MCLs. U.S. Environmental Protection Agency. Available at:http://www.epa.gov/safewater/contaminants/index.html#listmcl. Accessed 20 October 2008.

APPENDIX D – INTERIM GUIDANCE DOCUMENT AND MUNITIONS DATA SHEETS

DEPARTMENT OF THE ARMY
HUNTSVILLE CENTER, CORPS OF ENGINEERS
P.O. BOX 1600
HUNTSVILLE, ALABAMA 35807-4301

REPLY TO
ATTENTION OF:

MAR 1 6 2006

CEHNC-OE-CX

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Procedure for Preliminary Assessment (PA) and Site Inspection (SI) Teams that Encounter Unexploded Ordnance (UXO) While Gathering Non-UXO Field Data, Military Munitions Center of Expertise (MM CX) Interim Guidance Document (IGD) 06-05

1. PURPOSE: This procedure describes the responsibilities of project teams during the preliminary assessment and site investigation phases should unexploded ordnance (UXO) be discovered.

2. APPLICABILITY: This guidance is applicable to the geographic military Districts, Military Munitions Response Program (MMRP) Design Centers, Major Subordinate Commands (MSCs), and designated Remedial Action Districts performing MMRP response actions.

3. REQUIREMENTS AND PROCEDURES:

a. During site visits to formerly used defense site (FUDS) properties to gather PA or SI information, in the rare instance that a UXO-qualified individual identifies an item that is an explosive hazard, the following actions will occur:

(1) The property owner or individual granting rights of entry to the property will be notified of the hazard and advised to call the local emergency response authority (i.e., police, sheriff, or fire department). The individual will also be informed that if they do not call the local response authority within 1 hour, the individual who identified the UXO item will notify the local emergency response authority.

(2) The local response authority will decide how to respond to the reported incident, including deciding not to respond (e.g., if the local response authority is already aware of the hazards on the property). If the local response authority decides to respond, the individual who identified the item or his designee will mark the location of the item and provide accurate location information to the emergency response authority. The individual who identified the item or his designee will generally remain in the area until the local response authority arrives, unless specifically indicated by the appropriate response authority that the individual may leave the area.

(3) During the SI, the state regulator may also be notified at their request.

b. During site visits to active installations or Base Realignment and Closure (BRAC) sites to gather PA or SI information, in the rare instance that a UXO-qualified individual identifies an item that is an explosive hazard, the following actions will occur:

(1) The installation point of contact (POC) or the BRAC coordinator will be notified of the hazard and requested to notify explosive ordnance disposal (EOD) through their channels.

(2) The installation/EOD will make the determination if they are going to respond to the incident. The installation/EOD may be aware of the hazards at the site and make the decision not to respond. If the installation/EOD decides to respond, the individual who identified the item or his designee will mark the location and provide accurate location information to the installation/EOD unit and will remain in the area unless the installation/EOD unit requests otherwise.

c. Neither the US Army Corps of Engineers personnel, nor their contractors have the authority to call EOD to respond to an explosive hazard. This call is the responsibility of the local emergency response authority for FUDS properties and it must come through the proper chain of command on installations.

d. AR 75-14 and AR 75-15 contain the information on how EOD responds to explosives hazards.

4. EFFECTIVE DATES: The requirements and procedures set forth in this interim guidance are effective immediately. They will remain in effect indefinitely, unless superseded by other policy or regulation.

5. POINT OF CONTACT: If you need additional information, please contact Mr. Brad McCowan at 256-895-1174.

Carol G. Youkey

CAROL A. YOUKEY, P.E.
Chief, Center of Expertise for Ordnance
and Explosives Directorate

MUNITIONS LIST:

ID	NAME	DATA SHEET
CTT01	50 CAL. MACHINE GUN	NO
CTT01	SMALL ARMS, GENERAL	YES
CTT10	AN-MK 5, AN-MK 23, AN-MK 43, PRAC	YES
CTT16	20MM HEI, MKI	YES
CTT17	20MM, BALL, MK1	YES
CTT21	37MM, TP, M63	YES
CTT22	60MM, HE, M49	YES
CTT22	81MM, HE, M43	YES
CTT46	60MM, TRAINING, M69	YES

CTT01

SMALL ARMS

NO DATASHEET AVAILABLE
50 CAL. MACHINE GUN

SMALL-ARMS AMMUNITION

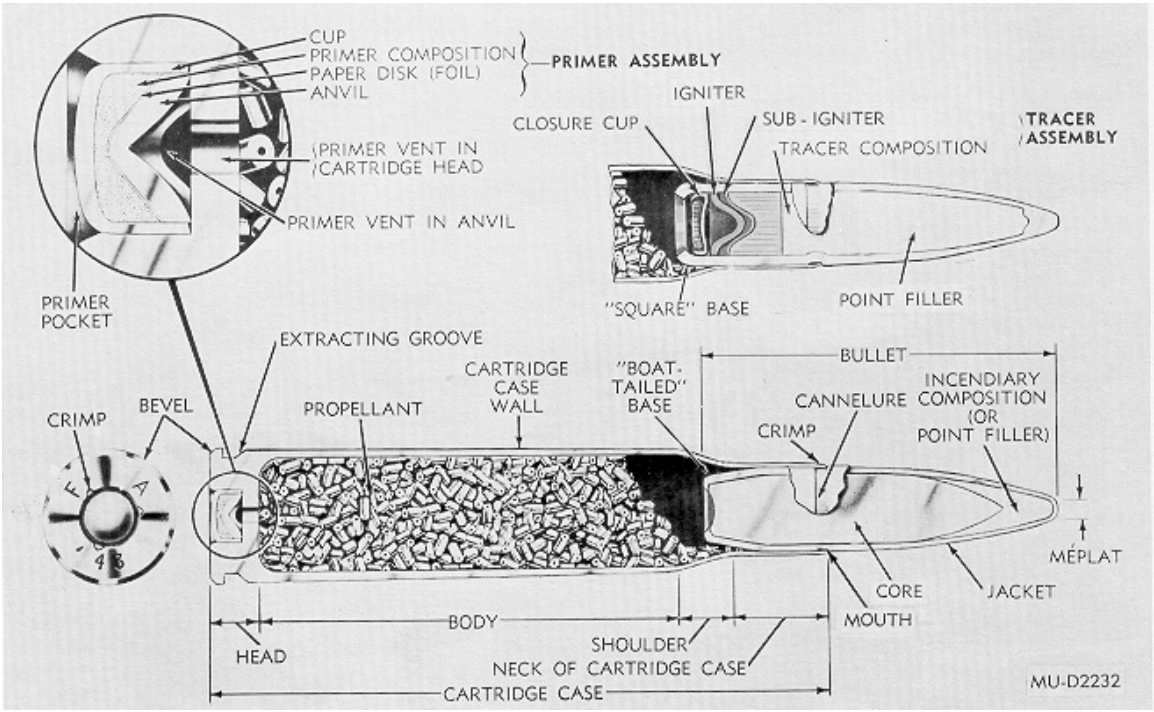


Figure 1. Typical cartridge (sectional)

General. Small-arms ammunition, as used herein, describes a cartridge or families of cartridges intended for use in various types of hand-held or mounted weapons through 30 millimeter. Within a caliber designation, these weapons may include one or more of the following: rifles (except recoilless), carbines, pistols, revolvers, machineguns and shotguns. For purposes of this publication, small-arms ammunition may be grouped as cartridges intended primarily for combat or training purposes (API, HEI, tracer or ball); for training purposes only (blank or dummy); or for special purposes (rifle grenade or spotter-tracer). Refer to TM 9-1306-200 for more detailed information on small-arms ammunition.

Cartridges. In general, a small-arms cartridge is identified as an assembly of a cartridge case, primer, a quantity of propellant within the cartridge case, and a bullet or projectile. Blank and rifle grenade cartridges are sealed with paper closure disks in lieu of bullets. Dummy cartridges are composed of a cartridge case and a bullet. Some dummy cartridges contain inert granular materials to simulate the weight and balance of live cartridges. A typical cartridge and the terminology of its components are shown in figure 1.

Case. Although steel, aluminum, zinc and plastic materials have been used experimentally, brass, a composition of 70 percent copper and 30 percent zinc, is the most commonly used material for cartridge cases. Steel, as well as brass, is an approved material for caliber .45 cartridge cases. Brass, paper and plastic are used for 12 gage shotshell bodies. Aluminum is used for military-type .410 gage shotshell bodies. Configurations of cartridges and bullets are illustrated in figures 2 through 9.

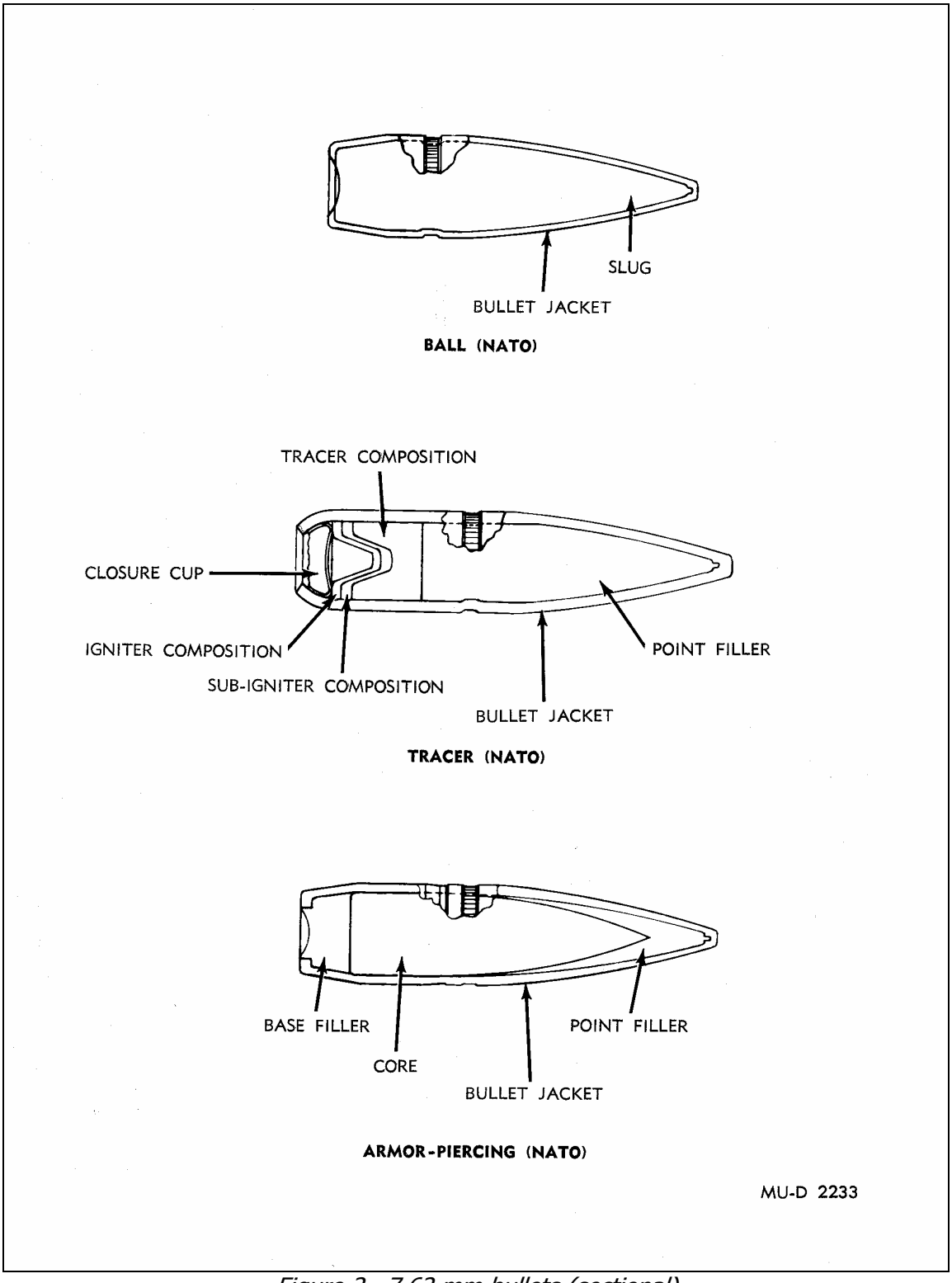


Figure 2. 7.62 mm bullets (sectional)

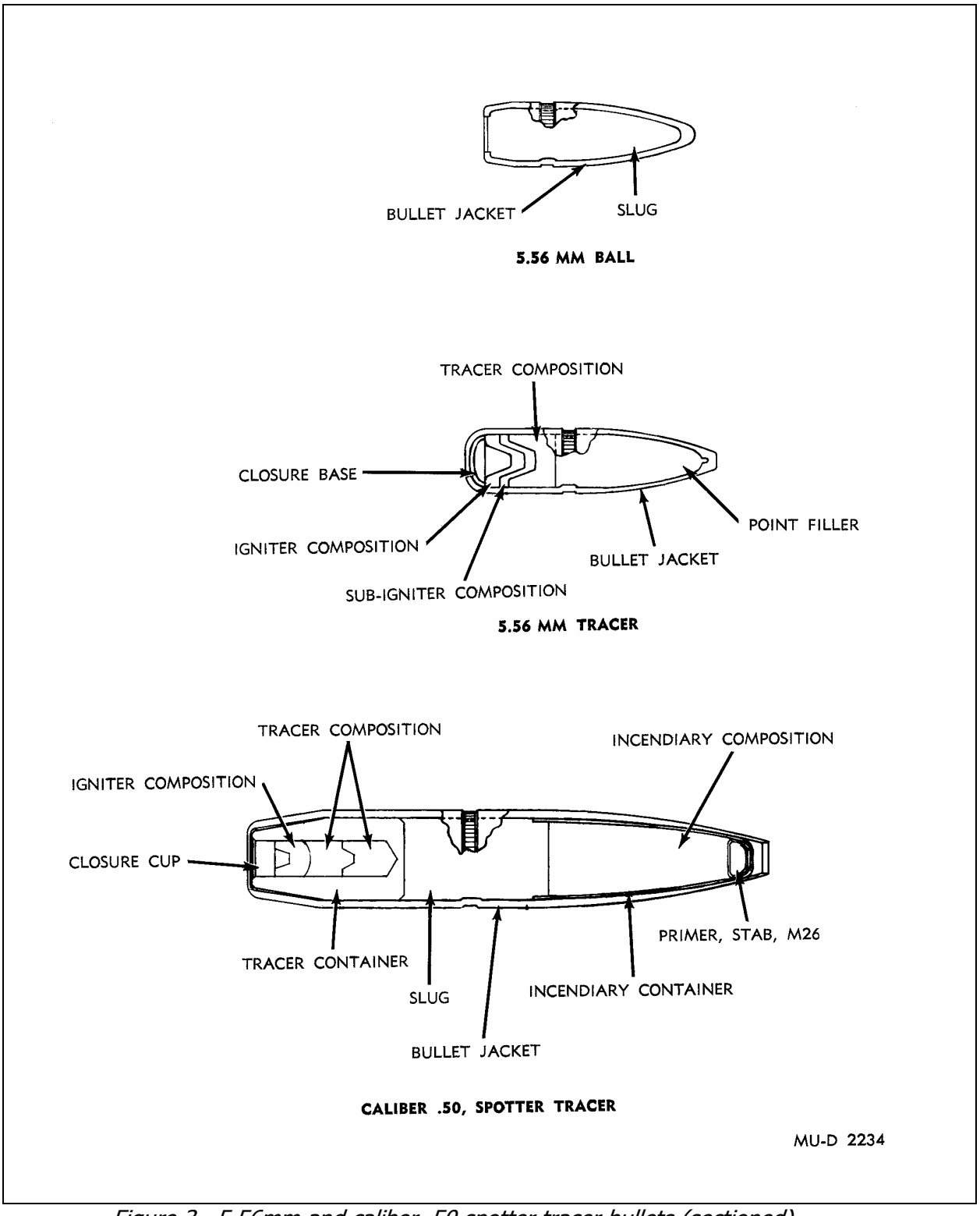


Figure 3. 5.56mm and caliber .50 spotter tracer bullets (sectioned)

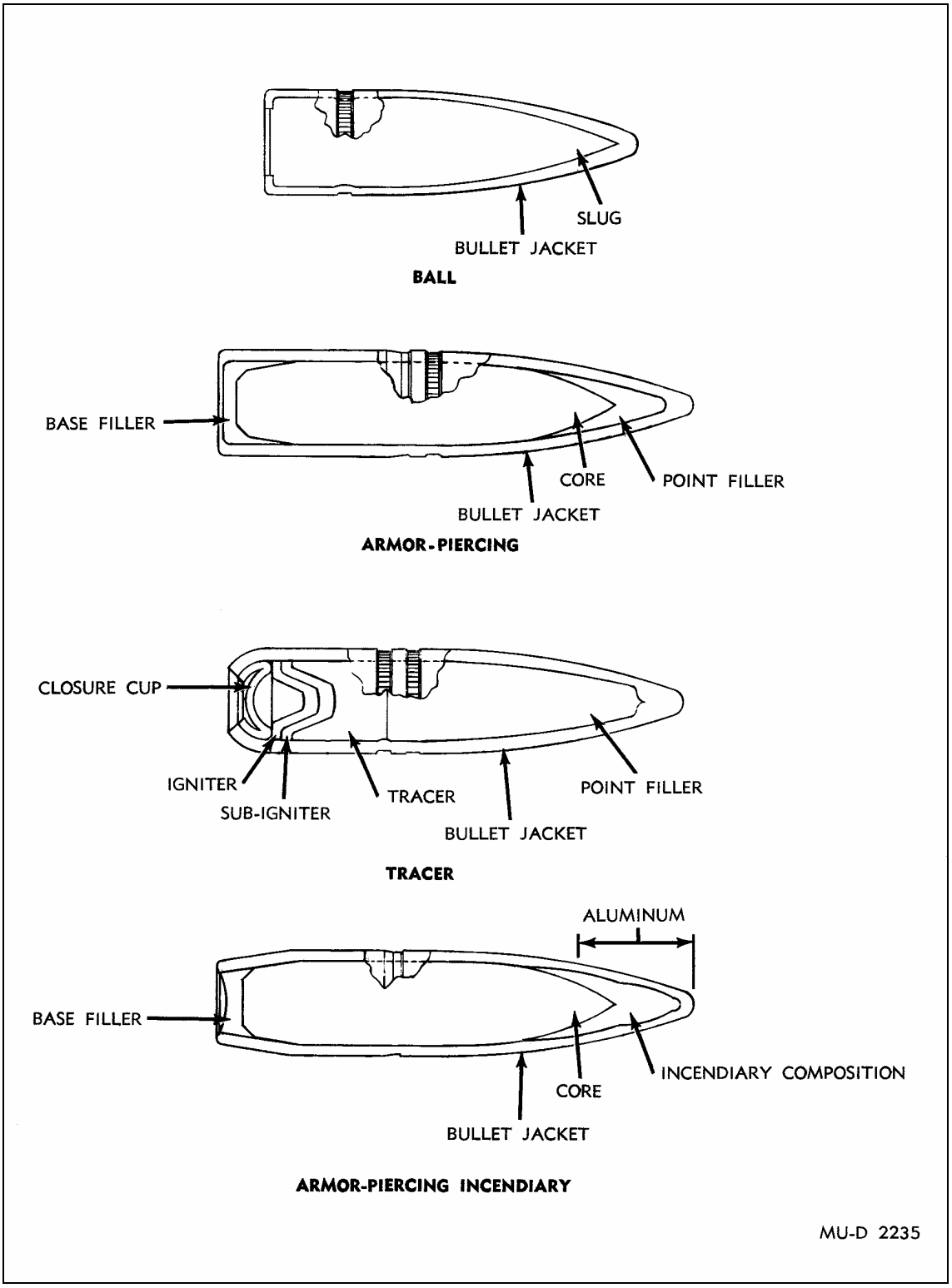


Figure 4. Caliber .30 bullets (sectional)

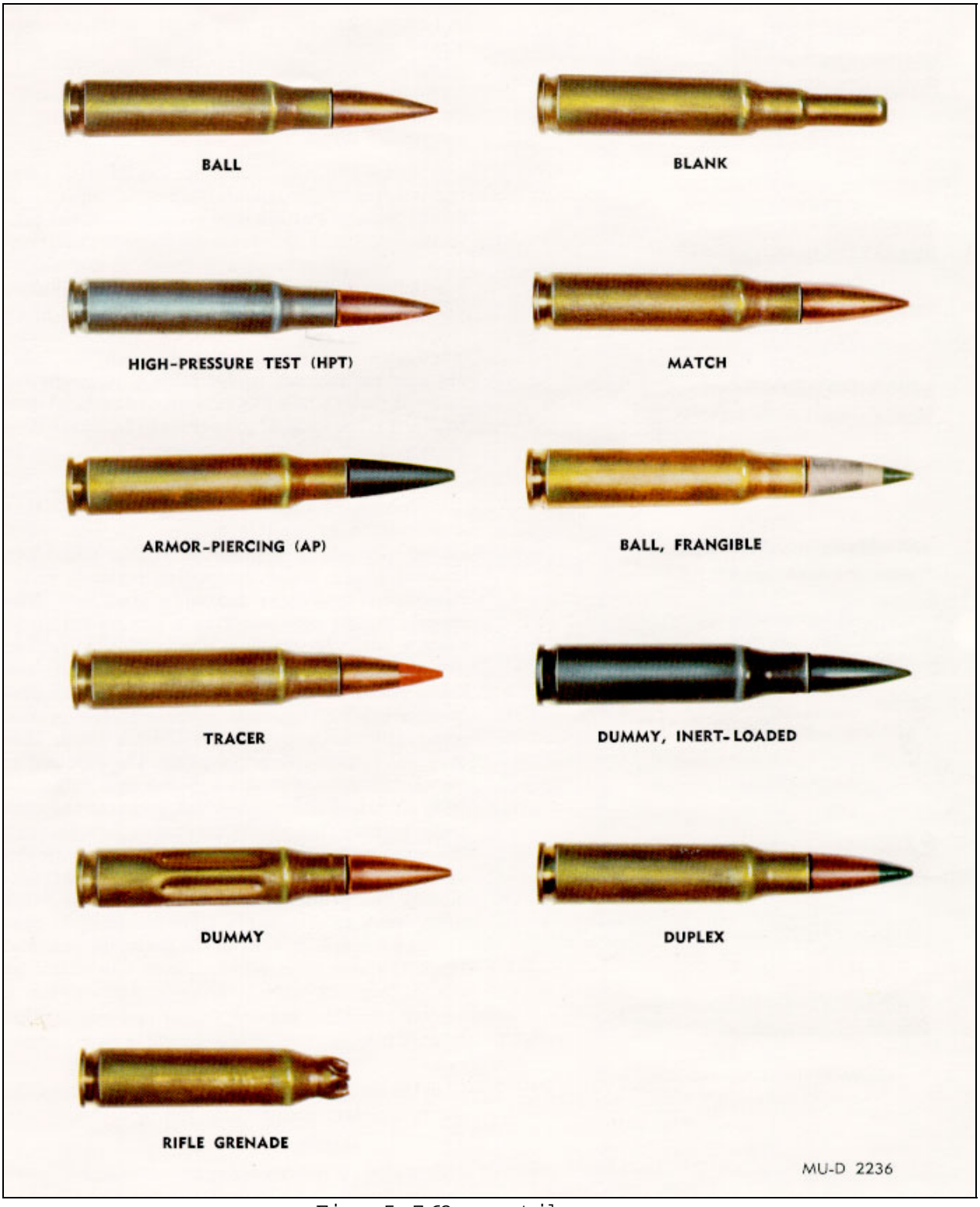


Figure 5. 7.62mm cartridges

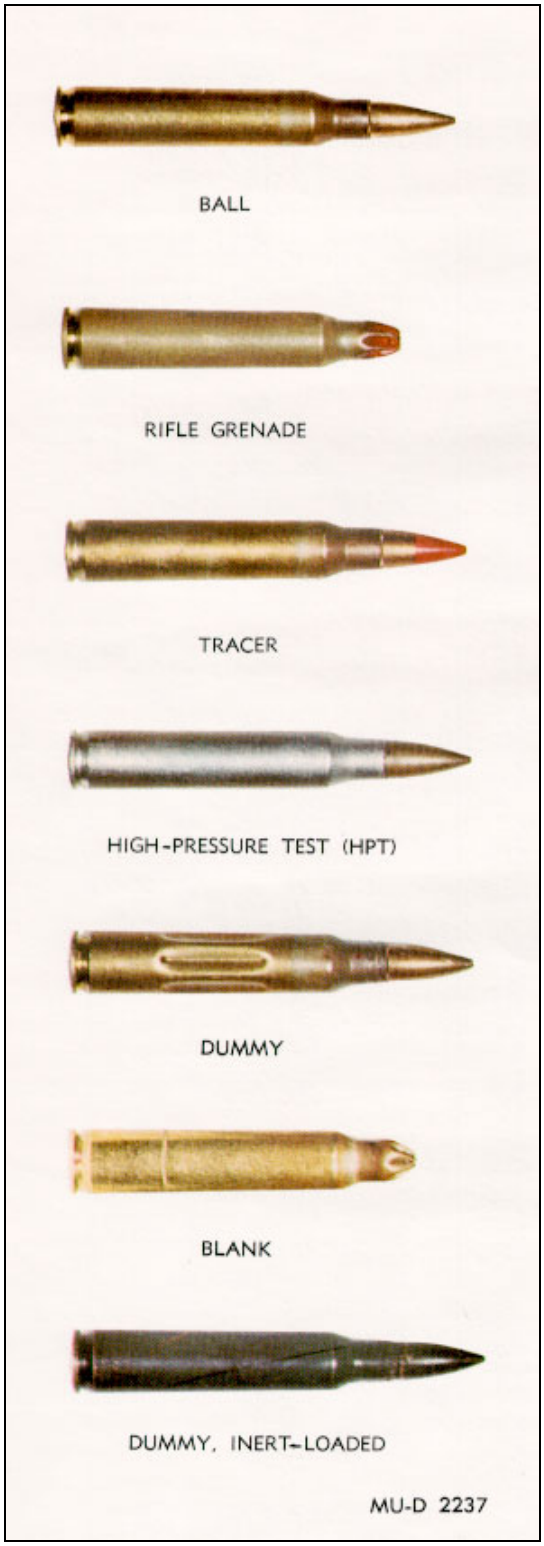


Figure 6. 5.56mm cartridges

Propellant. Cartridges are loaded with varying weights of propellant. This is to impart sufficient velocity (within safe pressures) to the projectile to obtain the required ballistic performance. These propellants are either of the single-base (nitrocellulose) or double-base (nitrocellulose and nitroglycerine) type. The propellant grain configuration may be cylindrical with a single, lengthwise perforation, spheroid (ball) or flake. Most propellants are coated with a deterrent (to assist in controlling the rate of combustion) and with a final coating of graphite (to facilitate flow of propellant and eliminate static electricity in loading cartridges).

Primer. Small-arms cartridges contain either a percussion or electric primer. The percussion primer consists of a brass or gilding metal cup that contains a pellet of sensitive explosive material secured by a paper disk and a brass anvil. The electric primer consists of an electrode button in contact with the priming composition, a primer cup assembly and insulator. A blow from the firing pin of the weapon on the center of the percussion primer cup base compresses the primer composition between the cup and the anvil. This causes the composition to explode. The function of the electric primer is accomplished by a firing pin with electrical potential, which contacts the electrode button. This allows current to flow through the energy-sensitive priming composition to the grounded primer cup and cartridge case, exploding the priming composition. Holes or vents in the anvil or closure cup allow the flame to pass through the primer vent in the cartridge case and ignite the propellant. Rimfire ammunition, such as the caliber .22 cartridge, does not contain a primer assembly. Instead, the primer composition is spun into the rim of the cartridge case and the propellant is in intimate contact with the composition. On firing, the firing pin strikes the rim of the cartridge case, compressing the primer composition and initiating its explosion.

Bullet. With few exceptions, bullets through caliber .50 are assemblies of a jacket and a lead or steel core. They may contain other components or chemicals which provide the terminal ballistic characteristics of the bullet type. The bullet jacket may be either gliding metal, gliding-metal clad steel, or copper plated steel. Caliber .30 and 7.62mm frangible bullets are molded of powdered lead and a friable plastic which pulverizes into dust upon impact with the target. The pellets used in the shotgun shells are spheres of lead alloys varying from 0.08 inch to 0.33 inch in diameter.

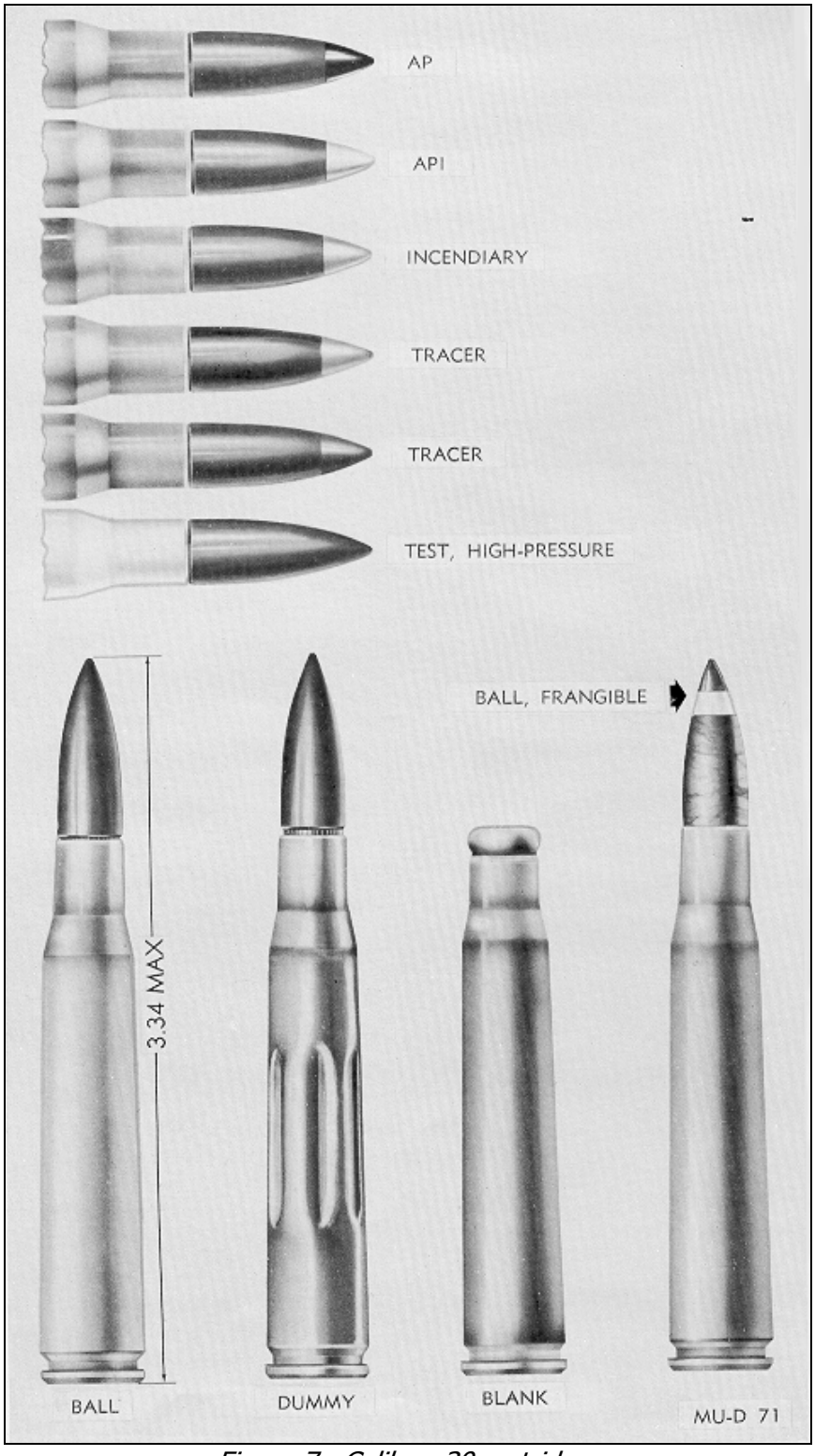


Figure 7. Caliber .30 cartridges

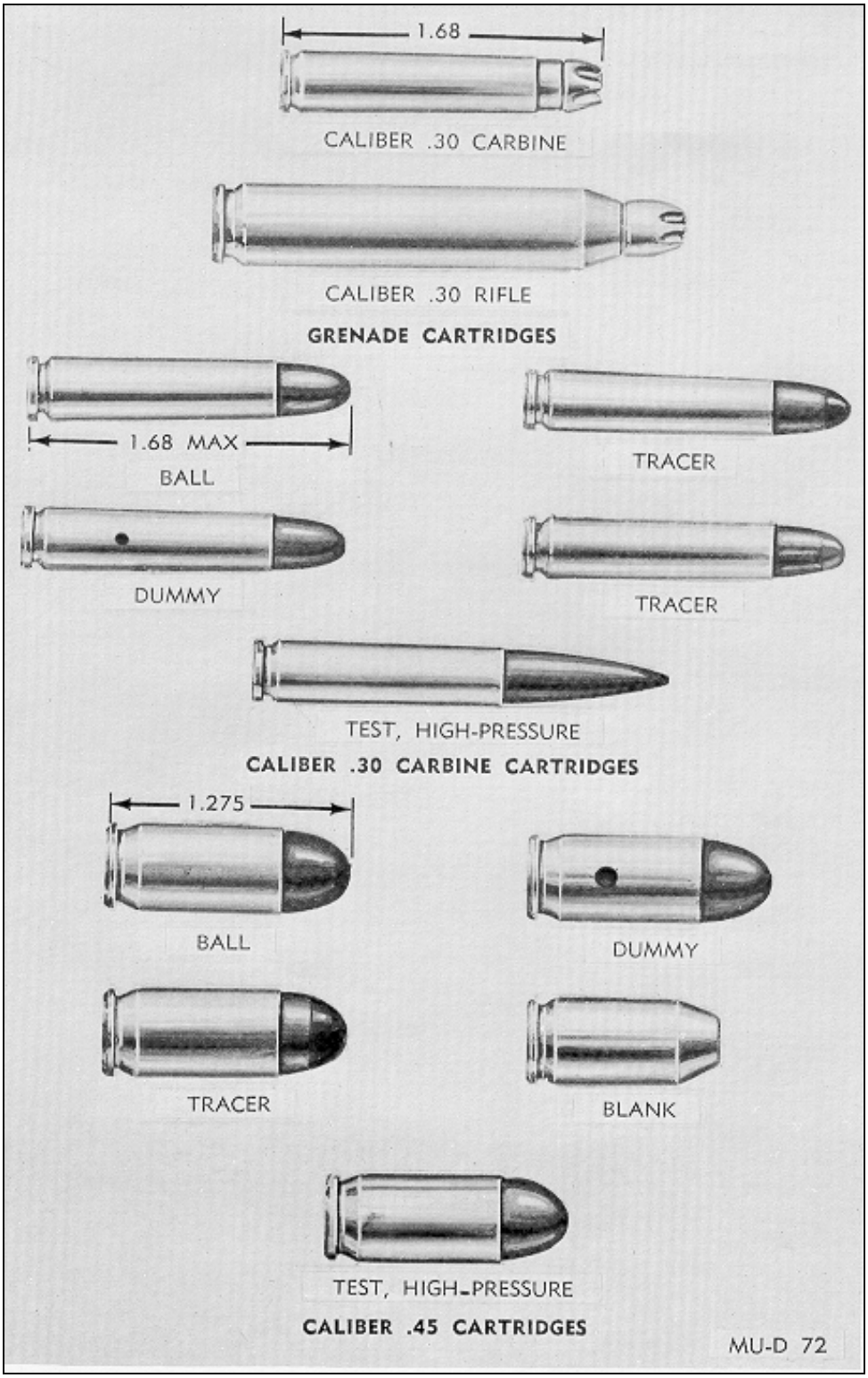


Figure 8. Caliber .30 carbine and caliber .45 cartridges

Figure 9. Caliber .50 cartridges

Ball Cartridge. The ball cartridge is intended for use in rifles, carbines, pistols, revolvers and/or machineguns against personnel and unarmored targets. The bullet, as designed for general purpose combat and training requirements, normally consists of a metal jacket and a lead slug. Caliber .50 ball bullet and 7.62-mm, Ball M59 bullet contain soft steel cores.

Tracer Cartridge. By means of a trail of flame and smoke, the tracer cartridge is intended to permit visible observation of the bullet's in-flight path or trajectory and the point of impact. It is used primarily to observe the line of fire. It may also be used to pinpoint enemy targets to ignite flammable materials and for signaling purposes. The tracer element consists of a compressed, flammable, pyrotechnic composition in the base of the bullet. This composition is ignited by the propellant when the cartridge is fired. In flight, the bullet emits a bright flame which is visible to the gunner. Trace burnout occurs at a range between 400 and 1,600 yards, depending upon the caliber of ammunition.

Match Cartridge. The match cartridge is used in National and International Match Shooting competitions. The bullet consists of a gliding-metal jacket over a lead slug. The cartridges are identified on the head face with the designation NM (National Match) or Match.

Armor-Piercing Cartridges. The armor-piercing cartridge is intended for use in machine-guns or rifles against personnel and light armored and unarmored targets, concrete shelters, and similar bullet-resisting targets. The bullet consists of a metal jacket and a hardened steel-alloy core. In addition, it may have a base filler and/or a point filler of lead.

Armor-Piercing-Incendiary Cartridge. The armor-piercing-incendiary cartridge is used in rifles or machineguns as a single combination cartridge in lieu of separate armor-piercing and incendiary cartridges. The bullet is similar to the armor-piercing bullet, except that the point filler is incendiary mixture instead of lead. Upon impact with the target, the incendiary mixture burst into flame and ignites flammable material.

Armor-Piercing-Incendiary Tracer Cartridge. The bullet of the armor-piercing- incendiary-tracer cartridge combines the features of the armor-piercing, incendiary, and tracer bullets and may be used to replace those cartridges. The bullet consists of a hard steel core with compressed pyrotechnic mixture in the cavity in the base of the core. The core is covered by a gilding-metal jacket with incendiary mixture between the core point and jacket. This cartridge is for use in caliber .50 weapons only.

Duplex Cartridge. The duplex cartridge contains two special ball type bullets in tandem. The front bullet is positioned partially in the case neck, similarly to a standard ball bullet. The rear bullet, positioned completely within the case, is held in position by a compressed propellant charge. The base of the rear bullet is angled so that in flight, it follows a path slightly dispersed from that of the front bullet.

Spotter-Tracer Cartridge. The spotter-tracer cartridge is intended for use in coaxially mounted caliber .50 spotting rifles. The bullet trajectory closely approximates that of

106mm projectiles. Thus, this cartridge serves as a fire control device to verify weapon sight settings before firing 106mm weapons. The bullet contains an impact detonator and incendiary composition which identify the point of impact by flash and smoke.

Blank Cartridge. The blank cartridge is distinguished by absence of a bullet. It is used for simulated fire, in training maneuvers, and for saluting purposes. It is fired in rifles and machineguns equipped with blank firing attachments.

Grenade Cartridge. The grenade cartridge is used to propel rifle grenades and ground signals from launchers attached to rifles or carbines. All rifle grenade cartridges are distinguished by the rose petal (rosette crimp) closure of the case mouth.

Frangible Cartridge. The caliber .30 frangible cartridge, designed for aerial target training purposes, is also used in rifles and machineguns for target shooting. Caliber .30 and 7.62mm frangible cartridges are used in tank machineguns, firing single shot, for training in tank gunnery. At its normal velocity, the bullet, which is composed of powdered lead and friable plastic, will completely disintegrate upon striking a 3/16-inch aluminum alloy plate at 100 yards from the muzzle of the gun. These cartridges are not to be used on any but well ventilated indoor ranges to preclude buildup of toxic bullet dust. Inhalation of bullet dust may be injurious to health.

Incendiary Cartridge. The incendiary cartridge was designed for aircraft and ground weapon use to ignite combustible targets (e.g., vehicular and aircraft fuel tanks). The bullet contains a compressed incendiary mixture which ignites upon impact with the target. The incendiary cartridge has been superseded by the API and APIT cartridges because of their improved terminal ballistic effects.

Special Purpose Cartridge

Cartridges of various calibers. (figures. 10 through 12), which consist of different types of projectiles and bullets, are used for training and special purposes. They include the following:

(1) Caliber .22 long rifle and caliber .38 and .45 wad-cutter cartridge for target shooting.

(2) Caliber .45 blank cartridges fired in exercises to condition dogs to gun fire.

(3) Caliber .22 hornet and .410 shotgun cartridges for firing in Air Force combination (survival) weapons for hunting purposes.

(4) Caliber.45 line-throwing cartridges for firing in caliber .45 line-throwing rifles. The Navy uses these for throwing lines from ship-to-ship. The Army Signal Corps uses these for projecting signal wires over elevated terrain.

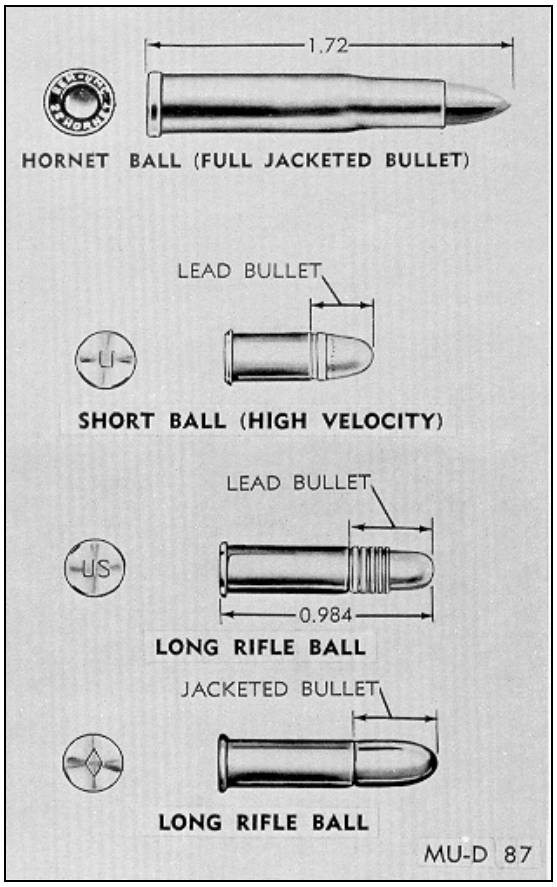


Figure 10. Caliber .22 cartridges

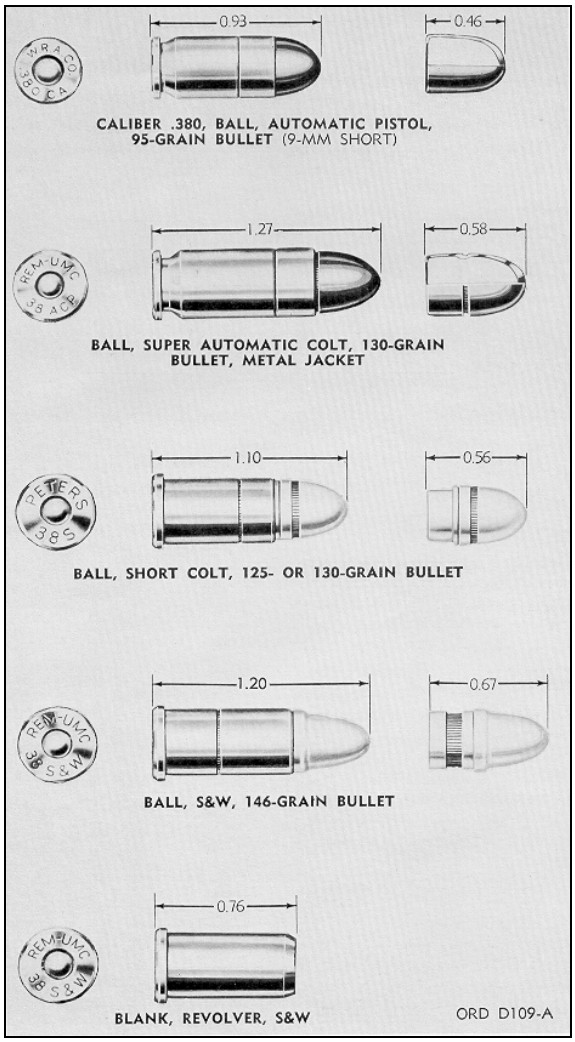


Figure 11. Caliber .38 cartridges

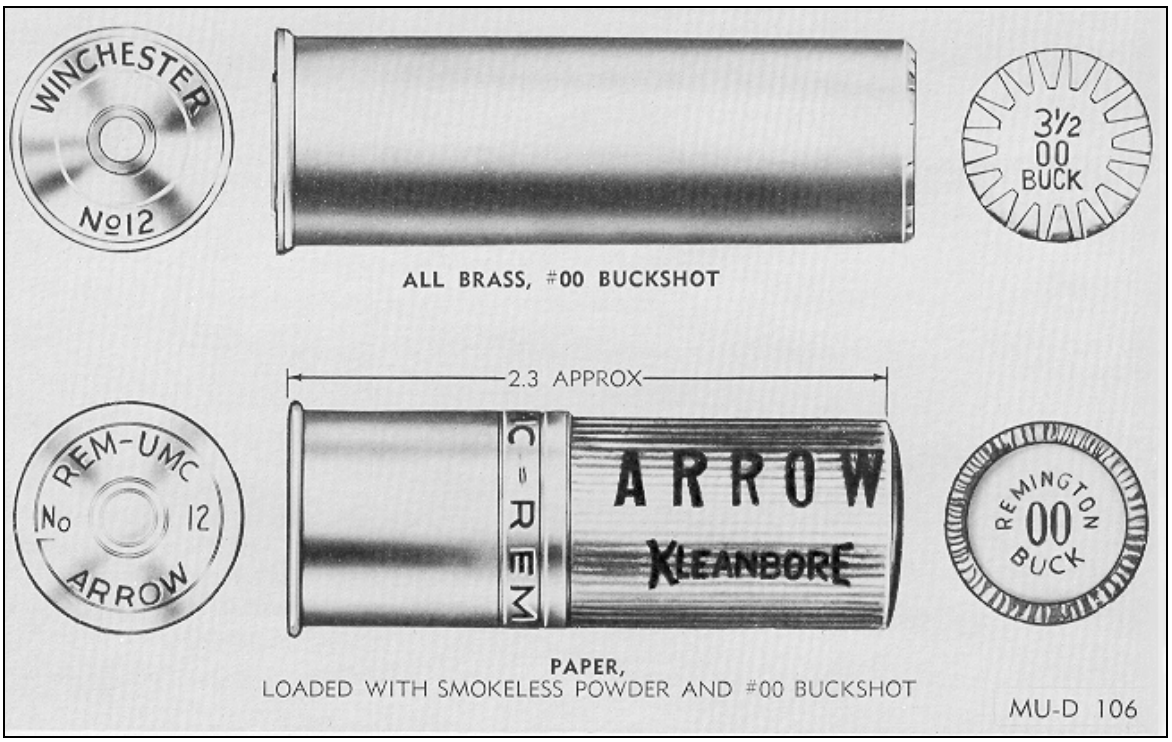


Figure 12. 12 gage shotgun shells

(5) Shotshells containing the designated shot sizes as required for the following:

12 gage #00 Buck for guard duty
12 gage #4 Buck for guerrilla purposes.
12 gage #6, 7½ and 8 shot for clay target shooting for training purposes.
.410 gage #7 shot for caliber .22/.410 survival weapons maintained by aircraft

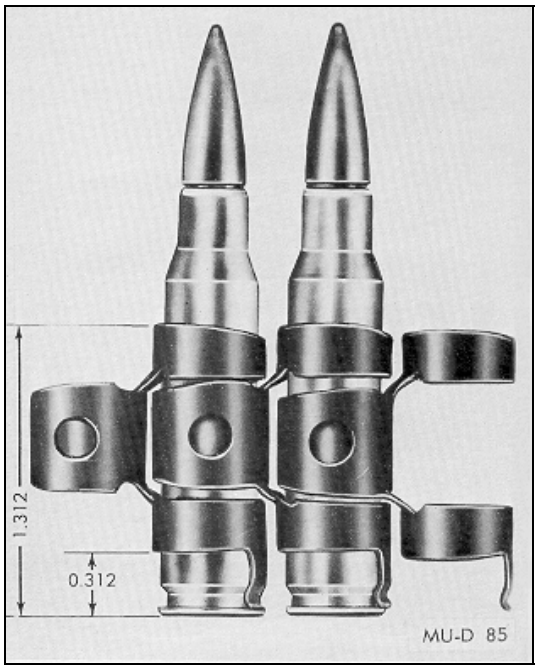


Figure 13. Linked 7.62-mm cartridges

Special purpose cartridges also include the following types of military cartridges:

(1) Dummy. The dummy cartridge is used for practice in loading weapons and simulated firing to detect flinching of personnel when firing weapons. It consists of a cartridge case and a ball bullet. Cartridge identification is by means of holes through the side of the case or longitudinal corrugations in the case and by the empty primer pocket.

(2) Dummy inert-loaded. This cartridge consists of a cartridge case, a ball bullet and inert granular material in the case simulating the weight and balance of a live cartridge. The exterior of the cartridge is identified by a black chemical finish and by the absence of a primer. This cartridge is used by installations for testing weapon function, linkage and feed chutes.

(3) High-pressure test. High-pressure test ammunition is specially loaded to produce pressures substantially in excess of the maximum average or individual pressures of the corresponding service cartridge. This cartridge is not for field issue. It is used only by armorers and weapons mechanics for proof firing of weapons (rifles, pistols, machine guns) at place of manufacture, test and repair. Because of excessive pressures developed by this type of ammunition, and the potential danger involved in firing, proofing of weapons is conducted only by authorized personnel from fixed and shielded rests by means of a lanyard or other remote control methods.

Metallic Links and Clip

Metallic links. (figures. 13 and 14) are used with caliber .30, caliber .50, 5.56mm, 7.62mm and 20mm cartridges in machine guns. The links are made of steel, surface treated for rust prevention. They are used to assemble cartridges into linked belts of 100 to 750 cartridges per belt. The links must meet specific test and dimension requirements to assure satisfactory ammunition feed and functioning in the machine gun under all training and combat service conditions.

Different configurations of cartridge clips. These permit unitized packages of ammunition. This facilitates transfer of cartridges to appropriate magazines for caliber .30, 7.62mm and 5.56mm rifles. The caliber .30 eight-round clip feeds eight cartridges as a unit into the receiver of the rifle. The caliber .45 clip feeds three cartridges as a unit into the revolver cylinder. Five-round and eight-round clips are used with caliber .30 cartridges; five-round clips with 7.62mm cartridges; ten- round clips with caliber .30 carbine and 5.56-mm cartridges; and three-round clips with caliber .45 cartridges.

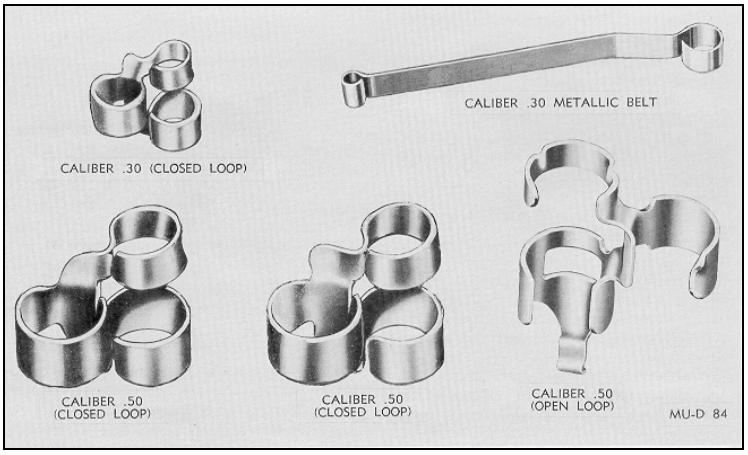


Figure 14. Links for caliber .30 and caliber .50 ammunition

Identification Markings. Each outer shipping container and all inner containers are fully marked to identify the ammunition. Wire- bound boxes are marked in black and ammunition boxes are painted olive drab, with markings in yellow. When linked ammunition is functionally packed, component lot numbers are replaced by a functional lot number. Typical packing and identification markings are illustrated in figures 15 through 17.

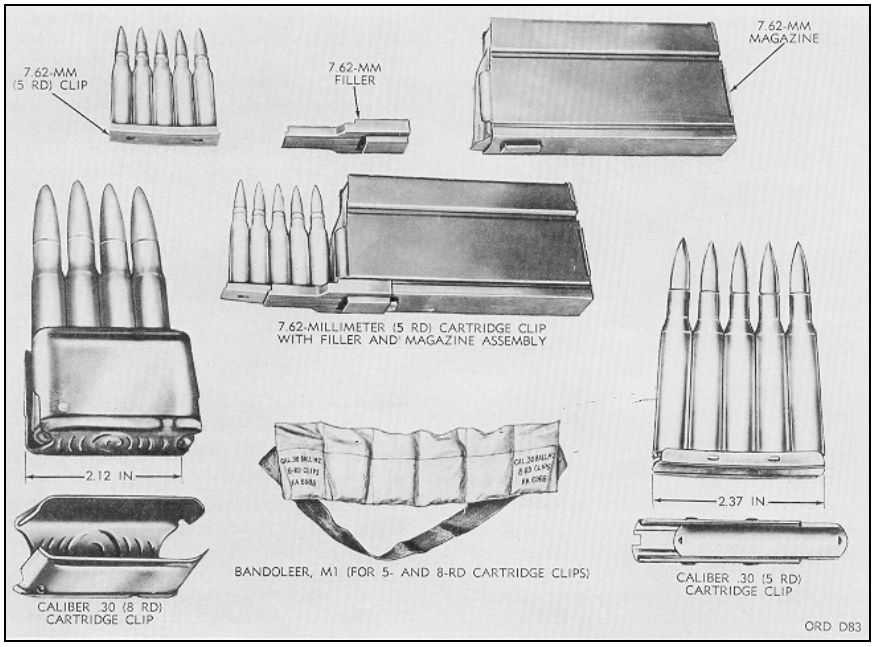


Figure 15. Cartridges, links, belt, cartons, bandoleers and ammunition box

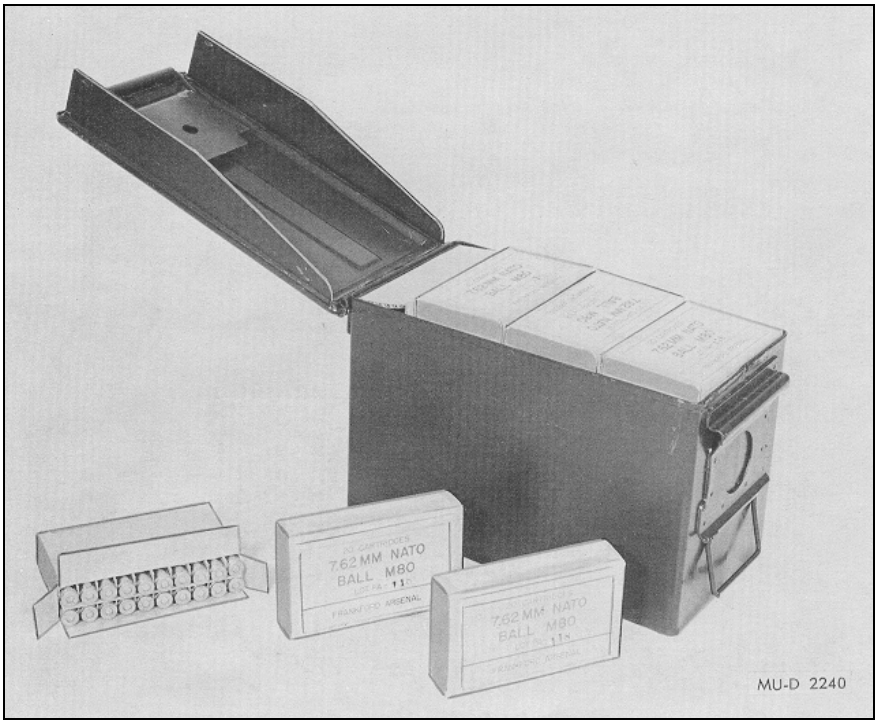


Figure 16. Cartridges, link belt, cartons, bandoleers and ammunition box

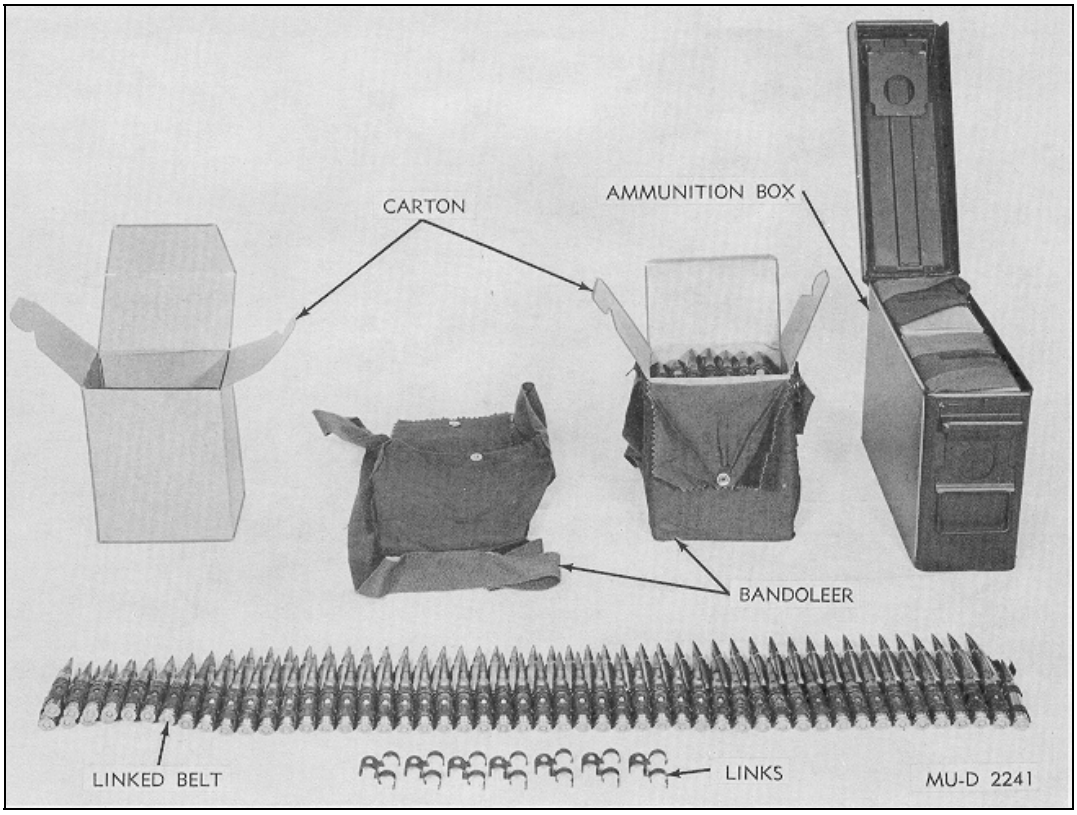


Figure 17. Cartridges, link belt, cartons, bandoleers and ammunition box

Care, Handling and Preservation

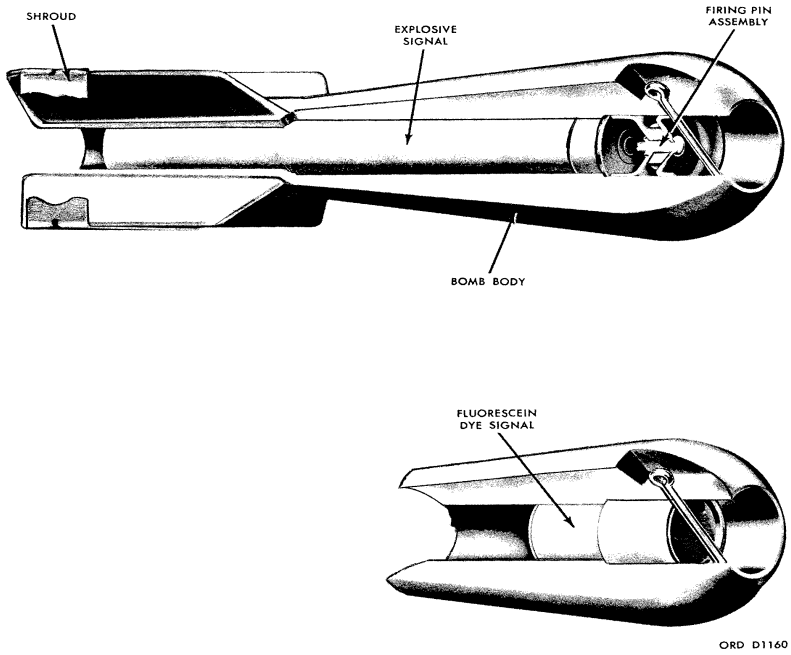
Small-arms ammunition is comparatively safe to handle. It is packed to withstand transportation, handling and storage conditions normally encountered in the field. However, consideration should be given to general handling precautions pertaining to ammunition and explosives.

Reference: This data is a reprint of Chapter 3, TM 9-1300-200, *Ammunition General,* October 1969

CTT10

BOMBS, PRACTICE

MINIATURE PRACTICE BOMBS
AN-Mk 5 Mod 1, AN-Mk 23, AN-Mk 43



Description. These bombs are used for low-altitude horizontal, or dive-bombing practice. The three bombs are similar in physical appearance, but differ basically in the metal used to cast the body. Bombs are used with the AN-Mk 4 practice bomb signal that is a blank 10-gauge shotgun shell (extended length). Signals contain a black powder expelling charge and a red phosphorous pyrotechnic mixture. These bombs also are used with the MK5 signal that contains a fluorescein dye and is actuated by impact on water. When the Mk5 signal is installed, the firing pin assembly is not used.

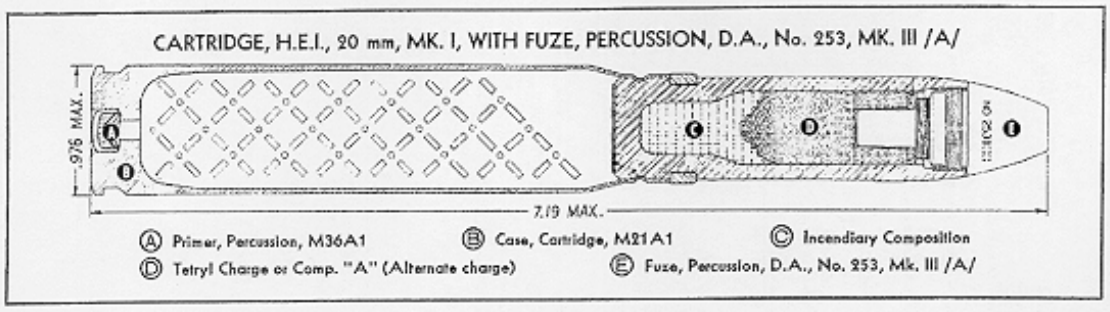
Over-all length ..... 8.25 inches
Body Diameter ..... 2.18 inches
Fin Dimension ..... 2.5 inches
Weight ..... AN-Mk 5 Mod 1 - 2 lb. 11 oz. $\pm$ 1 oz
AN-Mk 23 -3 lb. $\pm$ 2 oz
AN-Mk 43 - 4 lb. 7 oz. $\pm$ 2 oz.
Signal ..... AN-Mk 4, Black powder/pyro-Technic charge Mk 5, Fluorescein dye

Reference: OP 1280, *Aircraft Bombs*, February 1945; TM 9-1325-200, *Bombs and Bomb Components*, April 1966

CTT16

MEDIUM CALIBER (20MM, 25MM, 30MM), HE

SHELL, HIGH-EXPLOSIVE INCENDIARY 20MM, MK. I



SHELL, HIGH-EXPLOSIVE INCENDIARY, 20 mm, Mk. I—STANDARD—This shell for the 20 mm automatic guns, M1, AN-M2, and British Hispano-Suiza /A/, was adopted from the British early in 1941 and standardized in August of that year. There have been few changes except in the redesign of the cartridge case and primer.

The fuzed projectile remains essentially the same, as may be recognized from the adopted British nomenclature, Fuze, Percussion, D.A., No. 253, Mk. III /A/, which signifies that the shell is used for aircraft and has a delay action percussion fuze. The shell is designed for fire from aircraft guns against enemy aircraft, but it may be used against ground targets.

The complete round weighs 0.566 pound and consists of a cartridge case, M21A1, weighing 0.205 pound, and measuring 4.34 inches in length; a percussion primer, M36A1, weighing 0.003 pound, a propelling charge of Improved Military Rifle Powder weighing 0.072 pound, and the loaded and fuzed shell. The cartridge case is crimped to the fuzed and loaded projectile. A substitute standard for the cartridge case, M21A1, is the steel cartridge case, M21A1B1.

The projectile is of the high-explosive incendiary type. As fired, it weighs 0.286 pound and measures 3.23 inches in length by 0.784 inch in diameter. The bursting charge weighs 174.25 grains; 107.75 grains are tetryl and the remaining 66.5 grains are incendiary composition. The alternate bursting charge consists of 100.3 grains of composition A and 66.5 grains of incendiary composition.

The propelling charge is an IMR powder formula of single-perforation grains with a web of 0.021 inch.

The standard muzzle velocity with this propelling charge is 2,800 feet per second.

A cover is fixed to the base of the shell by a continuous resistance weld, and serves as a seal to prevent gas or flash from the propelling charge from entering the shell and prematurely detonating the bursting charge. This may happen as the shell is not forged or cast, but is turned from steel bar stock which may have fissures in its center.

CHARACTERISTICS

Caliber	20 mm
Model of Gun	‡
Proj. Weight	0.286 lb.
Proj. Charge and Weight	174.25 gr.*
Fuze	Percussion, D.A., No. 253, Mk. III /A/
Primer	M36A1
Cartridge Case	M21A1†
Propelling Charge and Weight	IMR powder, 0.072 lb.
Complete Round Weight	0.566 lb.
Muzzle Velocity	2,800 f/s
Maximum Range	5,100 yards
Chamber Capacity	2.22 cu. ins.
Rated Max. Pressure p.s.i.	49,000

*107.75 grains of tetryl, 66.5 grains of incendiary composition. (Alternate loading: 100.3 grains of Composition "A" and 66.5 grains of incendiary composition.)
†The steel cartridge case, M21A1B1, is substitute standard.
‡M1, AN-M2 and British Hispano-Suiza /A/.

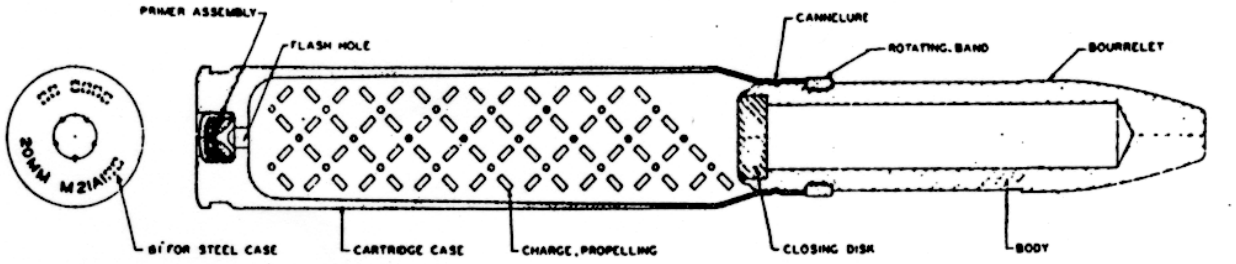
UNCLASSIFIED

References: ..... *Catalogue of Standard Ordnance Items, Volume III,* 1944

CTT17

MEDIUM CALIBER (20MM, 25MM, 30MM), PRACTICE

CARTRIDGE, 20mm, BALL, MK I



Use. This cartridge was fired in the M1, AN-M2 and British Hispano guns that were mounted in WW II aircraft. Originally designed as a training practice round to simulate the high explosive incendiary round, it proved successful in combat and was redesignated as a ball cartridge.

Description. The cartridge is a fixed type with an overall length of 7.23 inches (unfired). The projectile is machined from bar steel and has a hollow cavity through most of its length. There is a steel closing disc at the base and the nose has a template that makes it appear as though it was cut off about one quarter inch from the tip. The round uses the M21-series cartridge case, which may be of brass or steel. No tracer element is fitted.

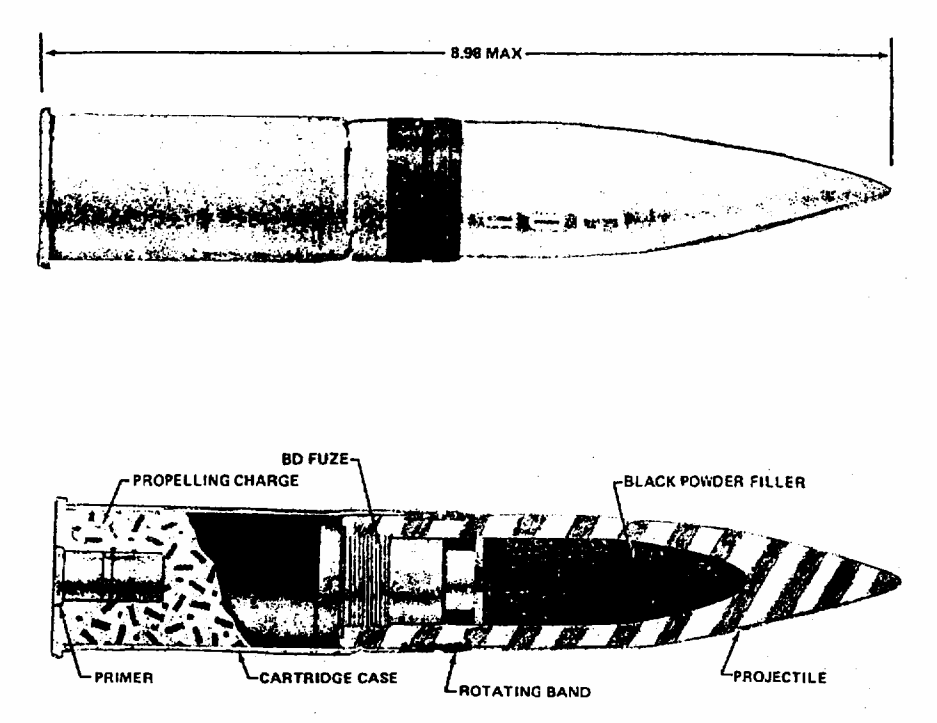
Overall Length.....7.23 inch
Projectile Length.....3.31 inch
Diameter .....0.784 inch
Weight of complete round.....0.56 pound
Filler .....None
Fuze.....None

Reference: TM 9-1904, *Ammunition Inspection Guide*, 2 March 1944; NAVSEA OP 1664, *U.S. Explosive Ordnance*, 28 May 1947

CTT21

LARGE CALIBER (37MM AND LARGER), PRACTICE

SHELL, 37mm, TP, M63 MOD 1



Use. This target practice cartridge is used in subcaliber 37-mm guns fitted to larger weapons for practice firing training.

Description. The cartridge consists of a black powder filled steel projectile crimped to a steel cartridge case and fitted with a base-detonating practice fuze. A rotating band encircles the projectile near the base. The cartridge case is loosely filled with propellant and is fitted with a percussion primer.

Weight..... 2.01 pound
Length..... 8.98 inch
Filler..... Black Powder
Filler weight..... 0.084 pound
Cartridge case..... MK1A2, MK1A2B1
Propellant..... M2, 0.56 pound
Color..... Blue with white markings
(brown band for later manufacture)

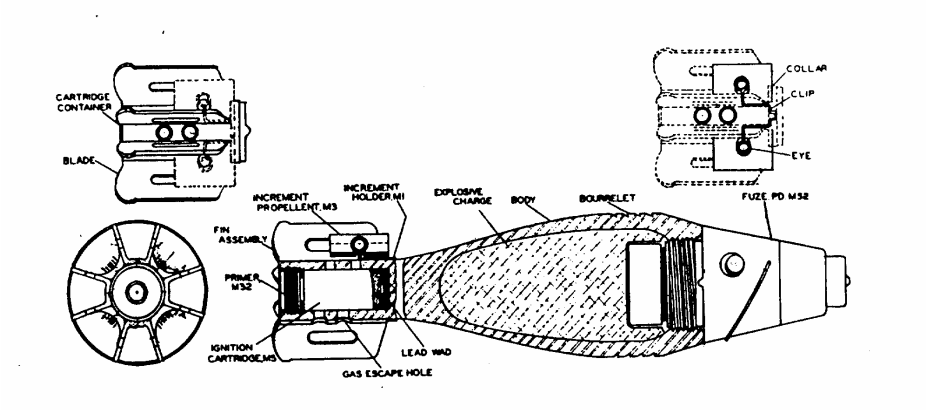
Reference: TM 43-0001-28, *Army Ammunition Data Sheets Artillery Ammunition*, April 1977

CTT22

MORTARS, HE

MORTAR, 60mm, HE, M49A2,

PRACTICE,M 50A2



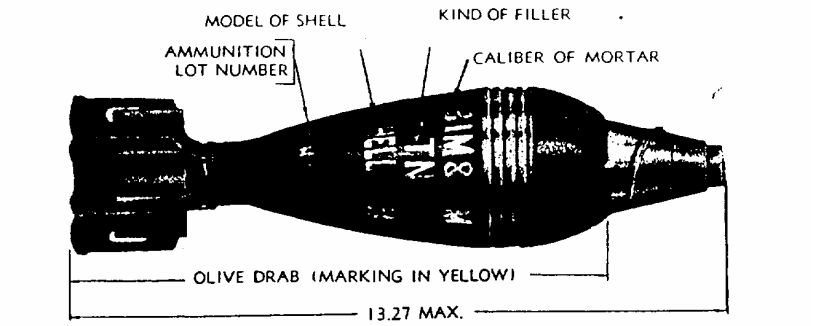
Description. The body of this shell may be constructed of forged steel, cupped-rolled, plate-welded longitudinally, or a machined casting. It is tear-dropped in shape, having a blunt nose and tapered tail. Near the nose end of the shell is a machined bourrelet which acts as a forward bearing surface and as a gas check. The nose is threaded to receive the fuze directly. The fuze used is the Point-detonating Fuze M525A2 which has a superquick action. The tail end is closed and internally threaded to receive the stabilizer assembly. The shell filler is 0.34 pounds of flake TNT. The ignition cartridge M5A1, contains 40 grains of double base powder. The propellant increments, M3, consists of square strips of double base powder sewn together. Each increment has 35 grains of finely granulated double base powder. The shell body is painted olive drab and stenciled in yellow.

Shell, Practice, M50A2. This shell is identical to the service round. It differs in that the filler consists of 0.05 pounds of black powder to act as a spotting charge, and 0.29 pounds of inert filler. The body is painted blue with white stenciling.

Over-all Length ..... 9.5 inch
Diameter (body) ..... 2.34 inch
Total Weight ..... 2.94 pound
Filler ..... TNT (flaked)
Filler weight ..... 0.34 pounds
Propellant ..... ballistite
Fuze ..... M52 PD
M525A1 PD
Painting and markings ..... Olive drab w/ yellow markings

Reference: TM 9-1904, *Ammunition Inspection Guide*, March 1944, TM 9-1300-205, *Ammunition for Mortars*, September 1960

MORTAR, 81mm, HE AND PRACTICE, M43A1



Shell, HE, M43A1, Shell Body. It is constructed of forged steel. It is tear-dropped in shape; that is, blunt nose and tapered tail. It has a bourrelet machined near the nose of the shell consisting of several annular grooves which serves to act as a forward bearing surface and a gas check The nose is machined and threaded to receive an adapter. The adapter is threaded and acts as a bushing for a bakelite fuze well cup and the fuze. The fuze used is the Point-detonating Fuze M45. This fuze has a selective element and can be set for either superquick or delay action. The shell filler is 1.22 pounds of TNT. The total weight of the completely assembled round is 7.05 pounds. Entire length of the fuzed shell is 13 1/4 inches.

Fin assembly. The fin assembly consists of a machined cartridge container to which are attached six stationary fins. One end is threaded and screwed on to the body of the shell. The other end is machined and hollow inside so as to receive the ignition cartridge. Several holes leading from the interior to the exterior periphery of the cartridge container serve to conduct the flames from the ignition cartridge to the propellant increments which are seated in the fins.

Shell, Practice, M43A1. The shell body, components used, and packing are identical to the shell previously described. It differs in that the filler consists of 0.16 pound of black powder to act as a spotting charge, and 1.06 pounds of inert filler such as wax, talcum, or rosin. The body is painted blue with white stencil to indicate a practice shell.

Over-all Length ..... 13.25 inches
Diameter (body) ..... 3.16 inches
Total Weight ..... 7.05 pounds
Filler
- **HE** ..... TNT, 1.22 pound
- **Practice** ..... Black powder, 0.16 pound

Propellant ..... Ballistite
Fuze ..... M45, point-detonating

Painting and markings

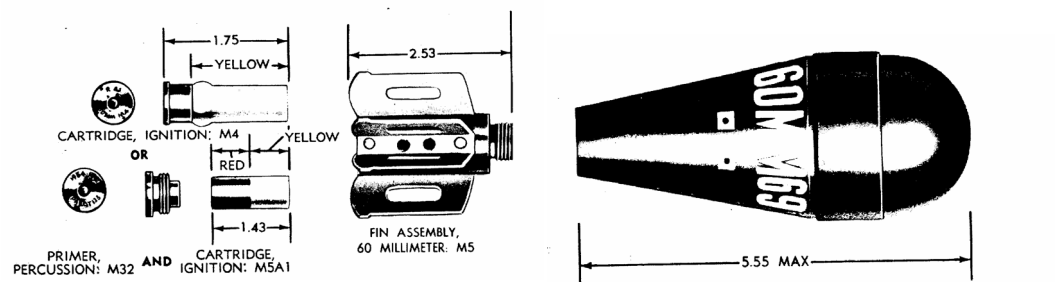
- **HE** ..... Olive drab, yellow markings
- **Practice** ..... Blue, white markings

Reference: TM 9-1904, *Ammunition Inspection Guide*, March 1944

CTT46

PRACTICE ORDNANCE (WITHOUT SPOTTING CHARGES)

MORTAR, 60mm, TRAINING, M69



Use. This cartridge is used for training in the loading and firing of 60-mm Mortars M2 and M19.

Description. Unlike other mortar ammunition, the components of this round are issued separately. This facilitates replacement of damaged, worn, or expended parts. The body of the shell is cast iron. It is tear-dropped with a blunt nose and tapered tail. It has a bourrelet on the body near the nose to act as a forward bearing surface and gas check. At the tail end is a recess which is threaded to receive a stabilizer assembly. The nose end is closed and rounded with no provisions made to receive a fuze. Its weight varies depending on its weight zone. Seven weight zones are possible with a minimum of 3.83 pounds for weight zones one and a maximum of 4.07 pounds for weight zone seven *without* fin assembly and ignition cartridge.

Fin assembly and propelling charge. The fin assembly consists of a machined cartridge container closed at one end with a threaded protrusion to screw into the shell body. It is hollow, with the other end threaded to receive an ignition cartridge and a percussion primer. Attached to the cartridge container are eight stationary fins. The shell can be fired more than one time. There are no propellant increments used, for the shell is designed to be fired in the first zone only.

Complete Round

Weight assembled	4.43 pounds
Length assembled	7.72 inches
Filler	INERT
Ignition Cartridge	M5A1 or M4
Propellant	None
Percussion Primer	M32
Fuze	None

Color

Old manufacture	Black or blue w/White markings
New manufacture	Bronze w/ White markings

Reference: TM 9-1904, *Ammunition Inspection Guide*, March 1944; TM 9-1300-205, *Ammunition for mortars*, September 1960; TM 43-0001-28, *Army Ammunition Data Sheets, Artillery Ammunition*, April 1977

APPENDIX E – SITE SPECIFIC ACCIDENT PREVENTION PLAN

Site Specific Accident Prevention Plan

The purpose of this appendix is to augment the programmatic Accident Prevention Plan (APP), Appendix D of the PWP (Alion 2005) by presenting site-specific information and any procedural deviations. The Programmatic APP will accompany this SS-WP during field activity.

SITE-SPECIFIC Accident Prevention Plan

Client: U.S. Army Corps of Engineers Baltimore

Project Name/Number: Site Inspection of Mitchel Field

Site Location/Address: Mitchel Field, Nassau County, New York (See Figure 2 – Aerial Map, Appendix A)

Work Description: Site Inspection of this Formally Used Defense Site (FUDS) will include site reconnaissance, limited geophysical survey, soil sampling, and possible groundwater sampling outside the FUDS from existing wells.

APPROVALS:

This Addendum to the project Work Plan and APP has been prepared under the supervision and review of a CIH certified by the American Board of Industrial Hygienists (ABIH).

Program Safety and Health Officer  12/12/05

Bill Beckett, CIH (ABIH No. 5246CP) Date

Hospital Route Map

MEDICAL EMERGENCY:

Distance to Nearest Hospital: 3.2 miles, about 8 minutes

Hospital Name: Nassau University Medical Center
Hospital Phone: (516) 572-0123
Hospital Address: 2201 Hempstead Turnpike, East Meadow, NY 11554

In Case of Emergency Contact: Call 911 for first responder. Arrangements will be made for faster transport to the hospital if necessary (i.e., helicopter).

Route to Hospital (from Perimeter Road): 3.2 miles, approximately 8 minutes

1. Head southwest on Perimeter Rd (0.3 mi)
2. Turn left to stay on Perimeter Rd (351 ft)
3. Slight right at Charles Lindbergh Blvd (0.2 mi)
4. Slight left toward Charles Lindbergh Blvd (361 ft)
5. Slight left at Charles Lindbergh Blvd (0.4 mi)
6. Take the ramp onto Meadowbrook State Pkwy S (0.6 mi)
7. Take exit M5 for State Hwy 24 E toward Farmingdale (0.2 mi)
8. Merge onto Hempstead Bethpage Turnpike/Hempstead Turnpike/RT-24 (1.5 mi)
9. Turn left at Jefferson St/Perimeter E

Continue to follow Perimeter E (92 ft)

10. Turn left at Hospital St N (89 ft)
11. Turn left to stay on Hospital St N (276 ft)

Map on following page.


Salisbury
Salisbury Park Dr
Stewart Ave
Park Blvd
Carman Ave
Mitchel Field
Meadowbrook State Pkwy
Hospit
Hemp ead Tur
24
Gerald Ave
E Meadow Ave
Bard Ln
Aaron Ave
Francis Dr
Casper Ave
Front St
East Meadow
Merrick Ave
© 2008 Acxiom
Image © 2008 New York GIS
© 2008 Tele Atlas
Google
18 T 620549.41 m E 4509698.24 m N
Eye alt 2.95 km

TABLE E-1. EMERGENCY CONTACT INFORMATION

Contacts	Name	Phone Number(s) work/cell
Program Manager	Roger Azar	Cell: 301-399-7304
Deputy Program Manager	Corinne Shia	703-259-5147 Cell: 703-485-6001
Project Manager	Rick Swahn	703-259-5286
Program Safety and Health Officer	Curtis Mitchell	Cell: 301-399-7152
Task Manager	Benjamin Claus	703-259-5264
Site Safety and Health Officer (SSHO)	Curtis Mitchell	Cell: 301-399-7152
Client Contact	Helen Edge – CENAN	917-790-8332
	Alan Warminski – Baltimore District	410-962-2179
	Paul Greene	410-962-6241
Regulatory Contact	Daniel Eaton - NYDEC	578-402-9620
Property Owner/Manager	Masoom Ali – Nassau C. College	516-572-7108
	Joseph DeFrano – Nassau County Dept of Health	516-227-9429
	Gary Monti – Cradle of Aviation Museum	516-572-4017
	Teresa Grise – Hofstra University	516-463-5062
	Chris Wright – Nassau Coliseum	TBD
	Michael Fritz – Nassau County Parks and Recreation	516-572-0288
Hospital	Nassau University Medical Center	516-572-0123
Poison Control	-	800-222-1222
National Response Center	-	800-424-8802
Alion Medical Services	Bill Beckett	908-852-4887

HAZARDS OF CONCERN: Check as many as are applicable. See Section 6 of Programmatic APP (Alion 2005) for Chemical, Physical and Biological Hazards.

(X) Heat Stress	( ) Reactive	( ) Oxygen Deficient	**(X) Insect Bite**
(X) Cold Stress	( ) Noise	( ) Corrosive	( ) Snake Bite
( ) Explosion/Flammable	( ) Inorganic	**(X) Toxic**	( ) Excavations
(X) Biological	( ) Organic	( ) Inert	**(X) Vegetation**
( ) Radiological	( ) Confined Space (see Section 9 of Programmatic APP)		
( ) Slip, Trip, Fall	( ) Lift, Push, Pull	( ) Volatile	

(X) Other, specify: Potential MEC. Site workers will practice MEC avoidance. Any suspected MEC will be left alone. A MEC avoidance team (provided by Alion/HFA) will identify routes free of anomalies to a sampling area. The MEC team will also ascertain that sample locations are free of anomalies. Once the MEC team has identified that a sampling area is free of anomalies, the MC sampling team will then collect samples for analysis. Soil samples will be collected from areas identified by CSM or the MEC survey to be suspect or contain high concentrations of MEC and/or MC. Activity Hazard Analysis tables have been completed for the proposed field work (to include Site Inspection and Reconnaissance and general sample collection) and are included at the end of this chapter. Other potential hazards include slips, trips, or falls (as discussed in Table E-2, E-3, and E-4).

PATHWAYS:

( ) Air **(X) Dust/Soil** ( ) Surface Water ( ) Sediment ( ) Groundwater ( ) Other

OVERALL HAZARD EVALUATION: ( ) High ( ) Medium **(X) Low** ( ) Unknown

JUSTIFICATION (brief narrative of how work activities may encounter hazards and their controls, include known or anticipated contaminant concentrations):
Site workers may be exposed to chemicals of concern (explosives) present in site soil during sampling activities. Site sampling will occur in wooded/overgrown areas that may contain biting insects and/or poisonous plants. Poison plant and insect identification and precautionary information are available to site personnel. Slip, trip and fall hazard is similar to that found on field sites that are not maintained and overgrown with vegetation.

FIRE/EXPLOSION POTENTIAL: ( ) High ( ) Medium **(X) Low** ( ) Unknown

SURROUNDING POPULATION: (X) Residential (X) Industrial ( ) Rural **(X) Urban**

ANTICIPATED LEVEL OF CHEMICAL EXPOSURE:

Low levels.

CONTINGENCY PLANS: Summarize below (Evacuation, assembly point, contingency leader)

During an emergency, site workers will gather at an assembly point (to be established during daily health and safety meeting). The SSHO will take the role of contingency leader.

DEVIATIONS/VARIATIONS FROM APP:

No deviations or variation from the Health and Safety Plan APP is permitted without specific written approval from the Program SSHO and PM. Deviation from the plan for an unforeseen hazard that demands an immediate decision can me made by SSHO and confirmed with the PS as soon as possible.

Do Hazardous Waste Site Workers and Supervisor (s) have Documentation of Required Training and Medical Exams? **(X) Yes** ( ) No, Explain

Do at least two people in the field have current Cardiopulmonary Resuscitation (CPR) and First Aid qualifications? **(X) Yes** ( ) No, Explain

Benjamin Claus, Todd Belanger, Sarah Moore, Cheryl Pruiett, Maria Borejsza-Wysocka, Kim Evers and HFA UXO Technician.

PROTECTIVE EQUIPMENT: Protective equipment should be specified by the type of task and site (e.g., soil boring and sampling at landfill). Indicate type and/or material, as necessary. Use additional pages as necessary.

Primary

TASKS: **Site Sampling, Site Reconnaissance, and Geophysical Survey**

INITIAL LEVEL: A - B - C - **(D)** - Modified (Circle applicable)
UPGRADE CRITERIA: **None – No air monitoring equipment will be used**

Respiratory: **(X) Not needed**
( ) SCBA, Airline: _____
( ) APR: _____
( ) Cartridge: _____
( ) Escape Mask: _____
( ) Other: _____

Head and Eye: ( ) Not needed
(X) Safety Glasses: _____
( ) Face Shield: _____
( ) Goggles: _____
( ) Hard Hat**:** _____

( ) Hearing Protection: _____

Protective Clothing: **(X) Not Needed**
( ) Encapsulating Suit: _____
( ) Splash Suit: _____
( ) Apron: _____
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Coverall: _____
( ) Other:

Gloves: ( ) Not needed
( ) Undergloves: _____
(X) Gloves: **Nitrile, during sampling**
( ) Overgloves: _____
( )**Other:**

Boots: ( ) Not Needed
Boots: **Work Boots/Shoes with slip resistant soles recommended; steel toe boots not required during Geophysical Surveying and soil sampling**
Overboots: _____

Contingency
TASKS: **NONE**

LEVEL: A - B – **(C)** – D - Modified (Circle applicable)
UPGRADE CRITERIA: **Personal Protective Equipment (PPE) Upgrade not permitted under this /APP**

Respiratory: **(X) Not needed**
( ) SCBA, Airline: _____
( ) APR: _____
( ) Cartridge: _____
( ) Escape Mask: _____
( ) Other: _____

Head and Eye: **(X) Not needed**
( ) Safety Glasses: _____
( ) Face Shield: _____
( ) Goggles: _____
( ) Hard Hat: _____
_____
( ) Hearing Protection: _____
_____

Protective Clothing: **(X) Not Needed**
( ) Encapsulating Suit: _____
( ) Splash Suit: _____
( ) Apron: _____
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Coverall: _____
( ) Other: _____

Gloves: **(X) Not needed**
( ) Undergloves: _____
( ) Gloves: _____
( ) Overgloves: _____
( ) Other: Specify below

Boots: ( ) Not Needed
Boots: _____

Overboots: _____

MONITORING EQUIPMENT: Monitoring equipment should be specified by task and type of site. Indicate type, as necessary. Attach additional sheets, as necessary.

TASKS: **NONE**

See APP for Calibration Procedures or attach if different. See 8-1 from the Programmatic APP (Alion 2005) for specific monitoring requirements and action levels.

INSTRUMENT	ACTION GUIDELINES
Combustible Gas Indicator **(X) Not needed**	0-10% LEL Continue. 10-20% LEL Potential explosion hazard, continuous monitoring. >20% LEL Explosion hazard; interrupt task/evacuate.
Oxygen (O_2) Percentage:	20.8% - O_2 normal. <20.8% - O_2 deficient, investigate cause. <19.5% O_2 Interrupt task/evacuate.

Type _____

Photoionization Detector Specify
( ) 11.7 ev ( ) 10.2 ev ( ) 09.8 ev ( ) __ ev
Type: Photovac or MiniRAE (circle applicable or list other): _____
(X) Not needed

Flame Ionization Detector Specify:
Type Photovac or Organic Vapor Analyzer (OVA) (circle applicable or list other): _____
(X) Not needed

Detector Tubes Monitor Specify: (Chemical, Range) COMMENTS (Interferences)
Type _____
(X) Not needed

Dust Monitor Specify:
Type _____
(X) Not needed

Radiation Survey Meter

	> Background	Contact Radiation Safety Officer (RSO)/SSHO and PM
	3 x Background	Notify CIH and stop work
	2.5mrem/hr	Interrupt task/evacuate

(X) Not needed Note: Annual Exposure not to exceed 100 mrem/yr or 50 urem/hr average

Other Specify:

DECONTAMINATION PROCEDURES:

Summarize personnel decontamination/containment and disposal method
( ) Not needed

Nitrile Gloves will be disposed of after sampling as general refuse. Wash hands before easting, drinking, and smoking.

Summarize equipment decontamination/containment and disposal method
( ) Not needed

Sampling equipment will be dedicated and disposed of following sample collection as general refuse following sample collection.

Summarize heavy equipment decontamination/containment and disposal method
(X) Not needed

TABLE E-2 SITE INSPECTION SAMPLING (SURFACE AND SUBSURFACE SOIL) ACTIVITY HAZARD ANALYSIS		
PRINCIPLE STEP	**POTENTIAL SAFETY/HEALTH HAZARDS**	**RECOMMENDED CONTROLS**
All Activities Related to soil sampling	Slips, Trips, Falls	Keep work area free of excess material and debris.
		Remove all trip hazards by keeping materials/objects organized and out of walkways.
		Be aware of uneven surfaces while walking around sampling locations.
		Keep work surfaces dry when possible.
		Wear appropriate Personal Protective Equipment (PPE) including non-slip rubber boots if working on wet or slick surfaces.
		Wear sturdy shoes with slip resistant soles.
		Stay aware of footing and do not run.
	Heat/Cold Stress	Take breaks as needed.
		Be aware of weather conditions and dress appropriately.
		Consume adequate food/beverages.
		If possible, adjust work schedule to avoid heat/cold stresses.
	Biological Hazards: Insects, Snakes, Wildlife, Vegetation	Inspect work areas when arriving at a sampling site to identify hazard(s).
		Use insect repellant as necessary.
		Stay alert and safe distance away from biological hazards.
		Wear appropriate PPE including work gloves, long sleeves and pants, and snake chaps if probability of encountering snakes, ticks, poison ivy or oak. Wear bug netting, long sleeves and gloves if working in Black Fly season.
		Workers with allergies should carry antidote kits, if necessary.
	Traffic (including pedestrian)	Notify attendant and/or site owner/manager of work activities and location.
		Set up exclusion zone surrounding work area.
		Wear appropriate PPE including high visibility clothing such as reflective vest if in high traffic areas.
		Inspect area behind vehicle prior to backing and use spotter.
	Fire/Explosion	Ensure type ABC, fully charged fire extinguisher on-site.
		Stop work if hazardous conditions are identified.

	Physical Hazard (Electrical)	Identify electrical utility hazards prior to sampling.
		Inspect work areas for spark sources, maintain safe distances, properly illuminate work areas, and provide barriers to prevent inadvertent contact.
		Maintain minimum clearance distances for overhead energized electrical lines as specified in the General Health and Safety Plan (GHASP).
	Physical Hazards (Weather)	Monitor radio for up-to-date severe weather forecasts.
		Discontinue work during thunderstorms and severe weather events.
	MEC Hazards	Follow established MEC avoidance protocols when performing intrusive sampling activities. If MEC is discovered or suspected, use existing access roads to retract from the MEC after completion of sample collection activities.
	Chemical Hazards (including MEC)	Perform environmental monitoring as required in Site Specifc Health and Safety Plan (SSHASP). Where appropriate PPE (including nitrile gloves) as indicated in the SSHASP.
	Biological Hazards	Wear proper PPE (including nitrile gloves) and a face shield or goggles when sampling sludge or sediments (if appropriate).
		Wash with soap and water as soon as PPE is removed or when contact or exposure has occurred.

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
• Vehicle • hand tools	• Inspect PPE prior to each use • Inspect vehicle daily • Use appropriate PPE • Underground hazards require clearance prior to execution • Work area upon arrival on site • Inspect emergency equipment/supplies daily (first aid kit)	• Use and limitations of PPE • AHA-review • SSHP-review • Valid driver's license • Use and limitations of PPE • Operator will be trained in equipment used • Lifting • AHA-review • SSHP-review • First aid/CPR—at least 2 people on site • Hazardous waste sites require 8-hour annual refresher and supervisor training

TABLE E-3 SITE INSPECTION AND RECONNAISSANCE ACTIVITY HAZARD ANALYSIS		
PRINCIPLE STEP	**POTENTIAL SAFETY/HEALTH HAZARDS**	**RECOMMENDED CONTROLS**
Driving to site and between site sampling / reconnaissance locations.	Automobile accidents/ personal injury	Follow posted speed limits and obey traffic/roadway signs.
		Always wear your seat belt when driving. In some states it may be the law.
		Follow the "Rules of the Road" including: use your turn signals, use the 2-second rule[1] when following behind a vehicle, and allow vehicles the right of way when they are turning or entering intersections in front of you.
		Review/make yourself familiar with maps and driving directions before beginning the drive to the Site. Do not attempt to drive and review maps/directions at the same time. Pull over and stop your vehicle before looking at maps/directions.
		Do not perform reconnaissance or inspections while driving. Your vehicle should be parked in a safe location when viewing or surveying the Site and vicinity.
		Avoid sudden turns and stops, don't drive recklessly.
		In inclement weather, drive as road conditions allow but at least 5-10 mph below the posted speed limit.
		If feeling drowsy or sleepy do not drive. Below[2] are warning signs of drowsiness or fatigue. Pull over in a safe place if you experience any of these signs to rest.
		Never operate a vehicle under the influence of alcohol or illegal substances
		Keep your eyes on the road.
		Check mirrors on a regular basis during driving so that you aware of other vehicles behind you.
All Activities Related to Site Inspection and reconnaissance	Slips, Trips, Falls	Keep work area free of excess material and debris.
		Remove all trip hazards by keeping materials/objects organized and out of walkways.
		Be aware of uneven surfaces while walking or getting in and out of

TABLE E-3 SITE INSPECTION AND RECONNAISSANCE ACTIVITY HAZARD ANALYSIS		
PRINCIPLE STEP	**POTENTIAL SAFETY/HEALTH HAZARDS**	**RECOMMENDED CONTROLS**
		the vehicle.
		Keep work surfaces dry when possible.
		Wear appropriate PPE including slip resistant sturdy shoes or non-slip rubber boots if working on wet or slick surfaces.
		Install rough work surface covers where possible.
		Stay aware of footing and do not run.
	Heat/Cold Stress	Take breaks as needed.
		Be aware of weather conditions and dress appropriately.
		Consume adequate food/beverages.
		If possible, adjust work schedule to avoid heat/cold stresses.
	Biological Hazards: Insects, Snakes, Wildlife, Vegetation	Inspect work areas when arrive at site to identify hazard(s).
		Use insect repellant as necessary.
		Stay alert and safe distance away from biological hazards.
		Wear appropriate PPE including work gloves, long sleeves and pants, and snake chaps if probability of encountering snakes, ticks, poison ivy or oak.
		Workers with allergies should carry antidote kits, if necessary.
	Traffic (including pedestrian)	Notify attendant and/or site owner/manager of work activities and location.
		Utilize cones, signs, flags and/or other traffic control devices as outlined in the Traffic Control Plan.
		Set up exclusion zone surrounding work area.
		Wear appropriate PPE including high visibility clothing such as reflective vest.
		Inspect area behind vehicle prior to backing and use spotter.
	Fire/Explosion	Ensure type ABC, fully charged fire extinguisher on-site.
		Stop work if hazardous conditions are identified.
	Physical Hazard (Electrical)	Identify electrical utility hazards prior to reconnaissance if possible.
		Inspect work areas for spark sources, maintain safe distances, properly illuminate work areas, and provide barriers to prevent inadvertent contact.

TABLE E-3 SITE INSPECTION AND RECONNAISSANCE ACTIVITY HAZARD ANALYSIS			
PRINCIPLE STEP	**POTENTIAL SAFETY/HEALTH HAZARDS**	**RECOMMENDED CONTROLS**	
		Maintain minimum clearance distances for overhead energized electrical lines as specified in the GHASP.	
	Physical Hazards (Weather)	Monitor radio for up-to-date severe weather forecasts.	
		Discontinue work during thunderstorms and severe weather events.	
	MEC Hazards	Follow established MEC avoidance protocols when performing site reconnaissance activities. If MEC is discovered or suspected, use existing access roads to retract from the area containing MEC after documenting coordinates and collecting samples (if appropriate).	
EQUIPMENT TO BE USED		**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
• Vehicle		• Inspect PPE prior to each use • Inspect vehicle daily	• AHA-review • SSHP-review • Valid driver's license • Use and limitations of PPE • First aid/CPR—at least 2 people on site • Hazardous waste sites require 8-hour annual refresher and supervisor training

1. "Two second rule" works by the driver choosing an object along the road in front of them. As the vehicle in front of them passes it, count aloud, slowly, "one thousand one, one thousand two." If you reach the object before you finish counting, you are following too closely. Allow the other vehicle to get further ahead. In bad weather, increase the count to three or four seconds for extra space.

2. Warning signs of drowsiness
or fatigue:
- can't remember the last few miles driven
- have wandering or disconnected thoughts
- experience difficulty focusing or keeping your eyes open
- have trouble keeping your head up

TABLE E-3 SITE INSPECTION AND RECONNAISSANCE ACTIVITY HAZARD ANALYSIS		
PRINCIPLE STEP	**POTENTIAL SAFETY/HEALTH HAZARDS**	**RECOMMENDED CONTROLS**

- drift from lanes or hit a rumble strip
- yawn repeatedly
- tailgate or miss traffic signs
- find yourself jerking your vehicle back into lane

If you find yourself experiencing the above, you may be suffering from drowsiness or fatigue. Continuing to drive in this condition puts you at serious risk of being involved in a fatigue-related crash. You should pull over in a safe place and get some rest before resuming your trip.

TABLE E-4 SOIL SAMPLING ACTIVITY HAZARD ANALYSIS		
Task	**Potential Hazards**	**Hazard Control Measures**
MOBILIZATION / DEMOBILIZATION	Physical Hazards (slips, trips, fall, cuts, etc.)	□ Clear walkways, work areas of equipment, tools, debris. □ Watch for accumulation of water work surfaces. □ Mark, identify, or barricade obstructions. □ Wear cut-resistant work gloves when the possibility of lacerations or other injury caused by sharp or protruding objects occurs. □ Wear sturdy shoes with slip resistant soles.
	Physical Hazards (Material Handling, Moving, Lifting)	□ Observe proper lifting techniques. □ Obey sensible lifting limits (60 lb maximum per person manual lifting). □ Use mechanical lifting equipment (hand carts, trucks, etc.) to move large awkward loads. □ Use two or more persons for heavy bulk lifting.
	Physical Hazards (Vehicle and Pedestrian Traffic)	□ Use orange traffic cones where necessary. □ Use reflective warning vests if exposed to vehicular traffic. □ Locate staging areas in locations with minimal traffic.
	Physical Hazards (Cold Stress /Heat Stress)	□ Monitor of cold/heat stress as recommended in Section 6 of the GHASP.
	MEC Hazard	□ Practice site reconnaissance with a trained, experienced MEC specialist capable of recognizing MEC hazards. If MEC is discovered, use existing access roads to retract from the MEC.
	Biological Hazards (insects, poisonous plants, ticks)	□ Wear protective outer clothing and insect repellant to avoid insect bites and ticks. □ Wear long sleeve shirts when working in areas with poison ivy or oak. □ Workers with allergies should carry antidote kits, if necessary.
SAMPLING ACTIVITIES	Physical Hazards (slips, trips, fall, cuts, etc.)	□ Clear walkways, work areas of equipment, tools, debris. □ Watch for accumulation of water work surfaces. □ Mark, identify, or barricade obstructions. □ Wear cut-resistant work gloves when the possibility of lacerations or other injury caused by sharp or protruding objects occurs. □ Wear sturdy shoes with slip resistant soles.

TABLE E-4 SOIL SAMPLING ACTIVITY HAZARD ANALYSIS		
Task	**Potential Hazards**	**Hazard Control Measures**
	Physical Hazard (Electrical)	□ Identify electrical utility hazards prior to sampling. □ Inspect work areas for spark sources, maintain safe distances, properly illuminate work areas, and provide barriers to prevent inadvertent contact. □ Maintain minimum clearance distances for overhead energized electrical lines as specified in the GHASP.
	Physical Hazards (Weather)	□ Monitor radio for up-to-date severe weather forecasts. □ Discontinue work during thunderstorms and severe weather events.
	Physical Hazards (Cold Stress /Heat Stress)	□ Monitor of cold/heat stress as recommended in Section 6 of the GHASP.
	MEC Hazards	□ Follow established MEC avoidance protocols when performing intrusive sampling activities. If MEC is discovered or suspected, use existing access roads to retract from the MEC.
	Chemical Hazards (including MEC)	□ Perform environmental monitoring as required in SSHASP. Where appropriate PPE as indicated in the SSHASP.
	Biological Hazards (Bloodborne pathogens)	□ Wear proper PPE including nitrile gloves and a face shield or goggles when sampling sludge. □ Wash with soap and water as soon as PPE is removed or when contact or exposure has occurred.
	Biological Hazards (insects, poisonous plants, ticks)	□ Wear protective outer clothing and insect repellant to avoid insect bites and ticks. □ Wear long sleeve shirts when working in areas with poison ivy or oak. □ Workers with allergies should carry antidote kits, if necessary.

APPENDIX F – LOGS AND FORMS USED DURING THE SITE INSPECTION

ACCIDENT PREVENTION PLAN REVIEW RECORD

SITE: Mitchel Field

Project No. C02NY064503

I have read the Accident Prevention Plan and have been briefed on the nature, level, and degree of exposure likely as a result of participation of field activities. I agree to conform to all the requirements of this Plan.

Name	Signature	Affiliation	Date

HEALTH AND SAFETY ACTIVITY REPORT

Site: Mitchel Field Location: Garden City, Nassau County, New York

Weather Conditions: _____ Onsite Hours: From _____ To _____

Morning Briefing Topic:

_____

_____

_____

General Activities Complete:

_____

_____

Morning Briefing Attendance: _____ _____

_____ _____ _____

_____ _____ _____

Changes in PPE Levels*	Work Operations	Reasons for Change

Site Safety and Health Plan Violations	Corrective Action Specified	Corrective Action Taken (yes/no)

Observations and Comments:

_____

_____

_____

Completed by: _____ Date: _____

Site Health and Safety Supervisor

*Only SSHO may change PPE levels, using only criteria specified in Programmatic APP.

Alion Science and Technology, Inc.

DAILY QUALITY CONTROL REPORT

Report Number:		Date:	
Project Name: Mitchel Field		Contract Number: W912DY-04-D-0017	
Location of Work:			
Description of Work: Conduct Site Inspection by collecting environmental samples,			
performing reconnaissance, photographing site, etc.			
Weather:	Rainfall:	Temperature: Min.	Max.
1. Work performed today by Alion.			
Reconnaissance Acreage Discussion:			
Samples Collected:			
Field Tests:			
Calibration of Instruments:			
Other:			

2. Work performed today by Subcontractors.
3. Type and results of Control Phases and Inspection. (Indicate whether Preparatory – P, Initial – I, or Follow-Up – F and include satisfactory work completed or deficiencies with actions to be taken)
4. List type and location of tests performed and results of these tests.
5. List material and equipment received.
6. Submittals reviewed. (Include Transmittal No., Item No., Spec/Plan Reference, by whom, and any action.
7. Off-site surveillance activities, including action taken.
8. Job Safety. (Report safety violations observed and actions taken)

9. Remarks. (Instructions received or given. Conflicts in Plans or Specifications)

Alion Science and Technology, Inc's Verification: On behalf of Alion, I certify this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as noted above.

Quality Control System Manager (Sign and Print Name)

FIELD CALIBRATION FORM - YSI

(pH, CONDUCTIVITY, TURBIDITY)

Site Name: Mitchel Field

CALIBRATION
DATE:
TIME:
METER ID:

pH CALIBRATION

pH STANDARD	INITIAL READING	FINAL READING
4.0		
7.0		

CONDUCTIVITY CALIBARATION

CONDUCTIVITY STANDARD	STANDARD READING	FINAL READING

TURBIDITY CALIBRATION

STANDARD	INITIAL READING	FINAL READING
0 NTU		
100 NTU		

FIELD CALIBRATION FORM (continued) - YSI

COMMENTS

SIGNATURE

WELL PURGING AND SAMPLING RECORD

WELL ID _____ SAMPLE NO. _____

WELL/SITE DESCRIPTION _____

DATE _____/_____/_____ TIME _____ AIR TEMP. _____

WELL DEPTH _____ ft CASING HEIGHT _____ ft
WATER DEPTH _____ ft WELL DIAMETER _____ in
WATER COL. HEIGHT _____ ft SANDPACK DIAM. _____ in
EQUIVALENT VOLUME OF STANDING WATER _____
(gal) (L)
PUMP RATE _____ (gpm)
(LPM)
PUMP TIME _____ min
WELL WENT DRY? ( ) Yes ( ) No PUMP TIME _____ min
VOL. REMOVED _____ (gal) (L) RECOVERY TIME _____ min
PURGE AGAIN? ( )Yes ( ) No TOTAL VOL. REMOVED _____ (gal) (L)

Date	Time	Volume Removed Unit:	pH	Cond.	Temp.	ORP	Turb.	DO	Depth to Water from TOC	Pump Rate

COMMENTS _____

SIGNATURE

APPENDIX G

LIST OF ENDANGERED, THREATENED AND SPECIAL CONCERN FISH & WILDLIFE SPECIES FOR THE STATE OF NEW YORK

List of Endangered, Threatened and Special Concern Fish & Wildlife Species of New York State

Endangered

Those endangered species which meet one or both of the criteria specified in section 182.2(g) of 6NYCRR Part 182 and which are found, have been found, or may be expected to be found in New York State include:

	Common Name	Scientific Name
Molluscs	[1]Dwarf Wedgemussel	*Alasmidonta heterodon*
	[1]Pink mucket	*Lampsilis abrupta*
	[1]Clubshell	*Pleurobema clava*
	[1]Fat pocketbook	*Potamilus capax*
	Rayed Bean	*Villosa fabalis*
	[2]Chittenango Ovate Amber Snail	*Novisuccinea chittenangoensis*
Insects	Tomah Mayfly	*Siphlonisca aerodromia*
	[1,3]American Burying Beetle	*Nicrophorus americanus*
	Hessel's Hairstreak	*Callophrys hesseli*
	[1]Karner Blue Butterfly	*Lycaeides melissa samuelis*
	Regal Fritillary	*Speyeria idalia*
	Persius Duskywing	*Erynnis persius*
	Grizzled Skipper	*Pyrgus centaureae wyandot*
	Arogos Skipper	*Atrytone arogos arogos*
	Bog Buckmoth	*Hemileuca species 1*
	Pine Pinion Moth	*Lithophane lepida lepida*
Fishes	[1]Shortnose Sturgeon	*Acipenser brevirostrum*
	[3]Silver Chub	*Macrhybopsis storeriana*
	Pugnose Shiner	*Notropis anogenus*
	Round Whitefish	*Prosopium cylindraceum*
	Bluebreast Darter	*Etheostoma camurum*
	[3]Gilt Darter	*Percina evides*
	[3]Spoonhead Sculpin	*Cottus ricei*
	Deepwater Sculpin	*Myoxocephalus thompsoni*

Amphibians	Tiger Salamander	*Ambystoma tigrinum*
	Northern Cricket Frog	*Acris crepitans*
Reptiles	Mud Turtle	*Kinosternon subrubrum*
	[2]Bog Turtle	*Clemmys muhlenbergii*
	[1]Atlantic Hawksbill Sea Turtle	*Eretmochelys imbricata*
	[1]Atlantic Ridley Sea Turtle	*Lepidochelys kempii*
	[1]Leatherback Sea Turtle	*Dermochelys coriacea*
	Queen Snake	*Regina septemvittata*
	Massasauga	*Sistrurus catenatus*
Birds	Spruce Grouse	*Falcipennis canadensis*
	[3]Golden Eagle	*Aquila chrysaetos*
	Peregrine Falcon	*Falco peregrinus*
	Black Rail	*Laterallus jamaicensis*
	[1,2,4]Piping Plover	*Charadrius melodus*
	[1,3]Eskimo Curlew	*Numenius borealis*
	[1]Roseate Tern	*Sterna dougallii dougallii*
	Black Tern	*Chlidonias niger*
	Short-eared Owl	*Asio flammeus*
	Loggerhead Shrike	*Lanius ludovicianus*
Mammals	[1]Indiana Bat	*Myotis sodalis*
	[3]Allegheny Woodrat	*Neotoma magister*
	[1]Sperm Whale	*Physeter catodon*
	[1]Sei Whale	*Balaenoptera borealis*
	[1]Blue Whale	*Balaenoptera musculus*
	[1]Finback Whale	*Balaenoptera physalus*
	[1]Humpback Whale	*Megaptera novaeangliae*
	[1]Right Whale	*Eubalaena glacialis*
	[2,3]Gray Wolf	*Canis lupus*
	[1,3]Cougar	*Felis concolor*

Threatened

Those threatened species which meet one or both of the criteria specified in section 182.2(h) of 6NYCRR Part 182 and which are found, have been found, or may be expected to be found in Ne State include:

	Common Name	Scientific Name
Molluscs	Brook Floater	*Alasmidonta varicosa*
	Wavy-rayed Lampmussel	*Lampsilis fasciola*
	Green Floater	*Lasmigona subviridis*
Insects	Pine Barrens Bluet	*Enallagma recurvatum*
	Scarlet Bluet	*Enallagma pictum*
	Little Bluet	*Enallagma minisculum*
	[2,3]Northeastern Beach Tiger Beetle	*Cicindela dorsalis dorsalis*
	Frosted Elfin	*Callophrys irus*
Fishes	Lake Sturgeon	*Acipenser fulvescens*
	Mooneye	*Hiodon tergisus*
	[3]Lake Chubsucker	*Erimyzon sucetta*
	Gravel Chub	*Erimystax x-punctata*
	[3]Mud Sunfish	*Acantharchus pomotis*
	Banded Sunfish	*Enneacanthus obesus*
	Longear Sunfish	*Lepomis megalotis*
	Longhead Darter	*Percina macrocephala*
	Eastern Sand Darter	*Ammocrypta pellucida*
	Swamp Darter	*Etheostoma fusiforme*
	Spotted Darter	*Etheostoma maculatum*

Amphibians	None Listed	
Reptiles	Blanding's Turtle	*Emydoidea blandingii*
	[2]Green Sea Turtle	*Chelonia mydas*
	[2]Loggerhead Sea Turtle	*Caretta caretta*
	Fence Lizard	*Sceloporus undulatus*
	Timber Rattlesnake	*Crotalus horridus*
Birds	Pied-billed Grebe	*Podilymbus podiceps*
	Least Bittern	*Ixobrychus exilis*
	[2]Bald Eagle	*Haliaeetus leucocephalus*
	Northern Harrier	*Circus cyaneus*
	King Rail	*Rallus elegans*
	Upland Sandpiper	*Bartramia longicauda*
	Common Tern	*Sterna hirundo*
	Least Tern	*Sterna antillarum*
	Sedge Wren	*Cistothorus platensis*
	Henslow's Sparrow	*Ammodramus henslowii*
Mammals	[2,3]Canada Lynx	*Lynx canadensis*

Special Concern

The following are designated as species of special concern as defined in Section 182.2(i) of 6NYCRR Part 182. Species of special concern warrant attention and consideration but current information, collected by the department, does not justify listing these species as either endangered or threatened.

	Common Name	Scientific Name
Molluscs	Buffalo Pebble Snail	*Gillia altilis*
	Fringed Valvata	*Valvata lewisi*
	Mossy Valvata	*Valvata sincera*
Insects	Unnamed Dragonfly Species	*Gomphus spec. nov.*
	Southern Sprite	*Nehalennia integricollis*
	Extra Striped Snaketail	*Ophiogomphus anomalus*
	Pygmy Snaketail	*Ophiogomphus howei*
	Common Sanddragon	*Progomphus obscurus*
	Gray Petaltail	*Tachopteryx thoreyi*
	Checkered White	*Pontia protodice*
	Olympia Marble	*Euchloe olympia*
	Henry's Elfin	*Callophrys henrici*
	Tawny Crescent	*Phyciodes batesii*
	Mottled Duskywing	*Erynnis martialis*
	Barrens Buckmoth	*Hemileuca maia*
	Herodias Underwing	*Catocala herodias gerhardi*
	Jair Underwing	*Catocala jair*
	A Noctuid Moth	*Heterocampa varia*

Fishes	Mountain Brook Lamprey	*Ichthyomyzon greeleyi*
	Black Redhorse	*Moxostoma duquesnei*
	Streamline Chub	*Erymystax dissimilis*
	Redfin Shiner	*Lythrurus umbratilis*
	Ironcolor Shiner	*Notropis chalybaeus*
Amphibians	Hellbender	*Cryptobranchus alleganiensis*
	Marbled Salamander	*Ambystoma opacum*
	Jefferson Salamander	*Ambystoma jeffersonianum*
	Blue-spotted Salamander	*Ambystoma laterale*
	Longtail Salamander	*Eurycea longicauda*
	Eastern Spadefoot Toad	*Scaphiopus holbrookii*
	Southern Leopard Frog	*Rana sphenocephala utricularius*
Reptiles	Spotted Turtle	*Clemmys guttata*
	Wood Turtle	*Clemmys insculpta*
	Eastern Box Turtle	*Terrapene carolina*
	Eastern Spiny Softshell	*Apalone spinifera*
	Eastern Hognose Snake	*Heterodon platyrhinos*
	Worm Snake	*Carphophis amoenus*

Birds	Common Loon	*Gavia immer*
	American Bittern	*Botaurus lentiginosus*
	Osprey	*Pandion haliaetus*
	Sharp-shinned Hawk	*Accipiter striatus*
	Cooper's Hawk	*Accipiter cooperii*
	Northern Goshawk	*Accipiter gentilis*
	Red-shouldered Hawk	*Buteo lineatus*
	Black Skimmer	*Rynchops niger*
	Common Nighthawk	*Chordeiles minor*
	Whip-poor-will	*Caprimulgus vociferus*
	Red-headed Woodpecker	*Melanerpes erythrocephalus*
	Horned Lark	*Eremophila alpestris*
	Bicknell's Thrush	*Catharus bicknelli*
	Golden-winged Warbler	*Vermivora chrysoptera*
	Cerulean Warbler	*Dendroica cerulea*
	Yellow-breasted Chat	*Icteria virens*
	Vesper Sparrow	*Pooecetes gramineus*
	Grasshopper Sparrow	*Ammodramus savannarum*
	Seaside Sparrow	*Ammodramus maritimus*
Mammals	Small-footed Bat	*Myotis leibii*
	New England Cottontail	*Sylvilagus transitionalis*
	Harbor Porpoise	*Phocoena phocoena*

[1]Currently listed as "endangered" by the U. S. Department of the Interior.

[2]Currently listed as "threatened" by the U. S. Department of the Interior.

[3]Species is extirpated from New York State.

[4]Piping Plover is listed as federally endangered in the Great Lakes Region, and as federally threatened in the Atlantic Coastal Region.

Definitions

Extinct - Species is no longer living or existing.

Extirpated - Species is not extinct, but no longer occurring in a wild state within New York, or no longer exhibiting patterns of use traditional for that species in New York (e.g. historical breeders no longer breeding here).

Endangered - Any native species in imminent danger of extirpation or extinction in New York State.

Threatened - Any native species likely to become an endangered species within the foreseeable future in New York State.

Special Concern - Any native species for which a welfare concern or risk of endangerment has been documented in New York State.

Authority

Environmental Conservation Law of New York, Section 11-0535 and 6 NYCRR (New York Code of Rules and Regulations) Part 182 - effective (last promulgated in state regulation) December 4, 1999.

Revision History

Effective April 24, 2000 - Canada Lynx (*Lynx canadensis*) was added to the Threatened list.

FINAL

Response to Comments - Site Specific Work Plan for the Formerly Used Defense Site (FUDS) Mitchel Field, Garden City, New York

FUDS Project # **C02NY064503**

Prepared Under: **Contract No. W912DY-04-D-0017**
Delivery Order # 00170001

Prepared for:

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January 2008

PROJECT: Draft SSWP Mitchel Field (C02NY064503)			
DESIGN REVIEW COMENTS			
		REVIEW: Draft SSWP Mitchel Field DATE: 30 December 2008 NAME: Daniel Eaton (NYSDEC)	
ITEM	DRAWING NO OR REFERENCE	COMMENT	ACTION
1	Section 2.6	a) 60 mm and 81 mm mortars were found by construction workers in the 1980s. This section and subsequent sections present the theory that these munitions items were likely practice bombs and not mortars. This theory was also presented at the TPP meeting. After further consideration of the mortar vs practice bomb theory, it seems unlikely that a 13 inch mortar would be mistaken for an 8 inch practice bomb. Even if the shapes are similar, the size difference would seem to tip the balance toward the item actually being a mortar. b) In light of this, and in order to fully answer all questions raised about the possibility of munitions remaining in this area, we would like to see more geophysical testing with denser coverage in each of the areas where a mortar was found in the past.	(a) N-Non-concur. Historical documents, such as the ASR, do not indicate that Mitchel Field had a mortar range or was used for mortar training. Interviews of former military officers presented in the ASR (Section 6.3.11 and 6.3.12) indicate that the U.S. Marines did not perform training exercises at Mitchel Field and that all training exercises were performed at Ft. Dix. Furthermore, the items found in the early 1980's were identified by police personnel, not trained UXO personnel; therefore, the presumed identification of these items as mortars (specifically 60 mm & 81 mm) cannot be verified (via photographs or a EOD report). Practice bombs come in a variety of shapes and sizes and were known to be stored and dropped within Mitchel Field. It is far more likely that the items found (exact measurements of the items was not documented) were in fact practice bombs or munitions. (b) A-Accept/Concur. Irrespective of the response to comment (1a) above, Alion will complete additional reconnaissance in accordance with NYSDEC's request. As can be seen from the figures in the SS-WP as well as other current aerial imagery (Google –Earth etc.), the areas near and surrounding MRS 6 (Unknown Mortar Range) are either paved, redeveloped, or within the footprint of a current building. It is unlikely that additional geophysical reconnaissance will produce useful information pertaining to the potential presence of munitions or munitions related materials. However, to address NYSDEC concerns, additional geophysical reconnaissance was added to the areas within MRS 6 that are currently undeveloped or lightly developed (re-graded, athletic fields etc.). Please refer to Figure 8 of the Final SS-WP to verify this revised plan.

2	General	There are suspicions that drums of materials associated with chemical warfare may have been buried at the former base. We recommend more geophysical survey work be conducted over appropriate portions of the former base to evaluate these suspicions.	N-Non-Concur. As the ASR noted in Section 6, *"Based on the extensive archive searches performed, the interviews with the owners and/or occupants of major portions o f this DERP-FUDS site, and the results of the site investigation, there are no indications as to any CWM contamination at the site of the former Mitchell Field. It is known that various chemical warfare materials were shipped to Mitchel Field and that gas mask training exercises and related instructions were given at Mitchel Field. There is one report of an accident involving a gas identification instruction kit (M1) during the World War II time period. However, there is noting in the records that would indicate any CWM contamination at the site from any of the operations conducted at this site."* Furthermore, the ASR notes that the CWM shipped to the facilities includes CN grenades, capsules, and 55 gallon drums o f solution. Other items included 55 gallon drums of smoke agents (FS and FM), smoke pots and smoke producing material, land mines (simulated mustard gas-filled), M10 smoke tanks, sets of gas identification instructional kits (M1), gallons of tear gas (CNB), incendiary bombs (100 lb) and smoke pots (HG, M1). In accordance with USACE Guidance, none of these items are considered CWM. And since there are no records of disposition of the aforementioned items at this FUDS, the material is considered expended in training and no related hazards exist. Additional information pertaining to the definition and classification of CWM is included in the Final SS-WP. An ASR Addendum was created by the USACE and supplied to NYSDEC. This document discussed potential CWM items that were determined to be outside the current FUDS boundary. Any investigation of the areas discussed in the ASR Addendum with potential CWM will be completed under a separate CWM project if USACE determines CWM was in fact used and there is a potential related hazard.. Therefore, no additional geophysical reconnaissance or sampling is planned with respect to this reviewer's comment other than that noted in the SS-WP with respect to MRS 6 (see also RTC to Comment #1). Section 2.5.3 in the Final SS-WP presents the discussion above.

3	General	Since evidence of munitions remaining at the former Mitchel Field has already been identified (e.g., 60 mm and 81 mm mortars were discovered in the 1980s), and there are suspicions that drums containing materials associated with chemical weapons have been buried at the former base, this investigation should be transitioning from the Site Inspection stage into the Remedial Investigation stage.	A-Accept/Concur: There is no verifiable evidence of mortar use at Mitchel Field, as discussed in the RTC to Comment #1. Furhtermore, there is no evidence of CWM-related hazards (see RTC to Comment #2). Should this FUDS be carried forward to the RI/FS, additional research and field work may be conducted if evidence is available warranting this further action . The RI/FS planning process would be the appropriate forum to raise these concerns with USACE.
4	General	(1) This site is very large (over 1400 acres) and there are 11 soil samples planned to be collected to characterize the site. For a site this size, in a setting that is densely populated with large public spaces which are extensively used, 11 soil samples may not be sufficient and we recommend that more samples be collected. (2) Surface and subsurface soil samples should be collected in each sampling location.	(1) A-Accept/Concur. The majority of the Mitchel Field FUDS property is developed (paved parking lots, buildings, re-graded athletic fields); therefore, there is limited acreage or media available for sampling. However, one additional soil sample location was added to MRS 5. Two soil sample locations were added to an undeveloped/unpaved area adjacent to where a suspected mortar was historically discovered. The other areas of MRS 6 are either paved or heavily developed. (2) A-Accept/Concur. As noted in the Draft SS-WP subsurface soil samples were proposed for select soil sample locations at MRS 1, 2, 3 and 5. In the Final SS-WP surface and subsurface soil samples will be collected at all soil sample locations at Mitchel Field (with the exception of MRS 4 where no samples are proposed).
5		In addition, we believe that sampling the groundwater in the shallow aquifer would provide a broader evaluation of the overall conditions at the site than soil sampling alone will accomplish. Sampling of the groundwater medium should be added to the scope of work to evaluate the potential for impact from munitions and explosives of concern.	A-Accept/Concur: Two groundwater samples will be collected at pre-existing wells screened within the shallow aquifer. These groundwater samples will be analyzed for a select list of explosive compounds (NG, DNT and DNT breakdown products).

6	General	The New York State Department of Health has anecdotal information which indicates that the fumigant Agent Orange was tested at Mitchel Field. There are also stories of planes being buried in a swamp when they could not stop at the end of the runway. These concerns should be addressed as part of the Site Inspection -Remedial Investigation.	N-Non-Concur: Agent Orange is a herbicide developed for military use. Chemically, the product was a 50/50 mix of two herbicides, 2,4,-D (2,4, dichlorophenoxyacetic acid) and 2,4,5-T (2,4,5 trichlorophenoxyacetic acid). Herbicides, among other chemicals, are not addressed within the scope the MMRP FUDS SIs. Furthermore, none of the historical documents provided by the USACE indicate that the defoliant Agent Orange was used or tested at Mitchel Field FUDS. Finally, please note that this FUDS has a high probability of moving forward to the RI/FS phase of the CERCLA process. During the RI/FS phase, the scope of the investigation may be expanded through dialogue with state and federal agencies to include additional areas of interest, chemical compounds, and sample media. In regards to an investigation of the suspected buried planes, salvage operations are not within the scope of the SI. Should an RI/FS be implemented, this topic should be raised during the RI/FS planning stage.
7	General	The list of analytes in the workplan is restricted to compounds expected to be found in the practice ranges. This base was also used for chemical weapons training and there are suspicions that drums containing materials associated with chemical weapons have been buried at the base. The compounds to be analyzed for should be expanded to include those analytes associated with the chemical weapons activities at the base. This applies in particular to the groundwater samples.	N-Non-Concur: See the RTC to Comment 2 regarding CWM. Groundwater samples will be collected, as noted in the RTC to Comment 5; however, the analyte suite is confined to a select list of explosives.