FINAL

Site Inspection Report for Malta Test Station

DERP FUDS Project No. **C02NY089802**

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

Prepared for:
U.S. Army Engineering and Support Center, Huntsville
4280 University Square
Huntsville, AL 35807
and
U.S. Army Corps of Engineers, Baltimore District
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The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

September 2007

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ALION
SCIENCE AND TECHNOLOGY

9/19/07

Roger Azar
Alion Program Manager
Date

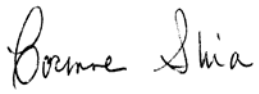
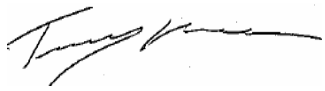
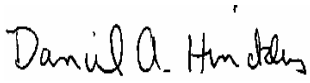
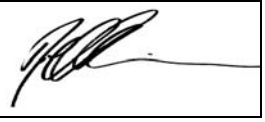
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September 2007

CONTRACTOR STATEMENT OF AUTHORSHIP AND INDEPENDENT TECHNICAL REVIEW

Alion Science and Technology Corporation has prepared this Draft Site Inspection Report for Malta Test Station, Formerly Used Defense Site (FUDS), Project No. C02NY089802. An independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Programmatic Work Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions; methods, procedures, and material used in analyses; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with existing Corps policy. In accordance with Corps requirements, significant authors to this report are presented below.

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Significant concerns and explanation of the resolutions are documented within the project file.

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LIST OF ACRONYMS AND ABBREVIATIONS

Alion	Alion Science and Technology Corporation
ARC	Annual Report to Congress
ASR	Archive Search Report
Bgs	Below Ground Surface
CENAB	U.S. Army Corps of Engineers North Atlantic-Baltimore District
CENAN	U.S. Army Corps of Engineers North Atlantic-New York District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHE	Chemical Warfare Materiel Hazard Evaluation
CONUS	Continental United States
COPC	Chemicals of Potential Concern
COPEC	Chemicals of Potential Ecological Concern
CSM	Conceptual Site Model
CWM	Chemical Warfare Material
DCR	Department of Conservation and Recreation
DERP	Defense Environmental Restoration Program
dL	Deciliter
DMM	Discarded Military Munitions
DoD	Department of Defense
DoE	Department of Energy
DQO	Data Quality Objective
EA	EA Engineering, Science, and Technology, Inc.
EDS	Environmental Data Services
EHE	Explosive Hazard Evaluation
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration

LIST OF ACRONYMS AND ABBREVIATIONS

ER	Engineering Regulation
ERA	Ecological Risk Assessment
°F	Degrees Fahrenheit
FDE	Findings and Determination of Eligibility
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
Ft	Foot/Ft
FUDS	Formerly Used Defense Site(s)
GE	General Electric Company
GIS	Geographic Information Systems
GPL	GPL Laboratories, LLLP
GSA	General Service Administration
HE	High explosive
HEAT	high explosive anti-tank
HFA	Human Factors Applications, Inc.
HHE	Health Hazard Evaluation
HHRA	Human Health Risk Assessment
HI	Hazard Index
HMX	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HQ	Hazard Quotient
HRS	Hazard Ranking System
HTRW	Hazardous Toxic and Radiological Waste
in.	Inch/Inches
INPR	Inventory Project Report
L	Liter
LFTCEDC	Luther Forest Technology Campus Economic Development Corporation
LLLP	Limited Liability Limited Partnership

LIST OF ACRONYMS AND ABBREVIATIONS

M	Model
MC	Munitions Constituents
MD	Munitions Debris
MDL	Method Detection Limit
Mi	Mile
Mk	Mark
MEC	Munitions and Explosives of Concern
MFR	Memorandum for the Record
mg/kg	milligram per kilogram
Mm	Millimeter(s)
MMRP	Military Munitions Response Program
MPPEH	Material Potentially Presenting an Explosive Hazard
MRA	Munitions Response Area
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
NAD	North American Datum
NASA	National Aeronautics and Space Administration
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDAI	No Department of Defense Action Indicated
NYSASDA	New York State Atomic and Space Development Authority
NYSDOH	New York State Department of Health
NYSERDA	New York State Energy Research and Development Authority
ODW	Office of Drinking Water
OEW	Ordnance and Explosive Waste
PID	Photoionization Detector
PRGPRG	Preliminary Remediation Goal
PRP	Potentially Responsible Party
PSAP	Programmatic Sampling and Analysis Plan

LIST OF ACRONYMS AND ABBREVIATIONS

PVC	Polyvinyl chloride
PWS	Performance Work Statement
PWSID	Public Water Supply Identification
PWP	Programmatic Work Plan for Formerly Used Defense Sites FUDS) Military Munitions Response Program (MMRP) Site Inspections at Multiple Sites in the Northeast Region
QA	QUALITY ASSURANCE
QC	Quality Control
QR	Qualitative Site Reconnaissance
RAC	Risk Assessment Code
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RfCs	Reference Concentrations
RfDs	Reference Doses
RI/FS	Remedial Investigation and Feasibility Study
RME	Reasonable Maximum Exposure
RMIS	Restoration Management Information System
SF	Slope Factor
SI	Site Inspection
SLERA	Screening-Level Ecological Risk Assessment
SSL	Soil Screening Level
SS-WP	Final Site-Specific Work Plan Addendum to the MMRP Programmatic Work Plan for the Site Inspection of Fort Hancock
TAL	Target Analyte List
TCRA	Time Critical Removal Action
TNT	Trinitrotoluene
TPP	Technical Project Planning
TRV	Toxicity Reference Values
UCLM	Upper Confidence Level of the Mean

LIST OF ACRONYMS AND ABBREVIATIONS

US	United States
USACE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USAESCH	U.S. Army Engineering and Support Center, Huntsville
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance
µG	MICROGRAM

GLOSSARY OF TERMS

Comprehensive Environmental Response, Compensation, and Liability Act (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 2004a).

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 2003).

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 (USACE 2004a).

Formerly Used Defense Site (FUDS)—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 Department of Defense (DoD) control prior to 17 October 1986. FUDS properties can be located within 50 States, District of Columbia, Territories, Commonwealths, and possessions of the United States (USACE 2004a).

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 (Department of the Army 2005).

GLOSSARY OF TERMS

Military Munitions—All ammunition products and components produced for or used by the armed forces for national defense and security. 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 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., trinitrotoluene [TNT], Hexahydro-1,3,5-trinitro-1,3,5-triazine [RDX]), as defined in 10 U.S.C. 2710(e)(3), present in high enough concentrations to pose an explosive hazard.

Munitions Constituents (MC)—Any 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—Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal (Department of the Army 2005).

Potentially Responsible Party (PRP) **—**In CERCLA Section 107, a PRP is defined as any person related to a property that is a:

- Current owner or operator.
- Past owner or operator at the time of disposal of any hazardous substance, pollutant, or contaminant.
- Person who arranges for disposal, treatment, or transport for disposal or treatment of hazardous substances.
- Transporter who has selected the site for the disposal of a hazardous substance. (USACE 2004a)

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)).

Unexploded Ordnance (UXO)—Military munitions that (A) have been primed, fused, 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)).

EXECUTIVE SUMMARY

ES.1 Under contract with the United States Army Corps of Engineers (USACE), Alion Science and Technology Corporation (Alion) has prepared the following Site Inspection (SI) Report to document SI activities and findings for the Malta Test Station Formerly Used Defense Site (FUDS), Property No. C02NY0898/Project No. C02NY089802. The Department of Defense (DoD) has established the Military Munitions Response Program (MMRP) under the Defense Environmental Restoration Program (DERP) to address potential munitions and explosives of concern (MEC) and munitions constituents (MC) remaining at FUDS. This SI addresses potential MMRP hazards remaining at the Malta Test Station FUDS.

ES.2 **Malta Test Station.** The Malta Test Station is located on a square parcel of approximately 165 acres (USACE 1980) in the towns of Malta and Stillwater, Saratoga County, New York, approximately 1.5 miles (mi) south of Saratoga Lake and 2 mi northeast of Round Lake (Figure 1-1). The Malta Test Station was established by the United States (U.S.) Government in 1945 and was owned and operated by various agencies of the U.S. Government for a variety of rocket and weapons testing and space research activities from 1945 to 1964. Since site closure, the property was owned by various state government entities. The Luther Forest Technology Campus Economic Development Corporation (LFTCED) is the current property owner. For the purpose of this SI, the site has been identified as one Munitions Response Sites (MRS) based on past use by DoD. This site was not submitted with the other FUDS in the 2000 Annual Report to Congress (ARC) and does not have an Archive Search Report (ASR) or a Supplemental ASR. Given that the latter document is not available, the FUDS boundary has been defined as being equal to the munition response site (MRS) for this SI.

ES.3 **SI Objectives and Scope**. The overall project objective of this SI was to determine if the site warrants further response action or if no DoD action indicated (NDAI) is recommended under the authority of the MMRP. To accomplish this objective, existing documentation and analyses were supplemented by a limited site reconnaissance and MC sampling. Potential risks to human health and the environment also were evaluated. A determination of NDAI or further action for an MMRP project only addresses MEC/MC issues at the site, i.e., potential Hazardous Toxic Radiological Waste (HTRW) and potentially responsible party (PRP) issues which may exist at the property are not addressed in this recommendation. Issues involving metals and perchlorate are being addressed in remedial investigations separate from this SI.

ES.4 **Technical Project Planning.** The SI for the Malta Test Station included review of historical information, site reconnaissance and sampling, and analysis and interpretation of data. Stakeholder involvement including the state regulators as well as the owner of the site during this SI was achieved through the USACE's technical project planning (TPP) process (USACE 1998). The Project Team, consisting of the USACE, Alion, New York State Department of Environmental Conservation, and LFTCED agreed that meandering reconnaissance around sample locations and the collection of 14 soil (including 13 surface soils and one subsurface soil sample), two sediment, two surface water, and three groundwater would be sufficient to meet the SI project objectives. Samples were located in areas where military munitions were used/stored or MEC/Munition Debris (MD) and/or Material Potentially Presenting an Explosive Hazard (MPPEH) was found historically (USACE 1980).

ES.5 **Qualitative Site Reconnaissance and MEC Assessment.** Qualitative site reconnaissance (QR) and MC sampling for the SI were performed from 18 December through 19 December 2006. QR conducted of the site was performed to identify any visual indications of suspect disposal areas or firing points, including distressed vegetation, ground scars or craters, target remnants, and visible metallic debris. Reconnaissance was conducted on approximately 17 acres (approximately 10%) of the MRS. MD was identified at the FUDS. The field work did not include intrusive investigation of subsurface anomalies in accordance with the Performance Work Statement (PWS) for this SI.

ES.6 **MC Sampling and Risk Screening.** Surface soil, sediment, surface water, and groundwater sampling was performed during the SI. Collected samples were analyzed for MC, specifically explosives. Explosives compounds were detected in the surface soil and sediment samples and are shown on Figure ES-1. Pathway/receptor analysis was conducted to support refinement of the conceptual site model and a screening level risk assessment was completed to assess human health. In accordance with USACE HTRW Center of Expertise guidance, the Army checklist for Important Ecological Places is completed to determine if a FUDS requires a screening level ecological risk assessment (SLERA) (USACE 2006 and 2007b). Malta does not contain any important ecological places; therefore, the performance of a SLERA is not required.

ES.7 The results of the screening level Human Health Risk Assessment (HHRA) indicate that there are no explosives of potential concern at the Malta Test Station.

ES.8 Historical documentation and interview reviews performed in support of this SI indicated the following munitions were used/discovered: 120 millimeter (mm) Projectiles Full Range Practice, 155 mm Projectiles, 18 inch (in.) artillery shells, 105 mm to 152 mm tank gun, 105 mm

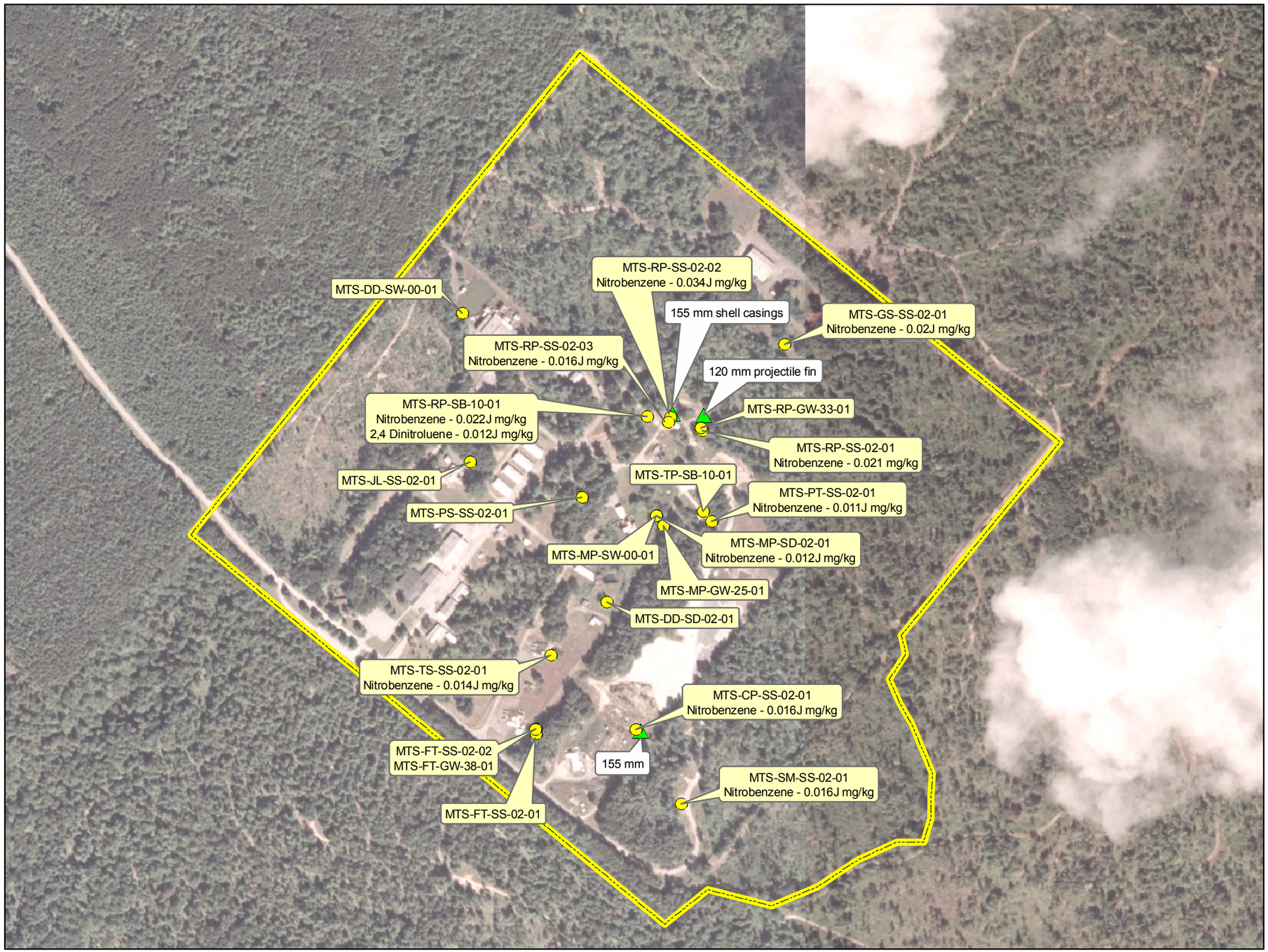
to 155 mm Howitzers, 60 mm, 90 mm, and 150 mm recoiler rifles, Rocket Fuel, and Hydrazine/hydrazine nitrate liquid monopropellants were used and/or found at the Malta Test Station. There are several historical accounts of MEC/MD being found at the FUDS. There were no ordnance items (or components thereof) identified during our site inspection which pose a potential explosive hazard.

ES.9 **Recommendations.** For ***MRS 1 (Malta Test Station),*** no MC compounds were identified that exceeded any risk based screening levels and therefore no MC compounds were identified as Chemicals of Potential Concern (COPC) for human health. Based on the MC results and conclusions, an NDAI for MC is recommended. An RI/FS for MEC is recommended at the Malta Test Station for MRS 1 due to the presence of MD and the potential for MEC to remain at the FUDS (refer to Table ES-1). It is FUDS policy not to perform response actions at PRP sites. Based on the analytical results and the QR conducted, further investigation is recommended under a potential PRP project. At this time, there are no (time critical or non-time critical) removal actions recommended at this site.

Table ES-1. Summary of Site Recommendations: Malta Test Station (FUDS Property No. C02NY089802)

MRS 1	Recommendation	Basis for Recommendation	
		MEC	MC
MRS 1 Malta Test Station	Future MMRP PRP project should focus on MEC. TCRA/NTCRA not recommended.	MEC Assessment: Low to moderate risk MD/MEC found historically and during the SI qualitative reconnaissance.	Risk Screening: Potential risks to human receptors acceptable HHRA identified acceptable risk for MC/Explosives. ERA was not completed per *Screening-Level Ecological Risk Assessments for FUDS MMRP Sites* (USACE 2006).

USACE=US Army Corps of Engineers
MRS=Munitions Response Site
MD=Munitions Debris
ERA=Ecological Risk Assessment
PRP=Potentially Responsible Party
NTCRA=Non-Time Critical Removal Action
SI=Site Inspection
MEC=Munitions and Explosives of Concern
MC=Munitions Constituents
RI/FS=Remedial Investigation/Feasibility Study
HHRA=Human Health Risk Assessment
TCRA=Time Critical Removal Action
FUDS=Formally Used Defense Site
ES=Executive Summary



Malta Test Station
Malta, New York

Legend

- Field Sample Locations
- MEC/MD Discoveries
- FUDS Boundary

Sample ID
Constituent Detection Value

J - Analyte is present. Estimated value.
mg - milligram
kg - kilogram

Sample ID Designation
"MTS-FT-SS-02-01"
Site Name-Sampling Location-Sample Type-Sample Depth-Sample #
SS - Surface Soil Sample
SB - Subsurface Soil Sample
SD - Sediment Sample
SW - Surface Water Sample
GW - Groundwater Sample

Acronyms
FUDS - Formerly Used Defense Site

Source:
USDA-FSA-APFO, 2006

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Figure ES-1. Detections of Explosives and Munitions Debris.

1. INTRODUCTION

1.0.1 This report documents the findings of the MMRP SI performed at the Malta Test Station FUDS located in Malta and Stillwater, NY MMRP Project No. C02NY089802. Alion prepared this report under contract to the U. S. Army Engineering and Support Center Huntsville (USAESCH). This work is being performed in accordance with contract no. W912DY-04-D-0017, Task Order 00170001 for FUDS in the Northeast Region of the Continental United States (CONUS). USAESCH transferred management of the contract to the U.S. Army Corps of Engineers, Baltimore District (CENAB). CENAB is working with USAESCH and its contractor, Alion, on the completion of this project in accordance with the SI PWS (see Appendix A).

1.0.2 Alion and Human Factors Applications, Inc. (HFA), a wholly owned subsidiary of Alion, along with Alion's subcontractors EA Engineering, Science, and Technology, Inc. (EA), Environmental Data Services, Inc. (EDS), and GPL Laboratories (GPL), (limited liability limited partnership)(LLLP), collectively known as the Alion Team, completed this SI under this Task Order.

1.1 Project Authorization

1.1.1 The DoD established MMRP to address DoD sites suspected of containing MEC or MC. Under the MMRP, the USACE is conducting environmental response activities at FUDS for the Army, DoD's Executive Agent for the FUDS program.

1.1.2 Pursuant to USACE's FUDS Program Policy's Engineer Regulation (ER) 200-3-1 (USACE 2004a) and the *Management Guidance for the Defense Environmental Response Program (DERP)* (Office of the Deputy Under Secretary of Defense (Installations and Environment), September 2001), USACE is conducting FUDS response activities in accordance with the DERP statute (10 USC 2701 et seq.), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC §9620), Executive Orders 12580 and 13016, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] Part 300). As such, USACE is conducting remedial SIs, as set forth in the NCP, to evaluate hazardous substance releases or threatened releases from eligible FUDS.

1.1.3 While not all MEC/MC constitute CERCLA hazardous substances, pollutants or contaminants, the DERP statute provides DoD the authority to respond to releases of MEC/MC,

and DoD policy states that such responses shall be conducted in accordance with CERCLA and the NCP.

1.2 Project Scope and Objectives

1.2.1 A primary objective of the MMRP SI is to determine whether or not the FUDS warrants action under CERCLA. The SI collects the minimum amount of information necessary to make this determination as well as (i) determines the potential need for a removal action; (ii) collects or develops additional data, as appropriate, for potential Hazard Ranking System (HRS) scoring by the Environmental Protection Agency[1] (EPA); and (iii) collects data, as appropriate, to characterize the hazardous substance release for effective and rapid initiation of the RI/FS. An additional objective of the MMRP SI is to collect additional data necessary to evaluate MRSs using the Munitions Response Site Prioritization Protocol (MRSPP)[2].

1.2.2 The *Programmatic Work Plan for Formerly Used Defense Sites (FUDS) Military Munitions Response Program (MMRP) Site Inspections at Multiple Sites the Northeast Region* (PWP) (Alion 2005) and the *Final Site-Specific Work Plan Addendum to the MMRP Programmatic Work Plan for the Site Inspection of Malta Test Station* (SS-WP) (Alion 2006b) were followed to complete the sampling at this FUDS. This Malta Test Station SS-WP is provided in Appendix L-Reference Copies.

1.3 Project Location

1.3.1 The Malta Test Station, FUDS Project No. CO2NY089802, is located on a square parcel of approximately 165 acres (USACE 1980) in the towns of Malta and Stillwater, Saratoga County, New York, approximately 1.5 miles (mi) south of Saratoga Lake and 2 mi northeast of Round Lake (Figure 1-1). This site falls under the geographical jurisdiction of the USACE New York District.

1.4 MRS Identification

1.4.1 The entirety of the FUDS eligible property has been identified as one MRS for the purpose of this SI (Figure 1-1). This site was not submitted with the other FUDS in the 2000 ARC and does not have an ASR or a Supplemental ASR. (USACE 2007b). This MRS

[1] EPA may or may not elect to do the HRS Scoring. Since there is an ongoing HTRW project at the site, the EPA may use the data collected during the MMRP SI to supplement the HRS score for the site.

[2] MRSPP scoring sheets will not be included in this SI Report due to the revised PRP designation for the site in compliance with the *Supplemental Guidance for Executing FUDS MMRP SI* dated 16 July 2007. The MRSPP scoring sheets will be kept in the USACE project files and reviewed/revised annually.

designation was used in the development of the Conceptual Site Model (CSM) diagram and to complete the MRSPP module. A discussion of the CSM development (Appendix J) is presented in Section 6 and typically the associated MRSPP modules are presented in Appendix K (see note 2), but, since this property has been designated as a potential PRP project a MRSPP priority score is not required to be calculated and modules for the MRSPP have been filed in the USACE project files and will be reviewed/revised annually, and not included in this document.

Malta Test Station
Malta, New York

Legend

- 1 Mile Radius
- Wetlands
- FUDS Boundary

Acronyms
FUDS - Formerly Used Defense Site

Sources:
US Fish and Wildlife Service, 2006
USDA-FSA-APFO, 2006

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Figure 1-1. Site Location & Description.

2. PROPERTY DESCRIPTION AND HISTORY

2.1 Site Description and History

2.1.0.1 The Malta Test Station was established in 1945 by the DoD and used as a research and development facility for rockets and weapons testing. During its period of use, conventional munitions were used at the FUDS. Common munitions used/tested at the site were 120 mm full range practice projectiles, 155 mm projectiles, 18 inch artillery shells, 105 mm to 152 mm tank guns, 105 to 155 mm Howitzers, 60 mm, 90 mm, and 150 mm recoilless rifles, and rocket fuels (ERM 1995). The site is comprised of 33 buildings, multiple rocket test stands, concrete quench pits, leach fields, septic tanks, dry wells, storage areas, disposal areas, magazines, and an artificial pond (ERM 1995). Table 2-1 provides a list of the owners and operators of the Malta Test Station along with years of association and site activities. Table 2-1 also notes the operators and/or owners listed as PRPs by the EPA. General Electric Company (GE) served as the contractor/operator of the facility for the duration of DoD ownership of the site, which began in 1945 and ended in 1964. The entire property, 165 acres including a perpetual 1,800-acre easement which surrounds the facility, was reported excess to the General Services Administration in 1960 and conveyed to the New York State Atomic and Space Development Authority (NYSASDA) in 1964.

2.1.0.2 The Malta Test Station was established on a 165 acre tract of land in the towns of Malta and Stillwater, New York by the United States (U.S.) Government in 1945 (Figure 1-1). The Test Station was owned and operated by various agencies of the U.S. Government for a variety of rocket and weapons testing and for space research activities from 1945 to 1964. During this time, and for the duration of the DoD ownership, GE was contractor-operator of the approximately 25 structures on site. Several other companies, acting as contractors to the U.S. Government, have utilized portions of the facility including: Wright-Malta Corporation, Exxon Nuclear Company, Inc. (Advanced Nuclear Fuels, Inc.) Curtis-Wright Corporation, Olin Corporation, Iso-Nuclear Corporation, Gamma Processing Company, Mechanical Technology, Inc., and Power Technology, Inc. The use of Malta Test Station was granted to the U.S. Air Force by permit from October 1955 to June 1960 and the National Aeronautics and Space Administration (NASA) used the site to simulate re-entry conditions for space vehicles in 1960 (USACE 1980).

2.1.0.3 The property of the Malta Test Station was reported excess to the General Service Administration (GSA) on 25 November 1960. GSA conveyed the 165.36 acre to the New York State Atomic and Space Development Authority (NYSASDA), now known as New York State Energy Research and Development Authority (NYSERDA), by quitclaim deed dated 4 February 1964. This deed prohibited human habitation and hunting with the right to remove buildings used for human habitation and to post signs indicating the nature and extent of control over the easement. NYSASDA was succeeded by the New York State Energy Research Development Authority (NYSERDA) (USACE 1980). Since site closure, the property was owned by various state government entities. The Luther Forest Technology Campus Economic Development Corporation (LFTCED) is the current property owner.

2.1.1 Physical Setting

2.1.1.1 The topography of the Malta Test Station area is characterized by gently rolling hills with elevations ranging from 300 to 350 feet (ft) above mean sea level. Several ravines are present along the southwestern boundary of the site with elevations dropping to 250 ft above mean sea level in the ravines. Much of the topography onsite has been disturbed by earth moving and construction activities associated with the site buildings and testing facilities. A small hill and valley remain within the site boundary, extending across the center of the site in a northeast-southwest orientation (Figure 1-1). The small valley contains Muggett's Pond and Muggett's Pond Drainage Ditch (ERM 1995).

2.1.2 Climate and Vegetation

2.1.2.1 The climate in the Malta Test Station region is characterized by long winters and short summers with average temperatures in the area ranging from 24 degrees Fahrenheit (º F) (-4.4 degrees Celsius [ºC]) in January to 72º F (22.2ºC) in July. The mean annual temperature in the area is 48º F (8.9ºC). The average annual rainfall in the vicinity of the site is 37 inches (in.) and the average annual snowfall is 63.8 in. with the ground remaining frozen from late November to early March (ERM 1995).

2.1.2.2 Winds in the Malta Test Station area are predominantly from the west and northeast between the months of January and April and predominantly from the south between the months of May and December (ERM 1995).

2.1.3 Soil

2.1.3.1 Surface soil in the area of the Malta Test Station is aeolian deposits consisting of Colonie Silty Sand. This soil is generally deep, homogenous, and moderately well to well drained throughout the site (ERM 1995).

2.1.4 Current and Future Land Use

2.1.4.1 LFTCEDC is the current owner of the approximately 165-acre site. LFTCEDC plans to develop the Malta Test Station site into a technology campus (Alion 2006a). An initial activity of the new development is the installation of high voltage power lines, which are shown on Figure 2-1.

2.1.5 Demographics

2.1.5.1 The Malta Test Station is located in the cities of Malta and Stillwater, New York in the towns of Malta and Stillwater, Saratoga County, New York, approximately 1.5 miles south of Saratoga Lake and 2 miles northeast of Round Lake. The site is fenced and inaccessible to the public. There are no residents or schools/daycares located within 200 feet of the FUDS. According to the 2000 census, Malta has a population of 13,005 people with 5,295 households, 3,537 families, and a population density of 464.2 per square mile (mi^2). Malta is a primarily residential city with some commercial and light industry. The city of Stillwater is adjacent to Malta and is also primarily residential with some commercial and light industrial. The 2000 census reported a population of 7,522 with 2,786 households, 2,109 families, and a population density of 181.9 per mi^2. Both Malta and Stillwater are located in Saratoga County. In 2000, Saratoga County had a population of 200,635 people with 78,165 households, 53,699 families and a population density of 247 per mi^2 (U.S Census Bureau 2000).

2.2 Summary of Previous Investigations for MC/MEC

2.2.1 1980 Inventory Project Report (INPR), amended 2005

2.2.1.1 The USACE New York District completed an Inventory Project Report (INPR) for Malta Test Station in 1980, which was later amended in 2005. An electronic copy of the INPR and the amended INPR are available in Appendix L. The site was determined to be formerly used for the research, development, and testing of rocket engines and fuels. The signed Findings and Determination of Eligibility (FDE) concluded that the site consisted of 165.36 acres, was used from 1945 to 1964, and was eligible for restoration under the purview of DERP FUDS. A

project, DERP FUDS Project No.C02NY089802, was proposed to address the remaining ordnance hazards at the site (USACE 1980). An amendment to the INPR for the Malta Test Station was recommended to evaluate the potential for munitions and explosives of concern and/or munitions constituents at the site. Based on the review of the Site Survey Summary Sheet and other available records, the potential for the presence of MEC exists at the site. A site inspection was recommended in accordance with the protocol of MMRP to evaluate the potential for the presence of MEC/MC (USACE 2006). In a Memorandum dated 8 February 2006, a MMRP project was granted to perform an SI at Malta Test Station. A preliminary Risk Assessment Code (RAC) of 2 was assigned to the site 16 August 2003 (USACE 1980). RAC scores indicate the level of MEC risk associated with the area. RAC scores range from 1, being the highest category of risk, to 5, being the lowest. *Note: This site was not submitted with the other FUDS in the 2000 Annual Report to Congress (ARC) and has neither an ASR nor a Supplemental ASR.*

2.2.2 1989 Aerial Photo Analysis

2.2.2.1 The EPA Environmental Photographic Interpretation Center analyzed aerial photographs from 1952 through 1982 of the Malta Test Station Site per the request of the Superfund Branch of the EPA in 1989. The EPA divided the site into three separate areas which included the Test Station/Triangular Parcel, the former GE/Exxon Building, and Area D-3. The analysis concluded that there was evidence of the presence of tanks, drums, standing liquid, stains, waste/drum burial, fill areas, excavations, an open burning pit, and an impoundment on site (ERM 1995).

2.2.3 1992 Literature Search Report

2.2.3.1 A Literature Search Report (LSR) was completed for the Malta Test Station Site in 1992. The report contains a culmination of 26 environmental-related investigations conducted by 16 different companies or government agencies at the site from 1977 through 1992. The LSR includes interviews of present Malta Test Station personnel, a summary of the chemicals used and detected, and a summary of activities by building/area (ERM 1995).

2.2.4 1995 Remedial Investigation (RI) Report and Ongoing Feasibility Study

2.2.4.1 An RI was completed for the Malta Test Station by ERM-Northeast, Inc. (ERM) in February 1995 (Appendix L). The objective of the RI was to assess the nature and extent of constituents present in the environment originating from past site activities, conduct a risk assessment, and evaluate and select appropriate cleanup activities, if necessary. A

comprehensive field investigation was conducted between 1991 and 1994. During the course of the RI, a total of 48 distinct areas of the site were investigated by collecting samples from various media (soil, surface water, sediment, and groundwater) analyzed for Target Compound List/Target Analyte List (TCL/TAL) plus Boron, a radiation survey in the former GE/Exxon Nuclear building, geophysical surveys to identify locations of possible buried metal at 19 areas on site, and soil gas surveys at 46 areas to evaluate the extent of Volatile Organic Compounds (VOCs) in shallow soil, a dry well investigation from 23 dry well features (dry wells, catch basins, floor drains, a swale and an open sump), and a septic tank investigation. The groundwater investigation included the installation of 30 monitoring wells to supplement the existing network of 18 monitoring wells already on site. During the RI, 108 soil samples, 254 shallow subsurface soil samples, three deep subsurface soil samples, 17 surface water samples, 17 sediment/soil samples, and 43 groundwater samples were analyzed for TAL metals and were validated under USEPA Region 2 validation requirements (ERM 1995 and EPA 1999).

2.2.4.2 As part of the 1994 RI, ERM developed media-specific Malta Rocket Fuel Area (MRFA) Comparative Criteria for data comparison. The MRFA Criteria used a comparison of maximum background concentrations (statistically derived for soil from validated soil sampling results); available regulatory standards, guidance values, and criteria; and health-based criteria. These MRFA criteria referred to in the RI as health-based comparative criteria were developed for VOCs, Semi-Volatile Organic Compounds (SVOCs), and metals. Specifically, MRFA criteria were only developed for twenty-one of the twenty-five inorganic analytes. Health-based comparative criteria were not calculated for the remaining four inorganic analytes (barium, beryllium, cobalt, and selenium) because the MRFA RI analytical results showed that these inorganic analytes were either not detected, were detected at concentrations below the 1992 New York State Technical Administrative Guidance Memorandum (NYSTAGM)[2] value, or were below the maximum statistical background concentration in all of the soil samples collected. For the inorganic data, if the calculated health-based comparative criteria for an inorganic analyte exceeded both the NYSTAGM value and the maximum statistical background concentration,

2 The New York State Technical Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Clean-up Levels (NYSTAGM) (NYSDEC, 1992 values for inorganic analyzes and organic compounds in the soil were considered under this first category (i.e., regulatory guidance). If a specific inorganic analyze did not have a NYSTAGM value, then the maximum statistical background concentration was used. No statistical analysis was performed for organic compounds in soil because either no background organic compound data were available or the analytical results (SVOCs in surface soil only) were below the NYSTAGM values. The NYSTAGM values and maximum statistical background concentrations were then compared to the calculated health-based comparative criteria (ERM 1995).

then the health-based comparative criteria was used for the MRFA Comparative Criteria. It is also noted that no criteria were developed for molybdenum, strontium, titanium, and zirconium. These metals are not expected to be associated with MEC formerly used at the site (ERM 1995 and EPA 1999).

2.2.4.3 The MRFA Comparative Criteria were developed to assess the significance of the RI analytical data and identify which areas potentially required further investigation. These criteria were not intended as cleanup goals or preliminary remediation goals (PRGs); rather, ERM reported the criteria as "a level of environmental quality above which further characterization and potential risk evaluation may be warranted." The MRFA criteria were used to establish the baseline level of metals in the Malta Test Station area (ERM 1995 and EPA 1999).

2.2.4.4 The RI determined that the depth to groundwater at the site ranged from 15 to 55 feet below the land surface. The water supply system onsite consists of two active production wells that began being treated by an air stripper in January 1987. Groundwater samples collected during the RI confirmed the presence of VOCs above federal drinking water standards. The RI indicated that the groundwater plume, defined by 5 ppb iso-concentration contour for carbon tetrachloride and trichloroethylene (TCE), was well within the safety easement established for the site. Carbon tetrachloride and TCE were detected near the center of the site at maximum concentrations of 220 ppb and 280 ppb, respectively, compared to their Maximum Contaminant Levels (MCLs) of 5 ppb. The groundwater and surface water samples collected at the site indicated that the VOC concentrations were steady and decreasing, which suggested that the plume was not migrating in the subsurface into uncontaminated areas under current groundwater flow conditions (ERM 1995, EPA 1999).

2.2.4.5 The results of the sampling were used to complete a Human Health Risk Assessment and Ecological Risk Assessment for the site. The risk assessments indicated unacceptable concentrations of polychlorinated biphenlys (PCBs) in soil at Building 23P area (where lead also was detected) and mercury in the soil at the Muggett's Pond Drainage Ditch Intersection (ERM 1995). Cleanup goals of 10 ppm of PCBs in the surface soil (top one foot) and 25 ppm in the subsurface soil (below one foot), 1,000 ppm of lead at the Building 23P area, and 2 ppm of mercury at the Building 23P area were established. Although the risk due to groundwater contamination falls within acceptable risk range, the EPA Record of Decision (ROD) called for the treatment of the Malta Test Station water supply to MCLs and monitoring of natural attenuation and degradation processes until the groundwater plume attains MCLs (ERM 1995and EPA 1999).

2.2.4.6 Several response actions were performed concurrent with the RI in accordance with EPA-approved work plan, including: 1) decommissioning and removal of two compressed gas cylinders; 2) excavating and recycling 560 empty, buried, crushed drums; 3) cleaning out several septic tanks, catch basins, and dry wells; 4) cleaning out a sump; and 5) disposal of investigation-derived waste generated during the RI. The FS report evaluated in detail five remedial alternatives to address groundwater contamination and four remedial alternatives to address soil contamination at the site (ERM 1995 and EPA 1999).

2.2.5 1999 Superfund Preliminary Site-Closeout Report

2.2.5.1 The EPA issued an Administrative Order to eight PRPs for the performance of a remedial investigation and feasibility study (RI/FS). Following the issuance of EPA's Record of Decision in July of 1996, a Consent Decree was signed in September 1997 by settling federal agencies and seven defendants for performance of remedial design and remedial design action. GE is identified in the Consent Decree as the performing party responsible for implementation of the remedy selected in the ROD (EPA 1999).

2.2.5.2 The major components of the remedial action identified in the ROD include the following (EPA 1999):

- Continued pumping of the Test Station water supply wells and treatment of the water by air stripping to provide an acceptable drinking water supply for the Test Station employees, which may be accomplished using the existing air stripper. Continued monitoring of the influent and effluent of the air stripper in accordance with New York State requirements to ensure that it effectively treats the onsite water supply to federal MCLs, or if more stringent, New York State drinking water standards.
- Natural attenuation and degradation of VOCs in groundwater that are not captured by the pumping wells until the groundwater attains federal MCLs, or if more stringent, New York State drinking water standards.
- Monitoring of surface water and groundwater to ensure that off-site groundwater users are not impacted by contamination from the site, that contaminated groundwater does not migrate into uncontaminated areas (i.e., that the groundwater plume is contained), and that the natural attenuation and degradation processes are restoring the groundwater to the cleanup standards. The existing surface water and groundwater sample locations may be modified as necessary to meet the objectives of this monitoring program.

- Excavation of contaminated soil at the Building 23P area at a depth of one foot or less having a concentration of greater than 10 ppm of PCBs, soil at depth below one foot having a concentration of greater than 25 ppm of PCBs, and soil at any depth with a concentration of lead of greater than 1,000 ppm.
- Excavation of contaminated soil at the Muggett's Pond Drainage Ditch Intersection at any depth with a concentration of greater than 2 ppm of mercury.
- Backfilling of excavations in the Building 23P area and at Muggett's Pond Drainage Ditch Intersection with clean fill material, grading to blend with the surrounding areas, and re-vegetated.
- Transportation of the excavated soil from the Building 23P area and Muggett's Pond Drainage Ditch Intersection and disposal off-site at an appropriate EPA-approved facility, consistent with RCRA regulations and all other applicable or relevant and appropriate requirements.
- Implementation of institutional controls, which may include new deed restrictions, to prevent ingestion of contaminated groundwater, to restrict withdrawal of groundwater within the vicinity of the plume that could adversely impact groundwater remediation, and to restrict the Test Station to its current commercial/industrial land use.
- Evaluation of site conditions at least once every five years to ensure that the remedy is protective of human health and the environment.

2.2.5.3 The following Remedial Design and Remedial Action were implemented at the Malta Test Station in accordance with the ROD (EPA 1999):

- Approximately four cubic yards of soil was excavated from the Building 23P area on July 1998 and was backfilled with clean fill material. Six post-excavation soil samples were collected from the excavation site and were analyzed for PCBs and lead. All of the samples contained less than 10 ppm of total PCBs and less than 1,000 ppm of lead, and thus met the cleanup criteria specified in the ROD (EPA 1999).
- Soil was excavated from the concrete trough at the Muggett's Pond Drainage Ditch Intersection and surrounding areas in July 1998. Nine post-excavation samples were collected in the excavation area, six of which had concentrations of mercury greater than the 2 ppm cleanup criteria specified in the ROD. Additional soil excavation was conducted in September 1998 to the nearest RI sampling locations that were known to be below the 2 ppm cleanup goal. Approximately 62 cubic yards of soil, including visible elemental mercury in the soil and debris, were excavated and backfilled with clean fill material,

2.2.6 2006 Environmental Assessment

2.2.6.1 A Phase II Environmental Site Assessment (ESA) was conducted at the Malta Test Station by C.T. Male and Associates, P.C. (C.T. Male) in April 2006 as requested by the LFTCEDC (Appendix L). The purpose of the assessment was to further evaluate and identify potential or known sources of hazardous wastes, hazardous substances, and/or chemical or petroleum contamination relative to underground storage tanks, surface water bodies, and to determine the quality of site soil and groundwater in the area of Building 24. The data collected during the assessment were used to establish a baseline condition at the time Wright Malta Corporation vacated the subject property and future protocols for abandoning structures. The assessment included a subsurface and tank investigation, excavation of test pits, six soil borings (three converted to micro-monitoring wells), collection of soil samples for VOC vapor screening, and the collection and analysis of tank contents, groundwater samples, surface water samples, a sediment sample and a soil sample for TCL of VOCs, SVOCs, and TAL metals laboratory analysis (C.T. Male 2006).

2.2.6.2. The assessment confirmed the existence of six underground storage tanks on site with varying degrees of product. An active spill with contaminated soil was encountered at the man ways of two tanks in the tank farm area. The photoionization detector (PID) screening results of the soil samples from borings at Building 24 did not indicate the presence of VOC vapors. Laboratory analysis of the soil samples did not detect VOCs or SVOCs above the laboratory method detection with the exception of p-Isoproyltoluene which was detected at a level slightly higher than its NYSDEC recommended cleanup value (C.T. Male 2006).

2.2.6.3 Various metals were detected in the surface water samples in Muggett's Pond and the Building 20 pond. Several metals exceeded surface water standards or guidance values including aluminum, cobalt, iron, and manganese in Muggett's Pond and antimony in the Building 20 pond. All metals detected were generally less than or within an order of magnitude of the surface water standard. Various metals were detected in the sediment sample collected at Muggett's Pond, but did not exceed soil cleanup objective values, except for mercury, iron, and zinc. Mercury and iron were found within background levels typical for the Eastern United States and zinc was found just above these levels. All metals detected were generally less than or within an order of magnitude of the cleanup objective values. Metals were also detected in the soil samples collected from borings at Building 24. All metals detected were within the soil cleanup objective values except for copper, iron, magnesium, mercury, nickel, and zinc. Copper, iron, nickel, and zinc were found within background levels. The magnesium and mercury were

found above background values at isolated locations at the site. Mercury, iron, and zinc were generally less than or within an order of magnitude of the cleanup objective values. Various metals were detected that exceeded groundwater standards or guidance values from the micro monitoring wells at Building 24 including beryllium, chromium, copper, iron, magnesium, manganese, nickel, and lead. Cobalt and Vanadium were found above surface water standards. These metals were generally less than or within an order of magnitude of the groundwater standards, surface water standards, or guidance values and according to C.T. Male may be attributed to suspended solids present in the groundwater samples (C.T. Male 2006).

2.2.7 Perchlorate Investigation

2.2.7.1 In 2006, perchlorate was added to the quarterly groundwater sampling suite, as part of the ongoing RI investigation (Appendix L). The findings of this investigation will be available in the future. Issues involving metals and perchlorate are being addressed in remedial investigations separate from this SI.

2.3 Citizen Reports of Munitions and Explosives of Concern

2.3.1 Interviews with the site manager and past employees of the Malta Test Station indicate that practice firing/testing of weapons occurred at the site. The Site Manager, Mr. Ray Kazyaka, indicated that 105 mm ammunition boxes, 90 mm projectiles, 120 mm projectiles, 155 mm projectiles, black powder, bismuth and liquid propellants (HAN and OTTO) have been found in the area of the fuel storage magazines in the past (Kazyaka 2006). Mr. Kazyaka was interviewed during the SI and documentation of this interview is included in Appendix C.

2.4 Non-DoD Contamination/Regulatory Status

2.4.1 There is no documentation available that would indicate possible MC contamination prior to DoD acquisition of Malta Test Station in 1945. The INPR provides information concerning the prior use and ownership of the site.

2.4.2 As detailed in the INPR (which includes the FDE) and discussed at the TPP meeting, non-DoD activities (i.e. PRP) at the site were identified such as rocket motor testing, munitions testing, fuels testing, as well as the National Aeronautics and Space Administration use of the site to simulate re-entry conditions for space vehicles. Non-DoD activities may have resulted in potential metals and perchlorate contamination, which are also possible sources of DoD MC contamination. Therefore, because of these non-DoD activities, stakeholders agreed during the

TPP meeting that only explosives compounds and not metals or perchlorate would be investigated during the MMRP SI. Since the transfer of the Malta Test Station in 1964, this FUDS has been utilized by the NYSERDA for energy and power research. The site was also leased and utilized to conduct a gas centrifuge enrichment technology research project and for the development of pressurized fluidized bed combustion and molten carbonate fuel cell development. The Wright-Malta Corporation utilized the site to conduct rocketry and weapons research for the DOD and classified and confidential research for other private organizations. During the period of DoD and NYSERDA ownership, GE used various solvents including carbon tetrachloride and trichloroethylene. Since the former Malta Test Station has been used for various testing and development activities as discussed directly above by the Wright-Malta Corporation; consequently, non-DoD contamination could have occurred in MRS 1, possibly involving metals Exxon Nuclear Company also handled several hazardous chemicals including methyl, ethyl, ketone, acetone, perchloroethylene, and toluene over a five year period lease from NYSERDA. It is FUDS policy not to perform response actions at potential PRP sites under these circumstances. Therefore, this MMRP SI investigated only those constituents attributable to activities prior to the closure and transfer of the Malta property.

Table 2-1. Summary of Owners and Operators: Malta Test Station (FUDS Property No. C02NY089802) (USACE 1980) (EPA 2007a) (EPA 2007b)		
Owner or Operator	**Years of Association**	**Site Activities**
Thomas F. Luther	Prior to 1945	Not available
Department of Defense(DoD) with General Electric Company (GE) as the contractor/operator	1945 to 1964	Research, development, and testing of rocket engines and fuels
United States (US) Air Force granted by permit	October 1955 to 30 June 1960	Possibly simulated re-entry conditions for space vehicles
National Aeronautics and Space Administration (NASA)	1960 to not available	Simulated re-entry conditions for space vehicles on behalf of the Department of Energy (DoE)
General Services Administration (GSA)	25 November 1960 to not available	The entire property was reported excess to the GSA on 25 November 1960[1]
New York State Atomic and Space Development Authority (NYSASDA) and succeeded by New York State Energy Research and Development Authority (NYSERDA)	4 February 1964 to not available	Atomic and space research
NYSERDA	Unknown renovated area from 1979 to 1981 unknown	NYSERDA portion of site at one time was named Saratoga Research and Development Center (designated for energy and power research)[2]; atomic and space research Conducted water spray evaporation studies for

		cooling systems
GE under contract with NYSASDA and NYSERDA GE under lease with NYSERDA	1964 to 1972 1972 to 1974	Research (type of research conducted in not available) experiments on low-level radiation of medical equipment and food preservation and for gas centrifuge, and uranium enrichment research project
Wright Malta Corporation (through lease in 1972 and ownership of portions of site starting the 20 December 1984)	1972 to Not available	Former DoD structures to conduct rocketry and weapons research for DoD. Research for other private organizations. Majority of work is classified and confidential[3]
Curtis Wright Corporation	Not available	Type of research not available
Olin Corporation (through lease)	Not available	Type of research not available
Power Technologies, Inc. through lease from NYSERDA	Not available	Occupied converted warehouses; type of research not available
Mechanical Technologies, Inc. through lease from NYSERDA	Not available	Occupied converted warehouses; type of research not available
Exxon Nuclear Company, Inc. (also known as Advanced Nuclear Fuels, Inc.) (through lease with NYSERDA)	1974 to possibly 1979	continue research GE had started including experiments on low-level radiation of medical equipment and food preservation and for gas centrifuge, and uranium enrichment research project
Optimum Air Corporation	Not available	Possibly manufacturing

(through lease with NYSERDA)		equipment to dry industrial coatings
GE through lease with NYSERDA	1981 to possibly 1987	development of pressurized fluidized bed combustion and molten carbonate fuel cell development[4]
New York State Department of Transportation	Not available	Disposal of construction and demolition debris during construction of Interstate 87
Luther Forest Corporation/Luther Forest Technology Campus Economic Development Corporation (LFTCED) (real estate development company)	Not available	Maintain timber rights to the forest, real estate developer of surrounding area

[1]GSA conveyed the 165.36 acre in fee to NYSASDA by quitclaim deed dated 4 February 1964 along with perpetual easement of 1800 acres.

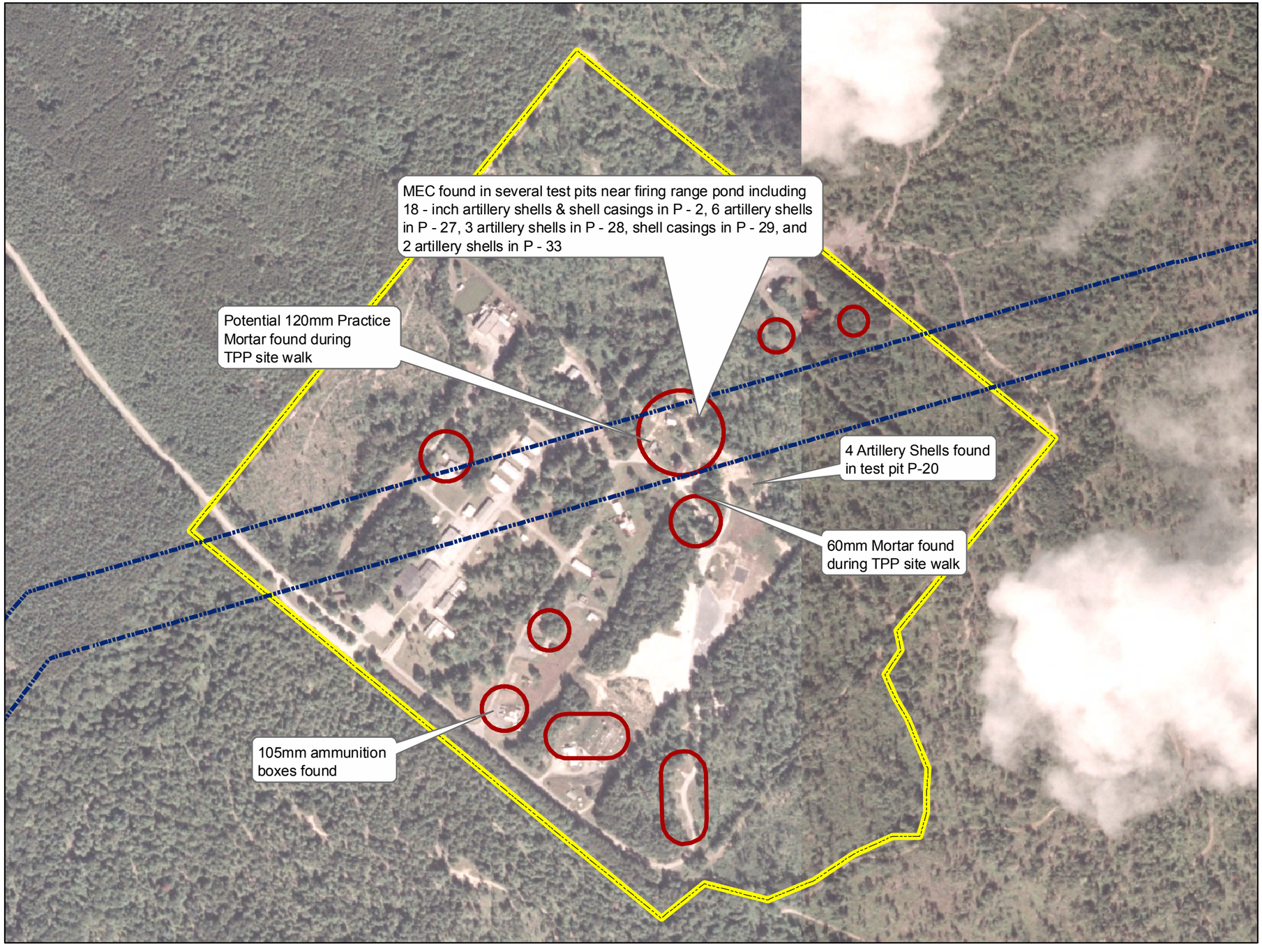
[2]The area was originally constructed for the Iso-Nuclear Corporation (through lease) to sanitize hospital equipment and preserve food. The Corporation defaulted and the area was leased to GE.

[3]There are no restrictive clauses within deed to property under Wright-Malta Corporation.

[4]Facility vacant since April or May 1987

Note: Advanced Nuclear Fuels, Inc, Curtis Wright Corporation, GE, Mechanical Technology, Inc, NYSERDA, Olin Corporation, Power Technologies, Inc., and Wright-Malta Corporation are listed as potentially responsible parties (PRPs).

DoD- Department of Defense
DoE-Department of Energy
GE- General Electric Company
GSA-General Service Administration
LFTCED-Luther Forest Corporation/Luther Forest Technology Campus Economic Development Corporation
NASA-National Aeronautics and Space Administration
NYSASDA-New York State Atomic Space Development Authority
NYSERDA-New York State Energy Research and Development Authority
US-United States



Malta Test Station
Malta, New York

Legend

- Line Right of Way
- Potential Ordnance Impact Area as per Ray Kazyaka (March 23, 2006)
- FUDS Boundary

Acronyms
FUDS - Formerly Used Defense Site

Sources:
Luther Forest Technology Campus, Potential Ordnance Impact Areas March 28, 2006

Potential Ordnance Impact Areas as per Ray Kazyaka dated March 23, 2006

USDA-FSA-APFO, 2006

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Meters



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Figure 2-1. Historical Munitions Related Discoveries.

3. SI TASKS

3.1 Technical Project Planning

3.1.1 The TPP Meeting for the Malta Test Station was conducted on 23 May 2006 at the site of the Malta Test Station, presently known as the Luther Forest Technology Campus, in Saratoga Springs, New York. The Final TPP Memorandum documenting the meeting was issued in July 2006 (Alion 2006a). The meeting participants included representatives from the CENAB, USACE New York District, the Luther Forest Technology Campus Economic Development Corporation (LFTCEDC), the New York State Department of Environmental Conservation (NYSDEC), Wright Malta Corporation, the New York State Energy Research and Development Authority (NYSERDA), C.T. Male Associates, Continental Placer Inc., the Saratoga Economic Development Corporation (SEDC), New York State Department of Health (NYSDOH), and the Alion Team. The participants in the TPP discussed the results of previous investigations, historical aerial photographs, the CSM, and DQOs. The TPP participants concurred with the technical approach for the planned SI activities discussed during the TPP as documented in the TPP memorandum. More specific details of the TPP Meeting are contained in the Final TPP Memorandum (Alion 2006a) which is included in Appendix B as well as the Memorandum For Record (MFR) Worksheets. Note: Appendix C contains a conversation record about the MPPEH observed during the TPP site walk. Six Data Quality Objectives (DQOs) were defined for this SI (Alion 2006b) and included the following:

- Determine the presence/absence of MEC
- Eliminate from further consideration those releases that pose no significant threat to public health or the environment by collecting adequate samples to assess the presence or absence of MC at the site.
- Determine the potential need for an emergency response action and/or Time Critical Removal Action (TCRA) of MEC by collecting and analyzing data from previous investigations/reports, conducting site visits, and performing analog geophysical activities, as appropriate.
- Collect data and complete related analyses to determine if an RI/FS is necessary.
- Collect additional data, as appropriate, in support of potential HRS scoring that may be performed by the EPA[3].

[3] The wording of this DQO has been revised slightly to clarify that MMRP SI data may be used for potential HRS scoring by EPA.

- Collect the additional data necessary to complete the MRSPP.

3.1.2 Data users have reviewed these DQOs, as well as the SI Report (draft final version) and its associated data, findings, and recommendations and determined they were achieved. Deviations from the original DQOs and from the Final SS-WP (Alion 2006b) have been documented in the DQO Verification Worksheet, also included in Appendix B. Note: The final SS-WP (Alion 2006b) has also been included in Appendix L-Reference Copies.

3.1.3 Following the completion of the Draft Final SI Report, the stakeholders will have an opportunity to participate in a second TPP meeting to discuss the finding, conclusions, and recommendations of the Draft Final SI Report, review the MRSPP (Appendix K) and confirm that the project objectives and DQOs have been achieved.

3.2 Interview

3.2.1 An interview was conducted on 4 May 2006 with the Site Manager (Mr. Kazyaka) previously employed by Wright Malta Corporation. Mr. Kazyaka identified the locations of the pond, firing range, and tower. The interview indicated that practice firing/testing of weapons occurred at the site. The Site Manager indicated that 105 mm ammunition boxes, 90 mm projectiles, 120 mm projectiles, 155 mm projectiles, black powder, bismuth and liquid propellants (HAN and OTTO) have been found in the area of the fuel storage magazines in the past (Kazyaka 2006). Interview documentation is included in Appendix C.

3.3 Historical Record Review

3.3.1 EA performed a document review of Malta Test Station. Documents reviewed included the 1980 INPR, the 1995 IR Report by ERM Northeast Inc, the 1999 Record of Decision (ROD), the Phase II Environmental Site Assessment (ESA) performed C.T. Male and Associates, P.C., and the semi-annual groundwater reports. The title pages and associated table of contents are included in Appendix L as well as the full INPR.

3.4 Additional Record Review

3.4.1 Coordination with State Historic Preservation Office

3.4.1.1 The State Historic Preservation Office (SHPO) was contacted and requested to be informed of any cultural resources were discovered during the course of the site inspection. No cultural resources were identified during this SI.

3.4.2 Coordination with Natural Resources Offices

3.4.2.1 Department of Natural Resources was contacted about threatened and endangered species on the site of which there are none (Appendix L).

3.4.3 Army Checklist for Important Ecological Places

In accordance with USACE HTRW Center of Expertise guidance, the Army Checklist for Important Ecological Places is completed to determine if a FUDS requires a screening level ecological risk assessment (SLERA). The FUDS contains no important ecological places. Refer to Table 3-1 for the completed checklist for Malta Test Station.

3.5 Site Specific Work Plan, SI Field Work, and SI Laboratory Data Quality Indicators

3.5.1 Site Specific Work Plan

3.5.1.1 The Final SS-WP is included in Appendix L.

3.5.2 SI Field Work

3.5.2.1 On December 18 through December 19, 2006 the Alion field team visited the Malta Test Station to conduct SI field activities in accordance with the Final SS-WP (Alion 2006b). The field team was comprised of two unexploded ordnance (UXO) Technicians, a Sampling Technician, an Alion Team Task Manager, Alion Team Project Manager, the Malta Site Manager-Ray Kazyaka, and CENAB UXO Safety Specialist-Paul Greene. The primary task of the SI, to assess the presence of MEC and possible MC contamination, was accomplished by conducting site reconnaissance and collecting surface soil, subsurface soil, sediment, surface water, and groundwater samples. No MPPEH was identified as MEC during the QR conducted for this SI. A photo documentation log from the SI is included in Appendix E and Figure 3-1.

3.5.2.2 Thirteen surface soil, one subsurface soil, two sediment, two surface water, and three groundwater samples were collected during the SI. Section 3.6 documents changes to sampling plans based on site conditions. Sample designations, locations, and sampling rationale are summarized in Table 3-2 Additional information pertaining to the field activities, including the field notes and forms, has been included in Appendix D.

3.5.3 SI Laboratory Data Quality Indicators

3.5.3.1 This section summarizes the data quality assessment for the Malta Test Station SI analytical data. Data were generated by GPL Laboratories under the DOD QSM and validated

by a third-party validate (Environmental Data Services, EDS) using USEPA Region II Functional Guidelines. The detailed GPL and EDS reports are contained in Appendix F and G respectively, and the following text summarizes the findings. In addition, the USACE Memorandum for Record which contains the chemical QA report of the QA split samples is also contained in Appendix G. Data Quality indicators (DQI) include precision, accuracy, representativeness, completeness, and comparability (PARCC) and sensitivity.

3.5.3.2 Precision is a measure of the reproducibility of repetitive measurements of the same process under similar conditions. Precision is determined by measuring the agreement among individual measurements of the same property, under similar conditions, and is calculated as an absolute value. The degree of agreement was expressed as the relative percent difference (RPD) between the separate measurements (usually matrix spike/matrix spike duplicate (MS/MSD) pairs) and the observed RPD compared to acceptable values, both for the DOD QSM and Region II Functional Guidelines. No significant RPD was observed between MS/MSD pairs for the Malta Test Station data. Field precision is measured by the comparison of field duplicate samples, which are also discussed as appropriate in Appendix G. No significant RPD was observed in field duplicates from Malta Test Station.

3.5.3.3 Accuracy is the degree of agreement of a measurement with an accepted reference or true value. Accuracy measures the bias or systematic error of the entire data collection process. To determine accuracy a sample which has been spiked with a known concentration is analyzed by the laboratory as the MS, MSD, or Laboratory Control Spike (LCS). EDS assessed accuracy according to DOD QSM and Region II Functional Guidelines and found no problems associated with accuracy measurements.

3.5.3.4 Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point or an environmental condition. Representativeness is achieved through proper development of the field sampling program during the TPP and work plan development. All samples were collected and analyzed as planned during these stages; therefore, the representative DQI has been achieved for Malta Test Station.

3.5.3.5 Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. Data are complete and valid if the data achieve all acceptance criteria including accuracy, precision, and any other criteria specified by the particular analytical method being used. All soil and sediment field samples were collected as planned in the SS-WP, and no analyses were rejected

out of the total 384 analytical measurements taken for this site. Consequently, the Malta Test Station data meet the completeness data quality indicator.

3.5.3.6 Comparability expresses the confidence with which one data set can be compared to another. There are no previous analyses of explosives at Malta Test Station for comparison of reported concentrations from this project. Standard methods for sampling and analyses were followed as documented in the SS-WP; therefore, the comparability DQI has been achieved.

3.5.3.7 Sensitivity is a measure of screening criteria as they compare to detection limits. If screening criteria exceed detection limits, the certainty of "non-detected data is called into question. All Screening values are higher than the reporting limits for the analytes of concern at Malta Test Station; consequently, sensitivity has been achieved for all MC associated with Malta Test Station.

3.6 Departures from Planning Documents

3.6.1 Thirteen surface soil, one subsurface soil, two sediment, two surface water, and three groundwater samples were collected during the SI. Based on MD observed in the field (ISS mm projectile) sample MTS-CP-SS-02-01 was moved from the locations designated in the SS-WP to the nearby MD. In addition, surface water sample MTS-DD-SW-00-01 was relocated from a drainage ditch to an onsite cooling pond due to the lack of water in the drainage ditch. Sample MTS-RP-SB-10-01 was collected as a surface soil sample instead of a subsurface soil sample. This change was made in the field when the field team was informed that the soil in the area of the sample had been disturbed historically and MEC/MC was more likely to remain nearer to the surface. Additional information pertaining to the field activities, including the field notes and forms, has been included in Appendix D.

3.7 Second TPP Meeting

3.7.1 Following the completion of the Draft Final SI Report, stake holders had an opportunity to participate in a second TPP meeting (August 9, 2007) to discuss the findings, conclusions, and recommendations of the Draft Final SI Report; review the MRSPP modules (Appendix K); and confirm that the project objectives and DQOs have been achieved (Alion 2007b and 2006b). More specific details of the second TPP meeting are included in Appendix B.

Table 3-1 Army Checklist for Important Ecological Places

No.	Checklist Item	Yes / No[1]		Comments
1.	Locally important ecological place identified by the Integrated Natural Resource Management Plan, BRAC Cleanup Plan or Redevelopment Plan, or other official land management plans.		No	
2.	Critical habitat for Federal designated endangered or threatened species. See No. 12 below.		No	
3.	Marine Sanctuary		No	
4.	National Park		No	
5.	Designated Federal Wilderness Area		No	
6.	Areas identified under the Coastal Zone Management Act		No	
7.	Sensitive Areas identified under the National Estuary Program or Near Coastal Waters Program		No	
8.	Critical areas identified under the Clean Lakes Program		No	
9.	National Monument		No	
10.	National Seashore Recreational Area		No	
11.	National Lakeshore Recreational Area		No	
12.	Habitat known to be used by Federal designated or proposed endangered or threatened species		No	
13.	National preserve		No	
14.	National or State Wildlife Refuge		No	
15.	Unit of Coastal Barrier Resources System		No	
16.	Coastal Barrier (undeveloped)		No	
17.	Federal land designated for protection of natural ecosystems		No	
18.	Administratively Proposed Federal Wilderness Area		No	
19.	Spawning areas critical for the maintenance of fish/shellfish species within river, lake, or coastal tidal waters		No	
20.	Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which fish spend extended periods of time		No	
21.	Terrestrial areas utilized for breeding by large or dense aggregations of animals		No	
22.	National river reach designated as Recreational		No	
23.	Habitat known to be used by state designated endangered or threatened species		No	

Table 3-1 Army Checklist for Important Ecological Places

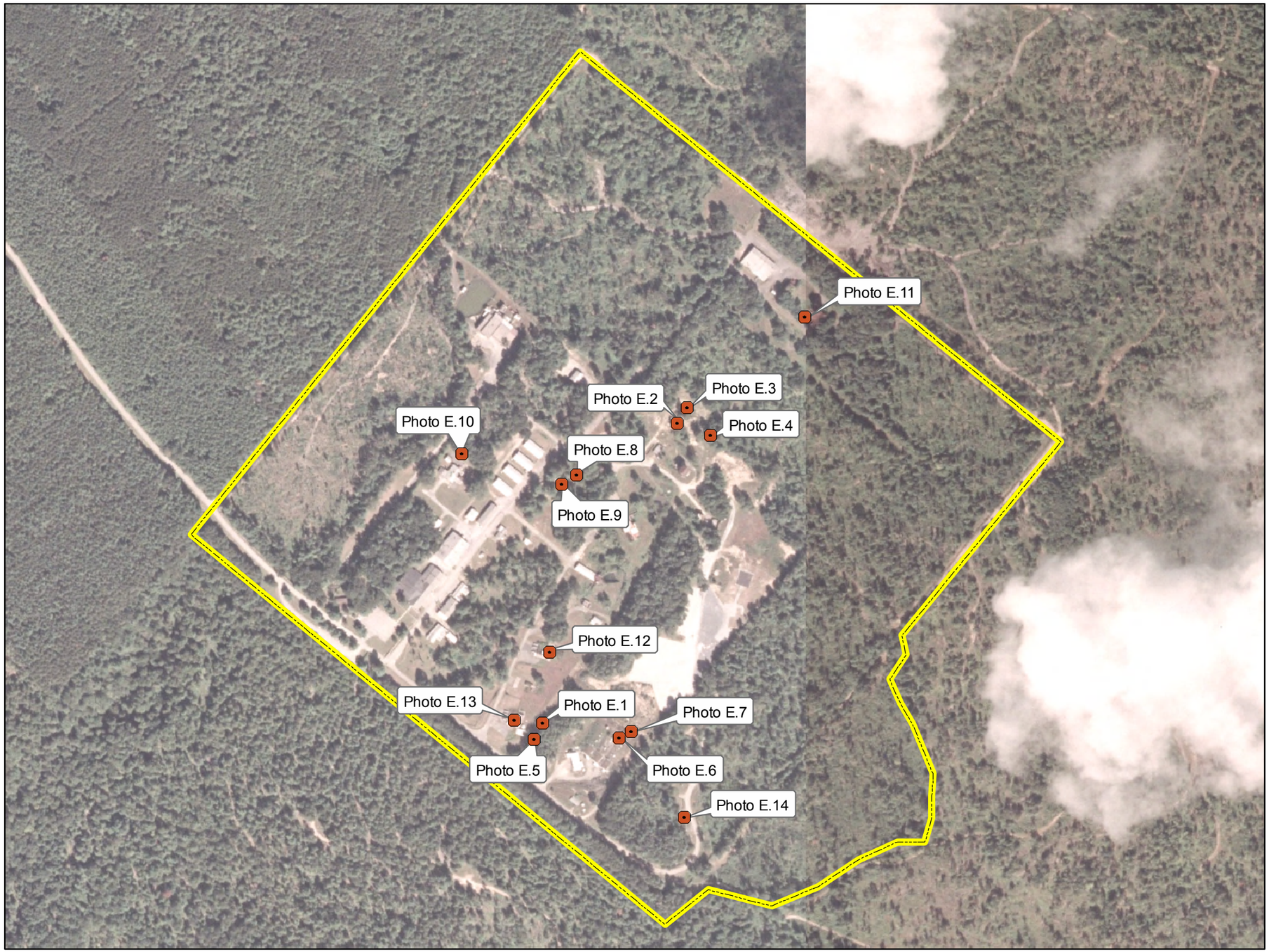
No.	Checklist Item	Yes / No[1]		Comments
24.	Habitat known to be used by species under review as to its Federal endangered or threatened status		No	
25.	Coastal Barrier (partially developed)		No	
26.	Federally designated Scenic or Wild River		No	
27.	State land designated for wildlife or game management		No	
28.	State-designated Scenic or Wild River		No	
29.	State-designated Natural Areas		No	
30.	Particular areas, relatively small in size, important to maintenance of unique biotic communities		No	
31.	State-designated areas for protection or maintenance of aquatic life		No	
32.	Wetlands		No	
33.	Fragile landscapes, land sensitive to degradation if vegetative habitat or cover diminishes		No	

[1] One or more Yes responses indicates the need for a SLERA.

Table 3-2. Sample Locations				
Location	**Sampling Identification (ID)**	**Coordinates (North American Datum [NAD] 83 Universal Transverse Mercator [UTM] Zone 18N)**		**Area of Interest / Rationale of Sampling Locations**
		Easting(ft)	**Northing(ft)**	
Ram Jet Lab	MTS-JL-SS-02-01	601167.94	4757549.37	Low-lying area near the Ram Jet Lab.
Test Structure	MTS-TS-SS-02-01	601269.19	4757308	Low-lying area near the Test Structure.
Fuel Test	MTS-FT-SS-02-01	601250.31	4757209.39	Low-lying area near the location where 105 millimeter (mm) ammunition boxes were historically found (105 mm ammunition reportedly shot into a berm in the area).
	MTS-FT-SS-02-02	601250.26	4757216.01	Low-lying area in the Fuel Test area near the location where 105 mm ammunition boxes were historically found (105 mm ammunition reportedly shot into a berm in the area).
	MTS-FT-GW-38-01	601249.28	4757215.16	An approximately 38 feet (ft) deep from a GeoProbe location in the Fuel Test area.
Muggett's Pond	MTS-MP-SW-00-01	601400.55	4757482.03	Surface water in Muggett's Pond.
	MTS-MP-SD-02-01	601400.55	4757482.03	Sediment in Muggett's Pond.
	MTS-MP-GW-25-01	601409.42	4757469.67	An approximately 25 ft deep from a GeoProbe location near Muggett's Pond.
Chemical Test Pit	MTS-CP-SS-02-01	601374.96	4757215.28	Low-lying area within the area of potential concern indicated by Ray Kazyaka.
Fuel Storage Magazines	MTS-SM-SS-02-01	601431.45	4757121.88	Low-lying area within the area of potential concern indicated by Ray Kazyaka.

Table 3-2. Sample Locations				
Location	**Sampling Identification (ID)**	**Coordinates (North American Datum [NAD] 83 Universal Transverse Mercator [UTM] Zone 18N)**		**Area of Interest / Rationale of Sampling Locations**
		Easting(ft)	**Northing(ft)**	
Drainage Ditches	MTS-DD-SW-00-01	601157.92	4757735.5	Surface water in Drainage Ditch.
	MTS-DD-SD-02-01	601338.97	4757373.93	Sediment in Drainage Ditch.
Pump Test	MTS-PT-SS-02-01	601469.65	4757475.22	Low-lying area within the area of potential concern indicated by Ray Kazyaka.
Test Pits	MTS-TP-SB-10-01	601459.45	475787.34	Low-lying area near the location of Test Pit P-20 where 4 artillery shells were found within the top 8 feet (ft) of soil during the RI and a 60 mm mortar was found during the TPP site walk.
Firing Range Pond	MTS-RP-GW-33-01	601456.75	4757592.2	An approximately 33 ft deep from a GeoProbe location near the Test Pits excavated during the RI.
	MTS-RP-SS-02-01	601458.44	4757588.22	Low-lying area near the location of Test Pits P-29 and P-27 where shell casing and 6 artillery shells were found within the top 8 ft of soil during the RI.
	MTS-RP-SS-02-02	601418.57	4757605.14	Low-lying area near Test Pit P-33 where 2 artillery shells were found within the top 8 ft of soil during the RI.
	MTS-RP-SS-02-03	601415.33	4757598.84	Low-lying area near Test Pit P-2 where 18” artillery shells and shell casings were found within the top 8 ft of soil during the RI.

Table 3-2. Sample Locations				
Location	**Sampling Identification (ID)**	**Coordinates (North American Datum [NAD] 83 Universal Transverse Mercator [UTM] Zone 18N)**		**Area of Interest / Rationale of Sampling Locations**
		Easting(ft)	**Northing(ft)**	
Firing Range Pond (continued)	MTS-RP-SB-10-01	601389.56	4757605.92	Low-lying area near the location of the 120 mm practice mortar round found during the TPP site walk.
Gas Storage	MTS-GS-SS-02-01	601560.55	4757696.55	Low-lying area within the area of potential concern indicated by Ray Kazyaka.
Powder Storage	MTS-PS-SS-02-01	601308.09	4757505.64	Low-lying area within the area of potential concern indicated by Ray Kazyaka.



Malta Test Station
Malta, New York

Legend

Photo ID - E.1
SI Photo Locations

FUDS Boundary

Acronyms
FUDS - Formerly Used Defense Site

Source:
USDA-FSA-APFO, 2006

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Figure 3-1. Site Inspection Photographic Locations.

4. MEC FINDINGS

4.1 Operational History/Military Munitions

4.1.1 The Malta Test Station was established in 1945 by the DoD and was used as a research and development facility for rocket and weapons testing. During its period of use, conventional munitions were used at the FUDS (refer to Table 4-1). Common munitions used/tested at the site are discussed in Section 2.1.

4.1.2 The site includes ten main areas of evaluation based on past operations at the site (Figure 2-1 and 4-1). These ten areas are the Control Station Area, Fuel Test Area, Firing Range, Gas Storage Area, Powder Storage Area, Ram Jet Area, Range Pond Area, Test Structure Area, Test Pit Area, and Fuel Magazine Area (Kazyaka 2006). Each of these areas was evaluated for MEC and MC concerns as part of this SI.

4.2 Results of Previous MEC/MC Investigations

4.2.1 Previous investigations and cleanup activities involving the nature and extent of contamination from PRPs, summarized in Section 2, do not document evidence of MC explosive sampling at Malta Test Station. Given other uses since site closure in 1964, multi media sampling for other constituents (e.g., metals) possibly associated with the former use would not provide the necessary and sufficient conditions for attribution to the rocket and weapons testing mission (1945-1964). The working draft CSM in the Final SS-WP (Alion 2006b) lists MC contamination (explosives)[4] as potential due to past uses of MEC at the site. As previously documented in Section 2.2 Summary of Previous Investigations for MC and MEC, there is a potential for MEC to remain. A summary of previous MEC findings is included in Table 4-2.

4.2.2 The Malta Test Station was assigned a RAC of 2 due to the presence of conventional ordnance on the site. The scoring was based on the best available information resulting from record searches, field observations (site visits), and interviews. The 1995 RI indicated the existence of artillery shells in the firing range pond area and an individual with former knowledge of the site noted that there may be 105 mm and 90 mm projectiles buried on site (ERM 1995). A summary of munitions is provided in Table 4-3.

[4] Metals and perchlorate are additional potential MC constituents at the site but were not included in this MMRP SI or in the CSM given that they are potential past non-DoD contamination.

4.3 Accessibility to MEC/MC by Receptors

4.3.1 The Malta Test Station is located on 165 acres off Interstate 87 in the Towns of Stillwater and Malta, New York. There is no public access to the majority of the site; however, some of the roads are open to the public. In the past, there was a one mile safety easement surrounding the site which consisted of primarily forestland that was logged by the Luther Forest Corporation (ERM 1995). According to LFTCEDC, this easement no longer exists. In the future, the current owner, LFTCEDC, plans to develop the Malta Test Station site into a technology campus (Alion 2006a).

4.4 Site Inspection MEC Field Observations

4.4.1 On December 18 through December 19, 2006 the Alion field team visited the Malta Test Station to conduct SI field activities in accordance with the Final SS-WP (Alion 2006b). The field team was comprised of two unexploded ordnance (UXO) Technicians, a Sampling Technician, an Alion Team Task Manager, Alion Team Project Manager, the Malta Site Manager (Ray Kazyaka), and CENAB UXO Safety Specialist (Paul Greene). The primary task of the SI, to assess the presence of MEC and possible MC contamination, was accomplished by conducting site reconnaissance and collecting surface soil, subsurface soil, sediment, surface water, and groundwater samples. A photo documentation log from the SI is included in Appendix E and Figure 3-1.

4.4.2 During the SI field activities, site reconnaissance was conducted in a meandering path using analog geophysics. Reconnaissance was conducted on approximately 17 acres of the site. In addition, to completing reconnaissance to and around the sampling locations, reconnaissance was completed on the power line right of way. Several pieces of MD were noted (refer to Figure 4-2. During the December 2006 site visit (Appendix D), the SI field team found a 120 mm projectile fin, 155 mm shells, and shell casings on the surface at Malta Test Station (Table 4-2).

Table 4-1. Military Munitions Type and Composition (Wikipedia 2006)

Note: Limited information pertaining to munition type and munition use at Malta Test Station is available, since an ASR or Supplemental ASR were not completed for the site.

Item	Filler/Weight
120 millimeter (mm) Projectiles Full Range Practice	Not Known
60 mm and 120 mm Mortars Practice	Not Known
155 mm Projectiles	M549 16 pound Comp B M107 14.6 pound Trinitrotoluene (TNT) or 15.4 pounds of Comp B M483A1 M42 and M46 Grenades with Comp A5 (wikipedia.org)
8 inch and 18 inch (in.) artillery shells	Not Known
105 mm to 152 mm tank guns	M1, High Explosives (HE)
105 mm to 155 mm Howitzers	M198 (155mm) M107 Comp B
60 mm, 90 mm, and 150 mm recoilless rifles	M371 practice round (90mm) Smoke pellet M371A1 High Explosives Anti-Tank (HEAT) (90mm) M590 antipersonnel (90mm)
Rocket Fuel	Tetryl Sticks of Double Base powder Ballistite T1E1 salted powder M7 liquid (mixture of red fuming nitric acid, unsymmetrical dimethyhydrazine (UDMH), and JP-4 jet fuel), or solid
Hydrazine/hydrazine nitrate liquid monopropellants	Not Known
mm=millimeter lb=pound(s)	Tetryl= Nitramine booster explosive or RDX Ballistite = Nitrocellulose, Nitroglycerin, Diphenylamine Comp A5 = 98.5 % RDX (Type II) and 1.5 % Stearic Acid Comp B = TNT, RDX and wax Double Base Powder = Nitrocellulose and nitroglycerine UDMH = unsymmetrical dimethyhydrazine HEAT = High Explosives Anti-Tank Salted powder

http://www.globalsecurity.org/military/systems/munitions/explosives-booster.htm

Tetryl: Tetryl (2,4,6-trinitrophenyl-methylnitramine)Tetryl is a nitramine booster explosive

Table 4-2 Previous MEC Findings

Previous Investigations/Source	MEC Results and Findings	Conclusions/ Recommendations
INPR (USACE 1980 addended 2005) TPP Meeting (Alion 2006a)	**February 2006 Trip Report** • Live 120mm mortar rounds have been found at the site. • Planned site development may be in the area where artillery shells have been found in the past. • Cleanup of soils during Superfund work did not reveal any ordnance. **1995 RI/FS** • Several artillery shells were found within the top eight ft of soil in test pits P-2, P-27, P-28, P-29, and P-33 in the area of the firing range pond. Including: 8 in. artillery shells and casings, and several other unspecified artillery shells. • Four unspecified artillery shells were found in the area designated D-2 (south east of the firing range pond) in test pit P-20 **2006TPP Site Walk** • The Site Manager indicated that 105 mm ammunition boxes, 90 mm projectiles, 120 mm projectiles, 155 mm projectiles, Black powder, Bismuth and liquid propellants (HAN and OTTO) have been found in the area of the fuel storage magazines in the past. • A 60 millimeter (mm) mortar and a potential 120 mm practice mortar were found partially buried on the road near the firing range pond.	Perform a site inspection for munitions and explosives of concern and munitions constituents, and perform further action, if necessary.

MEC=Munitions and Explosives of Concern
INPR=Inventory Project Report
USACE=U.S. Army Corps of Engineers
mm=millimeter
RI/FS=Remedial Investigation/Feasibility Study
TPP=Technical Project Planning

Table 4-3. Risk from Munitions and Explosives of Concern (MEC) (ERM 1995, Kazyaka 2006, Alion 2006)

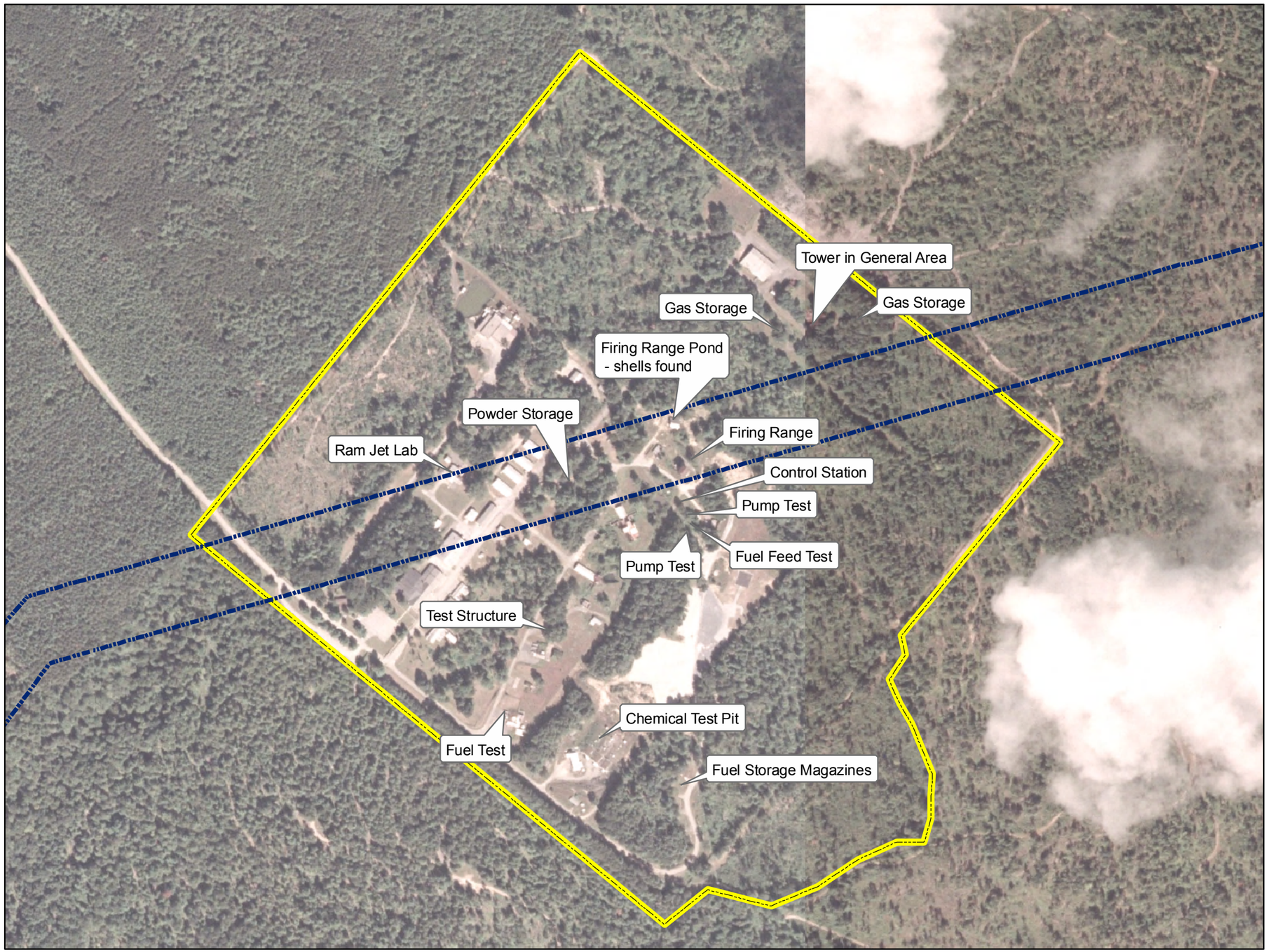
Site Name	Range/Area Name	Acreage[1]	RAC Score[1]	Type Of Munitions	Munitions Identification (ID)
Malta Test Station	Malta Test Station	165.36	2	Conventional	• 120 millimeter (mm) Projectiles Full Range Practice • 155 mm Projectiles • 18 inch (in.) artillery shells • 105 mm to 152 mm tank guns • 105 mm to 155 mm Howitzers • 60 mm, 90 mm, and 150 mm recoiler rifles • Rocket Fuel • Hydrazine/hydrazine nitrate liquid monopropellants

RAC=Risk Assessment Code

MEC=Munitions and Explosives of Concern

mm=millimeter

in.=inch(es)



Malta Test Station
Malta, New York

Legend

Power Line Right of Way

FUDS Boundary

Acronyms
FUDS - Formerly Used Defense Site

Source:
USDA-FSA-APFO, 2006

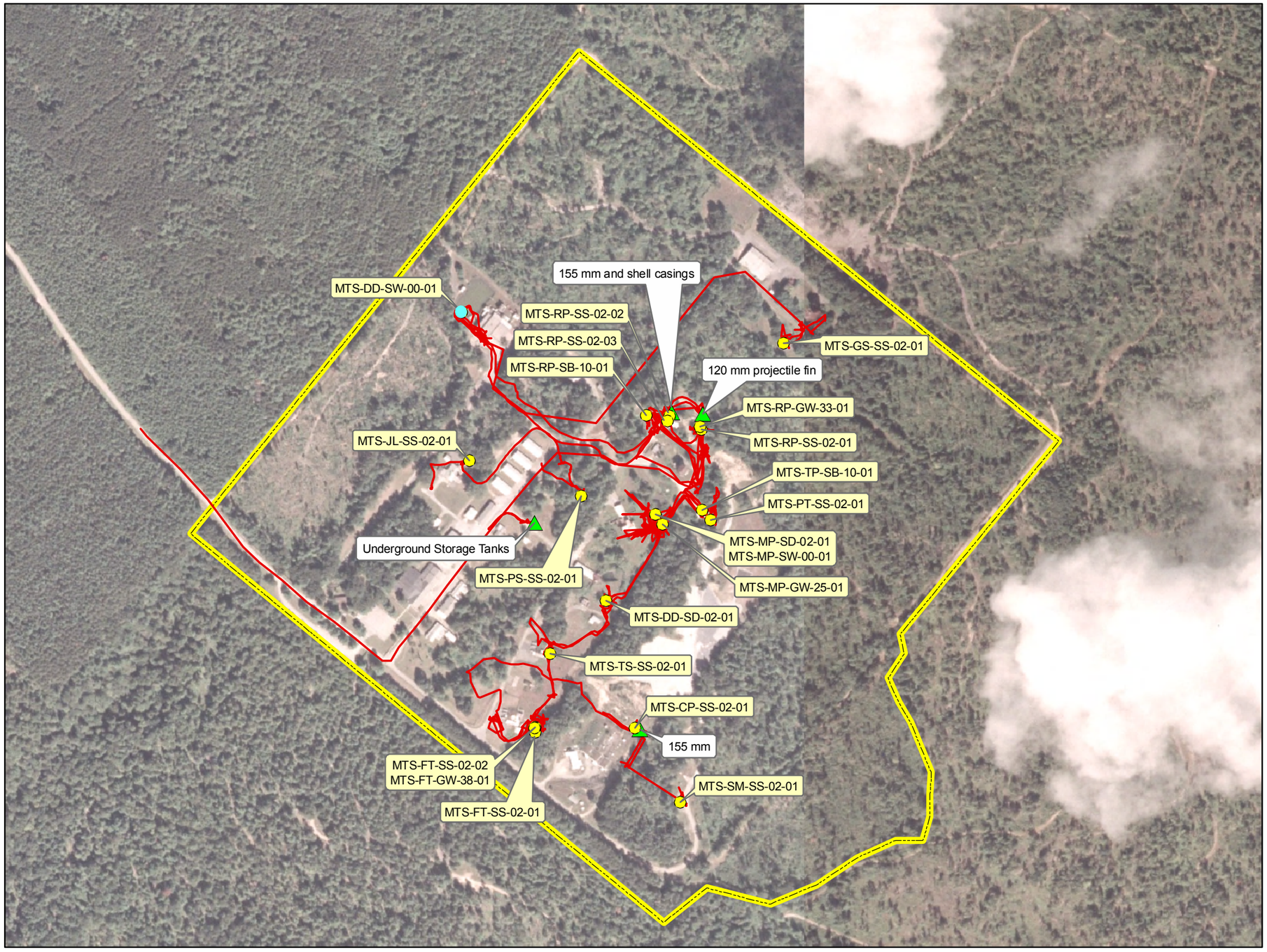
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Figure 4-1. Historic Site Layout.



Malta Test Station
Malta, New York

Legend

- Field Sample Locations
- Anomalies
- Geophysical Reconnaissance Routes
- FUDS Boundary

Sample ID Designation
"MTS-FT-SS-02-01"
Site Name-Sampling Location-Sample Type-Sample Depth-Sample #
SS - Surface Soil Sample
SB - Subsurface Soil Sample
SD - Sediment Sample
SW - Surface Water Sample
GW - Groundwater Sample

Acronyms
FUDS - Formerly Used Defense Site

Source:
USDA-FSA-APFO, 2006

N
W
E
S

0 100 200
Meters



Q:\projects\GIS\62023011\2006\Malta\FINAL\Figure7-1.mxd

Figure 4-2. Sample Locations & Geophysical Site Reconnaissance Findings.

5. MIGRATION/EXPOSURE PATHWAYS AND TARGETS

5.1 Groundwater Migration Pathway

5.1.1 Geologic Setting

5.1.1.1 The Malta Test Station is underlain by a series of unconsolidated deposits including aeolian sands, lake sands, lake silty sands, and lake clays and silts. The aeolian deposits vary in thickness from 0 to 14 ft and are underlain by a series of glacio-lucustrine deposits varying in thickness from 30 to 60 ft. Below the lucustrine sands lies a layer of 30 to 40 ft thick lucustrine sand and silt which differs from the lucustrine sands by a higher silt composition and the presence of clay lenses. Underlying the lucustrine sand and silt is a layer of lucustrine blue-gray clay and silt extending to a depth of approximately 140 ft below ground surface. Below the blue-gray clay and silt lies a lucustrine blue-clay layer and gray clay layer extending to an approximate depth of 250 ft below ground surface. Underlying the clay layers is a dense glacial till deposit extending to an approximate depth of 275 ft below ground surface, which lies directly above the Canajoharie Shale bedrock. The bedrock consists of blue-black to gray shale ranging from several feet to several in. thick and containing thin layers of sandstone (ERM 1995).

5.1.2 Hydrogeologic Setting

5.1.2.1 Atmospheric precipitation is the source of all groundwater at the Malta Test Station. There is one water supply system in proximity to the site. This existing water supply is known as Saratoga Water Services. The system has two sources of groundwater, the Knapp Road Well Field to the south of the site, and the Cold Spring Road Well Field to the north of the site. The groundwater in the area generally lies 15-25 ft below grade, but can be deeper in some areas. Residential consumers in the area are supplied by one of the systems located in a deep (200-400 ft), highly permeable aquifer. During the 1995 remedial investigation (RI) (ERM 1995), both aquifers and the supply system were determined to be disconnected hydrogeologically from any groundwater contamination at the site (ERM 1995, C.T. Male 2006).

5.1.2.2 The site contains at least two private water wells that serve the LFTCEDC. Forty-eight existing wells (monitoring and production) are present on the site. Pumping tests for the two active wells indicate that the wells can yield 30 gallons per minute (gpm). In general, in the shallow glacio-lacustrine deposits, groundwater flows to the west with an average hydraulic conductivity of 4.27 foot per day (ft/day). In deeper lake silt and sand deposits, a southeast to

northwest groundwater divide results in westerly and northerly flows with an average hydraulic conductivity of 3.10 ft/day (ERM 1995).

5.1.3 Groundwater Use

5.1.3.1 The New York State Department of Health (NYSDOH) was contacted by CENAN to determine wells and water supply systems within a four mile radius of the site. NYSDOH was able to provide general information on the surrounding wells and source water assessment areas but specific information cannot be included in the SI Report due to NYSDOH confidential protocols NYSDOH can be contacted for specific well information..

5.1.3.2 NYSDOH indicated that there is one water supply system in proximity to the site. This existing water supply is known as Saratoga Water Services. The system has two sources of groundwater, the Knapp Road Well Field to the south of the site, and the Cold Spring Road Well Field to the north of the site. Residential consumers in the area are supplied by one of the systems located in a deep (200-400 ft), highly permeable aquifer. The number of residents supplied by these wells is unavailable. The site contains two private water wells that serve LFTCEDC (C.T. Male 2006). Forty-eight existing wells (monitoring and production) are present on the site (C.T. Male 2006).

5.1.4 Groundwater Sampling Results

5.1.4.1 No previous groundwater sampling for explosives has been completed at the Malta Test Station. A Geoprobe® was used to collect three groundwater samples in the fuel test area, Muggett's Pond area, and the Range Pond area. The sandy soil was relatively easy to push through at each location and the depth to groundwater ranged from 12 ft to 30 ft below ground surface at the three locations. Details pertaining to each Geoprobe location are provided Table 5-1 and additional information pertaining to the field activities, including the field notes and forms, are included in Appendix D. The locations of the Geoprobe® locations are provided in Figure 4-2.

5.1.4.2 Target Analyte List (TAL) metals were not analyzed as part of the MMRP SI in accordance with the SS-WP (Alion 2006b) (Appendix L) (refer to Sections 2.2.4 and 2.2.5) because metals are potential past non-DoD contamination. A summary of groundwater analytical results and Preferred Maximum Method Quantitation Limit (PMMQL) values are provided in Table 5-2. No explosives were detected in any of the three groundwater samples. Screening to select contaminants of potential concern is found in Section 6 for human health

receptors. The complete report of the analytical results and the analytical Quality Assurance/Quality Control (QA/QC) report are in Appendix F and G, respectively.

5.2 Surface Water Migration Pathway

5.2.1 Hydrogeologic Setting

5.2.1.1 Several artificial water bodies are present at the Malta Test Station including three quench pits associated with testing facilities and Muggett's Pond located in the center of the site. Muggett's Pond is a small man-made pond (approximately 50 ft by 60 ft) that contains water throughout the year (ERM 1995). The concrete quench pits are located at Building 3, Building 4, and Building 25 and also contain water throughout the year. There are four storm water retention basins without standing water and two dry, unused lagoons present at the site. Adjacent to the site are several streams/ravines.

5.2.1.2 Surface water runoff at the Malta Test Station is expected to flow towards Muggett's Pond, the four storm water retention basins, two dry lagoons, three quench pits, and/or a low area between Building 24 and Area D-1 (ERM 1995).

5.2.2 Surface Water Use

5.2.2.1 Muggett's Pond reportedly was used to collect runoff and discharge water from various test facilities on the Test Station from the mid-1940s to the present. Currently, the pond is used for the collection of storm water runoff only. The quench pits are concrete-lined structures completed below the groundwater table with holes designed in the concrete walls to allow groundwater to enter the pits. The purpose of these quench pits was to quench the rocket exhausts during rocket tests conducted in the 1950s and 1960s. They are no longer in use (ERM 1995). During the field visit, surface water was evident only in Muggett's pond and a cooling pond onsite.

5.2.3 Surface Water and Sediment Sampling Results

5.2.3.1 Previous surface water samples were not analyzed for explosives (ERM 1995 and C.T. Male 2006). Two discrete surface water samples were collected at the Malta Test Station. A surface water sample was collected from Muggett's Pond and an onsite cooling pond. Sample MTS-DD-SW-00-01 was relocated from a drainage ditch to the cooling pond due to the lack of water in the ditch. The locations of these samples are noted in Table 3-2 and additional information pertaining to the field activities, including the field notes and forms, have been included in Appendix D. Samples were analyzed for explosives. Water parameters including

temperature, conductivity, turbidity, pH, and oxidation-reduction potential were collected in the field prior to surface water sampling. Water parameter results are located in Appendix D. A summary of the explosives analytical results for surface water are summarized in Table 5-3. No explosives were detected in any of the two surface water samples. The complete report of the analytical results and the analytical quality assurance/quality control (QA/QC) report are in Appendix F and G, respectively.

5.2.3.2 Previous sediment samples were not analyzed for explosives. Two discrete sediment samples were collected at Malta Test Station. A sediment sample was collected in one of the drainage ditches and on the edge of Muggett's Pond on site. The locations of these samples are noted in Table 3-2 and additional information pertaining to the field activities, including the field notes and forms, has been included in Appendix D. The sediment samples were analyzed for explosives. A summary of the analytical results for sediment are summarized in Table 5-4. Nitrobenzene was detected in one (0.012 ug) of the two sediment samples. The complete report of the analytical results and the analytical QA/QC report are in Appendix F and G, respectively.

5.2.4 Sensitive Environments

5.2.4.1 According to the U.S. Department of Agriculture (USDA) (USDA 2002), there are no wetlands on the Malta Test Station site. However, freshwater forested shrub wetland is present south of the site. Two ponds (Muggett's Pond and a pond near the chemical plant on the eastern side of the property) and several drainage ditches are located on the site. Nearby wetlands are shown on Figure 1-1.

5.2.4.2 Malta Test Station is not within a designated coastal zone area.

5.3 Soil Exposure Pathway

5.3.1 Soil Sampling Results

5.3.1.1 Previous sampling results for VOCs, SVOCs, and metals at the Malta Test Station are discussed in Section 2.2. As noted in earlier discussions, attribution of contamination from prior DOD munition-related activities is not possible for the metals component of these constituents given the numerous PRPs, nature of operational activities, and cleanup activities at this FUDS. Consequently, sampling data (i.e., metals) from these historic investigations are not used to support recommendations in this MMRP SI.

5.3.1.2 Thirteen composite surface soil samples and one discrete subsurface soil sample was collected at the Malta Test Station. The locations of these samples are noted in Table 3-2 and additional information pertaining to the field activities, including the field notes and forms, are included in Appendix D. The samples were analyzed for explosives, in accordance with the SS-WP (Alion 2006b). The following explosives were detected in soil: 2,4-dinitrotoluene and nitrobenzene. A summary of surface soil analytical results is provided Table 5-5. The complete report of the analytical results and the analytical Quality Assurance/Quality Control (QA/QC) report are in Appendix F and G, respectively.

5.3.2 Terrestrial Exposure

5.3.2.1 Potential receptors on the site include site workers and trespassers. Refer to Section 2.1.5 for further details on demographic information.

5.3.2.2 Several historic structures remain at Malta Test Station. New York State Historic Preservation Analyst reviewed the SS-WP (Alion 2006b) for the inspection of the military munitions at the former Malta Test Station and indicated that the plan would have no effect historic properties (USACE 2006).

5.3.2.3 According to the NYSDEC, there are no records of known occurrences of rare or state-listed animals or plants, significant natural communities, or other significant habitats, on or in the immediate vicinity of the Malta Test Station site (NYSDEC 2006).

5.4 Air Migration Pathway Analysis

5.4.1 Demographic information pertaining to population, student, and workers within four miles of the site is found in Section 2.1.5.

5.4.2 The air migration pathway at Malta Test Station has an extremely low potential, if any, for human and/or environmental receptors to come into contact with the analytes detected in surface soil. These constituents are non-volatile; therefore, the suspension of constituents in air is limited to airborne particulate.

5.4.3 With a negligible air contamination source, there is low potential for the air pathway on Malta Test Station to negatively impact any human or environmental receptors. Therefore, no air samples were collected.

Table 5-1. Groundwater Sample Locations

Location	Sampling ID	Coordinates (UTM NAD 1983, zone 18)		Well Depth (ft)	Depth to groundwater (ft)
		Easting (m)	Northing (m)		
Fuel Test Area	MTS-FT-GW-38-01	601249.28	4757215.16	32	16.7
Muggett's Pond Area	MTS-MP-GW-25-01	601409.42	4757469.67	22.5	22.5
Range Pond Area	MTS-RP-GW-33-01	601456.75	4757592.20	35	30

ft=feet
ID=identification
m=meter
NAD=North American Datum
UTM=Universal Transverse Mercator

Table 5-2 Summary of Groundwater Analytical Results

				Sample Name:	MTS-FT-GW-38-01	MTS-MP-GW-25-01	MTS-RP-GW-33-01
				Sample Date:	12/19/2006	12/19/2006	12/19/2006
				Parent Name:			
Analyte	**CAS**	**T/D**	**PMMQL***	**Unit**			
Explosives							
1,3,5-TRINITROBENZENE	99-35-4	T	2.5	ug/L	0.21 U	0.21 U	0.21 U
1,3-DINITROBENZENE	99-65-0	T	0.185	ug/L	0.21 U	0.21 U	0.21 U
2,4-DINITROTOLUENE	121-14-2	T	2.5	ug/L	0.21 U	0.21 U	0.21 U
2,6-DINITROTOLUENE	606-20-2	T	1.8	ug/L	0.21 U	0.21 U	0.21 U
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	T	0.365	ug/L	0.21 U	0.21 U	0.21 U
2-NITROTOLUENE	88-72-2	T	0.00245	ug/L	0.42 U	0.42 U	0.42 U
3-NITROTOLUENE	99-08-1	T	2.5	ug/L	0.42 U	0.42 U	0.42 U
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	T	0.365	ug/L	0.21 U	0.21 U	0.21 U
4-NITROTOLUENE	99-99-0	T	2.5	ug/L	0.42 U	0.42 U	0.42 U
HMX	2691-41-0	T	NA	ug/L	0.42 U	0.42 U	0.42 U
NITROBENZENE	98-95-3	T	0.175	ug/L	0.21 U	0.21 U	0.21 U
NITROGLYCERIN	55-63-0	T	2.4	ug/L	21 U	21 U	21 U
PETN	78-11-5	T	NA	ug/L	1.1 U	1.1 U	1.1 U
RDX	121-82-4	T	NA	ug/L	0.42 U	0.42 U	0.42 U
TETRYL	479-45-8	T	NA	ug/L	0.42 U	0.42 U	0.42 U
TNT	118-96-7	T	NA	ug/L	0.21 U	0.21 U	0.21 U

* PMMQL- Preferred Maximum Method Quantitation Limit is set to one-half of the lowest of either Human Health Screening Values or Ecological Screening Values. The PMMQL is taken from the Malta Test Station Site-Specific Work Plan Addendum dated November 2006 to the MMRP Programmatic Work Plan.

U-Not detected. The associated number indicates the approximate sample concentration necessary to be detected.

NA-Not Applicable

T-Total

D-Dissolved

Table 5-3 Summary of Surface Water Analytical Results

				Sample Name:	MTS-DD-SW-00-01	FD#3	MTS-MP-SW-00-01
				Sample Date:	12/18/2006	12/18/2006	12/18/2006
				Parent Name:		MTS-DD-SW-00-01	
Analyte	**CAS**	**T/D**	**PMMQL***	**Unit**			
Explosives							
1,3,5-TRINITROBENZENE	99-35-4	T	NA	ug/L	0.21 U	0.21 U	0.21 U
1,3-DINITROBENZENE	99-65-0	T	NA	ug/L	0.21 U	0.21 U	0.21 U
2,4-DINITROTOLUENE	121-14-2	T	NA	ug/L	0.21 U	0.21 U	0.21 U
2,6-DINITROTOLUENE	606-20-2	T	NA	ug/L	0.21 U	0.21 U	0.21 U
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	T	NA	ug/L	0.21 U	0.21 U	0.21 U
2-NITROTOLUENE	88-72-2	T	NA	ug/L	0.42 U	0.42 U	0.42 U
3-NITROTOLUENE	99-08-1	T	NA	ug/L	0.42 U	0.42 U	0.42 U
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	T	NA	ug/L	0.21 U	0.21 U	0.21 U
4-NITROTOLUENE	99-99-0	T	NA	ug/L	0.42 U	0.42 U	0.42 U
HMX	2691-41-0	T	NA	ug/L	0.42 U	0.42 U	0.42 U
NITROBENZENE	98-95-3	T	0.2	ug/L	0.21 U	0.21 U	0.21 U
NITROGLYCERIN	55-63-0	T	NA	ug/L	21 U	21 U	21 U
PETN	78-11-5	T	NA	ug/L	1.1 U	1.1 U	1.1 U
RDX	121-82-4	T	NA	ug/L	0.42 U	0.42 U	0.42 U
TETRYL	479-45-8	T	NA	ug/L	0.42 U	0.42 U	0.42 U
TNT	118-96-7	T	NA	ug/L	0.21 U	0.21 U	0.21 U

* PMMQL- Preferred Maximum Method Quantitation Limit is set to one-half of the lowest of either Human Health Screening Values or Ecological Screening Values. The PMMQL is taken from the Malta Test Station Site-Specific Work Plan Addendum dated November 2006 to the MMRP Programmatic Work Plan.

U-Not detected. The associated number indicates the approximate sample concentration necessary to be detected.

NA-Not Applicable

T-Total

D-Dissolved

Table 5-4 Summary of Sediment Analytical Results

			Sample Name:	MTS-DD-SD-02-01	MTS-MP-SD-02-01
			Sample Date:	12/18/2006	12/18/2006
			Parent Name:		
Analyte	**CAS**	**PMMQL***	**Unit**		
Explosives					
1,3,5-TRINITROBENZENE	99-35-4	NA	mg/kg	0.04 U	0.04 U
1,3-DINITROBENZENE	99-65-0	NA	mg/kg	0.04 U	0.04 U
2,4-DINITROTOLUENE	121-14-2	NA	mg/kg	0.04 U	0.04 U
2,6-DINITROTOLUENE	606-20-2	NA	mg/kg	0.04 U	0.04 U
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	NA	mg/kg	0.04 U	0.04 U
2-NITROTOLUENE	88-72-2	NA	mg/kg	0.08 U	0.08 U
3-NITROTOLUENE	99-08-1	NA	mg/kg	0.08 U	0.08 U
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	NA	mg/kg	0.04 U	0.04 U
4-NITROTOLUENE	99-99-0	NA	mg/kg	0.08 U	0.08 U
HMX	2691-41-0	NA	mg/kg	0.08 U	0.08 U
NITROBENZENE	98-95-3	NA	mg/kg	0.04 U	0.012 J
NITROGLYCERIN	55-63-0	NA	mg/kg	4 U	4 U
PETN	78-11-5	NA	mg/kg	0.2 U	0.2 U
RDX	121-82-4	NA	mg/kg	0.08 U	0.08 U
TETRYL	479-45-8	NA	mg/kg	0.08 U	0.08 U
TNT	118-96-7	NA	mg/kg	0.04 U	0.04 U

* PMMQL- Preferred Maximum Method Quantitation Limit is set to one-half of the lowest of either Human Health Screening Values or Ecological Screening Values. The PMMQL is taken from the Malta Test Station Site-Specific Work Plan Addendum dated November 2006 to the MMRP Programmatic Work Plan.

J-Analyte is present. Reported value may not be accurate or precise.

U-Not detected. The associated number indicates the approximate sample concentration necessary to be detected.

NA-Not Applicable

Table 5-5 Summary of Soil Analytical Results

			Sample Name:	MTS-CP-SS-02-01	MTS-FT-SS-02-01	MTS-FT-SS-02-02	MTS-GS-SS-02-01	MTS-JL-SS-02-01	MTS-PS-SS-02-01	MTS-PT-SS-02-01	MTS-RP-SB-10-01	MTS-RP-SS-02-01	FD#2
			Sample Date:	12/18/2006	12/18/2006	12/18/2006	12/18/2006	12/18/2006	12/18/2006	12/18/2006	12/18/2006	12/19/2006	12/18/2006
			Parent Name:										MTS-RP-SS-02-02
Analyte	**CAS**	**PMMQL***	**Unit**										
Explosives													
1,3,5-TRINITROBENZENE	99-35-4	90	mg/kg	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
1,3-DINITROBENZENE	99-65-0	0.305	mg/kg	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
2,4-DINITROTOLUENE	121-14-2	0.0004	mg/kg	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.012 J	0.04 U	0.04 U
2,6-DINITROTOLUENE	606-20-2	0.00035	mg/kg	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	0.6	mg/kg	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
2-NITROTOLUENE	88-72-2	0.44	mg/kg	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
3-NITROTOLUENE	99-08-1	36.5	mg/kg	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	0.6	mg/kg	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
4-NITROTOLUENE	99-99-0	6	mg/kg	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
HMX	2691-41-0	NA	mg/kg	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
NITROBENZENE	98-95-3	0.05	mg/kg	0.016 J	0.04 U	0.04 U	0.02 J	0.04 U	0.04 U	0.011 J	0.022 J	0.021 J	0.023 J
NITROGLYCERIN	55-63-0	17.5	mg/kg	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
PETN	78-11-5	NA	mg/kg	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
RDX	121-82-4	NA	mg/kg	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
TETRYL	479-45-8	NA	mg/kg	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
TNT	118-96-7	NA	mg/kg	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U

*PMMQL - Preferred Maximum Method Quantitation Limit is set to one half of the lowest of either Human Helath Screening Values or Ecological Screening Values. The PMMQL is taken from the Malta Test Station Site-Specific Work Plan Addendum dated Novemver 2006 to the MMRP Programatic Work Plan.

J - Analyte is present. Reported VAlue may not be accurate or precise

U - Not Detected. The associated number indicates the approxamate sample concentration necessary to be detected.

NA - Not Applicable.

Table 5-5 Summary of Soil Analytical Results

Analyte	CAS	PMMQL*	MTS-RP-SS-02-02 12/18/2006	MTS-RP-SS-02-03 12/18/2006	MTS-SM-SS-02-01 12/18/2006	FD#1 12/18/2006 MTS-TP-SB-10-01	MTS-TP-SB-10-01 12/18/2006	MTS-TS-SS-02-01 12/18/2006
Explosives								
1,3,5-TRINITROBENZENE	99-35-4	90	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
1,3-DINITROBENZENE	99-65-0	0.305	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
2,4-DINITROTOLUENE	121-14-2	0.0004	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
2,6-DINITROTOLUENE	606-20-2	0.00035	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	0.6	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
2-NITROTOLUENE	88-72-2	0.44	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
3-NITROTOLUENE	99-08-1	36.5	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	0.6	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
4-NITROTOLUENE	99-99-0	6	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
HMX	2691-41-0	NA	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
NITROBENZENE	98-95-3	0.05	0.034 J	0.016 J	0.016 J	0.04 U	0.04 U	0.014 J
NITROGLYCERIN	55-63-0	17.5	4 U	4 U	4 U	4 U	4 U	4 U
PETN	78-11-5	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
RDX	121-82-4	NA	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
TETRYL	479-45-8	NA	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
TNT	118-96-7	NA	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U

*PMMQL - Preferred Maximum Method Quantitation Limit is set to one half of the lowest of either Human Helath Screening Values or Ecological Screening Values. The PMMQL is taken from the Malta Test Station Site-Specific Work Plan Addendum dated Novemver 2006 to the MMRP Programatic Work Plan.

J - Analyte is present. Reported VAlue may not be accurate or precise

U - Not Detected. The associated number indicates the approxamate sample concentration necessary to be detected.

NA - Not Applicable.

6. SCREENING LEVEL RISK ASSESSMENT

6.1 Screening-Level Human Health Risk Assessment

6.1.0.1 A screening level human health risk assessment (HHRA) for explosives is performed to determine whether COPCs in environmental media at Malta Test Station exist to current or potential future human receptors and require further characterization.

6.1.1 Conceptual Site Model

6.1.1.1 A CSM diagram that defines the source (e.g., the secondary source/media), the interaction (e.g., the secondary release mechanism, the tertiary source, and the exposure route), and the current and potential future human receptors is provided in Appendix J. The CSM in Appendix J now reflects the results of this SI and has no potential or completed pathways for MC (explosives). The media of concern at the site are surface soil, sediment, surface water, and groundwater. Surface soil samples were collected in the MRS to identify if there are any MC on the surface from MEC or MD.

6.1.1.2 Industrial and residential receptor scenarios are evaluated in this screening level HHRA. The industrial scenario is assessed for the protection of site workers or maintenance workers, potential construction workers and other workers that may frequent the site. Residential development at the Malta Test Station is an unlikely future scenario; however, the residential scenario is assessed as a conservative measure. Furthermore, the residential scenario is protective of all potential recreational users. The media of concern at the site include surface soil, surface water, groundwater and sediment.

6.1.2 Potential Human Health Receptors

6.1.2.1 Current and future human receptors for both MC and MEC are expected to be employees that work at the site.

6.1.2.2 Both residential and industrial receptor scenarios are evaluated in the screening level HHRA. In addition, the residential scenario was assessed even though there are no current residents at the site. The industrial scenario is conservative and assessed for the protection of construction or other workers that may frequent the site. Trespassers are also evaluated as potential receptors at the site. Further discussion about potential and complete pathways is found in Section 6.

6.1.3 Hazard Identification

6.1.3.0.1 The purpose of the hazard identification process is to summarize data and identify COPCs that are evaluated in the human health screening-level risk assessment. This process is described in the following sections.

6.1.3.1 Data Summary

6.1.3.1.1 Analytical data collected during the SI are used to identify the COPCs for Malta Test Station. The data were collected in areas of suspected potential contamination. These data and the associated collection methods are discussed provided in the SS-WP. Only validated data are evaluated in the screening level HHRA. The following samples are included:

- Thirteen surface soil samples (between 0 in.-2 in. below ground surface [bgs]) (includes two duplicate samples)
- One subsurface soil sample (1 ft bgs);
- Two sediment samples;
- Two surface water samples (includes one duplicate sample); and
- Three groundwater samples.

6.1.3.2 Selection of Chemicals of Potential Concern

6.1.3.2.1 Initially, all target analytes (identified in the individual sampling plans) detected at concentrations exceeding the Minimum Detection Limit (MDL) are evaluated. The frequency of detection and range of MDLs for each analyte, in each medium of interest, are examined. Selection of COPCs for inclusion in the HHRA included the following steps:

- Analysis and evaluation of data quality (Section 6.1.3.3)
- Comparison to screening concentrations (Section 6.1.3.4)
- Review of the preliminary COPC list and exclusion of analytes based on additional considerations, such as essential nutrient status, as per EPA guidance (EPA 1989)
- Evaluation of the potential toxicity of COPCs that have no screening concentrations and inclusion of analytes, where warranted, on the basis of known toxicity (e.g., elemental lead), structural similarity to other toxicants, other relevant guidance, and/or additional considerations;
- Review of the final COPC list to ensure that both selection and exclusion of COPCs for the HHRA were justified.

6.1.3.2.2 These steps are described in more detail in the following sections.

6.1.3.3 Data Quality Evaluation

6.1.3.3.1 The first step in the process of selecting COPCs is the evaluation of analytical data on the basis of qualifiers in each medium of concern. Inclusion or exclusion of data on the basis of analytical qualifiers is performed in accordance with EPA guidance (EPA 1989) and considers the following:

- Analytical results bearing the U or UJ qualifiers (indicating that the analyte was not detected at the given detection limit) are retained in the data set at ½ the method detection limit (MDL).
- Analytical results bearing the J or F qualifiers (indicating that the reported value was estimated because the analyte was detected at a concentration below the reporting limit or for other reasons) are retained at the measured concentration.
- Analytical results bearing the M qualifier (indicating that the reported value was estimated due to matrix interferences) are retained at the measured concentration.
- Analytical results bearing the B qualifier (indicating the chemical was detected in an associated blank) are retained at the measured concentration if greater than five times the concentration reported for the associated blank or ten times for common laboratory contaminants.
- Analytical results bearing the R qualifier (indicating that the analytical result is not usable) are deleted from the data set for evaluation.

6.1.3.3.2 If duplicate samples were collected or duplicate analyses were conducted on a single sample, the following guidelines are employed to select the appropriate sample measurement:

- If both samples/analyses show that the analyte was present, the arithmetic average of the two detected concentrations is utilized.
- If only one sample/analysis indicates that the analyte is present, it is retained.
- If both samples/analyses are non detect, the lower MDL is retained, if selected as a COPC.

6.1.3.4 COPC Screening

6.1.3.4.1 COPC screening is conducted by comparing maximum detected chemical concentrations to EPA Region IX Preliminary Remediation Goals (PRGs) (EPA 2004a).

6.1.3.4.2 The EPA Region IX PRG tables combine current EPA toxicity values with standard exposure factors to estimate contaminant concentrations in environmental media (soil, air, water) that are protective of humans, including sensitive groups, over a lifetime. The PRGs consist of concentrations for nearly 600 chemicals that, in general, correspond to fixed levels of risk (i.e., either a one-in-one-million cancer risk or a non-carcinogenic HQ of one, whichever occurs at a lower concentration) in soil, air, and water. There are two important exceptions to risk-based standards for soil: (1) PRGs are based on a soil saturation equation for several VOCs; and (2) a non-risk-based "ceiling limit" is given as 10^{+5} mg/kg for relatively less toxic semivolatile contaminants.

6.1.3.4.3 The surface soil sample analytical results are compared against residential and industrial soil PRGs (EPA 2004a). In accordance with EPA guidance, PRG values used are those at a cancer risk level of $1x10^{-6}$ and a non-cancer HQ of 0.1, for the purpose of screening.

6.1.3.4.4 Sediment sample analytical results are compared to the residential and industrial soil PRGs. The PRGs are increased by a factor of ten to account for reduced sediment exposures versus those of soil based on best professional judgment. Surface water sample analytical results are compared to the tap water PRGs, which are increased by a factor of ten, to account for reduced surface water exposure versus that of tap water based on best professional judgment.

6.1.3.4.5 Per EPA guidance, the following screening process is utilized.

1. The maximum concentration of each chemical detected in each medium is identified.

2. If the maximum concentration of a specific chemical exhibiting carcinogenic effect exceeds its screening value, the chemical is retained as a COPC, and risk is assessed for all routes of exposure involving the medium.

3. If the maximum concentration of a specific chemical exhibiting non-carcinogenic health effects exceeds its screening value, the chemical is retained as a COPC, and potential risk is assessed for all routes of exposure involving the medium.

4. If a chemical was detected in at least one sample in a specific medium, it is retained for consideration in the screening of COPCs. If the chemical is retained as a COPC, all reported non-detects for the chemical are considered to be present at one-half the MDL.

5. If a screening concentration is not available for a specific chemical in a particular medium, the screening concentration for a structurally similar compound is used, if warranted. The screening tables list any surrogates that are used.

6.1.4 Chemicals of Potential Concern Identified

6.1.4.1 All media of concern were sampled and analyzed for explosives. Groundwater and surface water did not have any detections of explosives and, therefore, have no COPCs. For surface soil and sediment, the screening results for Malta Test Station are presented in Tables 6-1 through 6-4.

6.1.4.2 No COPCs for residential exposure to surface soil (Table 6-1) are identified based on the residential soil screen.

6.1.4.3 No COPCs are identified for industrial exposure to surface soil (Table 6-2) based on the industrial soil screen.

6.1.4.4 No COPC for residential exposure to sediment (Table 6-3) are identified based on the residential screen.

6.1.4.5 No COPCs are identified for industrial exposure to sediment (Table 6-4) based on the industrial soil screen.

6.1.4.6 No COPCs are identified for exposure to surface water as there were no detections in surface water at the site.

6.1.4.7 No COPCs are identified for exposure to groundwater as there were no detections in groundwater at the site.

6.1.4.8 Table 6-5 presents the range of detection limits for all media of concern at the Malta Test Station. Only analytes that are not detected at all at the site in a medium are included on the table. The table also presents the Region IX PRG human health risk-based screening value for each analyte per medium of concern.

6.1.4.9 According to Table 6-5, all minimum detection limits (MDL) in all media of concern are below human health risk-based screening values with the exception of four explosives in groundwater (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene, and TNT). The detection

limit achieved for 2,4-dinitrotoluene and 2,6-dinitrotoluene was 0.21mg/L as compared to the Region 9 carcinogenic screening value for dinitrotoluene mixtures of 0.099 mg/L. The noncarcinogenic screening values for 2,4-dinitrotoluene and 2,6-dinitrotoluene, respectively, are 0.73 mg/L and 0.36 mg/L when divided by 10 as a conservative measure, which are greater than the detection limits. The detection limit for 2-nitrotoluene was 0.42 mg/L in groundwater compared to the Region 9 carcinogenic screening value of 0.049 mg/L. These MDLs are low; however, these MDLS are an order of magnitude higher than their respective screening values and represent those concentrations achievable using standard analytical methods. Therefore, there is uncertainty associated with the conclusion that acceptable risks are present from exposure to groundwater at Malta Test Station, assuming that the groundwater is used as a drinking water source.

6.1.5 HHRA Summary

6.1.5.1 The results of the screening level HHRA indicate that there are no explosives of potential concern at Malta Test Station.

6.2 Screening Level Ecological Risk Assessment (SLERA)

6.2.1 SLERA Introduction

6.2.1.1 The former Malta Test Station is a square land parcel of 165 acres (USACE 1980) in the towns of Malta and Stillwater, Saratoga County, New York, approximately 1.5 miles south of Saratoga Lake and 2 miles northeast of Round Lake. The Malta Test Station was established in 1945 by the Department of Defense and was used as a research and development facility for rockets and weapons. In 1964, the property was conveyed to the New York State Atomic and Space Development Authority (NYSASDA). The site is comprised of 33 buildings, multiple rocket test stands, concrete quench pits, leach fields, septic tanks, dry wells, storage areas, disposal areas, and an artificial pond (ERM 1995).

6.2.1.2 The US Army Corps HTRW CX has instituted a process (Figure 6-1) for identifying sites for which Screening Level Ecological Risk Assessments (SLERAs) may be required (USACE 2006). The step-wise process is characterized by assessing the importance of the site for ecological receptors.

6.2.1.3 The first step is to assess whether important ecological places are present on-site. Malta Test Station is ~ 5 miles east of the Hudson River. The sediments of the Hudson River have been designated a Superfund site for PCBs and remedial planning and actions are underway.

The river is also designated as an American Heritage River, although this includes no provision natural resource management planning. None of these designations extend to the Malta Test Station. There are no wetlands at the Malta Test Station, and the two ponds are artificial, used for storm water management and testing activities, and small areas of fragmented woodland persist at the edges of the site. No rare, threatened or endangered species are known to use the site. Consequently, the Malta Test Station FUDS does not constitute an important ecological place.

6.2.1.4 The second step is to determine whether the site is managed for ecological purposes. The current use of the site by LFTCEDC is for commercial development and the proposed future use of the site is not for protection of ecological resources; therefore, this site is not, and will not be, managed for ecological purposes. In fact, redevelopment of the site will include structural alterations to the site. Consequently, "the overarching goal of avoidance of widespread lethal impacts to plants and animals is established and the absence of such should be confirmed during a site walkover" (USACE 2006). This activity was completed in December 2006, and no widespread lethal impacts were documented for plants and animals at the Malta Test Station. This section of the SI report clearly documents "a departure from the SLERA process for reasons meeting the CLERCLA requirement" (USACE 2006); therefore, a SLERA is not required for the Malta Test Station. Consequently, no further analysis of risks to ecological receptors at this site is required.

6.2.2 Ecological Summary

6.2.2.1 The former Malta Test Station does not constitute an important ecological place, is not to be managed for ecological resources now or in the future, and does not impose widespread lethal impacts for plants and animals. Consequently, the USACE (2006) MMRP guidelines indicate that the performance of a SLERA is not required for this site.

6.3 Risk from MEC

6.3.1 A qualitative MEC screening-level risk assessment for potential explosive safety risks was conducted based on the SI qualitative reconnaissance, as well as historical data documented in the INPR, ASR, and the ASR Supplement. An explosive safety risk is the probability for a MEC item to detonate and potentially cause harm as a result of human activities. An explosive safety risk exists if a person can come near or in contact with MEC and act on it to cause a detonation. The potential for an explosive safety risk depends on the presence of three elements: a source

(presence of MEC), a receptor (person), and interaction (*e.g.*, touching or picking up an item). The CSM for the MRS reflects this MEC assessment strategy (Appendix J).

6.3.2 The exposure route for a MEC receptor typically is direct contact with a MEC item on the surface or through subsurface activities (*e.g.*, digging during construction activities). A MEC item tends to remain in-place unless disturbed through human activity or other natural forces (*e.g.*, frost heaving and erosion). If MEC movement occurs, the probability of direct human contact may increase, but may not necessarily result in direct contact or exposure.

6.3.3. Each of these primary risk factors were used to evaluate the field and historic data to generate an overall hazard assessment rating of either low, moderate, or high. An evaluation of low risk indicates that the MEC type would not result in major injury or the item is insensitive or inert; site characteristics are such that there is limited to no site access and the site is stable; and potential for contact is low for either surface or subsurface based on human receptor activities and the population accessing the site. An evaluation of high risk indicates that the MEC type would result in major injury or the item is sensitive; site characteristics are such that there is frequent access and the site is unstable; and potential for contact is high for either surface or subsurface based on human receptor activities and the population accessing the site.

6.3.4 The MEC assessment indicates the following:

- Historically MD and MEC have been identified at the Malta Test Station.
- RAC scoring was completed for the Malta Test Station as part of the INPR process to evaluate hazard severity and probability from MEC. The Malta Test Station (evaluated as MRS 1) received a RAC score of 2, indicating that there relatively high hazard severity at the site (USACE 1980).
- During the SI, reconnaissance was conducted on approximately 17 acres (10%) of the MRS. During the December 2006 site visit the SI field team found a 120 mm projectile fin, 155 mm shells, and shell casings on the surface at Malta Test Station (Appendix E). MD also has been observed historically on the surface at the site (refer to Section 2.2).
- The overall MEC risk is considered “low to moderate” because MEC and MD have been found in the past. There is a likelihood of additional ME contamination remaining at the site.

6.4 Munitions Response Site Prioritization Protocol

6.4.1 The MRSPP ranking applies to the MRS. Non-measurement data including existing site information, as presented in the INPR and other existing site reports, along with data collected from SI planning and field activities was used to complete the MRSPP. MRSPP includes three hazard evaluation modules for each MRS within a MRA: Explosive Hazard Evaluation (EHE), Chemical Warfare Materiel Hazard Evaluation (CHE), and Health Hazard Evaluation (HHE). For the EHE, factors evaluated include the details of the hazard, accessibility to the MRS, and receptor information. Chemical Warfare Material (CWM) was not used at Malta Test Station; therefore, the CHE module was not completed at this site. HHE factors include an evaluation of MC and any non-munitions-related incidental contaminants present, receptor information, and details pertaining to environmental migration pathways. The MRS priority is determined based on integrating the ratings from the EHE, CHE, and HHE modules.

6.4.2 Since this property has been designated as a potential PRP project a MRSPP priority score is not required to be calculated. However, the modules for the MRSPP are included in Appendix K for future reference.

TABLE 6-1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MALTA TEST STATION
SURFACE SOIL - RESIDENTIAL

Scenario Timeframe: Current/Future
Medium: Surface soil
Exposure Medium: Surface soil
Exposure Point: Malta Test Station

CAS Number	Chemical	Minimum [1] Concentration	Minimum Qualifier	Maximum [1] Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	EPA Region IX PRG Screening [4] Value		Potential Screening Value	Potential Screening Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
EXPLOSIVES																	
121-14-2	2,4-DINITROTOLUENE	1.20E-02	J	1.20E-02	J	mg/kg	MTS-RP-SB-10-01	1/14	4.00E-02 - 4.00E-02	1.20E-02	NA	7.20E-01	C	NA	NA	No	BSL
98-95-3	NITROBENZENE	1.10E-02	J	2.85E-02	J / J	mg/kg	MTS-RP-SS-02-02	9/14	4.00E-02 - 4.00E-02	2.85E-02	NA	2.00E+00	N	NA	NA	No	BSL

(1) Minimum/maximum detected concentration.
(2) Maximum concentration used as screening value.
(3) Background values were collected during the Site Investigation (EA 2006).
(4) USEPA Region IX Preliminary Remediation Goals (PRGs) Table, USEPA, December 2004. For non-carcinogens, value shown is equal to 1/10 the residential soil PRG value. For carcinogens the value shown is equal to the residential soil PRG value.
(5) Rationale Codes

Selection Reason:
Deletion Reason:

ASL = Above Screening Toxicity Level
BSL = Below Screening Toxicity Level
NSL = No Screening Level
NUT = Essential Nutrient

Definitions:

C = Carcinogenic
COPC = Chemical of Potential Concern
N = Non-Carcinogenic
NA = Not Applicable
mg/kg = milligram per kilogram

Data Qualifiers:

J = Value is estimated.

Surrogates: Dinitrotoluene mixture for 2,4-Dinitrotoluene.

TABLE 6-2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MALTA TEST STATION
SURFACE SOIL - INDUSTRIAL

Scenario Timeframe: Current/Future
Medium: Surface soil
Exposure Medium: Surface soil
Exposure Point: Malta Test Station

CAS Number	Chemical	Minimum [1] Concentration	Minimum Qualifier	Maximum [1] Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	EPA Region IX PRG Screening [4] Value		Potential Screening Value	Potential Screening Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
EXPLOSIVES																	
121-14-2	2,4-DINITROTOLUENE	1.20E-02	J	1.20E-02	J	mg/kg	MTS-RP-SB-10-01	1/14	4.00E-02 - 4.00E-02	1.20E-02	NA	2.50E+00	C	NA	NA	No	BSL
98-95-3	NITROBENZENE	1.10E-02	J	2.85E-02	J / J	mg/kg	MTS-RP-SS-02-02	9/14	4.00E-02 - 4.00E-02	2.85E-02	NA	1.00E+01	N	NA	NA	No	BSL

(1) Minimum/maximum detected concentration.
(2) Maximum concentration used as screening value.
(3) Background values were collected during the Site Investigation (EA 2006).
(4) Taken from USEPA Region IX Preliminary Remediation Goals (PRGs) Table, USEPA, December 2004. For non-carcinogens, value shown is equal to 1/10 the industrial soil PRG value. For carcinogens the value shown is equal to the industrial soil PRG value.
(5) Rationale Codes

Selection Reason:
Deletion Reason:

ASL = Above Screening Toxicity Level
BSL = Below Screening Toxicity Level
NSL = No Screening Level
NUT = Essential Nutrient

Definitions:

C = Carcinogenic
COPC = Chemical of Potential Concern
N = Non-Carcinogenic
NA = Not Applicable
mg/kg = milligram per kilogram

Data Qualifiers:

J = Value is estimated.

Surrogates: Dinitrotoluene mixture for 2,4-Dinitrotoluene.

TABLE 6-3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MALTA TEST STATION
SEDIMENT - RESIDENTIAL

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Malta Test Station

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration (2) Used for Screening	Background (3) Value	EPA Region IX PRG Screening (4) Value		Potential Screening Value	Potential Screening Source	COPC Flag	Rationale for (5) Contaminant Deletion or Selection
EXPLOSIVES																	
98-95-3	NITROBENZENE	1.20E-02	J	1.20E-02	J	mg/kg	MTS-MP-SD-02-01	1/2	4.00E-02 - 4.00E-02	1.20E-02	NA	2.00E+01	N	NA	NYDEP	No	BSL

(1) Minimum/maximum detected concentration.
(2) Maximum concentration used as screening value.
(3) Background values are not included as part of the COPC selection process.

(4) USEPA Region IX Preliminary Remediation Goals (PRGs) Table, USEPA, December 2004. For non-carcinogens, value shown is equal to 1/10 the residential soil PRG value. For carcinogens the value shown is equal to the residential soil PRG value. To account for sediment exposures, the resulting values have been increased by a factor of ten.

(5) Rationale Codes
Selection Reason: ASL = Above Screening Toxicity Level
Deletion Reason: BSL = Below Screening Toxicity Level
NSL = No Screening Level
NUT = Essential Nutrient

Definitions: C = Carcinogenic
COPC = Chemical of Potential Concern
N = Non-Carcinogenic
NA = Not Applicable
mg/kg = milligram per kilogram

Data Qualifiers: J = Value is estimated.

TABLE 6-4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MALTA TEST STATION
SEDIMENT - INDUSTRIAL

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Malta Test Station

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration (2) Used for Screening	Background (3) Value	EPA Region IX PRG Screening (4) Value	Potential Screening Value	Potential Screening Source	COPC Flag	Rationale for (5) Contaminant Deletion or Selection
EXPLOSIVES																
98-95-3	NITROBENZENE	1.20E-02	J	1.20E-02	J	mg/kg	MTS-MP-SD-02-01	1/2	4.00E-02 - 4.00E-02	1.20E-02	NA	1.00E+02 N	NA	NA	No	BSL

(1) Minimum/maximum detected concentration.
(2) Maximum concentration used as screening value.
(3) Background values are not included as part of the COPC selection process.

(4) USEPA Region IX Preliminary Remediation Goals (PRGs) Table, USEPA, December 2004. For non-carcinogens, value shown is equal to 1/10 the industrial soil PRG value. For carcinogens the value shown is equal to the industrial soil PRG value. To account for sediment exposures, the resulting values have been increased by a factor of ten.

(5) Rationale Codes
Selection Reason: ASL = Above Screening Toxicity Level
Deletion Reason: BSL = Below Screening Toxicity Level
NSL = No Screening Level
NUT = Essential Nutrient

Definitions: C = Carcinogenic
COPC = Chemical of Potential Concern
N = Non-Carcinogenic
NA = Not Applicable
mg/kg = milligram per kilogram

Data Qualifiers: J = Value is estimated.

Table 6-5
Non-Detection Concentrations and Screening Values for Human Health at Malta Test Station

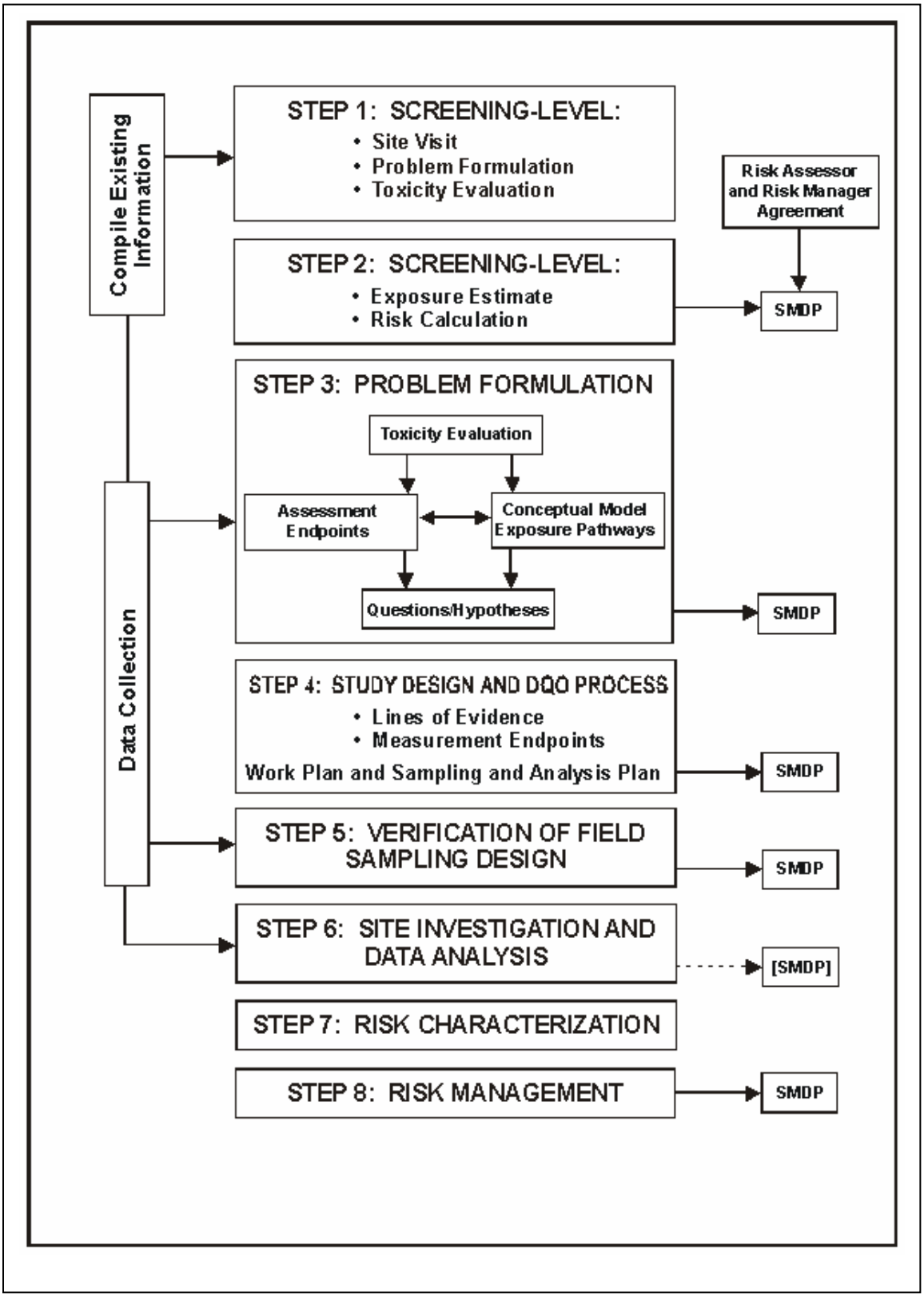
Analyte	Cas no.	Units	Minimum Non-Detect Concentration	Maximum Non-Detect Concentration	Screening [1] Value
Sediment					
Explosives					
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	0.04	0.04	1800
1,3-DINITROBENZENE	99-65-0	mg/kg	0.04	0.04	6.1
2,4-DINITROTOLUENE	121-14-2	mg/kg	0.04	0.04	7.2
2,6-DINITROTOLUENE	606-20-2	mg/kg	0.04	0.04	7.2
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	mg/kg	0.04	0.04	12
2-NITROTOLUENE	88-72-2	mg/kg	0.08	0.08	8.8
3-NITROTOLUENE	99-08-1	mg/kg	0.08	0.08	730
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	mg/kg	0.04	0.04	12
4-NITROTOLUENE	99-99-0	mg/kg	0.08	0.08	120
HMX	2691-41-0	mg/kg	0.08	0.08	3100
NITROGLYCERIN	55-63-0	mg/kg	4	4	350
PETN	78-11-5	mg/kg	0.2	0.2	NA
RDX	121-82-4	mg/kg	0.08	0.08	44
TETRYL	479-45-8	mg/kg	0.08	0.08	610
TNT	118-96-7	mg/kg	0.04	0.04	31
Surface Soil					
Explosives					
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	0.04	0.04	180
1,3-DINITROBENZENE	99-65-0	mg/kg	0.04	0.04	0.61
2,6-DINITROTOLUENE	606-20-2	mg/kg	0.04	0.04	0.72
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	mg/kg	0.04	0.04	1.2
2-NITROTOLUENE	88-72-2	mg/kg	0.08	0.08	0.88
3-NITROTOLUENE	99-08-1	mg/kg	0.08	0.08	73
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	mg/kg	0.04	0.04	1.2
4-NITROTOLUENE	99-99-0	mg/kg	0.08	0.08	12
HMX	2691-41-0	mg/kg	0.08	0.08	310
NITROGLYCERIN	55-63-0	mg/kg	4	4	35
PETN	78-11-5	mg/kg	0.2	0.2	NA
RDX	121-82-4	mg/kg	0.08	0.08	4.4
TETRYL	479-45-8	mg/kg	0.08	0.08	61
TNT	118-96-7	mg/kg	0.04	0.04	3.1
Groundwater					
Explosives					
1,3,5-TRINITROBENZENE	99-35-4	ug/L	0.21	0.21	110
1,3-DINITROBENZENE	99-65-0	ug/L	0.21	0.21	0.36
2,4-DINITROTOLUENE	**121-14-2**	**ug/L**	**0.21**	**0.21**	**0.099**
2,6-DINITROTOLUENE	**606-20-2**	**ug/L**	**0.21**	**0.21**	**0.099**
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	ug/L	0.21	0.21	0.73
2-NITROTOLUENE	**88-72-2**	**ug/L**	**0.42**	**0.42**	**0.049**
3-NITROTOLUENE	99-08-1	ug/L	0.42	0.42	12
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	ug/L	0.21	0.21	0.73
4-NITROTOLUENE	99-99-0	ug/L	0.42	0.42	0.66
HMX	2691-41-0	ug/L	0.42	0.42	180
NITROBENZENE	98-95-3	ug/L	0.21	0.21	0.34
NITROGLYCERIN	55-63-0	ug/L	21	21	4.8
PETN	78-11-5	ug/L	1.1	1.1	NA
RDX	121-82-4	ug/L	0.42	0.42	0.61
TETRYL	479-45-8	ug/L	0.42	0.42	36
TNT	**118-96-7**	**ug/L**	**0.21**	**0.21**	**1.8**

Table 6-5
Non-Detection Concentrations and Screening Values for Human Health at Malta Test Station

Analyte	Cas no.	Units	Minimum Non-Detect Concentration	Maximum Non-Detect Concentration	Screening [1] Value
Surface water					
Explosives					
1,3,5-TRINITROBENZENE	99-35-4	ug/L	0.21	0.21	1100
1,3-DINITROBENZENE	99-65-0	ug/L	0.21	0.21	3.6
2,4-DINITROTOLUENE	121-14-2	ug/L	0.21	0.21	0.99
2,6-DINITROTOLUENE	606-20-2	ug/L	0.21	0.21	0.99
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	ug/L	0.21	0.21	7.3
2-NITROTOLUENE	88-72-2	ug/L	0.42	0.42	0.49
3-NITROTOLUENE	99-08-1	ug/L	0.42	0.42	120
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	ug/L	0.21	0.21	7.3
4-NITROTOLUENE	99-99-0	ug/L	0.42	0.42	6.6
HMX	2691-41-0	ug/L	0.42	0.42	1800
NITROBENZENE	98-95-3	ug/L	0.21	0.21	3.4
NITROGLYCERIN	55-63-0	ug/L	21	21	48
PETN	78-11-5	ug/L	1.1	1.1	NA
RDX	121-82-4	ug/L	0.42	0.42	6.1
TETRYL	479-45-8	ug/L	0.42	0.42	360
TNT	118-96-7	ug/L	0.21	0.21	1.8

[1]USEPA Region IX Preliminary Remediation Goals (PRGs) Table, USEPA, December 2004. For non-carcinogens, value shown is equal to 1/10 the PRG value. For carcinogens the value shown is equal to the PRG value. To account for sediment and surface water exposures, the resulting values have been increased by a factor of ten.
NA - No screening value
mg/kg = milligram per kilogram
ug/kg = microgram per kilogram

FIGURE 6-1 THE USEPA EIGHT STEP ECOLOGICAL



RISK ASSESSMENT FOR SUPERFUND
(USACE 1997)

7. SUMMARY AND CONCLUSIONS

7.0.1 An SI was completed at Malta Test Station, Malta and Stillwater, NY, MMRP Project Number C02NY089802 in accordance in accordance with Engineer Regulation 200-3-1 (USACE 2004a), the DoD Management Guidance for DERP (Office of the Deputy Under Secretary of Defense [Installations and Environment] 2001), CERCLA, NCP, and the SS-WP (Alion 2006b). The goal of this SI was to determine if whether the site warrants further response action or NDAI.

7.1 MEC/MC Exposure of Receptors

7.1.1 As mentioned in Section 2-2, items have been previously found on the ground surface and in subsurface soil and would be easily accessible to receptors.

7.1.2 The final CSM diagram, as presented in Appendix J, includes the findings. Surface soil, subsurface soil, sediment, surface water, and groundwater were selected as potential exposure pathways within the MRS to be evaluated during the SI.

7.2 Release or Threatened Release of MEC/MC

7.2.1 MEC

7.2.1.1 Conventional munitions were used at the FUDS from 1945 to 1964. The site was used for a variety of rocket and weapons testing throughout its history. Interviews with the Site Manager and past employees of the Malta Test Station indicate that practice firing/testing of weapons occurred and that 105 mm ammunition boxes, 90 mm projectiles, 120 mm projectiles, 155 mm projectiles, black powder, bismuth and liquid propellants (HAN and OTTO) have been found in the area of the fuel storage magazines in the past.

7.2.1.2 During the December 2006 site visit the SI field team found a 120 mm projectile fin, 155 mm shells, and shell casings on the surface at Malta Test Station (Appendix E).

7.2.1.3 Based on site conditions, previous investigations, past use of the site as a weapons testing facility, and finding during the SI field work, MEC is likely to remain at the FUDS. The overall MEC risk is considered to be “low to moderate” .

7.2.1.4 For this MMRP SI, MC includes explosives. MC detections greater than screening levels (of which there were none) would be designated as COPC. Media of concern at the site which were evaluated for potential impact from MC included surface soil, subsurface soil, sediment, surface water, and groundwater. Samples were collected throughout the MRS in former impact and testing areas.

7.3 Exposure Analysis and Risk Assessment

7.3.1 Human Receptors

7.3.1.1 Current and future human receptors for both MC and MEC are expected to be employees that work at the Malta Test Station as described in the CSM diagram for MRS in Appendix J. The results of the screening level HHRA indicate that there are no explosives of potential concern at the Malta Test Station.

7.3.2 Ecological Receptors

7.3.2.1 The former Malta Test Station does not constitute an important ecological place, is not to be managed for ecological resources now or in the future, and does not impose widespread lethal impacts for plants and animals. Consequently, the USACE (2006) MMRP guidelines indicate that the performance of a SLERA is not required for this site.

8. RECOMMENDATIONS

8.0.1 The Malta Test Station FUDS includes one identified MRS.

8.0.2 The following SI recommendations are based on the findings, conclusions for this MRS:

- **NDAI for MC.** This recommendation is based on identified acceptable levels of risk from MC explosives to human health. Malta does not constitute an important ecological place, is not to be managed for ecological resources now or in the future, and does not impose widespread lethal impacts for plants and animal; therefore a SLERA was not performed in this SI and risks to ecological receptors are not anticipated.
- **RI/FS for MEC.** This recommendation is based on the presence of MD and the potential for MEC to remain at the FUDS.
- **TCRA/NTCRA:** Neither a TCRA/NTCRA is recommended.
- **Potential PRP Project.** It is FUDS policy not to perform response actions at PRP sites (USACE 2007a). Based on the analysis results and the QR conducted, further investigation is recommended as a MMRP PRP project.

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APPENDIX A - SCOPE OF WORK

Located on CD.

APPENDIX B - TPP MEMORANDUM

- TPP Memorandum #1 and #2 (Located on CD)
- DQO Verification Worksheets

Data Quality Objective Verification Worksheet			
Site: Fort Tilden			
Project: FUDS MMRP SI Project Number **C02NY001604**			
DQO Statement Number: **1 of 4**			
DQO Element Description	**Site-Specific DQO Statement**	**Attained?**	**Required Corrective Action**
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).	Yes__X__ No ____	
Data Needs Requirements:			
Data User Perspective(s)	Risk-MEC and MC, Compliance	Yes__X__ No ____	
Contaminant or Characteristic of Interest	MEC or Material Potentially Presenting an Explosive Hazard (MPPEH) and MC.	Yes__X__ No ____	
Media of Interest	MEC –Surface soil. MC – Surface soil and subsurface soil.	Yes__X__ No ____	
Required Sampling Locations or Areas	MEC and MC: Areas where military munition-related operations occurred and/or where MEC or MPPEH has been identified historically based on existing documentation and interviews.	Yes__X__ No ____	

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 and the area around the sampling locations is approximately 33,960 m^2 (see Appendix A, Figure 7). MC - Sampling to include: 7 surface soil, 3 subsurface soil, and 5 background.		
Reference Concentration of Interest or Other Performance Criteria		Yes__X__ No ____	
Appropriate Sampling and Analysis Methods:			

Sampling Method and Depths	MEC: Geophysics with a handheld analog magnetometer, which will 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 used as an additional documentation method. Geophysical methods/procedures are 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 are described in detail in Section 4 of the S-SWP, and Field Activities section of the PFSP.	Yes__X__ No ____	
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 Baltimore District Design Center, and USACE Center of Expertise. MC: The following analytical methods are proposed: Explosives Methods - SW8330A, SW8330M; Explosives Prep Methods – SW8330A; Metals Prep Method – 3050B/3050M.		

Data Quality Objective Verification Worksheet			
Site: Malta Test Station			
Project: FUDS MMRP SI Project Number **C02NY089802**			
DQO Statement Number: **2 of 4**			
DQO Element Description	**Site-Specific DQO Statement**	**Attained?**	**Required Corrective Action**
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.	Yes__X__ No ____	
Data Needs Requirements:			
Data User Perspective(s)	Risk-MEC/MC, Compliance	Yes__X__ No ____	
Contaminant or Characteristic of Interest	MEC and/or MC in the surface/subsurface	Yes__X__ No ____	
Media of Interest	Surface soil, subsurface soil, sediment, surface water and groundwater.	Yes__X__ No ____	
Required Sampling Locations or Areas	Areas where military munitions-related operations occurred and/or where MEC or MPPEH has been identified historically based on existing documentation and interviews.	Yes__X__ No ____	
Number of Samples Required	Refer to DQO 1 for MC/MEC sampling parameters.	Yes__X___ No _____	
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, 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 stakeholde	Yes__X__ No ____	
Appropriate Sampling and Analysis Methods:			
Sampling Method and Depths	MEC: Geophysical methods/procedures are 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 are described in detail in Section 4 of the S-SWP, and Field Activities section of the PFSP	Yes__X__ No ____	
Analytical Method	Refer to DQO 1 for MEC and MC analytical methods to be incorporated.	Yes__X__ No ____	

Data Quality Objective Verification Worksheet			
Site: Malta Test Station			
Project: FUDS MMRP SI Project Number **C02NY089802**			
DQO Statement Number: **3 of 4**			
DQO Element Description	**Site-Specific DQO Statement**	**Attained?**	**Required Corrective Action**
Intended Data Use(s):			
Project Objective(s) Satisfied	Collect, or develop, additional data, as appropriate, for Hazard Ranking System (HRS) scoring by Environmental Protection Agency (EPA).	Yes__X__ No ____	
Data Needs Requirements:			
Data User Perspective(s)	Risk-MC, Compliance.	Yes__X__ No ____	
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.	Yes__X__ No ____	
Media of Interest	Surface soil, subsurface soil, sediment, surface water and groundwater.	Yes__X__ No ____	
Required Sampling Locations or Areas	Areas where MEC has been historically found, used, or disposed as documented in interviews or existing documentation.	Yes__X__ No ____	
Number of Samples Required	Refer to DQO 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).	Yes__X__ No ____	
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 National Priorities List (NPL) Characteristics Data Collection Form, Version 3.0 (EPA 2001).	Yes__X__ No ____	
Analytical Method	Refer to DQOs 1and 2 for associated methods.		

Data Quality Objective Verification Worksheet			
Site: Malta Test Station			
Project: FUDS MMRP SI Project Number **C02NY089802**			
DQO Statement Number: **4 of 4**			
DQO Element Description	**Site-Specific DQO Statement**	**Attained?**	**Required Corrective Action**
Intended Data Use(s):			
Project Objective(s) Satisfied	Collect the additional data necessary to the complete the Munitions Response Site Prioritization Protocol (MRSPP).	Yes__X__ No ____	
Data Needs Requirements:			
Data User Perspective(s)	Risk-MEC and MC, Compliance	Yes__X__ No ____	
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.	Yes__X__ No ____	
Media of Interest	Surface soil, subsurface soil, sediment, surface water and groundwater.	Yes__X__ No ____	
Required Sampling Locations or Areas	Areas where MEC has been identified historically and where sampling is recommended.	Yes__X__ No ____	
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.	Yes__X__ No ____	
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).	Yes__X__ No ____	
Analytical Method	Refer to DQOs 1and 2 for associated methods.		

APPENDIX C - INTERVIEW DOCUMENTATION

- Mr Kazyaka 2006
- Mr Carr 2007

ALION
SCIENCE AND TECHNOLOGY

COMMUNICATIONS RECORD FORM

Date: 5/04/06

Contract Number:W912DY-04-D-0017

Delivery Order #: 00170001

Distribution: SIs MMRP - MALTA

Person Contacted: Mr. Ray Kazyaka

Affiliation: Previously employed by Wright Malta Corp., former site owner/operator

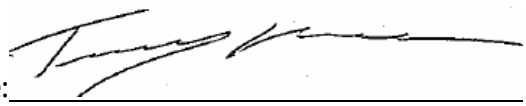
Address: Malta, NY

Type of Contact: Phone (518) 396-0749

Person Making Contact: Nikki Auth

Communications Summary: Alion contacted Mr. Kazyaka with intent to utilize his knowledge of the Mata Test Station. Mr. Kazyaka was on the trip visit in February of 2006 and helped to create the Luther Forest Technology *Potential Impact Areas* map given to us by Greg Goepfert. Clarification was needed on the areas that were circled and labeled as potential ordnance areas, as well as locations for the firing range, firing range pond, 120 mm round found, and the tower (locations that were photographed during the site visit).

Mr. Kazyaka was successful in helping to specify where the pond, firing range, round and tower were found. He also stated that there were various places throughout the site in those areas of concern that 155mm and 30 mm rounds were fired. Small mounds/hills were used to be fired into and in some cases concrete stops were built for impact. These areas were identified on map. According to Mr. Kazyaka, the magazines found onsite are all empty but were used for storage of powder and/or igniters.

Signature: 

ALION
SCIENCE AND TECHNOLOGY

COMMUNICATIONS RECORD FORM

Date: September 7, 2007

Contract Number:W912DY-04-D-0017

Delivery Order #: 00170001

Distribution: SIs MMRP

Person Contacted: Stu Carr, UXO Technician III, Alion

Affiliation: Alion

Type of Contact: Telephone Conversation

Person Making Contact: Rusty Mitchell, Alion, Safety/Quality Manager and Senior UXO Technician

Communications Summary:

Based on a telephone conversation between the Alion Team (Corinne Shia and Tim Reese) and USACE New York District Project Manager (Gregory J. Goepfert) on September 7, 2007, Alion was requested to contact Stu Carr, the UXO Technician present during the initial TPP Meeting (May 23, 2006) and for the field work (December 17-18, 2006) to classify the munitions potentially presenting an explosive hazard (MMPEH). During the site walk after the TPP meeting, MMPEH was found (an empty 60 mm mortar and 120 mm mortar fin assembly) partially buried on the road near the firing range pond area. The 120 mm mortar fin assembly also was observed during the field work.

MMPEH is inspected and classified only by a UXO Technician II/III as either:

- Unexploded ordnance (UXO)
- Discarded military munitions (DMM)
- MC (explosive concentrations)
- Munitions Debris (MD)
- Range-related Debris
- Cultural Debris.

Mr. Curtis "Rusty" Mitchell, Alion's Safety/Quality Manager and Senior UXO Technician, contacted Mr. Carr on September 7, 2007 to determine the classification of the MMPEH. Mr. Carr, UXO Technician III, indicated that both items were MD.

Signature: 



60 mm Mortar

Signature: _____



Photo E.4 – Fin of 120 mm projectile found in the Firing Range area.

Signature: _____

APPENDIX D - FIELD NOTES AND FIELD FORMS

- Daily Quality Control Reports
- Calibration Sheets
- Chain for Custody (s)
- Logbook

Alion Science and Technology, Inc.

DAILY QUALITY CONTROL REPORT

Report Number:	01-12-18-06	**Date:** 12/18/06	
Project Name:	Malta Test Station C02NY089801	**Contract Number:** W912DY-04-D-0017	
Location of Work:	Malta, NY		
Description of Work: Conduct a Site Inspection of the Malta Test Station by collecting environmental samples, performing reconnaissance, photographing, etc.			
Weather: Clear	**Rainfall:** None	**Temperature:** **Min.** 30 F	**Max.** 35 F

1. Work performed today by Alion Team.

- Conducted H&S briefing and provided H&S oversight

-Provided MEC avoidance support during sampling

-Recorded anomaly counts/locations/descriptions during meandering path to sampling locations

-Sample collection

Reconnaissance Acreage / Discussion:

Meandering path reconnaissance was completed around sampling areas and through the utilities right of way. The reader is referred to the planned recon maps in the SS-WP. Anomaly hits in the right of way area were attributed to underground utilities and storage tanks. The field team found the fin of a suspect 120 mm projectile, suspect 155 mm shells (reportedly practice), and suspect MD in the former Range Pond area of the site.

Samples Collected:

Samples collected: MTS-JL-SS-02-01, MTS-TS-SS-02-01, MTS-FT-SS-02-01, MTS-FT-SS-02-02, MTS-MP-SW-00-01, MTS-MP-SD-02-01, MTS-CP-SS-02-01, MTS-SM-SS-02-01, MTS-DD-SW-00-01, MTS-DD-SD-02-01, MTS-PT-SS-02-01, MTS-TP-SB-10-01, MTS-RP-SS-02-02, MTS-RP-SS-02-03, MTS-RP-SB-10-01, MTS-GS-SS-02-01, MTS-PS-SS-02-01

Note: Field Duplicate samples were collected at MTS-TP-SB-10-01, MTS-RP-SS-02-02, and MTS-DD-SW-00-01.

Field samples were picked up at EA by GPL Labs on 12/21/06.

Sample MTS-DD-SW-00-01 was relocated to an old cooling pond due to lack of water in drainage ditches.

Samples were relocated (within the areas designated in the SS-WP) in the field to locations most likely to contain MC (as per site manager). Samples designated as subsurface samples were collected at the surface due to site conditions and the relocation of subsurface samples to the former Range Pond Area (site manager indicated that the locations presented in the SS-WP were not likely impacted).

Field Tests:

Schonstedt checked ok.

Trimble-Benchmark (Surveyed point outside Malta Test Station)checked/confirmed to be within 1 meter.

YSI Readings for surface water sample MTS-MP-SW-00-01

T = 4.82 °C, pH =6.50, turbidity = -6.9 NTU, conductivity = 0.223 mS/cm.
YSI Readings for surface water sample MTS-DD-SW-00-01
T = 5.56 °C, pH =7.01, turbidity = -4.4 NTU, conductivity = 0.027 mS/cm.
Calibration of Instruments:
YSI Calibration Info (parameter) initial/final
pH – (4.0) 3.94/4.00; (7.0) 6.94/7.0
Conductivity – (1.409) 1.401/1.409
Turbidity – (0) 10.0/0.0; (100) 98.5/101.3
Other: PID- Isobutylene 100ppm- calibrated
2. 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)
All preparatory phase inspections for field work were completed prior to mobilizing to Malta Test Station. Initial
phase inspections were completed upon arrival at Malta Test Station. No additional follow-on inspections were
completed. Satisfactory work completed.
3. List type and location of tests performed and results of these tests. None
4. List material and equipment received.
None. All material/equipment already mobilized.
5. Submittals reviewed. (Include Transmittal No., Item No., Spec/Plan Reference, by whom, and any action.
None.
6. Off-site surveillance activities, including action taken.
None.
7. Job Safety. (Report safety violations observed and actions taken)
No safety violations observed. Safety orientation and briefing conducted prior to fieldwork.
8. Remarks. (Instructions received or given. Conflicts in Plans or Specifications)
Field Team: Katie Drewett, Garth Hoxsie-Quinn, Tim Reese, Mike Shoop
Note: Ray Kazyak (Site Manager), Paul Greene (USACE-Baltimore), and Gregory Goepfert (USACE-New York) accompanied the field team.

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.



Curtis Mitchell
Quality Control System Manager

Alion Science and Technology, Inc.

DAILY QUALITY CONTROL REPORT

Report Number:	02-12-19-06	**Date:** 12/19/06	
Project Name:	Malta Test Station C02NY089801	**Contract Number:** W912DY-04-D-0017	
Location of Work:	Malta, NY		
Description of Work: Conduct a Site Inspection of the Malta Test Station by collecting environmental samples, performing reconnaissance, photographing, etc.			
Weather: Clear	**Rainfall:** None	**Temperature:** **Min.** 25 F	**Max.** 30F

1. Work performed today by Alion Team.

- Conducted H&S briefing and provided H&S oversight

-Provided MEC avoidance support during sampling

-Recorded anomaly counts/locations/descriptions during meandering path to sampling locations

-Sample collection

Reconnaissance Acreage / Discussion:

Meandering path reconnaissance was completed around sampling areas and through the utilities right of way.

The reader is referred to the planned recon maps in the SS-WP. Anomaly hits in the right of way area were attributed to underground utilities and storage tanks.

Samples Collected:

Samples collected: MTS-FT-GW-38-01, MTS-RP-SS-02-01, MTS-RP-GW-33-01, MTS-MP-GW-25-01

Note: QA Split samples were collected at MTS-RP-SS-02-01, MTS-RP-GW-33-01, and MTS-MP-GW-25-01

QA split samples were shipped to STL Labs on 12/19/06

All sampling completed today.

Field Tests:

Schonstedt checked ok.

Trimble-Benchmark (Surveyed point outside Malta Test Station)checked/confirmed to be within 1 meter.

YSI Readings groundwater sample MTS-FT-GW-38-01

T = 7.13 °C, pH =6.59, turbidity = 1710.4 NTU, conductivity = 0.649 mS/cm.

YSI Readings for surface water sample MTS-MP-GW-25-01

T = 7.33 °C, pH =7.77, turbidity = 1711.8 NTU, conductivity = 0.206 mS/cm.

YSI Readings for surface water sample MTS-RP-GW-33-01

T = 8.74 °C, pH =7.46, turbidity = 1713.2 NTU, conductivity = 0.600 mS/cm.

Calibration of Instruments:
YSI Calibration Info (parameter) initial/final
pH – (4.0) 4.07/3.98; (7.0) 6.87/7.01
Conductivity – (1.409) 1.406/1.409
Turbidity – (0) -10.0/0.2; (100) 108.0/100.0
Other: PID- Isobutylene 100ppm- calibrated
2. 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)
All preparatory phase inspections for field work were completed prior to mobilizing to the Malta Test Station.
Initial phase inspections were completed upon arrival at the Malta Test Station.
No additional follow-on inspections were completed. Satisfactory work completed.
3. List type and location of tests performed and results of these tests.
None.
4. List material and equipment received.
None. All material/equipment already mobilized.
5. Submittals reviewed. (Include Transmittal No., Item No., Spec/Plan Reference, by whom, and any action.
None.
6. Off-site surveillance activities, including action taken.
None.
7. Job Safety. (Report safety violations observed and actions taken)
No safety violations observed. Safety orientation and briefing conducted prior to fieldwork.
8. Remarks. (Instructions received or given. Conflicts in Plans or Specifications)
Field Team: Katie Drewett, Garth Hoxsie-Quinn, Mike Shoop, Stuart Carr
Note: Ray Kazyak (Site Manager) accompanied the field team.

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.



Curtis Mitchell
Quality Control System Manager

ZEBRA

DAILY PROJECT REPORT

Project Day & Date 12/19/06 (TUES)

ZEBRA Office ALBANY Crew Base ALBANY Z# _____ ZEBRA Unit #/Type #9

CLIENT / OFFICE EA Client Project # _____

PROJECT NAME ALION

PROJECT LOCATION MALTA, NEW YORK

Client PM: _____ Client Site Contact: TIM REESE

ZEBRA PERSONNEL ON SITE:

Name/Company	Start	Arrive	Leave	Finish	Total Site Time	OT	Client Init.
WILLIAM MCALLISTER / ZEBRA		9:00A		1:00P			
KIRK SHOEN / ZEBRA		9:00A		1:00P			
Other Personnel On Site:							

Description of Work (detailed):

GROUND WATER SAMPLING @ (3) THREE LOCATIONS
Pt 1 28'-32' BG
Pt 2 12'-16' BG
Pt 3 24'-28' BG

APP. DGW:

MATERIALS	QTY. USED	UNIT	EQUIPMENT	
MC Liners		Liners	Drill Steel	
LB Liners		Liners	Core Drill	
_____ Expendable Points		Points	Generator	
_____" x 5' PVC Screen		PC's	GS 1000/2000 Grout Pump	
_____" x 5' PVC Riser		PC's	Steam Genny	
_____ PVC points		Points	Rupe Pump	
_____ Flush Mount Well Box		Boxes	Water Level Indicator	
			P.I.D.	
			Trailer (Decon/Utility)	

Probe Tools Damaged / Lost:

Number of Points	Number of Samples	Soil MC	Soil LB	GW	Wells Installed	Soil Gas	Sparge Points	Misc.
3				3				

Field Verification:

ZEBRA: _____ CLIENT: (Print) _____

(Sign) _____

FIELD CALIBRATION FORM - YSI

(pH, CONDUCTIVITY, TURBIDITY)

Site Name: Malta Test Station MMRP SI

CALIBRATION
DATE: 12/19/06
TIME: 0950
METER ID:

pH CALIBRATION

pH STANDARD	INITIAL READING	FINAL READING
4.0	4.07	3.98
7.0	6.87	7.01

CONDUCTIVITY CALIBARATION

CONDUCTIVITY STANDARD	STANDARD READING	FINAL READING
1.409	1.406	1.409

TURBIDITY CALIBRATION

STANDARD	INITIAL READING	FINAL READING
0 NTU	-10.0	0.2
100 NTU	108.0	100

FIELD CALIBRATION FORM (continued) - YSI

COMMENTS

Problems were encountered Calibrating the turbidity

SIGNATURE _____

PID AND CGI CALIBRATION LOG

Site Name: Malta Test Facility MMRP-SI

INSTRUMENT:	INSTRUMENT ID No:
OPERATOR: Garth Hoxsie Quinn	WEATHER: Clear/cold
SPAN GAS TYPE: Isobutylene	DATE: 12/18/06
CALIBRATION NOTES:	
100ppm	
COMMENTS: Calibrated with no problems	
SIGNATURE:	DATE 12/18/06

FIELD CALIBRATION FORM - YSI

(pH, CONDUCTIVITY, TURBIDITY)

Site Name: Malta Test Station MMRP SI

CALIBRATION
DATE: 12/18/06
TIME: 0800
METER ID:

pH CALIBRATION

pH STANDARD	INITIAL READING	FINAL READING
4.0	3.94	4.00
7.0	6.94	7.00

CONDUCTIVITY CALIBARATION

CONDUCTIVITY STANDARD	STANDARD READING	FINAL READING
1.409 ms/cm	1.401	1.409

TURBIDITY CALIBRATION

STANDARD	INITIAL READING	FINAL READING
0 NTU	10.0	0
100 NTU	98.5	101.3

FIELD CALIBRATION FORM (continued) - YSI

COMMENTS

ORP calibration was also done though it would not easily calibrate. Initial Reading was 264. Slowly it stabilized @ 235.0. Turbidity was also difficult to stabalize

SIGNATURE _____

GPL LABORATORIES, LLLP

7210A Corporate Court
Frederick, MD 21703
(301) 694-5310
Fax (301) 620-0731

Contract #/Billing Reference

1 of 2 Pgs.

Project: CO2N089801 / Malta Test Station
Client: Alion
Send Results To: Corinne Shia
Address: 3975 Fair Ridge Drive Suite 125 S
Fairfax, VA 22033
Phone: 703-529-5147

Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Explosives 8330A/8330A	PETN 8330M/8330M	N6 8330A (mod)/8330A (mod)	Lab Cooler No. / CLIENT COMMENTS
Turnaround Time					Stnd →			
# of Containers					2/3 →			
Container Type					8oz jar 1L amber →			
Preservative Used					None →			
MTS-JL-SS-02-01	12/18/06	1055	SS	GH	X	X	X	
MTS-PS-SS-02-01	12/18/06	1115	SS	GH	X	X	X	
MTS-SM-SS-02-01	12/18/06	1145	SS	GH	X	X	X	
MTS-CP-SS-02-01	12/18/06	1200	SS	GH	X	X	X	
MTS-FT-SS-02-01	12/18/06	1230	SS	GH	X	X	X	
MTS-FT-SS-02-02	12/18/06	1240	SS	GH	X	X	X	
MTS-TS-SS-02-01	12/18/06	1250	SS	GH	X	X	X	
MTS-DD-SD-02-01	12/18/06	1305	SD	GH	X	X	X	
MTS-MP-SW-00-01	12/18/06	1330	SW	GH	X	X	X	
MTS-MP-SD-02-01	12/18/06	1340	SD	GH	X	X	X	
MTS-PT-SS-02-01	12/18/06	1400	SS	GH	X	X	X	
MTS-TP-SB-10-01	12/18/06	1430	SS	GH	X	X	X	

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
Heather Burnett	12/21/06 1000				

Relinquished By:	Date/Time	Received By:	Date/Time	Shipper:	Airbill No.:

Relinquished By:	Date/Time	Received By:	Lab Comments:	Temp:

G.P. W.O. _____

GPL LABORATORIES, LLLP

7210A Corporate Court
Frederick, MD 21703
(301) 694-5310
Fax (301) 620-0731

Contract #/Billing Reference

2 of 2 Pgs.

Project: CO2N4089801/Malta Test Station
Client: Alion
Send Results To: Corinne Shia
Address: 3975 Fair Ridge Drive suite1255
Fairfax, VA 22033
Phone: 703-529-5747

Turnaround Time: Std
# of Containers: 8oz jar (Amber)
Container Type: 2, 3
Preservative Used: None
Type of Analysis: Explosives 8330A/8330A; PETN 8330M; 8330M; NG 8330A (mod); 8330A (mod)

Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Explosives 8330A/8330A	PETN 8330M	8330M NG 8330A (mod)	8330A (mod)	Lab Cooler No.	CLIENT COMMENTS
MTS-RP-SS-02-02	12/18/06	1455	SS	GH	X	X	X			
MTS-RP-SS-02-03	12/18/06	1505	SS	GH	X	X	X			
MTS-RP-SB-10-01	12/18/06	1515	SS	GH	X	X	X			
MTS-DD-SW-00-01	12/18/06	1540	SW	GH	X	X	X			
MTS-GS-SS-02-01	12/18/06	1605	SS	GH	X	X	X			
MTS-FT-GW-38-01	12/19/06	1030	GW	GH	X	X	X			
MTS-MP-GW-25-01	12/19/06	1105	GW	GH	X	X	X			
MTS-RP-GW-33-01	12/19/06	1200	GW	GH	X	X	X			
MTS-RP-SS-02-01	12/19/06	1250	SS	GH	X	X	X			
FD #1	12/18/06	-	SS	-	X	X	X			
FD #2	12/18/06	-	SS	-	X	X	X			
FD #3	12/18/06	-	SW	-	X	X	X			

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
Matthew Brunt	12/21/06 1000				

Relinquished By:	Date/Time	Received By:	Date/Time	Shipper:	Airbill No.:

Relinquished By:	Date/Time	Received By:	Lab Comments:	Temp:

G.P. W.O. _____

STL Denver
4955 Yarrow Street

Arvada, CO 80002
phone 303-736-0100 fax 303-431-7171

Chain of Custody Record

SEVERN TRENT STL

Severn Trent Laboratories, Inc.

Client Contact	Project Manager: Corinne Shia	Site Contact: Lyn Benkers	Date: 12/19/06	COC No:
Alion Science & Technology	Tel/Fax: 703-259-5147	Lab Contact:	Carrier:	1 of 1 COCs
3975 Fair Ridge Drive, Suite 125S	**Analysis Turnaround Time**			Job No. CO2N4089801
Fairfax, VA 22033	Calendar (C) or Work Days (W) Stnd			
703-259-5147 Phone	TAT if different from Below ____			
703-259-5212 FAX	☐ 2 weeks			SDG No.
Project Name: MMRP FUDS 51	☐ 1 week			
Site: Malta Test Station CO2N4089801	☐ 2 days			
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Explosives 8330A+PETN+NG														Sample Specific Notes:
MTS-MP-GW-25-01-QA	12/19/06	1105	Grab	GW	3		X														
MTS-RP-GW-33-01-QA	↓	1200	↓	GW	3		X														
MTS-RP-SS-02-01-QA	↓	1250	Comp	SS	2		X														

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other ____

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	EA Engineering	12/19/1800			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

ACCIDENT PREVENTION PLAN REVIEW RECORD

SITE: _Malta and Stillwater, NY _____

Project No.____ 6202303.0034_____

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
Katie Drewett		EA / Alion Team	12/18/06
Tim Reese		EA/Alion Team	12/18/06
Mike Shoop		HFA/Alion Team	12/18/06
Paul Greene		CENAB	12/18/06
[illegible]		EA/ Alion Team	12/18/06
Stu Carr		HFA	12/18/06
Will Manchester		Zebra	12/18/06
Kirk Shorn		Zebra	12/19/06
GREGORY J. GOEPFERT		U.S. ARMY CORPS OF ENGINEERS	12/19/06

Site Entry and Exit Log

SITE: _Malta and Stillwater, NY _____
Project No.____ 6202303.0034_____

Date	Name	Representing	Time In	Time Out
12/18/06	Katie Drewett	EA	0930	1630
12/18/06	Garth Haxsie Sr.	EA	0930	1630
12/18/06	Tim Reese	EA	0930	1630
12/18/06	Mike Shoop	HPA/Alion	0930	1630
12/18/06	Paul Greene	USACE	0930	1630
12/19/06	Katie Drewett	EA	0845	1330
12/19/06	Kirk Sharpe	EA	0850	1300
12/19/06	Mel McAllister	ZEBRA	0850	1300
12/19/06	GREGORY GOEFFERT	US ARMY CORPS OF ENG	850	1100
12/19/06	Garth Haxsie Sr	EA	0845	1330
12/19/06	Mike Shoop	HPA/Alion	0900	1330
12/19/06	Stu Carr	HPA/Alion	0845	1330

"Rite in the Rain®"
ALL-WEATHER WRITING PAPER

ALL-WEATHER

ENVIRONMENTAL FIELD BOOK

Name Katie Drewett

Address 15 Laveton Circle
Sparks, MD 21152

Phone 410-771-4950

Project Malta Test Station
C02N4089801
MMRP FUDS
QC Review By:

This book is printed on "Rite in the Rain" All-Weather Writing Paper - A unique paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather. For best results, use a pencil or an all-weather pen.

Specifications for this book:

Page Pattern		Cover Options	
Left Page	Right Page	Polydura Cover	Fabrikoid Cover
Columnar	1/4" Grid	Item No. 550	Item No. 550F

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148 Sampling guidelines (Liquids)
149 Sampling guidelines (Solids)
150 Approximate Volume of Water in Casing or Hole, Ground Water Monitoring Well
151 PVC Pipe casing tables
152 Soil Classification
153 Soil Classification
154 Conversions (Length, Weight, Volume, Temp, etc...)
155 Conversions (Concentrations, Volume/Flow or Time, Velocity, Acceleration)
156 Maximum Concentration of Contaminants for the Toxicity Characteristic

Location Malta Test Station, NY Date 12/18/06

Project / Client CO2N408980I USACE/Alion

Sunny 40°

0800 Calibrate PID
Calibrate YSI
See field calibration forms for YSI calibration and PID calibration
ORP was not easily calibrated & Turbidity was difficult to stabilize

0930 Meet at Site
Field Team included:
Paul Greene
Mike Shoop
Tim Reese
Ray Kazyaka
Katie Drewett
Garth Hovis-Quinn
Greg Goepfert

1015 Benchmark GPS
(use a survey point off access road)
EOR point ① N 150 7282.5223 E 687773.3324
② N 150 7005.5258 E 688057.6078
Runway ② N 475 [illegible]80.62 E 600402.37 M

Location Malta Test Station, NY Date 12/18/06

Project / Client CO2N408980I USACE/Alion

Sunny 40°

1030 Paul and Mike Clear Western right of way for utilities
Find some anomalies
Collect surface soil sampling

1055 MTS-SL-SS-02-01
4757549.37N 601167.94
16 waypoint
Brown Med Fine Sand
Anomalies noted in area due to buried utilities

1115 Collect surface Soil Sample
MTS-PS-SS-02-01
4757505.64N 601308.09E
waypoint 17
At former magazine location stored stuff for police department historically
Dark grey silty sand w/ gravel
Collect X spray at magazine
Nothing turned up

Location Malta Test Station, NY Date 12/18/06

Project / Client CO2N4089801 USACE/Alion

Sunny 40°

1145 Collect surface soil sample
MTS-SM-SS-02-01
4757121.88N 601431.45E
Collected in drainage ditch
in front of Former Magazines
(fuel storage Magazines)
Medium-fine sand w/some
organics
Waypoint 18

1200 Collect surface soil sample
MTS-OP-SS-02-01
4757215.28N 601374.96
Waypoint 19
Collect in front of hole where
test projectiles come out and
were shot into sandy berm
Frag found in area
155 mm found
* 4757213 601388 [illegible]
Fine silty sand soil orange hue

1230 Collect surface soil sample
MTS-FT-SS-02-01
Waypoint 20
4757209.39N 601250.31E
Fine silty sandy soil
collected at low lying at
base of hill

Location Malta Test Station, NY Date 12/18/06

Project / Client CO2N4089801 USACE/Alion

Sunny 40°

1240 Collect surface soil sample
MTS-FT-SS-02-02
4757216.01N 601250.26E
Waypoint 21
Fine silty sandy soil w/ orange
hue and organics

1250 Collect surface soil sample
MTS-TS-SS-02-01
4757308.00N 601269.19E
Collect in sand pit where
30mm sub were tested (stop for projectile)
Waypoint 22
Medium sand w/ some silt
orange brown color

1305 Collect [illegible] sediment sample
MTS-DD-SD-02-01
4757373.93N 601338.97E
Collect at bottom of drainage
ditch / moist sediment
Dark brown medium fine sand
w/ silt
Waypoint 23

Location Malta Test Station, NY Date 12/18/06

Project / Client CO2NY089801 USACE/Alion

Sunny 40°

1330 Collect Surface Water Sample
MTS-MP-SW-00-01
4757482.03N 601400.55E
Temp 4.82°C
spCond 0.223 mS/cm
DO 5.22 M/L
PH 6.50
ORP 149.5
Turb -6.9 NTU
Waypoint 24
Collected at edge of Muggetts pond

1340 Collect discrete sediment Sample
MTS-MP-SD-02-01
4757482.03N 601400.55E
Waypoint 25
Collect at edge of Muggetts pond.
Sandy silt / Dark brown

1345 Site geoprobe location Waypoint 30

1400 Collect discrete soil sample
MTS-PT-SS-02-01
Waypoint 27
Collect sample in pit 5 under covered area
Med Sand

Location Malta Test Station, NY Date 12/18/06

Project / Client CO2NY089801 USACE/Alion

Sunny 40°

1400 - Contd
4757475.22N 601469.65E

1430 Collect surface Soil Sample
MTS-TP-SB-10-01
*Collect FD#1 here Waypoint 31
4757487.34N 601459.45E
clayey Medium sand collected in front of sand pit in Range area
Found fin of 120mm projectile Fin Assembly

1445 Collect surface soil sample
MTS-RP-SS-02-01
Waypoint 32
Collect from sand pits in test area
4757588.22N 601458.44E
Silty sand.

1450 Find a 155 and various other in the RP and sand pit test area & Casings
4757609.43N 601420.94E

1455 Collect Surface Soil sample
MTS-RP-SS-02-02
Waypoint 33
Collect FD#2 here
4757605.14N 601418.57E

8

Location Malta Test Station, NY Date 12/18/06

Project / Client C02N4089801 USACE/Alion

Sunny 40°F

1455 Collect in RP Sand Pit
Medium sand orange brown
moist

1505 Collect surface soil sample
MTS-RP-SS-02-03
4757598.84N 601415.33E
Waypoint 35
light brown brown fine→Medium
sand
Collect from covered area

1515 Collect Surface Soil sample
MTS-RP-SB-10-01
Changed to surface soil instead of
subsurface
4757605.92N 601389.56E
Light brown Medium fine sand

1540 Collect Surface Water Samples
MTS-DO-SW-00-01
YSI Readings
Temp 5.56 °C
Cond .027 mS/cm
DO 12.09 mg/L
PH 7.01
OR 113.4
Turb -4.4 NTU

9

Location Malta Test Station, NY Date 12/18/06

Project / Client C02N4089801 USACE/Alion

Sunny 40°F

Collect at edge of cooling
pond. Sample relocated due
to lack of water in drainage
ditches
4757735.50N 601157.92E
Collect FD#3 here
Waypoint 37

1605 Collect surface soil Sample
MTS-ES-SS-02-01
4757696.55N 601560.55E
Silty sand greenish brown
Waypoint 38
Collected near magazine

Not | Used

Location Malta Test Station, NY Date 12/19/06

Project / Client C02N4089801 USACE/Alion

Sunny 32°F

0800 Meet in hotel lobby discuss plan for day, fill out sampling labels

0835 Arrive on site

0840 Benchmark GPS

@ 4757926.07N 600465.91E

@ 4758008.38N 600377.75E

0900 GeoProbers arrive on site

910 4757471.55 N 601248.97 E

Locate USTs (Underground Storage Tanks) for GPR with GPS

0930 Geoprobe begins to push well for MTS-FT-GW-38-01 GW Sample

0940 Equipment blank collected here

0950 Calibrate YSI See field calibration form

1000 began purging water ≈ 28' Depth ≈ 32-38'

YSI Calibration Readings

Location Malta Test Station, NY Date 12/19/06

Project / Client C02N4089801 USACE/Alion

Sunny 32°F

1030 Collect Groundwater Sample MTS-FT-GW-38-01 depth 28-32 feet

YSI Readings ① ②

	①	②	
Temp	8.13	9.12	very turbid
Cond	0.649	0.658	
DO	5.54	6.10	
pH	6.59	7.07	
ORP	28.8	-48.0	
NTU	1710.4	1237.6	

4757215.16N 601249.28

Water level 16.7 ft

Medium Sand

1045 Begin punching Geoprobe

1100 Begin purging

YSI Reading

Temp	7.33°C	9.67	very turbid
Cond	0.206	0.360	
DO	10.93	5.36	slightly less turbid water
pH	7.77	7.90	
ORP	10.96	-54.5	
Turb	1711.8 NTU	1298.2	

Location Malta Test Station, NY Date 12/19/06

Project / Client C02NY089801 USACE/Alion

Sunny 32°F

1105 Collect Ground water Sample
MTS-MP-GW-25-01
4757469.67N 601409.42E
Collect QA Sample here
~~Drove to~~ Found
Approximately 12' deep

1140 Start ponding GeoProbe hole
depth to water 22~~8~~'

1200 Collect Groundwater Sample
MTS-~~MP~~-GW-33-01
4757592.20N 601456.75E
COllect QA Sample here
Not deep enough initally had to drill down deeper

1220 Drilled deeper ~ 35'
Water Level at ~30' deep
YSI Readings

Very Turbid Water	Temp	8.74°C	10.30
	Cond	0.600	0.604
	~~PH~~	7.46	~~Ran Out~~ 8.11
	ORP	39.0	-73.4
	Turb	1713.2 NTU	1717.5
	DO	3.98	4.01

Location Malta Test Station, NY Date 12/19/06

Project / Client C02NY089801 USACE/Alion

Sunny 32°F

1250 Re Collect Surface Soil Sample to collect QA Sample
MTS-~~RP~~-SS02-01
QA Collected here

1310 Walk right of way w/ GPS & flag coordinates given by Ray (site manager)

Benchmark
C 4757923.90 600463.28
① 4758010.61 600376.12

Not Used

APPENDIX E - PHOTO DOCUMENTATION LOG

APPENDIX E - PHOTOGRAPHIC LOG

Project/Site: Malta Test Station
Project No.: C02NY089802

Date	Taken By	Photo ID	Description
12/19/06	K. Drewett	E.1	Collecting discrete groundwater sample MTS-FT-GW-38-01 from geoprobe location in the Fuel Test area.
12/18/06	K. Drewett	E.2	155 mm project found in the Range Pond area.
12/18/06	K. Drewett	E.3	155 mm and various other casings found in a sand pit in the Range Pond area.
12/18/06	K. Drewett	E.4	Fin of 120 mm projectile found in the Firing Range area.
12/18/06	K. Drewett	E.5	Collecting composite soil sample MTS-FT-SS-02-01 in the Fuel Test area.
12/18/06	K. Drewett	E.6	Part of a 155 mm casing found in the Chemical Test Pit area.
12/18/06	K. Drewett	E.7	Geophysical reconnaissance of a proposed sample location MTS-CP-SS-02-01 in the Chemical Test Pit area. Projectiles were fired out of large holes (seen in the distance) and into berms for practice.
12/18/06	K. Drewett	E.8	Collecting composite soil sample MTS-PS-SS-02-01 in the Powder Storage area.
12/18/06	K. Drewett	E.9	Collecting an X-Spray sample at a historic storage magazine for the police department. No explosives were detected.
12/18/06	K. Drewett	E.10	Sample location MTS-JL-SS-02-01at the base of a hill in the Ram Jet Lab area.
12/18/06	K. Drewett	E.11	Test structure used in the testing of the Hermes Rocket (engine).
12/18/06	K. Drewett	E.12	Collect composite soil sample MTS-TS-SS-02-01 in sand pit where 30 mm slugs were tested in the Test Structure area.
12/18/06	K. Drewett	E.13	Fuel Test Compound.
12/18/06	K. Drewett	E.14	Collect composite soil sample MTS-SM-SS-02-01 in a drainage ditch in front of the Fuel Storage Magazines.



Photo E.1 – Collecting discrete groundwater sample MTS-FT-GW-38-01 from geoprobe location in the Fuel Test area.



Photo E.2 – 155 mm project found in the Range Pond area.

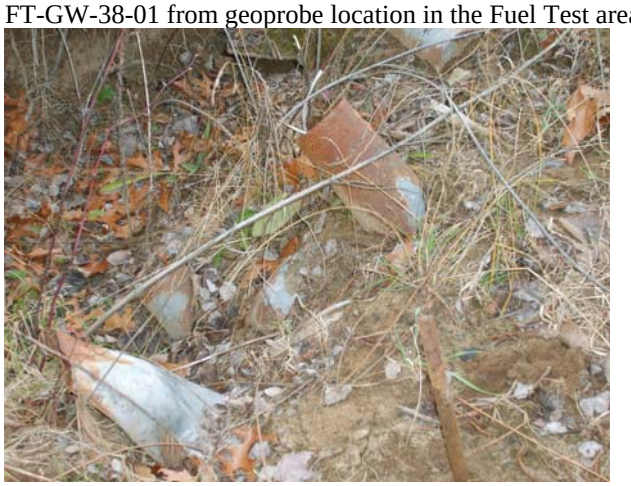


Photo E.3 – 155 mm and various other casings found in a sand pit in the Range Pond area.



Photo E.4 – Fin of 120 mm projectile found in the Firing Range area.



Photo E.5 – Collecting composite soil sample MTS-FT-SS-02-01 in the Fuel Test area.



Photo E.6 – Part of a 155 mm casing found in the Chemical Test Pit area.



Photo E.7 – Geophysical reconnaissance of a proposed sample location MTS-CP-SS-02-01 in the Chemical Test Pit area. Projectiles were fired out of large holes (seen in the distance) and into berms for practice.



Photo E.8 – Collecting composite soil sample MTS-PS-SS-02-01 in the Powder Storage area.



Photo E.9 – Collecting an X-Spray sample at a historic storage magazine for the police department. No explosives were detected.



Photo E.10 – Sample location MTS-JL-SS-02-01at the base of a hill in the Ram Jet Lab area.



Photo E.11 – Test structure used in the testing of the Hermes Rocket (engine).



Photo E.12 – Collect composite soil sample MTS-TS-SS-02-01 in sand pit where 30 mm slugs were tested in the Test Structure area.



Photo E.13 – Fuel Test Compound.



Photo E.14 – Collect composite soil sample MTS-SM-SS-02-01 in a drainage ditch in front of the Fuel Storage Magazines.

APPENDIX F - ANALYTICAL DATA

- ADR Library
- ADR EDDs
- EDMS
- Analytical Summary Reports
- Analytical Data Reports
- SEDD 2b

Located on CD.

APPENDIX G - ANALYTICAL DATA QA/QC REPORT

- Validated Data from EDS
- USACE Memorandum for Record-Chemical QA Report of QA Split Samples.

Located on CD.

APPENDIX H - GEOGRAPHIC INFORMATION SYSTEMS DATA

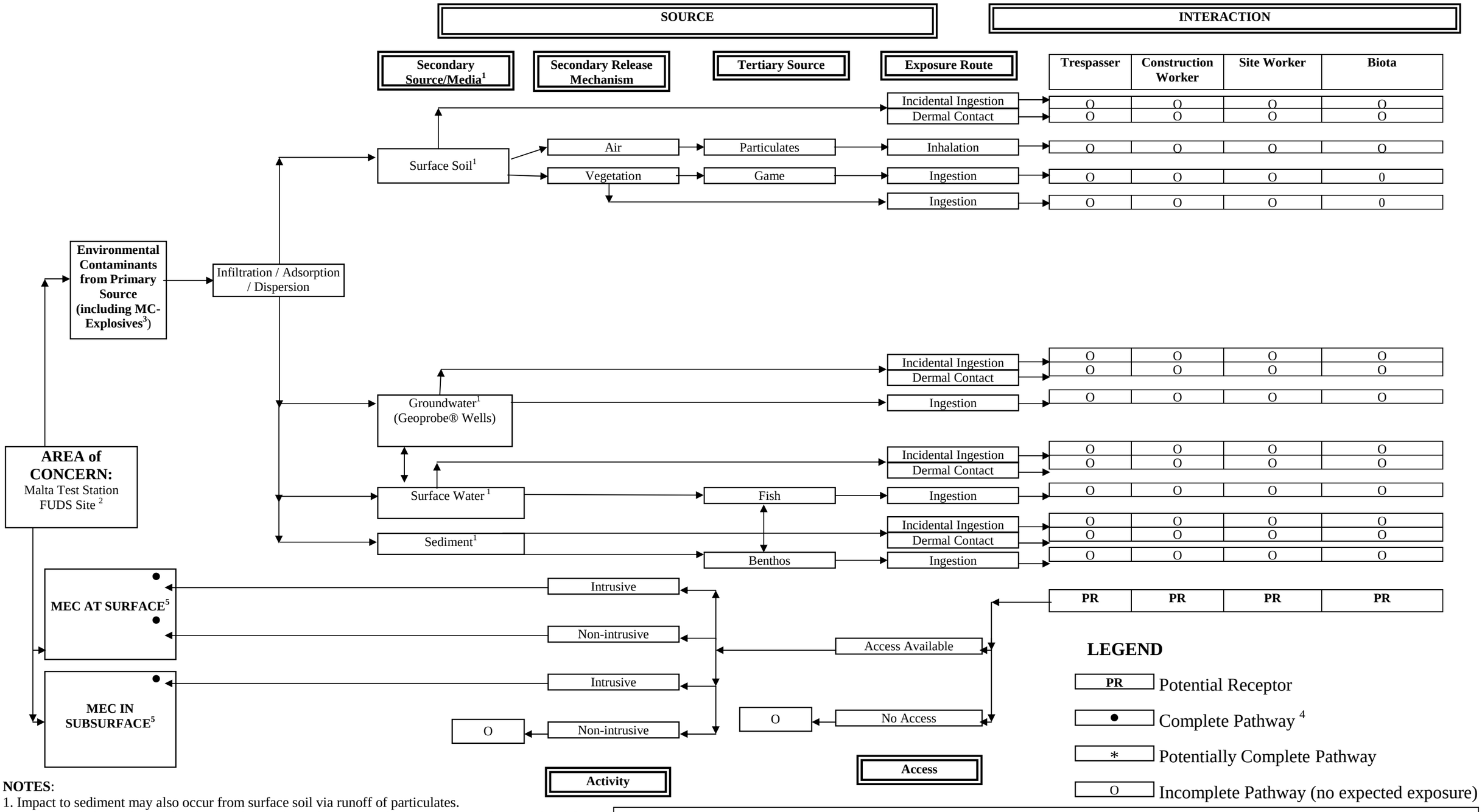
Located on CD.

APPENDIX I - GEOPHYSICAL DATA

Appendix not used.

APPENDIX J - CONCEPTUAL SITE MODEL

- MRS 1



NOTES:

1. Impact to sediment may also occur from surface soil via runoff of particulates. A separate risk for surface soil and subsurface soil may be combined to represent risk from total soil from some receptors. Impact to surface water may also occur from infiltration of groundwater.
2. Primary sources will vary but are expected to include test pads, target berms and storage tanks.
3. Explosives were the only contaminant investigated under the MMRP SI Program due to metals and perchlorate being investigated under an ongoing HTRW PRP RI/FS program.
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.
5. Interaction between a potential receptor and MEC has two components: access and activity.

DIAGRAM OF THE INTEGRATED CONCEPTUAL SITE MODEL FOR MALTA TEST STATION MMRP FUDS SITE (MRS 1)

Reference: **USACE. 2003. EM 1110-1-1200. Conceptual Site Models for Ordnance and Explosives (OE) and Hazardous, Toxic, and Radioactive Waste (HTRW) Projects**

J-1

APPENDIX K - MUNITIONS RESPONSE SITE PRIORITIZATION PROTOCOL RESULTS

Appendix not included.

Note: MMRP scoring sheets are not included in this SI Report due to the revised PRP designation for the site in compliance with *Supplemental Guidance for Executing FUDS MMRP SI* dated 16 July 2007. The MRSPP scoring sheets will be kept in the USACE project files and reviewed/revised annually.

APPENDIX L - REFERENCE COPIES

Located on CD.

RESPONSE TO COMMENTS

PROJECT: MALTA TEST STATION FUDS MMRP SITE INSPECTION (SI) C02NY089801			
		REVIEW: DRAFT FINAL MALTA TEST STATION SI REPORT DATE: 30 August 2007 NAME: Daniel Sleasman - Wright Malta Corporation (WMC)	
ITEM	DRAWING NO OR REFERENCE	COMMENT	ACTION
1.	MRSPP - Table 1	With respect to Table 1, Wright Malta Corporation (WMC) states that at no time were "High Explosives" used at this site. All shells were inert and did not contain high explosive fillers. There should be a reassessment of the score based on this fact	N - NON CONCUR. Munitions Response Site Prioritization Protocol (MRSPP) scoring sheets will not be included in the Final SI Report due to the revised Potentially Responsible Party (PRP) designation for the site in compliance with the *Supplemental Guidance for Executing Formerly Used Defense Sites (FUDS) Military Munitions Response Program (MMRP) Site Inspections (SI)* dated 16 July 2007. The MRSPP scoring sheets will be kept in the USACE project files and reviewed/revised annually. Revisions of the scoring will be considered if additional documentation is provided confirming the absence of high explosives utilized at the site.
2.	MRSPP - Table 2	With respect to Table 2, WMC disputes the description of the classification of the "former range" to the extent that the stated description states or implies the use of any high explosive shells at the site. For this reason, the score would be re- evaluated.	N - NON CONCUR. See response to Comment #1 above.
3.	MRSPP - Table 3	With respect to Table 3, WMC emphatically disagrees with the description which includes "UXO" (unexploded ordnance), as this activity did not take place on this site. For this reason, the Table 3 score requires re-evaluation	A-ACCEPTED/CONCUR – The “Confirmed Surface” classification will be deselected and the score of 10 will be used for “Suspected (physical evidence)” for Table 3. A memo detailing munitions debris finds at the site has been included in Appendix C of the Final SI Report.

ACTION CODES: A-ACCEPTED/CONCUR; D-ACTION DEFERRED; W-WITHDRAWN; N-NON CONCUR; V-VE POTENTIAL/VEP ATTACHED

PROJECT: MALTA TEST STATION FUDS MMRP SITE INSPECTION (SI) C02NY089801			
		REVIEW: DRAFT FINAL MALTA TEST STATION SI REPORT DATE: 9 July 2007 NAME: TPP #2 Discussions	
ITEM	DRAWING NO OR REFERENCE	COMMENT	ACTION
1.	MRSPP - Table 8	TPP #2 attendees agreed that Table 8, the "Residential, educational, commercial or subsistence" should be selected.	A-ACCEPTED/CONCUR – The "Residential, educational, commercial or subsistence" classification will be selected and the score of 5 will be used for Table 8.
2.	MRSPP - Table 9	TPP #2 attendees agreed that Table 9, the "Cultural resources present" should be selected.	A-ACCEPTED/CONCUR – The "Cultural resources present" classification will be selected and the score of 3 will be used for Table 9.

ACTION CODES: A-ACCEPTED/CONCUR; D-ACTION DEFERRED; W-WITHDRAWN; N-NON CONCUR; V-VE POTENTIAL/VEP ATTACHED