DRAFT FINAL

Site Inspection Report for Fort H.G. Wright

DERP FUDS Project Number: **C02NY061001**

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

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Photo: Gun Emplacement at Fort H.G. Wright's Battery Hoffman

August 2007

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ALION
SCIENCE AND TECHNOLOGY

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August 2007

CONTRACTOR STATEMENT OF AUTHORSHIP AND INDEPENDENT TECHNICAL REVIEW

Alion Science and Technology Corporation has prepared this Site Inspection Report for the Fort H.G. Wright Site, Formerly Used Defense Site (FUDS), Project No. C02NY061001. 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

AA	Anti-Aircraft
Alion	Alion Science and Technology Corporation
AMTB	Anti-Motor Torpedo Boat
ASR	Archive Search Report
bgs	Below Ground Surface
CAS #	Chemical Abstracts Service Number
CCC	Civilian Conservation Corps
CENAB	[U.S. Army] Corps of Engineers North Atlantic Baltimore
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COEC	Chemical of Ecological Concern
COPC	Chemical of Potential Concern
COPEC	Chemical of Potential Ecological Concern
CSM	Conceptual Site Model
CX	Center for Expertise
DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DNT	Dinitrotoluene
DoD	Department of Defense
DQI	Data Quality Indicators
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
ER	Engineer Regulation
ERA	Ecological Risk Assessment
°F	Degrees Fahrenheit

LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

FDE	Findings and Determination of Eligibility
ft	Foot or Feet
FUDS	Formerly Used Defense Site(s)
GIS	Geographic Information Systems
GPL	GPL Laboratories, LLLP
GSA	General Services Administration
HFA	Human Factors Applications, Inc.
HHE	Health Hazard Evaluation
HHRA	Human Health Risk Assessment
HMX	Octahydro-1,3,5,7-Tetranitro-1,3,5,7-Tetrazocine
HQ	Hazard Quotient
HRS	Hazard Ranking System
HTRW	hazardous, toxic, or radioactive waste
in.	Inch(es)
INPR	Inventory Project Report
LOAEL	Lowest Observed Adverse Effect Level
m	Meter(s)
MC	Munitions Constituent(s)
MD	Munitions Debris
MDL	Method Detection Limits
MEC	Munitions and Explosives of Concern
mg/kg	milligram per kilogram
mi	Mile(s)
mm	Millimeter(s)
MMRP	Military Munitions Response Program
MOD	modification
mph	Miles Per Hour
MRA	Munitions Response Area
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol

LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

MPPEH	Material Potentially Presenting an Explosive Hazard
NAD	North American Datum
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDAI	No Department of Defense Action Indicated
NOAEL	No Observed Adverse Effect Level
NTCRA	Non-Time-Critical Removal Action
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYS-NYNHP	NYSDEC, New York Natural Heritage Program
PARCC	precision, accuracy, representativeness, completeness, and comparability
PSAP	Programmatic Sampling and Analysis Plan
PWP	Programmatic Work Plan
PWS	Performance Work Statement
QA/QC	Quality Assurance/Quality Control
RAC	Risk Assessment Code
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RfC	Reference Concentration
RfD	Reference Dose
RI/FS	Remedial Investigation and Feasibility Study
ROC	Receptor of Concern
RMIS	Restoration Management Information System
SF(s)	Slope Factor(s)
SHPO	State Historic Preservation Office
SI	Site Inspection
SLERA	Screening-Level Ecological Risk Assessment
SSL	Soil Screening Level
SS-WP	Site-Specific Work Plan Addendum
T&E	Threatened and Endangered
TAL	Target Analyte List

LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

TCRA	Time Critical Removal Action
Tetryl	2,4,6-trinitrophenyl-n-methylnitramine
TNT	Trinitrotoluene
TPP	Technical Project Planning
TRV	Toxicity Reference Value
USACE	U.S. Army Corps of Engineers
USAESCH	U. S. Army Engineering and Support Center, Huntsville
USGS	U. S. Geological Survey
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance

GLOSSARY OF TERMS

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)—Also known as "Superfund," this congressionally enacted legislation provides the methodology for the removal of hazardous substances resultant from past / former operations. Response actions must be performed in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (USACE 2003).

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

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

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

Formerly Used Defense Site (FUDS)—Locations that were owned by, leased to, or otherwise possessed by the Department of Defense (DoD) are considered FUDS. A FUDS is eligible for the Military Munitions Response Program if the release occurred prior to 17 October 1986; the property was transferred from DoD control prior to 17 October 1986; and the property or project meets other FUDS eligibility criteria. The FUDS Program focuses on compliance and cleanup efforts at FUDS (USACE 2004b).

Material Potentially Presenting an Explosive Hazard (MPPEH)—Material potentially containing explosives or munitions (*e.g.*, munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or material potentially containing a high enough concentration of explosives such that the material presents an explosive hazard (*e.g.*, equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization or disposal operations). Excluded from MPPEH are munitions within DoD's established munitions management system and other hazardous items that may present explosion hazards (*e.g.*, gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions (USACE 2004c).

GLOSSARY OF TERMS

Military Munitions—Military munitions mean all ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives, and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges; and devices and components thereof. The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components, other then non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) have been completed (10 U.S.C 101(e)(4)(A) through (C)).

Munitions 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) DMM, as defined in 10 U.S.C. 2710(e)(2); or (C) Munitions constituents (*e.g.*, TNT, RDX), as defined in 10 U.S.C. 2710(e)(3), present in high enough concentrations to pose an explosive hazard.

Munitions Constituents (MC)—Any materials originating from UXO, 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 (USACE 2004c).

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

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

Munitions Response Site Prioritization Protocol (MRSPP) - The MRSPP was published as a rule on 5 October 2005. This rule implements the requirement established in section 311(b) of the National Defense Authorization Act for Fiscal Year 2002 for the DoD to assign a relative priority for munitions responses to each location in the DoD's inventory of defense sites known or suspected of containing UXO DMM, or munitions constituents (MC). The DoD adopted the MRSPP under the authority of 10 USC 2710(b). Provisions of 10 USC 2710(b) require that the Department assign to each defense site in the inventory required by 10 USC 2710(a) a relative priority for response activities based on the overall conditions at each location and taking into consideration various factors related to safety and environmental hazards (710 FR 58016).

GLOSSARY OF TERMS

Non-Time Critical Removal Action (NTCRA)—Actions initiated in response to a release or threat of a release that poses a risk to human health or the environment where more than six months planning time is available (USACE 2000).

Risk Assessment Code (RAC) - An expression of the risk associated with a hazard. The RAC combines the hazard severity and accident probability into a single Arabic number on a scale from 1 to 5, with 1 being the greatest risk and 5 the lowest risk. The RAC is used to prioritize response actions (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)).

Time Critical Removal Action (TCRA)—Removal actions conducted to respond to an imminent danger posed by the release or threat of a release, where cleanup or stabilization actions must be initiated within six months to reduce risk to public health or the environment (USACE 2000).

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) prepared the following Site Inspection (SI) Report to document SI activities and findings for the Fort H.G. Wright Formerly Used Defense Site (FUDS), Property No. C02NY0610. 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 is completed under Project No. C02NY061001 and addresses potential MMRP hazards remaining at the Fort H.G. Wright FUDS.

ES.2 **SI Objective and Scope.** The primary objective of the MMRP SI is to determine whether or not the FUDS project warrants further response action under the Comprehensive Environmental Response, Compensation, and Liability Act (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 Hazard Ranking System (HRS) scoring potentially to be performed by the U.S. Environmental Protection Agency (EPA); and (iii) collects data, as appropriate, to characterize the hazardous substance release for effective and rapid initiation of the remedial investigation/feasibility study (RI/FS). An additional objective of the MMRP SI is to collect data necessary to evaluate Munitions Response Sites (MRS) using the Munitions Response Site Prioritization Protocol (MRSPP).

ES.3 The scope of the SI is restricted to the evaluation of the presence of MEC or MC related to historical use of the FUDS prior to transfer. Potential releases of hazardous, toxic, or radioactive waste (HTRW) are not within the scope of the SI.

ES.4 **Fort H.G. Wright.** The Fort H.G. Wright FUDS consists of 412 acres located in the Town of Southold in Suffolk County, New York which lies on the eastern and southern edge of Fishers Island between Long Island and Connecticut. The FUDS was used as a coastal defense fortification and training facility from 1900 through 1949. The Fort H.G. Wright FUDS currently is owned by various private and residential entities and used for recreational, commercial, and municipal activities. With the exception of several small portions of the FUDS that are used for municipal and commercial purposes, the site is open to the public year round.

ES.5 **Technical Project Planning.** The SI approach was developed in concert with stakeholders through the USACE's Technical Project Planning (TPP) framework, which was applied at the initial TPP meeting held on 8 May 2006. In summary, these agreements, as presented and modified during the TPP meeting and as finalized in the Site-Specific Work Plan Addendum (SS-WP), were to inspect the MRS 1 and AOC1 and complete multimedia sampling in accordance with the DQOs and Final SS-WP

ES.6 USACE programmatic range documents (including the Supplemental Archive Search Report [ASR] and the DERP Fiscal Year 2005 Annual Report to Congress) identified one range, Range Complex No. 1, at the H.G. Wright FUDS. This range complex is designated MRS 1. Thirteen subranges are associated with MRS 1 to include: Battery Clinton, Battery Butterfield, Battery Barlow, Battery Dutton, Battery Hamilton, Battery Marcy, Battery Hoffman, Battery Hoppock, Dynamite Battery, Battery #215, Anti-Motor Torpedo Boat (AMTB) 913, Anti-Aircraft (AA) Battery, and Small Arms Range No. 1. One area of concern (AOC), a second small arms firing range, also was identified within the MRS during the TPP meeting. This area, not identified in historic documents (Inventory Project Report [INPR], ASR, or ASR Supplement) was designated AOC 1 and has been addressed in the SI per the TPP recommendations.

ES.7 **Qualitative Site Reconnaissance and MEC Assessment.** SI field activities were performed during 16-17 January 2007. A qualitative site reconnaissance for MEC was performed over approximately 10 acres using visual observations and analog geophysics. The field sampling approach included meandering reconnaissance in and around sampling locations to identify batteries, firing range backstops, MEC, munitions debris (MD), or other areas of interest (*e.g.*, areas containing possible firing points or other areas containing distressed vegetation related to range activities). Subsurface anomalies potentially attributable to MEC or MD were documented.

ES.8 A qualitative, MEC screening-level risk assessment was conducted based on the SI qualitative reconnaissance, as well as historical data documented in the INPR, ASR, and the ASR Supplement. Historical documentation and interviews performed as part of the SI indicate that a variety of conventional munitions were used at the FUDS, including small arms as well as medium and large caliber artillery. In addition, mines were located onsite and within the water of the range fans. Previous MEC discoveries in MRS 1 have included spent 0.30 and 0.50 caliber casings, as well as live 0.30 caliber and 37-millimeter (mm) rounds. One item, a parachute flare determined to be related to more recent military operations was found during the 16-17 January 2007 field sampling activities. No MEC or MD related to FUDS activities was

found during the site visit; however, numerous subsurface anomalies were recorded throughout MRS 1. A "low to moderate" risk for MEC at MRS 1 and a "low" risk for MEC at AOC 1 were identified based on an assessment of three risk factors (*i.e.*, presence of MEC source, accessibility or pathway presence, and potential receptor contact).

ES.9 **MC Sampling and Risk Screening**. A total of 32 surface soil and 2 sediment samples were collected (which included 5 background samples for soil). Samples were analyzed for specifically a target compound list of explosives and target analyte list of metals. A list of MC potentially associated with munitions used at the FUDS (*i.e.*, includes the MC associated with munitions used both the coastal batteries and small arms ranges) was developed. The list of associated MC includes explosives (nitroglycerin [NG] and dinitrotoluene [DNT]) and barium at the coastal batteries (MRS 1) as well as antimony, barium, copper, iron, lead, nickel, zinc, NG and DNT at the small arms ranges (MRS 1 and AOC 1). The list of MC associated with munitions used at the FUDS was used to support analysis of results and the risk screening. No exceedances of human health screening criteria were noted for surface soil or sediment, therefore, no human health chemicals of potential concern (COPC) were identified for MRS 1 or AOC 1.

ES. 10 A Screening-Level Ecological Risk Assessment (SLERA) was required given the former FUDS is located in an area regulated by the Coastal Zone Management Program, and contains habitat known to be used by designated Rare or Threatened and Endangered (T&E) species. The SLERA identified antimony and lead as exceeding screening values in MRS 1 and AOC 1. The concentrations of these metals were not considered to be significant (*i.e.*, the results were comparable to background concentrations). Therefore, no chemicals of potential ecological concern (COPEC) were identified in MRS 1 or AOC 1.

ES.11 **Recommendations.** Based on the findings of this SI, an RI/FS is recommended for MRS 1 (Table ES-1). The RI/FS should focus on the areas where MEC was historically found near the parade grounds and adjacent to the AA Battery. Neither a time-critical removal action (TCRA) nor a non-time-critical removal action (NTCRA) is recommended for MRS 1. Based on this SI, additional studies during the next CERCLA phase are required to determine the need to designate an MRS and proceed to investigate the nature and extent of contamination due to MEC and evaluate the risk of this AOC to human health and the environment. If an MRS is designated, an MRSPP score will be established using data obtained in this SI or from other reliable sources. Neither a TCRA nor a NTCRA is recommended for AOC 1.

ES.12 Finally, the range inventory should be modified to include AOC 1 as a sub-range to MRS 1. Including AOC 1 as a sub-range will not increase the total acreage of the MRS because the AOC is already located within MRS 1.

Table ES-1 Summary of Site Recommendations for Fort H.G. Wright

(FUDS Project No. C02NY061001)

Fort H.G. Wright	Recommendation	Basis for Recommendation	
		MEC	**MC**
MRS 1 (Range Complex No. 1), including AOC 1 – Small Arms Range No. 2	Remedial Investigation/ Feasibility Study Additional Studies should focus on MEC TCRA/NTCRA not recommended	MEC Assessment: Low-to-Moderate Risk Past finds of MEC/MD	Risk Screening Assessment: No risks to ecological receptors ***Surface Soil*** – Two metals (antimony and lead) exceeded risk screening values; however, these MCs do not exceed the range of background concentrations, except for 1 of 4 antimony detections which only slightly exceeded the maximum background detection (0.98 J mg/kg vs. 0.71 J mg/kg). Based on this weight of evidence, neither constituent was identified as a COPEC
AOC 1 (Small Arms Range No. 2)	Further studies for MEC only. The associated acreage should be further delineated TCRA/NTCRA not recommended	MEC Assessment; Low Risk No past finds of MEC / MD	Risk Screening Assessment: No risks to ecological receptors ***Surface Soil*** – Metals (antimony and lead) exceeded risk screening criteria ecological receptors (but not above range of background concentrations). Based on this weight of evidence, neither constituent was identified as a COPEC
General	The range inventory should be modified to include AOC 1 as a sub-range to MRS 1. Including AOC 1 as a sub-range will not increase the total acreage of the MRS because the AOC is already located within MRS 1.		

AOC – Area of Concern
MRS – Munitions Response Site
NDAI – No Department of Defense Action Indicated
TCRA – Time-Critical Removal Action
NTCRA – Non-Time-Critical Removal Action
MEC – munitions and explosives of concern
MC – munitions constituents
MD – munitions debris
mg/kg – milligrams per kilogram

1. INTRODUCTION

1.0.1 This report documents the findings of the Military Munitions Response Program (MMRP) Site Inspection (SI) performed at the Fort H.G. Wright Formerly Used Defense Site (FUDS) located in Suffolk County, New York, MMRP Project No. C02NY061001. Alion, along with its subcontractors EA Engineering, Science and Technology, Inc. (EA), Environmental Data Services (EDS), Inc., and GPL Laboratories, LLLP (GPL), 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. USAESCH transferred management of the contract to the U.S. Army Corps of Engineers North Atlantic Baltimore District (CENAB). CENAB is working with USAESCH and its contractor, Alion, on the completion of this project in accordance with the SI Performance Work Statement (PWS) (Appendix A).

1.0.2 The technical approach to this SI is based on the *Programmatic Work Plan for Formerly Used Defense Sites (FUDS) Military Munitions Response Program (MMRP) Site Inspections at Multiple Sites in 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 the Fort H.G. Wright* (SS-WP) (Alion 2006d).

1.1 Project Authorization

1.1.1 The Department of Defense (DoD) has established the MMRP to address DoD sites suspected of containing munitions and explosives of concern (MEC) or munitions constituents (MC). Under the MMRP, the U.S. Army Corps of Engineers (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 Engineer Regulation (ER) 200-3-1 (USACE, 10 May 2004) 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 of 1980 (CERCLA) (42 USC § 9601 et seq.), Executive Orders 12580 and 13016, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300). As such,

USACE is conducting 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/MCs, 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 The primary objective of the MMRP SI is to determine whether or not the FUDS project warrants further response 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 Hazard Ranking System (HRS) scoring potentially to be performed by the U.S. Environmental Protection Agency (EPA); and (iii) collects data, as appropriate, to characterize the hazardous substance release for effective and rapid initiation of the remedial investigation/feasibility study (RI/FS). An additional objective of the MMRP SI is to collect data necessary to evaluate Munitions Response Sites (MRSs) using the Munitions Response Site Prioritization Protocol (MRSPP).

1.2.2 The scope of the SI is restricted to the evaluation of the presence of MEC or MC related to historical use of this FUDS prior to transfer through records review, qualitative site reconnaissance to assess MEC presence/absence, and sampling where MC might be expected based on the conceptual site models (CSMs). Evaluation of potential releases of hazardous, toxic, or radioactive wastes (HTRW) is not within the scope of this SI.

1.3 Project Location

1.3.1 Fort H.G. Wright is situated on approximately 412 acres in the town of Southold located in Suffolk County, New York. The North American Datum (NAD) 83 North (N) coordinates for the FUDS are Universal Transverse Mercator (UTM) X and Y (meters) 749025 and 4563966, respectively. Fort H.G. Wright lies on the eastern and southern edge of Fishers Island between Long Island and Connecticut. This site falls under the geographical jurisdiction of the USACE New York District. The SI for Fort H.G. Wright is being completed under DERP FUDS Project No. C02NY061001, to address potential MMRP hazards remaining at the FUDS.

1.4 Munitions Response Site Prioritization Protocol

1.4.1 This SI includes draft MRSPP rankings that apply to the one MRS identified in this report (Appendix K). In accordance with USACE guidance, an MRSPP is not completed for the additional AOC. The MRSPP scoring will be updated on an annual basis to incorporate new information.

2. SITE DESCRIPTION

2.1 Site Description and History

2.1.1 Fort H.G. Wright is comprised of 412.45 acres of land located in Suffolk County, New York. The installation lies on the eastern and southern edge of Fishers Island between Long Island and Connecticut.

2.1.2 From the time construction began at Fort H.G. Wright in 1898 until 1949, the fort was used for military training and coastal defense activities (USACE 2003). In support of these missions, the fort included 12 gun emplacements, small arms ranges, various buildings formerly used for military administration and housing, and a small airfield (Figure 2-1). From 1953 to 1959, the property was transferred to various entities, including the U.S. Coast Guard, the U.S. Navy, the Fishers Island Union Free School, and the Town of Southold, New York (USACE 2003).

2.2 MRS Identification and Munitions Information

2.2.1 USACE programmatic range documents (including the Supplemental Archive Search Report [ASR] and the DERP Fiscal Year 2005 Annual Report to Congress) identified one range, Range Complex No. 1, at the H.G. Wright FUDS. Range Complex No. 1 consists of one MRS (designated MRS 1) comprised of the following thirteen evaluation areas (see Table 2-1 and Figure 2-2): the AA Battery, Battery Butterfield, Battery Clinton, Dynamite Battery, Battery Hamilton, Battery Barlow, Battery Marcy, Battery 215, Battery Dutton, Battery Hoffman, Battery Hoppock, anti-motor torpedo boat (AMTB) 913, and the Small Arms Range (referred to in the SI as Small Arms Range No. 1). During the TPP meeting (Alion 2006a), stakeholders identified an additional area of concern (AOC), the Small Arms Range No. 2 (Figure 2-2), which is not identified in the Inventory Project Report (INPR), Archive Search Report (ASR), or ASR Supplement (USACE 2003). This area was addressed in this SI in accordance stakeholder requests.

2.2.2 As shown on Figures 2-2 and 2-3, MRS 1 includes range fans from coastal fortification gun emplacements extending beyond the FUDS boundary. The coastal battery was used to fire from the land into the water impact area, Long Island Sound. The small arms ranges located in MRS 1 and the AOC each had both a firing point and impact area (backstop) on the land. Potential munitions associated with these MRSs/AOCs are summarized on Table 2-2.

2.2.3 The MRS includes a total of approximately 246 acres of land and 197,993 acres of tidal waters (which include off-shore impact areas in Long Island Sound) that are located within the FUDS property boundary (Figure 2-3 and Table 2-1).

2.3 Physical Setting

2.3.0.1 The following sections provide a physical description of the FUDS property with respect to relief, vegetation, and climate as well as the local demographic and land uses.

2.3.1 Topography and Vegetation

2.3.1.1 The topography of the Fort H.G. Wright area is moderately rugged rising from the shore to a maximum height of 100-ft above mean sea level within the interior of Fishers Island (Figure 2-4). Much of the original topography of the FUDS has been disturbed by construction activities associated with the FUDS buildings and coastal fortification facilities (USACE 2003).

2.3.2 Climate

2.3.2.1 The climate in the Fort H.G. Wright region is characterized as humid-continental. This area is dominated by both continental influences and maritime influences, as air masses and weather systems affecting the area originate principally over the land areas of North America. As a result, the area experiences extended periods of freeze-free temperatures, a reduced ranged in both diurnal and annual temperature, and heavy precipitation in the winter relative to summer. The coldest temperatures during the winter season usually range between 0°F and 10°F with average snowfall around 26 to 32 in. Minimum summer temperatures from mid-June through mid-September are frequently in the mid 60s to low 70s °F, with average temperatures of 90°F or higher occurring from 4 to 6 days per year. Average annual precipitation is 43 to 46 in. with reduced precipitation during June, July, and September and increased precipitation in March, August, November, and December (USACE 2003).

2.3.3 Local Demographics

2.3.3.1 Fort H.G. Wright is comprised of 412.45 acres of land located in Southold in Suffolk County, New York. The installation lies on the eastern and southern edge of Fishers Island between Long Island and Connecticut. The town of Southold encompasses all of Fishers Island. The Fishers Island Union Free School and numerous residences are located within 200 ft of the FUDS. The FUDS is not fenced and is accessible to the public. The population of Southold has 20,599 people with 8,461 households and 5,804 families residing in the town (U.S. Census Bureau 2000). The population density is 383.5 per square mile (mi^2).

2.3.4 Current and Future Land Use

2.3.4.1 The property that comprises the former Fort H.G. Wright presently is owned by several entities, including the Town of Southold, which operates the Elizabeth Field airfield (Figure 2-4). Former batteries at this FUDS are located on property currently owned by the Fishers Island Garbage and Refuse District and the Town of Southold. The remainder of this FUDS is owned by numerous federal, state, and private entities and is used for commercial, industrial (warehousing), residential, and educational purposes (USACE 2003). The Mount Prospect and Wilderness Point area (Figure 2-4) is under the jurisdiction of the Department of the Navy.

2.3.5 Geologic Setting

2.3.5.1 Igneous and metamorphic rocks dominate the lithology in this portion of Long Island Sound. Fishers Island and Fort H.G. Wright are underlain by granite (Fuller 1905). The bedrock at Fishers Island is unconformable overlain by glacial drift sheets generated during two ice advances. The inner end moraine deposits at Fishers Island extend across southern Rhode Island. The glacial sediments consist of unconsolidated gravel, sands, silts, and clay in beds from 60 to 80 meters thick.

2.3.5.2 Soil types at Fort H.G. Wright include sandy fill land; gently sloping and steep cut and fill land, 0 to 8 percent graded slopes of Riverhead and Haven soil types, graded Bridgehampton silt loam, muck, 8 to 15 percent sloped Riverhead, very stony sandy loam, and dune land (USACE 2003).

2.3.6 Hydrogeologic Setting

2.3.6.1 Most of the precipitation that falls on Fishers Island flows to one of the numerous freshwater ponds or directly to the coastal shoreline due to the island's moderately rugged topography. The numerous ponds on Fishers Island serve as the primary catchments and groundwater recharge areas for Fishers Island, which are estimated to hold approximately 709 million gallons per year (USACE 2003).

2.3.6.2 One surface water stream flows from a seasonally flooded wetland located in the center of the FUDS (Figure 2-4) towards the east-southeast. This stream empties into a surface water body located on the eastern portion of the FUDS adjacent to the shoreline. Several other small wetland areas are located on the FUDS (Section 2.3.8.2).

2.3.6.3 Based on the 1998 Federal Emergency Management Agency's (FEMA's) Flood Insurance Rate Maps (FIRM) for Suffolk County, the majority of the Fort H.G. Wright Site is

within "Zone X". This designation indicates that the FUDS is outside of the 500-year floodplain. However, some areas are designated as high-risk flood hazard areas. Specifically, the western and southwestern shoreline areas of Fort H.G. Wright that abut the Atlantic Ocean are designated "Zone AE", indicating that base flood elevations have been assigned (FEMA 1998).

2.3.7 Area Water Supply/Groundwater Use

2.3.7.1 The Fishers Island Waterworks, a subsidiary of Fishers Island Development Company, owns the water supply, treatment, distribution, and storage facilities for Fishers Island. Originally constructed in the early 1900s, the Fishers Island water supply system services approximately 600 customers utilizing 22 mi of water mains, an equalization reservoir, a surface water treatment plant, a groundwater treatment facility, a well field, and three surface water reservoirs (Barlow Pond, Middle Farm Pond, and Treasure Pond) (USACE 2003).

2.3.7.2 Currently, groundwater supply wells are the primary source of the Fishers Island water supply. The well field is located in the center of Fishers Island, approximately 6 to 7 miles northeast of Fort H.G. Wright. The Barlow Pond water treatment plant is being used as a backup supply system. Water is drawn from the Middle Farms well field area which is treated at the recently constructed groundwater treatment facility near the well field. Demand on the well field system averages 75,000 gallons per day during the winter, 200,000 gallons per day during the summer. Untreated well water can be pumped to Middle Farm Pond during periods of high demand. There are about 50 individual private wells in use on the island aside from the public supply system; the impact of these wells on the Fishers Island aquifer is unknown (USACE 2003). Groundwater below the FUDS is not used for drinking water and property representatives present at the TPP meeting indicated that there are no private or public wells present in the vicinity of Fort H.G. Wright (Alion 2006a)[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.

[1] A Freedom of Information Law (FOIL) request was submitted to obtain information from the New York State Department of Health (NYSDOH) regarding any public supply wells (or other wells in their database) and wellhead protection areas within 4 miles of Fort H.G. Wright. NYSDOH was subsequently contacted by Alion to determine wells and water supply systems within a four mile radius of the site. NYSDOH was able to confirm there were production supply wells and wellhead protection areas on Fishers Island but none beneath Ft H.G Wright FUDS. The NYDOH representative 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.

2.3.8 Sensitive Environments

2.3.8.0.1 The following subsections discuss the sensitive environments associated with the FUDS and the process used to determine the necessity for completing an ecological risk assessment at the FUDS.

2.3.8.1 Army Checklist for Important Ecological Places

2.3.8.1.1 In accordance with guidance from the USACE HTRW Center for Expertise (CX), the Army Checklist for Important Ecological Places is completed to determine if a FUDS may require a Screening-Level Ecological Risk Assessment (SLERA) (USACE 2006). Fort H.G. Wright is located within the Coastal Management Zone and contains habitat known to be used by designated Rare or Threatened and Endangered (T&E) species; therefore, the performance of a SLERA is required (USACE 2006). The checklist for Fort H.G. Wright is included as Table 2-3.

2.3.8.2 Wetlands

2.3.8.2.1 According to the National Wetlands Inventory (U.S. Fish & Wildlife Service 2006), there are estuarine and marine wetland complexes on the perimeter of Fishers Island, as well as freshwater forested/scrub wetlands and freshwater emergent wetlands within onshore areas of the island, which provide habitat for wetland plants and spawning fish. Wetlands areas are shown on Figure 2-4.

2.3.8.3 Coastal Zones

2.3.8.3.1 Fort H.G. Wright is located in a Significant Coastal Fish and Wildlife Habitat and the area is part of the New York State's Coastal Management Program administered by the New York Department of State. The SI field activities were completed in accordance with the SS-WP (Alion 2006d) and did not adversely impact coastal zone resources.

2.4 Previous Investigations for Munitions Constituents and Munitions and Explosives of Concern

2.4.0.1 A summary of previous historical investigations and related discoveries of MC and MEC (if applicable) is provided in the following subsections.

2.4.1 Inventory Project Report

2.4.1.1 In 1996, CENAB completed a Inventory Project Report (INPR) for Fort H.G. Wright under the DERP FUDS. The Findings and Determination of Eligibility (FDE) (USACE 1997) concluded that Fort H.G. Wright had been formerly used by the War Department. The INPR

concluded that there were eligible categories of hazards under the DERP FUDS program. An Ordnance and Explosive Waste (OEW)[2] project was recommended; DERP FUDS OEW Project Number C02NY061001. This determination was made based on the potential for accidentally buried or discarded ordnance or explosive waste hazards associated with the past usage of the FUDS as a coastal defense installation. An electronic copy of the INPR is available in Appendix L.

2.4.2 Archive Search Report

2.4.2.1 An ASR was completed in 2003 for the former Fort H.G. Wright. Historical records of MEC usage indicate that various types of mid-19th and early 20th century coastal artillery items, as well as small arms, were used. The ASR did not document any certificates of ordnance, clearance, or decontamination associated with the FUDS (USACE 2003). The ASR noted no evidence of chemical warfare material being present at the site.

2.4.2.2 The ASR determined that there was an orderly closure of the post with ammunition being returned to arsenals. No evidence or records were found of disposal of ammunition or components on the FUDS. The ASR identified no reports or evidence of ordnance or explosives being found since closure and, thereby, considered the battery area as having "no ordnance presence." An electronic copy of the 2003 ASR is provided in Appendix L.

2.4.3 ASR Supplement

2.4.3.1 The ASR Supplement assessed the acreage for the ranges and assigned a Risk Assessment Score (RAC) Fort H.G. Wright (USACE 2004a). Approximately 345 acres of land and 197,991 acres of tidal water were noted to have been impacted potentially due to historical DoD activities. The report also identified munitions used at the FUDS, noted the dates munitions were used, and assigned a RAC score to the FUDS (Table 2-1) (USACE 2004). An electronic copy of the 2004 ASR Supplement is provided in Appendix L.

2.5 Citizen Reports of Munitions and Explosives of Concern

2.5.1 Reports of the presence of MEC were not provided in the ASR or ASR Supplement. However, during the 8 May 2006 TPP meeting (Alion 2006a), Mr. Richard Ahman, an employee of the Fishers Island Waste Management (stakeholder) and a long time resident of Fishers Island, indicated that he occasionally searched for artifacts with a metal detector and had previously found MEC items within the FUDS boundary. Mr. Ahman offered to guide the New York State

[2] The terminology "ordnance and explosive waste" has been updated and is referred to as munitions and explosives of concern (MEC) throughout this report.

Department of Environmental Conservation (NYSDEC), USACE, and Alion Team members on a windshield tour to show them the location of another small arms range identified during the TPP and several existing batteries. A UXO-qualified technician was not present during the FUDS visit because no site investigation activities were to be conducted.

2.5.2 During the windshield tour, Mr. Ahman showed the Alion Team numerous items in his possession, including 30- and 50-caliber spent casings, two non-fired 30-caliber rounds, and a cartridge roughly 6 in. in length and 2 to 3 in. in diameter. Mr. Ahman indicated he found the 6-in. item approximately 10 years ago, west of Small Arms Range No. 2, in the vicinity of the parade ground field. The Alion Team members advised Mr. Ahman to contact the local emergency response authority and to relinquish the item. USACE subsequently determined this item to be a live 37-millimeter (mm) round. The Alion Team immediately notified CENAB and the Huntsville CX (Alion 2006b). On 11 May 2006, the Alion Team notified Mr. Ahman and the Fisher Island Garbage and Refuse District of the hazard associated with the subsequently identified 37-mm round and advised him to call the local emergency response authority (*e.g.*, law enforcement) for proper disposal of this hazardous item (Alion 2006c). The Fisher Island Garbage and Refuse District informed the Alion Team that this item was disposed of properly after this notification.

2.6 Non-DoD Contamination/Regulatory Status

2.6.1 Batteries Butterfield and Barlow are currently being used by Fishers Island Waste Management for disposal of household landscaping debris such as leaves, brush, stumps and other yard wastes. These batteries are not being used as an active landfill and/or active transfer area. Given the use of these areas for household landscaping debris disposal, it is unlikely that contamination would occur from non-DoD activities in this area. As a presumptive measure, samples collected from Batteries Barlow and Butterfield were located downgradient of gun emplacement firing points in forested areas where no visual evidence of disposal activities had occurred. Furthermore, the use of the airport located at the FUDS would not be a likely source of heavy metals contamination given that this airstrip operates as a local airport and receives minimal traffic and that the areas of concern associated with MRS 1 are not close enough in proximity to the airport to be susceptible to any heavy metal contamination generated by airport activities. There is no evidence, based on historical review and stakeholder comments, that any other activities occurring prior to or after DoD use of the land has contributed to present day MEC/MD and MC findings.

Table 2-1. Range Inventory (USACE 2004)

Site Name	Range Name[1]	Subrange Name	RMIS Range Number	RAC Score	Acreage[2]
Fort H.G. Wright	Range Complex No. 1 (MRS 1)		C02NY0610001R01	5	198,239
		Battery Clinton	C02NY061001R01-SR01	5	36,392
		Battery Butterfield	C02NY061001R01-SR02	5	67,003
		Battery Barlow	C02NY061001R01-SR03	5	34,107
		Battery Dutton	C02NY061001R01-SR04	5	66,839
		Battery Hamilton	C02NY061001R01-SR05	5	52,479
		Battery Marcy	C02NY061001R01-SR06	5	67,142
		Battery Hoffman	C02NY061001R01-SR07	5	20,168
		Battery Hoppock	C02NY061001R01-SR08	5	26,007
		Dynamite Battery	C02NY061001R01-SR09	5	13,630
		Battery #215	C02NY061001R01-SR10	5	188,859
		AMTB 913	C02NY061001R01-SR11	5	28,437
		AA Battery	C02NY061001R01-SR12	5	26,834
		Small Arms Range No. 1	C02NY061001R01-SR13	5	861
	Range Complex No. 1 (AOC 1)	Small Arms Range No. 2 (AOC 1)	NA	NA	NA

RMIS = Restoration Management Information System

RAC = Risk Assessment Code. Scores range from 1 to 5, with 1 being of the greatest concern.

AOC = Area of Concern

NA = Not applicable (Small Arms Range No. 2 is an AOC not identified in the USACE range inventory)

1 – MRS designation completed by Alion.

2 – Acreage included in Range Inventory. May include land outside FUDS Boundary. Subranges within range complexes overlap therefore acreage totals for subranges are greater than range complex numbers.

Table 2-2. Military Munitions Type and Composition (USACE 2003; USACE 2004)

Range ID (MRS)/ Subrange	Munitions ID	Munitions Type	Composition (Filler, Projectile, Body, Propellant, other)	Associated MC Analysis[1, 2]
Range Complex No. 1 (MRS 1)/ Battery Clinton	LARGE CALIBER (37MM AND LARGER), High Explosive (HE) (CTT18)	12-inch mortars, model 1890M1	*Projectile:* Common Steel *Filler*: trinitrotoluene (TNT) *Primer:* M30 Nitrocellulose, Black Powder (Sodium Nitrate or Potassium Nitrate plus Charcoal and Sulfur); booster – TNT, Tetryl *Propellant*: Nitrocellulose	*MC from coastal batteries are associated with the firing point; therefore, only propellant constituents (in the "Composition" column) are carried forward for analysis in this SI. See Note #2.* *MC from small arms range are associated with the firing point and backstop; therefore, propellantand projectile constituents (in the "Composition" column) are carried forward for analysis in this SI. See Note #1.* Explosives: • Nitrocellulose (no analysis) • Black Powder (no analysis) Metals: • No analysis
		Coast Artillery Early 1900s/ 37mm, M54, HE w/Tracer	*Projectile:* Common Steel *Filler*: Tetryl or Comp A (RDX and Desensitizer) *Primer:* M61 primer (Potassium Chlorate, Lead Thiocyanate, Antimony Sulfide, TNT) and Black Powder *Detonator:* M23 Potassium Chlorate, Antimony Sulfide, Lead Azide, Carborundum (silicon carbide) Tetryl *Booster* : Tetryl *Propellant*: M1 -Nitrocellulose, Dinitrotoluene (DNT), Dibutylphthalate, Diphenylamine, or M2 - Nitrocellulose, Nitroglycerin (NG), Barium Nitrate, Potassium Nitrate, Ethyl Centralite, Graphite *Tracer* : tracer compound not determined	Explosives: • Nitrocellulose (no analysis) • Black Powder (no analysis) • DNT • NG Metals: • Barium Other: • Ethyl Centralite (no analysis) • Diphenylamine (stabilizer - no analysis)

Table 2-2. Military Munitions Type and Composition (USACE 2003; USACE 2004)

Range ID (MRS)/ Subrange	Munitions ID	Munitions Type	Composition (Filler, Projectile, Body, Propellant, other)	Associated MC Analysis[1, 2]
Range Complex No. 1 (MRS 1)/ Battery Butterfield	LARGE CALIBER (37MM AND LARGER), HE (CTT18)	Coast Artillery Early 1900s/5-inch	*Projectile:* Cast Iron Shell *Primer:* M30 Nitrocellulose, Black Powder (Sodium Nitrate or Potassium Nitrate plus Charcoal and Sulfur), antimony sulfide *Propellant*: smokeless powder (Nitrocellulose, diphenylamine) *Filler*: None or black powder	Explosives: • Nitrocellulose (no analysis) • Black Powder (no analysis) Metals: • Iron Other: • Diphenylamine (stabilizer - no analysis)
Range Complex No. 1 (MRS 1)/ Battery Butterfield	LARGE CALIBER (37MM AND LARGER), HE (CTT18)	155mm Mk I Shrapnel, MK I Shell; MK III Shell; MK III AI Shell; M101 and M101B1 Shell H.E.; M102 and M101B1 Shell H.E.	*Projectile:* Common Steel *Filler*: TNT or black powder *Detonator/Booster:* mercury fulminate/Tetryl and TNT *Fuze:* potassium chlorate, antimony sulfide, lead azide, tetryl, carborundum 150 (silicon carbide) *Primer:* M30 Nitrocellulose, Black Powder (Sodium Nitrate or Potassium Nitrate plus Charcoal and Sulfur) Antimony Sulfide, Lead Sulphocyanate, Potassium Chlorate, TNT, Relay (M2): Black Powder (Sodium Nitrate or Potassium Nitrate plus Charcoal and Sulfur), mercury fulminate *Propellant*: (Nitrocellulose, diphenylamine)	Explosives: • Nitrocellulose (no analysis) • Black Powder (no analysis) Metals: • Iron Other: • Diphenylamine (stabilizer - no analysis)
Range Complex No. 1 (MRS 1)/ Battery Butterfield	LARGE CALIBER (37MM AND LARGER), HE (CTT18)	12-inch disappearing guns, Model 1898 Projectile D.P.; MK XVI projectile A.P.C.; MK XXVIII Projectile D.P.; M1911 AI Projectile D.P.; M1912A Projectile D.P.; M1913/ Projectile D.P.	*Projectile:* Common Steel *Filler*: Explosive D *Primer:* Nitrocellulose & Black Powder (M30) *Delay:* Black Powder *Detonator*: mercury fulminate *Booster:* tetryl *Propellant:* nonhygroscopic powder [NH] Nitrocellulose, Rosaliline, Diphenylamine	Explosives: • Nitrocellulose (no analysis) Metals: • Iron Other: • Rosaliline (no analysis) • Diphenylamine (stabilizer – no analysis)

Table 2-2. Military Munitions Type and Composition (USACE 2003; USACE 2004)

Range ID (MRS)/ Subrange	Munitions ID	Munitions Type	Composition (Filler, Projectile, Body, Propellant, other)	Associated MC Analysis[1, 2]
Range Complex No. 1 (MRS 1)/ Battery Barlow	LARGE CALIBER (37MM AND LARGER), HE (CTT18)	Coast Artillery Early 1900s/ 10-inch disappearing guns, model 1896…; MK III projectile A.P.C. MK IV Shell HE; 1911 projectile A.P.C.	*Projectile:* Common Steel *Filler*: Explosive D *Primer:* Nitrocellulose & Black Powder (M30) *Delay:* Black Powder *Detonator*: mercury fulminate *Booster:* tetryl, TNT *Fuze:* potassium chlorate, antimony sulfide, lead azide, tetryl, carborundum *Propellant:* NH	Explosives: • Nitrocellulose (no analysis) Metals: • Iron Other: • Rosaliline (no analysis) • Diphenylamine (stabilizer – no analysis)
Range Complex No. 1 (MRS 1)/ Battery Dutton	LARGE CALIBER (37MM AND LARGER), HE (CTT18)	Coast Artillery Early 1900s/ 6-inch disappearing guns, model 1897M1; M1911 Shell A.P.C.; M1911 Shot A.P.C.; MK II AI Shell H.E.	*Projectile:* Common Steel *Filler*: Explosive D *Primer:* Nitrocellulose & Black Powder (M30) *Delay:* Black Powder *Detonator*: mercury fulminate *Booster:* tetryl, TNT *Fuze:* potassium chlorate, antimony sulfide, lead azide, tetryl, carborundum *Propellant:* NH	Explosives: • Nitrocellulose (no analysis) Metals: • Iron Other: • Rosaliline (no analysis) • Diphenylamine (stabilizer – no analysis)
Range Complex No. 1 (MRS 1)/ Battery Hamilton	LARGE CALIBER (37MM AND LARGER), HE (CTT18)	Coast Artillery Early 1900s/ 6-inch guns, model 1903	*Projectile:* Common Steel *Filler*: Explosive D *Primer:* Nitrocellulose & Black Powder (M30) *Delay:* Black Powder *Detonator*: mercury fulminate, lead azide *Booster:* tetryl, TNT *Fuze:* potassium chlorate, antimony sulfide,	Explosives: • Nitrocellulose (no analysis) Metals: • Iron Other: • Rosaliline (no analysis) • Diphenylamine (stabilizer – no analysis)

Table 2-2. Military Munitions Type and Composition (USACE 2003; USACE 2004)

Range ID (MRS)/ Subrange	Munitions ID	Munitions Type	Composition (Filler, Projectile, Body, Propellant, other)	Associated MC Analysis[1, 2]
			lead azide, tetryl, carborundum *Propellant:* NH	
Range Complex No. 1 (MRS 1)/ Battery Marcy	LARGE CALIBER (37MM AND LARGER), HE (CTT18)	Coast Artillery Early 1900s/ 6-inch guns, model 1903	*Projectile:* Common Steel *Filler*: Explosive D *Primer:* Nitrocellulose & Black Powder (M30), *Delay:* Black Powder *Detonator*: mercury fulminate, lead azide *Booster:* tetryl, TNT *Fuze:* *Propellant:* NH	Explosives: • Nitrocellulose (no analysis) Metals: • Iron Other: • Rosaliline (no analysis) • Diphenylamine (stabilizer – no analysis)
Range Complex No. 1 (MRS 1)/ Battery Hoffman	LARGE CALIBER (37MM AND LARGER), HE (CTT18)	Coast Artillery Early 1900s/ 3-inch seacoast guns, model 1902 – M1915 HE, M42AI HE; TP MK VII or MK VIIAI, blank	*Projectile:* Common Steel *Filler*: Explosive D, TNT, or none *Primer:* Black Powder, potassium chlorate, antimony sulfide, lead azide, tetryl, carborundum, TNT *Delay:* Black Powder *Detonator*: mercury fulminate, lead azide *Booster:* tetryl, TNT RDX, *Propellant:* Mk IA1 or MK II A I (NH) or black powder	Explosives: • Nitrocellulose (no analysis) • Black powder (no analysis) Metals: • Iron Other: • Rosaliline (no analysis) • Diphenylamine (stabilizer – no analysis)
Range Complex No. 1 (MRS 1)/ Battery Hoppock	LARGE CALIBER (37MM AND LARGER), HE (CTT18)	Coast Artillery Early 1900s/ 3-inch seacoast guns, model 1902	*Projectile:* Common Steel *Filler*: Explosive D, TNT, or none *Primer:* Black Powder, potassium chlorate,	Explosives: • Nitrocellulose (no analysis) • Black powder (no analysis)

Table 2-2. Military Munitions Type and Composition (USACE 2003; USACE 2004)

Range ID (MRS)/ Subrange	Munitions ID	Munitions Type	Composition (Filler, Projectile, Body, Propellant, other)	Associated MC Analysis[1, 2]
			antimony sulfide, lead azide, tetryl, carborundum, TNT *Delay:* Black Powder *Detonator*: mercury fulminate, lead azide *Booster:* tetryl, TNT RDX, *Propellant:* Mk IA1 or MK II A I (NH) or black powder	Metals: • Iron Other: • Rosaliline (no analysis) • Diphenylamine (stabilizer – no analysis)
Range Complex No. 1 (MRS 1)/ Dynamite Battery	LARGE CALIBER (37MM AND LARGER), HE (CTT18)	Coast Artillery Early 1900s/ 15-inch Dynamite gun[3]	Filler : Dynamite: desensitized blasting gelatin, NG	Explosives: • None Metals: • None
Range Complex No. 1 (MRS 1)/ Battery #215	LARGE CALIBER (37MM AND LARGER), (INCENDIARY, SMOKE)(CTT 19)	6-inch HC, Mk 34/6-inch guns	*Projectile:* Common Steel *Filler*: Explosive D *Primer:* Nitrocellulose & Black Powder (M30) *Delay:* Black Powder *Detonator*: mercury fulminate, lead azide *Booster:* tetryl, TNT *Fuze:* potassium chlorate, antimony sulfide, lead azide, tetryl, carborundum *Propellant:* NH	Explosives: • Nitrocellulose (no analysis) Metals: • Iron Other: • Rosaliline (no analysis) • Diphenylamine (stabilizer – no analysis)
Range Complex No. 1 (MRS 1)/ AMTB 913	LARGE CALIBER (37MM AND LARGER), HE (CTT18)	90mm, HE. M71 and HE-T, M71A1/90-mm guns	*Projectile:* Common Steel *Filler:* TNT, Explosive D *Primer:* Primer (M54) Antimony Sulfide, Lead Sulphocyanate, Potassium Chlorate, TNT; Primer (M28A2, M28B2) consists of M61 Primer (Potassium Chlorate, Lead Thiocyanate, Antimony, Sulfide, TNT) and Black Powder *Relay:* (M2) Black Powder; (M7): Lead Azide *Detonator:* Detonator (M24) Lead Azide, Potassium Chlorate, Antimony Sulfide,	Explosives: • Nitrocellulose (no analysis) • NG • DNT • Nitroguanidine (no analysis) • Potassium Sulfate (no analysis) Metals: • Iron Other: • Diphenylamine

Table 2-2. Military Munitions Type and Composition (USACE 2003; USACE 2004)

Range ID (MRS)/ Subrange	Munitions ID	Munitions Type	Composition (Filler, Projectile, Body, Propellant, other)	Associated MC Analysis[1, 2]
			Carborundum 150 (silicon carbide) *Booster:* Booster (M20) Lead Azide, Tetryl; Booster (M20A1) Lead Azide, Tetryl; Booster (M24) Lead Azide, RDX, Tetryl Booster *Propellant:* Propellant (M15) Nitrocellulose, NG, Nitroguanidine, Cryolite, Ethyl Centralite; Propellant (M6) Nitrocellulose, DNT, Dibutylphthalate, Potassium Sulfate, Diphenylamine *Tracer*: Barium peroxide, magnesium powder, calcium resinate, graphite, strontium nitrate magnesium powder, aluminum powder, polyvinylchloride.	(no analysis) • Cryolite (no analysis) • Ethyl Centralite (no analysis)
Range Complex No. 1 (MRS 1)/ AA Battery	LARGE CALIBER (37MM AND LARGER), HE (CTT18)	3-inch, Shrapnel, Mk I/ 3-inch guns, Model 1918	*Projectile:* Common Steel *Filler*: Explosive D, TNT, or none *Primer:* Black Powder, potassium chlorate, antimony sulfide, lead azide, tetryl, carborundum, TNT *Delay:* Black Powder *Detonator*: mercury fulminate, lead azide *Booster:* tetryl, TNT RDX, *Propellant:* Mk IA1 or MK II A I (NH) or black powder	Explosives: • Nitrocellulose (no analysis) • Black powder (no analysis) Metals: • Iron Other: • Rosaliline (no analysis) • Diphenylamine (stabilizer – no analysis)
Range Complex No. 1 (MRS 1)/ Small Arms Range No. 1 and Small Arms Range No. 2	SMALL ARMS (CTT01)	General Small Arms	*Projectile:* .50 cal: Lead, Antimony, cupro-nickel, and Soft Steel. *Propellant*: Single or Double-base powder (Nitrocellulose and NG) or smokeless powder Nitrocellulose (91.18%), DNT (7.0%), Diphenylamine (0.87%), Potassium sulfate (0.55%), Graphite (0.4%). *Tracer:* R-256 (Strontium Peroxide, Calcium Resinate, Strontium Oxalate, Strontium Nitrate, Magnesium) and I-276 (Barium Peroxide, Magnesium, Zinc	Explosives: • Nitrocellulose (no analysis) • NG • DNT Metals: • Antimony • Barium • Copper • Lead • Nickel • Zinc

Table 2-2. Military Munitions Type and Composition (USACE 2003; USACE 2004)

Range ID (MRS)/ Subrange	Munitions ID	Munitions Type	Composition (Filler, Projectile, Body, Propellant, other)	Associated MC Analysis[1, 2]
			Stearate, Toluidine dry red) or R 237 (Strontium Nitrate, Magnesium, calcium resinate, potassium perchlorate) *Primer:* Barium Nitrate, Lead Styphn Antimony Sulfide, Aluminum Powder, PETN, Tetracene *Filler*: N/A. ……... *Projectile*: .30 cal: antimony, lead, and iron and potentially zinc. *Propellant*: Black Powder (Potassium Nitrate, Sulfur, and Charcoal), nitrocellulose, and NG. *Tracer: Tracer – R-321 or R 284, I-136 or R-10-F, I-280*1 or R-20-C* - Magnesium Powder, strontium peroxide, Calcium Resinate, Lead Dioxide, Barium peroxide Primer: FA 70 (Potassium Chlorate, Lead Thiocyanate, Antimony Sulfide, TNT) or FA 675 (Barium Nitrate, Red Phosphorus) *Filler*: N/A.	

AP=Armor Piercing
BD=Base Detonating
CTT=Closed Transferring and Transferred
DNT=dinitrotoluene
HE=High Explosive
Mk=Mark
M=Model
MRS=Munitions Response Site
N/A=Not Applicable
NG = nitroglycerine
PD=Point Detonating
PETN=Pentaerythrite Tetranitrate
RDX=Cyclotrimethylenetrinitramine, also called Cyclonite or Hexahydro-1,3,5-trinitro-1,3,5-triazine
Tetryl=Methyl-2,4,6-trinitrophenylnitramine
TNT=trinitrotoluene

[1] Based on available technical manuals, MC identified for site munitions includes the following: Primer (potassium chlorate, lead thiocyanate, antimony sulfide, PETN, lead styphnate, barium nitrate, calcium silicade, acacia technical, acetylene black; Fuze (mercury fulminate, lead azide, tetryl, lead styphnate); Tracer (strontium nitrate, strontium peroxide, magnesium powder, calcium resinate, strontium oxalate, potassium perchlorate); Incendiary mixtures (barium nitrate, magnesium/aluminum powder, asphaltum, graphite). These materials, when combined, typically represent less than 5% of the weight of the material projectile for small and medium caliber munitions. Typical volumes are broken out as follows: Primer (less than 1% or 1 gram), Tracer (less than 1% or < 1 gram), Incendiary (less than 2% or < 2 grams) and fuze (less than 1% or < 1 gram). These materials, along with the propellant, typically burn as the projectile is fired. Therefore, the MC sampling/analysis typically focuses on primary constituents present in propellants and the projectile/casings in firing points and impact areas. Therefore, these constituents are not included in the list of "Associated MC Analysis". In accordance with the Final Site-Specific Work Plan Addendum (SS-WP), perchlorate was not included in the list of analytes (Alion 2006d).

[2] No impact/target areas, burial areas, or open burn/open detonation (OB/OD) area are located onsite. No report of explosions associated with the batteries/firing points were found in historical records. One report of a firing accident was found for Battery Dutton. The accident was described as the gun falling off the mount and

Table 2-2. Military Munitions Type and Composition (USACE 2003; USACE 2004)

Range ID (MRS)/ Subrange	Munitions ID	Munitions Type	Composition (Filler, Projectile, Body, Propellant, other)	Associated MC Analysis[1, 2]
		damaging the wall because of the propellant explosion. Given the accident did not involve the projectile or its filler, booster, or detonator, the material present in the projectiles (to include Explosive D, TNT, mercury fulminate, or tetryl) is not likely to be found around the firing points (USACE 2003). [3] Requires a steam power plant to provide the compressed air it uses to propel the projectile (*i.e.*, no propellant).		

Table 2-3 Army Checklist for Important Ecological Places

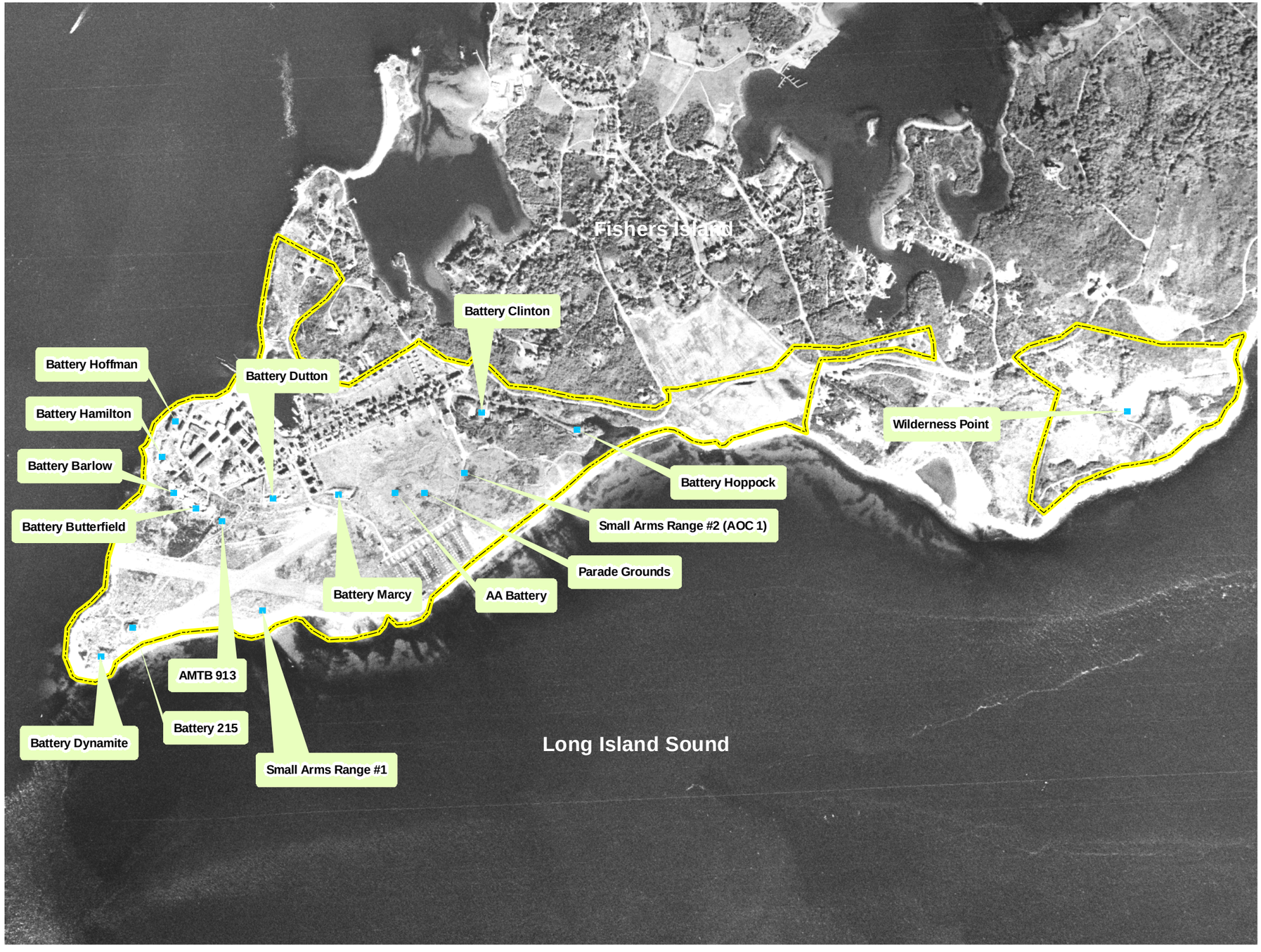
No.	Checklist Item	Yes[1] / No		Comments
1.	Locally important ecological place identified by the Integrated Natural Resource Management Plan, BRAC Cleanup Plan or Redevelopment Plan, or other official land management plans.		No	
2.	Critical habitat for Federal designated endangered or threatened species. See No. 12 below.	Yes		The former Fort H. G. Wright portion of Fishers Island provides habitat for 12 state or federally-listed Rare, Threatened, or Endangered species: two bird species (Piping Plover (*Charadius melodus*) and Common Tern (*Sterna hirundo*)) and 10 plant species.
3.	Marine Sanctuary		No	
4.	National Park		No	
5.	Designated Federal Wilderness Area		No	
6.	Areas identified under the Coastal Zone Management Act	Yes		Fort H.G. Wright is located within a Coastal Management Zone
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	Yes		The former Fort H. G. Wright portion of Fishers Island provides habitat for 12 state or federally-listed Rare, Threatened, or Endangered species: two bird species (Piping Plover (*Charadius melodus*) and Common Tern (*Sterna hirundo*)) and 10 plant species.
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	

Table 2-3 Army Checklist for Important Ecological Places

No.	Checklist Item	Yes[1] / No		Comments
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	Yes		The former Fort H.G. Wright portion of Fishers Island provides habitat for 12 state or federally-listed Rare, Threatened, or Endangered species: two bird species (Piping Plover (*Charadius melodus*) and Common Tern (*Sterna hirundo*)) and 10 plant species.
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	Yes		The former Fort H.G. Wright portion of Fishers Island contains several designated wetland areas.
33.	Fragile landscapes, land sensitive to degradation if vegetative habitat or cover diminishes		No	

[1] A SLERA is implemented if any of the questions are noted as a YES.

Fort H. G. Wright
Fishers Island, New York



Legend

- FUDS Boundary
- Facility Locations

Sources:
USDA-NRCS-GDG, 2006

0 205 410 820
Meters

Figure 2-1. Historic Site Layout

Fort H. G. Wright
Fishers Island, New York

Legend

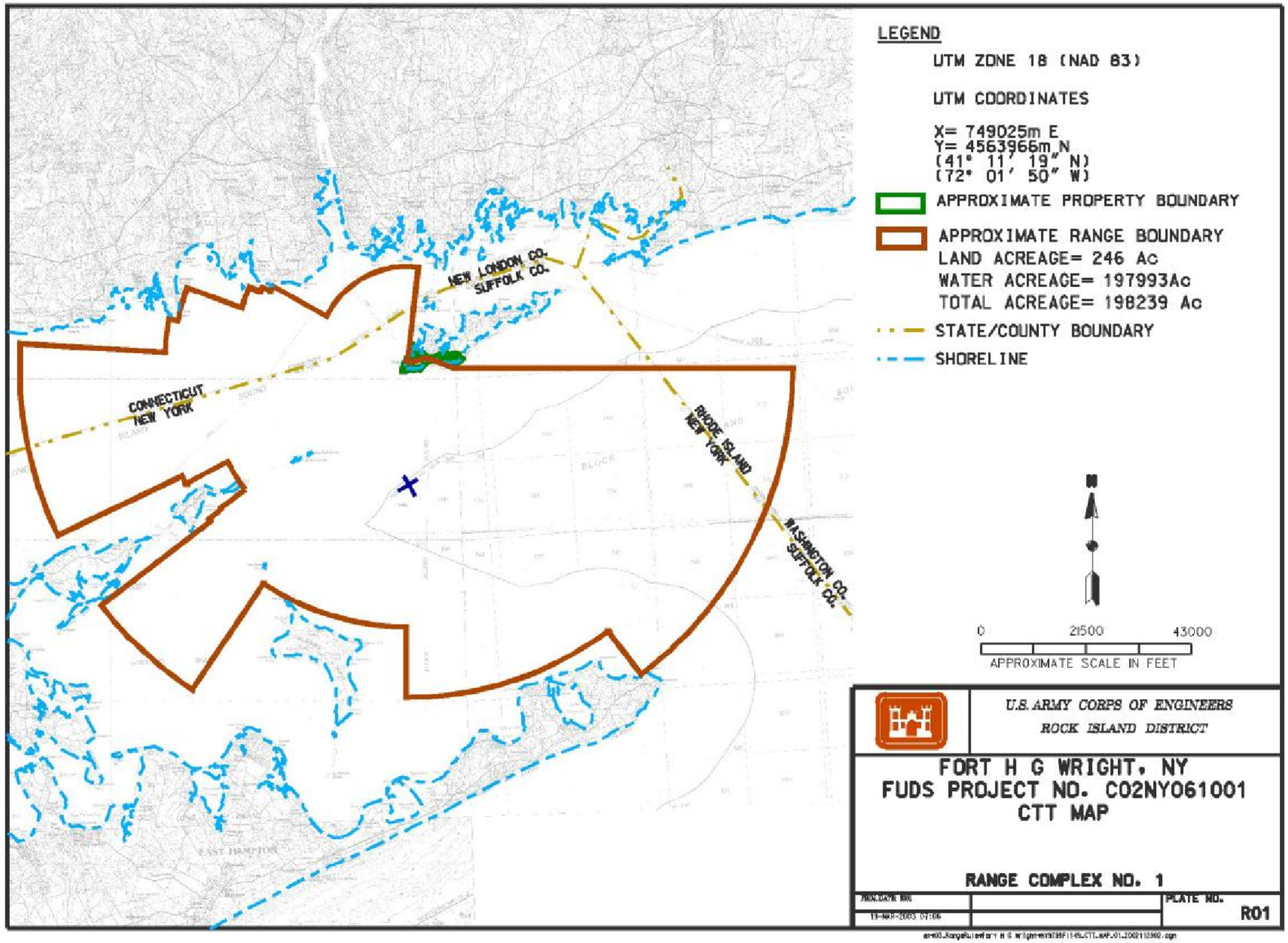
- MRA/MRS Boundary - Batteries/Small Arms Range
- FUDS Boundary
- Facility Locations

Sources:
USDA-NRCS-GDG, 2006

0 205 410 820
Meters

Figure 2-2. Munitions Response Site Boundary and Sub-Range Locations

Fort H. G. Wright
Fishers Island, New York



Note:

✕ Designates the Range Complex No.1 Centerpoint

Source:
USACE ASR Supplement, 2004

Figure 2-3. Range Complex 1 Impact Area

Fort H. G. Wright
Fishers Island, New York

Legend

- FUDS Boundary
- 1 Mile Radius
- Wetlands

Acronyms
FUDS - Formerly Used Defense Site

Sources:
USDA-NRCS-GDG, 2006
USFWS-NWI, 2006

0 390 780 1,560
Meters

Figure 2-4. Site Location, Topography, Wetlands, and Surface Water

3. SITE INSPECTION ACTIVITIES

3.1 Technical Project Planning

3.1.1 USACE conducted the TPP meeting for the Fort H.G. Wright FUDS on 8 May 2006 at the Fishers Island Fire Department in the Town of Southold in Suffolk County, New York. The final TPP Memorandum documenting the meeting was issued in July 2006. Participants in the TPP meeting included representatives from the CENAB, USACE New York District, the NYSDEC, Fishers Island Union Free School, Fishers Island Waste Management, Fishers Island Ferry District, and the Alion Team. During the first TPP meeting, the participants provided valuable information that guided SI activities. At that time, six Data Quality Objectives (DQOs) were defined for this SI (Alion 2006a); however, during the development of the SS-WP (Alion 2006d), the list of DQOs were revised and combined to the current list of four DQOs[3]. The TPP discussion involved a presentation of general decision rules for completing the SI objectives. These decision rules were summarized in the DQO worksheets and are summarized below.

3.1.2 DQO 1 – Determine if the site requires additional investigation through an RI/FS or if the site may be recommended for No Department of Defense Action Indicated (NDAI) based on the presence or absence of MEC and MC. The basis of recommendation for RI/FS related to the presence/absence of MEC includes:

- Historic data that indicates the presence of MEC or MD
- Visual evidence or anomalies classified as MEC, MD, or material potentially presenting an explosive hazard (MPPEH)
- One or more anomalies in a target area near historic or current MEC/MD finds or within an impact crater
- Physical evidence indicating the presence of MEC (*e.g.*, distressed vegetation, stained soil, ground scarring, bomb craters, burial pits, etc.)

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

- Maximum concentrations at the site that exceed EPA Region 9 Preliminary Remediation Goals (PRGs) based on current and future land use.

[3] Based on discussions with USACE, the DQOs were consolidated from six DQOs to four DQOs to be more in-line with the programmatic SI goals. The consolidation does not compromise the intent of the original DQOs.

- Maximum concentrations at the site that exceed EPA interim ecological risk screening values
- Maximum concentrations at the site that exceed site-specific background levels
- Data indicating the presence or absence (less than method detection limits for metals and less than the reporting limit for explosives) of analytes for which no screening criteria (decision limits: PRGs, etc.) are available are to be used to support the weight-of-evidence evaluation of MC at the site.

3.1.4 In each of these instances, all lines of evidence (*e.g.*, historical data, field data, etc.) are to be used to make a final recommendation for an NDAI or RI/FS. If none of these scenarios occur above for MEC or MC, then the recommendation for NDAI is a possible option.

3.1.5 DQO 2 – Determine the potential need for a Time Critical Removal Action (TCRA) for MEC and MC by collecting and analyzing data from previous investigations/reports, conducting site visits, and performing analog geophysical activities, and by collecting MC samples. The basis for the recommendations includes:

- A TCRA or an emergency response would be recommended if there is a complete pathway between source and receptor and if the MEC/MC and the situation are viewed as an "imminent danger threat posed by the release or threat of a release, and where cleanup or stabilization actions must be initiated within six months to reduce risk the risk to public health or the environment.
- A Non-Time-Critical Removal Action (NTCRA) would be recommended if a release or threat of a release that poses a risk where more than six months planning time is available.

3.1.6 In each of these instances, all lines of evidence (*e.g.*, historic data, field data, etc.) are to be used to make a final recommendation for a removal or emergency response action.

3.1.7 DQO 3 – Collect or develop additional data, as appropriate, for Hazard Ranking System (HRS) scoring by the Environmental Protection Agency (EPA).

- Verification that data was collected in accordance with the Final SS-WP.

3.1.8 DQO 4 – Collect the additional data necessary to complete the MRSPP

- Completion of the MRSPP for each MRS (Appendix K) with all available data and documentation of any data gaps for future annual MRSPP updates.

3.1.9 The TPP meeting participants concurred with the DQOs and the general technical approach for the planned SI activities discussed during the TPP (Alion 2006a) and as revised and subsequently documented in the Final SS-WP (Alion 2006d). In summary, these agreements were to inspect the cited areas of concern (including a request to investigate AOC 1) and to complete multimedia sampling in accordance with the DQOs and plans documented in the Final SS-WP. Please refer to the Final TPP Memorandum (Alion 2006a), attached in Appendix B, for more specific details of the TPP meeting. As part of this SI Report, Alion evaluated the DQOs presented in the SS-WP and completed a DQO attainment verification worksheet to document completion and achievement of the DQOs (included in Appendix B).

3.2 Supplemental Records Review

3.2.0.1 State agencies were contacted regarding threatened and endangered (T&E) species and cultural and ecological resources at the FUDS property.

3.2.1 Threatened and Endangered Species

3.2.1.1 The former Fort H. G. Wright portion of Fishers Island provides habitat for 12 state or federally listed T&E species which includes two bird species (Piping Plover [*Charadius melodus*] and Common Tern [*Sterna hirundo*]) and 10 plant species. The U.S. Fish and Wildlife Service (USFWS) and the NYSDEC, New York Natural Heritage Program (NYS-NYNHP) have provided current information on T&E for this FUDS (Alion 2006d). The NYS-NYNHP provided concurrence to SI sampling activities (Appendix L). No listed T&E species were identified during the SI field activities.

3.2.2 Cultural and Archeological Resources

3.2.2.1 During the SS-WP development, the Alion Team/USACE consulted with the New York State Historic Preservation Office (SHPO) to determine if planned SI field activities would impact potential cultural resources at Fort H.G Wright. The project was reviewed in accordance with Section 106 of the National Historic Preservation Act of 1966. No impacts to cultural or archaeological resources were identified by the New York SHPO (Appendix L).

3.3 Site Inspection Fieldwork

3.3.1 The SI field work included one sampling event (16-17 January 2007) which was conducted in accordance with the *Programmatic Work Plan for Formerly Used Defense Sites (FUDS) Military Munitions Response Program (MMRP) Site Inspections at Multiple Sites in the Northeast Region (PWP)* (Alion 2005) and the Final SS-WP for Fort H.G. Wright (Alion 2006d). A qualitative site reconnaissance for MEC and sample collection and analysis for MC was completed. A total of approximately 10 acres was assessed through the qualitative reconnaissance. A total of 32 surface soil samples (including five background samples) were collected along with two sediment samples. In accordance with the SS-WP, surface soil samples were collected as composite samples (7-point wheel composite). Sediment, samples were collected as discrete samples.

3.3.2 MEC reconnaissance findings and MC sample results are discussed in Sections 4 and 5, respectively. As-collected sample locations, sample designations, and sampling rationale are summarized in Table 3-1. Sampling locations and geophysical reconnaissance routes are depicted on Figure 3-1. Additional information pertaining to the field activities, including field notes and forms, are included in Appendix D. Photograph locations and descriptions are presented in Figure 3-2 and Appendix E.

3.4 Work Plan Deviations and Field Determinations

3.4.1 Deviations from the Final SS-WP occurred, mostly with respect to the location of samples and the number of samples collected. These deviations are acceptable as they have enhanced the data collection process with additional samples as well as sampling biased towards areas of expected contamination. The SS-WP specified the collection of 31 surface soil samples and 2 sediment samples (Alion 2006d). During the January 2007 sampling event, the Alion team collected 32 surface soil samples and 2 sediment samples. One additional sample was collected from the Dynamite Battery based on visual inspection of this area. Several areas were identified within the former location of this battery that were suspected to be associated with the gun emplacement. Since no evidence was found as to the exact location of this Battery, an additional sample was collected to more accurately assess conditions at this subrange. Additionally, throughout the SI field activities, samples were relocated to areas in front of the firing points of the former gun emplacements at each gun emplacement (*i.e.*, the down-range side of the guns) and in areas most representative of firing range berms/backstops of the suspect small arms ranges. The remaining SI field activities were conducted in accordance with the SS-WP. DQO Verification Worksheets are included in Appendix B along with the TPP Memorandum.

3.5 Site Inspection Laboratory Data Quality Indicators

3.5.1 This section summarizes the data quality assessment for the Fort H.G. Wright SI analytical data. Data were generated by GPL Laboratories under the DoD Quality Services Manual (QSM) Version III and validated by a third-party validator (EDS) using EPA Region II Data Validation Guidelines. The data were also analyzed using the Automated Data Review (ADR) Version 8.1 based on the DoD QSM Version III guidelines, and these results are included in the EDMS database. The detailed GPL and EDS reports are contained in Appendix F and G respectively, and the following text summarizes the findings. Data Quality Indicators (DQI) include precision, accuracy, representativeness, completeness, and comparability (PARCC) as well as sensitivity.

3.5.2 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 based on Region II Data Validation Guidelines. There were a few MS/MSD pairs that did not achieve acceptable values, and these samples were qualified appropriately (Appendix G). Field precision is measured by the comparison of field duplicate samples, which are also discussed as appropriate in Appendix G.

3.5.3 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, Surrogate, and Blank Spikes. EDS assessed accuracy according to Region II Data Validation Guidelines and assigned qualifiers as appropriate (Appendix G).

3.5.4 Representativeness expresses the degree to which data accurately and precisely represent 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. With the exception of the addition of one extra soil sample and the minor relocation of several other soil samples (see Section 3.4), all samples were collected and analyzed as planned; therefore, the representative DQI has been achieved for Fort H.G. Wright.

3.5.5 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 samples were collected as planned for Fort H.G. Wright. As discussed in Appendix G, none of the 1,511 total analyte results associated with this sample effort was rejected; therefore, the completeness indicator is 100 percent, and the Fort H.G. Wright data meet the completeness data quality indicator.

3.5.6 Comparability expresses the confidence with which one data set can be compared to another. There are no previous analyses of data at Fort H.G. Wright 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.

3.5.7 Sensitivity is a measure of the screening criteria as they compare to detection limits[4]. If screening criteria are lower than detection limits the certainty of "non-detected" data is called into question. The laboratory reported to the reporting limit (RL) for explosives, which represents the lowest concentration for which a standard was assessed; consequently, if screening values are greater than explosive detection limits, the DQI has been met. For metals, the laboratory report to the method detection limit, which represents the lowest concentration detectable above instrument noise. No calibration standards are analyzed between the MDL and RL; consequently, this adds uncertainty for nondetected metals. A discussion on data sensitivity is presented in Section 5.1.4, which will discuss any instances of uncertainty.

3.6 Second TPP meeting

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

[4] The method detection limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater then zero and is determined from analysis of a sample in a given matrix containing the analyte (Alion 2005).
The method reporting limit (RL) is established at a factor of five to ten times the MDL for the majority of target analytes but no lower then three times the MDL for any target analyte (Alion 2005).

Table 3-1 Sample Locations and Field Observations, Fort H.G. Wright

Range Name (MRS)	Sub-Range Name	Sampling ID	Coordinates (UTM, NAD 83, ZONE 18)		Work Plan Rationale for Sampling Locations (Alion 2006d)	Comments
			Easting (m)	Northing (m)		
Range Complex No. 1 (MRS 1)	Background Samples	HGW-BG-SS-02-01	749348	4571571	Undisturbed surface soil	None
		HGW-BG-SS-02-02	749324	4571413	Undisturbed surface soil	None
		HGW-BG-SS-02-03	749213	4571462	Undisturbed surface soil	None
		HGW-BG-SS-02-04	749553	4571507	Undisturbed surface soil	None
		HGW-BG-SS-02-05	749081	4571443	Undisturbed surface soil	None
	Battery Clinton	HGW-BC-SS-02-01	749426	4571487	Surface soil in front of gun emplacement firing point	None
		HGW-BC-SS-02-02	749434	4571442	Surface soil in front of gun emplacement firing point	None
	Battery Butterfield	HGW-BB-SS-02-01	748474	4571186	Surface soil in front of gun emplacement firing point	None
		HGW-BB-SS-02-02	748550	4571169	Surface soil in front of gun emplacement firing point	None
	Battery Barlow	HGW-BL-SS-02-01	748432	4571261	Surface soil in front of gun emplacement firing point	None
		HGW-BL-SS-02-02	748443	4571217	Surface soil in front of gun emplacement firing point	None

Table 3-1 Sample Locations and Field Observations, Fort H.G. Wright

Range Name (MRS)	Sub-Range Name	Sampling ID	Coordinates (UTM, NAD 83, ZONE 18)		Work Plan Rationale for Sampling Locations (Alion 2006d)	Comments
			Easting (m)	Northing (m)		
	Battery Dutton	HGW-DT-SS-02-01	748768	4571225	Surface soil in front of gun emplacement firing point	None
Range Complex No. 1 (MRS 1)	Battery Dutton	HGW-DT-SS-02-02	748794	4571227	Surface soil in front of gun emplacement firing point	None
	Battery Hamilton	HGW-BH-SS-02-01	748396	4571365	Surface soil in front of gun emplacement firing point	None
	Battery Hamilton	HGW-BH-SS-02-02	748422	4571318	Surface soil in front of gun emplacement firing point	None
	Battery Marcy	HGW-BM-SS-02-01	748966	4571277	Surface soil in front of gun emplacement firing point	None
	Battery Marcy	HGW-BM-SS-02-02	748995	4571235	Surface soil in front of gun emplacement firing point	None
	Battery Hoffman	HGW-HF-SS-02-01	748405	4571426	Surface soil in front of gun emplacement firing point	None
	Battery Hoffman	HGW-HF-SS-02-02	748401	4571416	Surface soil in front of gun emplacement firing point	None
	Battery Hoppock	HGW-HP-SS-02-01	749730	4571432	Surface soil in front of gun emplacement firing point	None
	Battery Hoppock	HGW-HP-SS-02-02	749709	4571421	Surface soil in front of gun emplacement firing point	None

Table 3-1 Sample Locations and Field Observations, Fort H.G. Wright

Range Name (MRS)	Sub-Range Name	Sampling ID	Coordinates (UTM, NAD 83, ZONE 18)		Work Plan Rationale for Sampling Locations (Alion 2006d)	Comments
			Easting (m)	Northing (m)		
Range Complex No. 1 (MRS 1)	Dynamite Battery[1]	HGW-BD-SS-02-01	748205	4570757	Surface soil in front of gun emplacement firing point	None
		HGW-BD-SS-02-02	748200	4570748	Surface soil in front of gun emplacement firing point	None
		HGW-BD-SS-02-03	748199	4570733	Surface soil in front of gun emplacement firing point	None
		HGW-BD-SD-02-01	748175	4570737	Sediment from wetland area adjacent to gun emplacement firing point	None
		HGW-BD-SD-02-02	748235	4570797	Sediment from wetland area adjacent to gun emplacement firing point	None
	Battery #215	HGW-BX-SS-02-01	748258	4570812	Surface soil in front of gun emplacement firing point	None
		HGW-BX-SS-02-02	748251	4570800	Surface soil in front of gun emplacement firing point	None
	AA Battery	HGW-AA-SS-02-01	749212	4571255	Surface soil from center of firing point	None
		HGW-AA-SS-02-02	749212	4571255	Surface soil from berms surrounding firing point	None

Table 3-1 Sample Locations and Field Observations, Fort H.G. Wright

Range Name (MRS)	Sub-Range Name	Sampling ID	Coordinates (UTM, NAD 83, ZONE 18)		Work Plan Rationale for Sampling Locations (Alion 2006d)	Comments
			Easting (m)	Northing (m)		
	Small Arms Range No. 1	HGW-SA-SS-02-01	748703	4570876	Surface soil from suspect berm/backstop	None
Range Complex No. 1 (MRS 1)		HGW-SA-SS-02-02	748721	4570929	Surface soil from suspect berm/backstop	None
	Small Arms Range No. 2	HGW-SA-SS-02-03	749369	4571332	Surface soil from suspect berm/backstop	None
		HGW-SA-SS-02-04	749443	4571313	Surface soil from suspect berm/backstop	None
Range Complex No. 1 (AOC 1)	Small Arms Range No. 2	HGW-SA-SS-02-03	749369	4571332	Surface soil from suspect berm/backstop	None
		HGW-SA-SS-02-04	749443	4571313	Surface soil from suspect berm/backstop	None

[1] The name of the battery in the ASR was designated as Battery Dynamite while the name of the battery in the ASR Supplement was Dynamite Battery. Text in the SI Report Follows the ASR Supplement however, the sample names follow the ASR designation of Battery Dynamite (i.e. BD).

Fort H. G. Wright
Fishers Island, New York

Legend

- FUDS Boundary
- Geophysical Reconnaissance Routes
- Field Sample Locations

Sample ID Designation

"MIL-TL-SS-02-01"
Site Name-Sampling Location-Sample Type-Sample Depth-Sample #

Sources:
USDA-NRCS-GDG, 2006

0 100 200 400
Meters

Figure 3-1. Sample Locations & Geophysical Site Reconnaissance Findings

Fort H. G. Wright
Fishers Island, New York

Legend

FUDS Boundary

Photo Locations

Acronyms
FUDS - Formerly Used Defense Site

Sources:
USDA-NRCS-GDG, 2006
USFWS-NWI, 2006

0 150 300 600
Meters

New York

Site Location

Figure 3-2. Site Inspection Photograph Locations

4. MUNITIONS AND EXPLOSIVES OF CONCERN SCREENING LEVEL RISK ASSESSMENT

4.1 Operational History

4.1.1 In 1898, construction began at Fort H.G. Wright and, from 1900 through 1949, the fort was used for military training and coastal defense activities (USACE 1997 and 2003). In the years prior to and during World War I (WWI), Fort H.G. Wright conducted coastal defense operations; served as a Reserve Officers Training Camp and a Civilian Military Training Camp; and supported National Guard and U.S. Army training. Gun emplacements at Fort H.G. Wright were armed prior to WWI with 3-in., 6-in., 10-in. and 12-in. guns, a 15-in. pneumatic dynamite gun, anti-aircraft (AA) emplacements, and 12-in. mortars (USACE 2003).

4.1.2 Between WWI and World War II (WWII), Fort H.G. Wright continued its role as a training center. During this time, 155-mm French guns were assigned as Anti-Torpedo Motor Boat defense in 1922 and 3-in. AA guns were constructed in 1928. In the 1930s, Fort H.G. Wright became the regional headquarters for the Civilian Conservation Corps (CCC) and munitions firing from the fort ceased prior to CCC occupancy (USACE 2003). During WWII, the Fort was used for coastal defense and included AA. The FUDS included 12 gun emplacements, two former suspect small arms ranges, various buildings formerly used for military administration and housing, and a small airfield (Figure 2-1). During operations, conventional munitions were used at the FUDS. Common munitions used/stored at the FUDS included 0.30- and 0.50-caliber cartridges, 37-mm, 3-in., 90-mm, 5-in., 6-in., 155 mm, 10-in., 12-in., and 15-in. cartridges and associated projectiles. Additional items stored at the FUDS included 32-in. spherical mines, which were employed in the waters around the FUDS (USACE 2003).

4.1.3 By the end of WWII, most of the armament at Fort H.G. Wright was obsolete and numerous batteries were scrapped, their guns salvaged, and ammunition returned to the supply system. From 1953 to 1959, the General Services Administration (GSA) transferred the Fort H.G. Wright property to various recipients (USACE 2003).

4.2 Site Inspection Munitions and Explosives of Concern Field Observations

4.2.1 A qualitative reconnaissance based on both visual observations and analog geophysics was completed. A visual reconnaissance of the surface areas within and around the ranges batteries of the FUDS was completed to identify MPPEH, MEC, or MD as well as visual indicators of suspect areas impacted by munitions to include distressed vegetation, stained soil, target butts, firing points and visual metallic debris). Analog geophysics was used by the field crew primarily

to support anomaly avoidance activities. Where appropriate, anomalies possibly attributable to MEC or MD were documented. The SI findings are presented below. The total estimated acreage subject to the qualitative reconnaissance is approximately 10 acres.

4.2.1 Range Complex No. 1 (MRS 1)

4.2.1.0.1 Range Complex No. 1 encompasses 246 acres and includes the thirteen subranges located within MRS 1 along with AOC 1. The Alion Team completed qualitative reconnaissance of the former range areas for MPPEH, MEC, and MD within MRS 1 and AOC 1 using visual observations and analog geophysics (magnetometer). Site reconnaissance and sampling locations are shown on Figure 3-1. Field observations related to cultural debris, range related features and MD/MEC finds are presented below.

4.2.1.1 Battery Clinton

- Located immediately south of the Whistler Avenue and Equestrian Avenue intersection.
- Concrete gun emplacement and associated magazines currently are being used for equipment storage by a landscaping company. Equipment and landscaping supplies including potting soil, bark mulch, lobster compost, wood debris, peat moss, slate, cobblestones and several vehicle batteries were observed on the surface in front of the firing point of this gun emplacement.
- No magnetic anomalies were recorded during the geophysical reconnaissance of this area due to the amount of surface metal present and the inability to discern actual subsurface anomalies versus the surface debris.
- No MD/MEC was observed.
- Two surface soil samples were collected near the proposed sampling locations. One sample was relocated in front of the gun emplacement's firing point. The other sample was collected at the base of the slope positioned downgradient of the gun emplacement firing point.

4.2.1.2 Battery Butterfield

- Located south of the Fox Lane and Whistler Avenue intersection, immediately to the southeast of Battery Barlow.
- The Field Team noted that the concrete gun emplacements were being used by Fishers Island Waste Management for household yard waste disposal.

- A large amount of construction debris and household yard waste including stumps, brush, stones, concrete, dirt and leaves was observed in and around the concrete gun emplacements.
- No subsurface anomalies were noted in the area.
- No MD/MEC was observed.
- Two surface soil samples were collected in the areas downgradient of firing points in a wooded area that showed no visual disposal evidence.

4.2.1.3 Battery Barlow

- Located south of the Fox Lane and Whistler Avenue intersection, immediately to the northwest of Battery Butterfield.
- The Field Team noted that the concrete gun emplacements were being used by Fishers Island Waste Management for household yard waste disposal.
- A large amount of construction debris and household yard waste including stumps, brush, stones, concrete, dirt and leaves was observed in and around the concrete gun emplacements.
- No subsurface anomalies were noted in the area.
- No MD/MEC was observed.
- Two surface soil samples were collected in the areas downgradient of firing points in a wooded area that showed no visual evidence of disposal.

4.2.1.4 Battery Dutton

- Located southwest of the Streamwood Ave and Whistler Avenue intersection in an overgrown and heavily vegetated area.
- The Field Team noted the gun emplacements to be partially backfilled with construction debris, metal pipes, soil, and boulders.
- No subsurface anomalies were noted in the area.
- No MD/MEC was observed.
- Two surface soil samples were collected in the areas downgradient of gun emplacement firing points.

4.2.1.5 Battery Hamilton

- Located west of the Fox Lane and Whistler Avenue intersection in an overgrown and heavily vegetated area.
- The area was extremely hard to navigate and visual inspection of ground surface was limited.
- Cultural debris (rubbish only) was found on the surface along the beach in front of the gun emplacements.
- No subsurface anomalies were identified in this area.
- No MD/MEC was observed.
- Two surface soil samples were collected in the areas downgradient of gun emplacement firing points.

4.2.1.6 Battery Marcy

- Located south of Whistler Avenue and immediately north of the 25 end of airport runway.
- Burned wooden pallets and charring of the underlying concrete was observed at this location.
- Several subsurface anomalies were identified to the east and southeast of Battery Marcy.
- No MD/MEC was observed.
- Two surface soil samples were collected in the areas downgradient of gun emplacement firing points.

4.2.1.7 Battery Hoffman

- Located west of the Fox Lane and Whistler Avenue intersection in an overgrown and heavily vegetated area.
- The area was extremely hard to navigate and visual inspection of ground surface was limited. Cultural debris (rubbish only) was found on the surface along the beach in front of the gun emplacements.
- No subsurface anomalies were identified in this area.
- No MD/MEC was observed.
- Two surface soil samples were collected in the areas downgradient of gun emplacement firing points.

4.2.1.8 Battery Hoppock

- Located south of Beach Road and due east from Battery Clinton at the end of an unnamed dirt road in an overgrown and heavily vegetated area.
- Area was overgrown and extremely hard to navigate. Concrete gun emplacements were noted currently to be used for boat repair/maintenance activities.
- No subsurface anomalies were identified in this area.
- No MD/MEC was observed.
- Two surface soil samples were collected in the areas downgradient of gun emplacement firing points.

4.2.1.9 Dynamite Battery

- Located on the southwestern corner/point of Fishers Island, southwest of Battery 215.
- The Field Team found remnants of the concrete battery as well as remnants (brick/concrete fragments, wood) of a former boiler house and railroad tracks. The area is relatively flat and overgrown with low brush and grass. Cultural debris (rubbish only) was found on the surface scattered throughout this area and adjacent beach from ocean storm surges.
- No anomalies were noted in this area.
- No MD/MEC was observed.
- Three surface soil samples were collected from the area downgradient of the battery firing point and the railway/boiler house area. Two sediment samples were collected from surface water pond areas adjacent to the battery and former boiler house.

4.2.1.10 Battery #215

- Located on the southwestern corner/point of Fishers Island, northeast of the Dynamite Battery.
- The concrete bunker entrance associated with this battery was blocked with soil and rubble.
- Several anomalies were noted but not recorded (attributed to surficial metal/cultural debris).
- No MD/MEC was observed.
- Two surface soil samples were collected in the areas downgradient and in front of the former firing points of the gun emplacements.

4.2.1.11 AMTB 913

- Reportedly located to the south of Battery Butterfield.
- This former battery reportedly was buried as part of Fort H.G. Wright closure activities and, therefore, in accordance with the approved SS-WP, was not investigated during SI field activities.

4.2.1.12 AA Battery

- Located in an overgrown vegetated area near a designated wetland located east of Battery Marcy and south of the former parade grounds. The area was overgrown and difficult to navigate.
- The concrete gun mount (located below ground surface [BGS]) was found in the center of a circular bermed area.
- Several unidentified subsurface anomalies were noted in this area.
- No MD/MEC was observed.
- Two surface soil samples were collected. One sample was collected from the center of the gun mount. The other sample was a composite from locations along the top of the berm surrounding the gun mount.

4.2.1.13 Small Arms Range No. 1

- Reportedly located adjacent to the shore immediately south of the intersection of the Fishers Island Airport runways.
- During reconnaissance of this area, the Field Team could find no visual evidence that indicated the existence of a small arms range in this area.
- The area consisted of a low lying area covered in low (1-2 ft) grass which gradually rose to meet the level of the adjacent beach.
- Two samples were collected from locations that were most representative of potential berms/backstops in this location.
- No MD/MEC was observed.
- No subsurface anomalies were noted in the area.

4.2.1.14 Other Findings

- On 17 January 2007, the Field Team discovered a suspect MEC item, identified as a parachute flare. The item was located behind the New York State Police building on

Whistler Avenue during the qualitative reconnaissance of the FUDS. The UXO Technician determined that this item was not associated with FUDS munitions-related activities which ended in the late 1940s, but rather that the flare was related to more recent military operations. It is not clear if the item was placed in this location or if it had been fired nearby and landed on the property. Explosive Ordnance Disposal (EOD) removed the flare.

4.2.2 Small Arms Range No. 2 (AOC 1)

Small Arms Range No. 2 is located within MRS 1. This range was not identified in range documents but it was identified by stakeholders to be located adjacent to an access road leading south from Battery Clinton.

4.2.2.1 Small Arms Range No. 2 (AOC 1) -

- During reconnaissance of this area, the Field Team could find no visual evidence that indicated the existence of a small arms range in this area; however, suspect berms were located in the area.
- The area consisted of overgrown vegetation and brush.
- No evidence of MD/MEC was observed.
- Two samples were collected from locations that were most representative of potential berms/backstops in this location.

4.2.3 Background Samples

4.2.3.1 Five surface soil background samples were collected from an open field area located within the FUDS. Site reconnaissance and sampling locations are shown on Figure 3-1. Locations selected were from areas deemed not impacted by DoD or current owner operations. There was no observed evidence of MEC or MD at any of the background sample locations.

4.3 MEC Risk Assessment

4.3.0.1 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 CSMs for MRS 1 and AOC 1 reflects this MEC assessment strategy (Appendix J).

4.3.0.2 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.

4.3.0.3 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.

4.3.1 Range Complex No. 1 (MRS 1)

4.3.1.1 MRS 1 encompasses 246 acres of the FUDS and includes all gun emplacement and a small arms range sub-range located within Range Complex No. 1. As discussed in Sections 3 and 4, MEC/MD have been recovered in MRS 1. MEC discoveries included numerous 0.30-caliber and 0.50-caliber spent casings, two live 0.30-caliber rounds, and one live 37-mm round. These items were reportedly found after a search by a stakeholder using a metal detector near the former parade grounds (Alion 2006a). During the SI, qualitative reconnaissance was conducted in areas adjacent to the parade grounds, including the AA Battery. Anomalies were noted around the AA Battery and the area surrounding the battery appeared to be hummocky and overgrown with some standing water due to nearby wetlands. Surface debris (cultural debris) was observed in this area. No MEC/MD was identified during the SI field reconnaissance in and around the batteries. Given the limited SI reconnaissance and the fact that small arms and medium-caliber shells have been found within this MRS, MEC could be present in the subsurface of other areas of the FUDS or in undeveloped/undisturbed areas of the FUDS (*e.g.*, wetland areas). In the vicinity of the batteries, however, there have been no documented MEC/MD findings historically or during the SI. Therefore, the likelihood of exposure of potential receptors to MEC/MD in this unrestricted area is remote.

4.3.1.2 No documented injuries have occurred since the FUDS was transferred from the GSA. Range Complex No 1 is comprised of hilly terrain with varying elevations; however, there are no fences restricting access to the former batteries or the suspected Small Arms Range No. 1 within this MRS. The MRS contains dirt and asphalt-paved roads that are easily accessible to visitors. The most likely human receptors are recreational users and Fishers Island Waste Management employees.

4.3.1.3 Due to the nature of the past military activities conducted at Fort H.G. Wright, the extent of potential MEC contamination is likely to be relatively small. This conclusion is based on the nature of training activities that were conducted during the Fort's operation, as well as the documentation indicating closure of this coastal fortification in accordance with DoD requirements. The overall MEC risk is considered "low to moderate" at MRS 1 because MEC (including live rounds removed from the subsurface) have been found in the past but there are no known or suspected burial areas. There is a low likelihood of significant MEC contamination remaining at the Fort H.G. Wright FUDS.

4.3.2 Small Arms Range No. 2 (AOC 1)

4.3.2.1 AOC 1 was not identified in the initial range inventory (USACE 2004a) but was included in the SI based upon stakeholder input during the TPP meeting (Alion 2006a). AOC 1 is located in the eastern portion of MRS 1 and is comprised of a suspected small arms range. There are no reports of past MEC/MD finds within AOC 1. During the SI, qualitative reconnaissance was conducted in the area of the samples locations at AOC 1. No MEC/MD was identified during the SI field reconnaissance at AOC 1. Given the accessibility of the FUDS and, along with the history (no documented findings of MEC or MD), MEC/MD is unlikely to present at AOC 1.

4.3.2.2 No documented injuries have occurred at AOC 1 since the FUDS was transferred from the GSA. There are no fences restricting access to the suspected small arms range and the area is easily accessible to visitors. The most likely human receptors are recreational users and Fishers Island Waste Management employees.

4.3.2.3 Due to the nature of the past military activities conducted at AOC 1 (Small Arms Range), the extent of potential MEC contamination is likely to be relatively small. This conclusion is based on the nature of training activities that were conducted during the Fort's operation, as well as the documentation indicating closure of this coastal fortification in accordance with DoD requirements. The overall MEC risk is considered "low" at AOC 1 because no MEC has been

found within the AOC and there are no known or suspected burial areas. There is a low likelihood of significant MEC contamination remaining at the FUDS.

5. MUNITIONS CONSITUENTS SAMPLING AND ANALYSIS

The analytical results for the MC sampling are presented below along with the screening methodology and the results of the screening assessment with respect to MRS 1 and AOC 1 identified at Fort H.G. Wright.

5.1 Data Evaluation Methodology

The following sections present the process used to evaluate the MC data collected for the FUDS. This process is consistent with the decision rules outlined in Section 3.1. Identification and refinement of MCs associated with munitions used at the FUDS is discussed below.

5.1.1 Refinement of Munitions Constituents

5.1.1.1 During the SI process, the Alion Team further evaluated the munitions reportedly used at the FUDS. Research was conducted to refine the specific list of constituents potentially associated with the MRS/range based on munitions reportedly used when the Fort was active. Refinement of the MC list is presented in Table 2-2. Samples were analyzed for the full, laboratory target analyte list of metals and target compound list of explosives in accordance with the approved SS-WP (Alion 2006d). Summary tables (Tables 5-1 and 5-2) are arranged by media (soil and sediment, respectively) and contain the complete analyte lists used by the laboratory. However***, the following discussions are limited to those analytes associated with the specific past munitions used and how these munitions were used (i.e., the full analyte list has been reduced to reflect actual munitions firing conditions and operational procedures).***

5.1.1.2 Specifically, based on the range and munitions-related operations, MCs from coastal batteries are associated with the firing point only; therefore, only the propellant constituents are carried forward for analysis in this SI. In addition, MCs from the land-based small arms ranges are associated with the firing point and the impact area (backstop); therefore, the propellant and the projectile constituents are carried forward in this SI Specific MCs associated with MRS 1 and AOC 1, as presented in Table 2-2, are summarized below:

Twelve Batteries (Firing Points in MRS 1)

- Explosives – Dinitrotoluene (DNT)[5], Nitroglycerin (NG)
- Metals – Barium

[5] Analyses included for 2,4-DNT and 2,6-DNT.

Two small arms firing ranges (firing points and impact areas in MRS 1 and AOC 1)

- Explosives – DNT, NG
- Metals – antimony, barium, copper, iron, lead, nickel, and zinc

5.1.2 Data Quality

5.1.2.1 All of the samples noted below were collected by Alion, analyzed by GPL Laboratories, and validated using EPA Region II validation guidance:

- Twenty-seven (27) surface soil samples (collected between 0 and 2 in. below ground surface [bgs])
- Two (2) sediment samples
- Five (5) background surface soil samples
- Duplicate samples.

5.1.2.2 The first step in the process of identifying chemicals of potential concern (COPC) and chemicals of potential environmental concern (COPEC) was 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.
- Analytical results bearing the J qualifier (indicating that the reported value was estimated) are retained at the measured concentration.

5.1.3 Screening Values

5.1.3.1 Screening for human health COPCs is conducted by comparing maximum detected chemical concentrations to EPA Region 9 Preliminary Remediation Goals (PRGs), as shown in Tables 5-1 through 5-2 (EPA 2004). The complete report of the analytical results and the analytical quality assurance/quality control (QA/QC) report are included in Appendix F and G, respectively. For the human health risk screening, the surface soil sample analytical results are compared to residential and industrial soil PRGs (EPA 2004). In accordance with EPA guidance, PRG values used are those at a cancer risk level of $1x10^{-6}$ and a non-cancer Hazard Quotient (HQ) of 0.1, for the purposes of screening. To account for potential additivity of non-carcinogenic hazards, non-carcinogenic PRGs have been divided by 10 for screening purposes. Sediment sample analytical results are compared to the residential and industrial soil PRGs. The

soil PRGs are increased by a factor of ten to account for typical reduced sediment exposures compared to that of soils, based on best professional judgment.

5.1.3.2 For the ecological risk screening, the surface soil sample results are compared to ecological soil screening levels (ecoSSLs) presented in Table 5-3. The site concentration in sediment was compared to the corresponding screening value (Table 5-2).concentration exceeded the screening value that analyte was retained as a COPEC. COPEC selection tables for soil and sediment are shown in Tables 5-1 and 5-2, respectively.

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

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

2. If the concentration of a specific chemical exceeds its screening value and is above the maximum background concentration the chemical is retained as a COPC/COPEC.

3. If a chemical was detected in at least one sample in a specific medium, it is retained for consideration in the screening of COPCs/COPECs.

4. 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.

5. An analyte is eliminated from the list of COPCs/COPECs if it is an essential nutrient of low toxicity, and its reported maximum concentration is unlikely to be associated with adverse health impacts. COPCs/COPECs excluded from further consideration on this basis include iron.

5.1.3.4 All target analytes (associated with munitions used at the FUDS site) detected at concentrations exceeding the MDL were evaluated.

5.1.4 Comparison of Screening Levels with Detection Limits for Non-Detected Analytes

Current EPA guidance (EPA 1989, 2001) requires that detection limits be addressed, particularly as related to the screening values used to select COPCs/COPECs. If a chemical is never detected, but the detection limit is higher than the screening value, or there is no screening value, then it may or may not be appropriate to designate the chemical as a COPC/COPEC, depending on whether the chemical is site-related or not. There is insufficient information in this case to

exclude or include the chemical. This would be noted as a source of uncertainty in the risk assessment screening. The detection limit reported by the laboratory was the reporting limit for organic chemicals (explosives) and the method detection limit for inorganics (metals) consistent with standard environmental analytical processes as well as CLP methods. Table 5-4 shows a comparison of the detection limits and human health and ecological risk screening values for all analytes in soil for those analytes never detected. Each screening value is higher than the respective reporting limit for the analytes of concern at Fort H.G. Wright; consequently, the data quality indicator for sensitivity has been achieved for all MCs associated with Fort H.G. Wright as identified in Section 5.1.1. Where no screening values are available, it is not possible to say whether the available detection limits were sufficient to detect these chemicals at concentrations that may pose risk to ecological receptors.

5.2 Conceptual Site Model (CSM)

5.2.1 CSM diagrams were prepared for MRS 1 and AOC 1 at Fort H.G. Wright (Appendix J). The CSMs define the source (*e.g.*, the secondary source/media), interaction (*e.g.*, the secondary release mechanism, the tertiary source, and the exposure route), and human receptors. In this SI Report, the CSM has been revised from the CSM presented in the Final SS-WP to reflect the results of the human health and ecological risk screening.

5.2.2 Potential current and future human receptors for MCs are expected to be trespassers/recreational users, construction/industrial workers, site workers, and current/future residents, as depicted in the CSM diagrams for MRS 1 and AOC 1 (Appendix J). Both residential and industrial receptor scenarios were evaluated in the human health screening-level risk assessment. The residential scenario was assessed for the protection of current and future residents and trespassers/recreational users on the FUDS. The industrial scenario was assessed for the protection of construction or site workers that may frequent the FUDS. The ecological receptors of concern (ROC) for the MRS and AOC include terrestrial plant/invertebrates (insects and worms), benthic organisms, aquatic organisms, terrestrial-feeding/predatory animals, terrestrial feeding/predatory birds, aquatic-feeding mammals, and aquatic-feeding birds.

5.2.3 Based on the possible existence of MEC/MC at ground surface and the location of the Dynamite Battery adjacent to a wetland, media of concern for human receptors at MRS 1 were determined to be surface soil and sediment. Based on the possible existence of MEC/MC at ground surface and/or within any remaining backstop material at the Small Arms Range No. 2, the medium of concern for human receptors at AOC 1 was determined to be surface soil. There were no disposal or burial areas identified in the ASR or ASR Supplement; therefore, subsurface soil was not determined to be a media of concern for potential human receptors. No permanent,

non-tidal, freshwater features are located on Fort H.G. Wright; therefore, surface water was determined not to be a media of concern for potential human receptors. Since Fishers Island's water supply is from a well field located 6 to 7 miles away and Fort H.G. Wright is not located on a productive aquifer, groundwater was not considered to be a media of concern for human receptors. Surface soil and sediment at MRS 1 and surface soil at AOC 1 are the media of concern for ecological receptors and for human health.

5.3 Background Data Evaluation

5.3.1 Tables 5-5 through 5-7 presents a range of concentrations in the five background soil samples for chemicals detected on-site. A qualitative comparison was made between the range of concentrations for on-site samples and the range of background samples for the metals associated with past munitions use at the FUDS (including antimony, barium, copper, lead, nickel, zinc) which excludes those essential nutrients called out in Section 5.1.3.

5.3.2 During SI field activities, five background soil samples were collected from three primary soil types located within MRS 1. Table 5-5 presents a range of concentrations identified from two background samples (HGW-BG-SS-02-01 and HGW-BG-SS-02-04) collected from Soil Type 1 – Riverhead & Haven Soils, Graded, 0 to 8 percent. Table 5-6 presents the concentrations identified from one background sample (HGW-BG-SS-02-02) collected from Soil Type 2 – Fill Land, Sandy. Table 5-7 presents a range of concentrations identified from two background samples (HGW-BG-SS-02-05 and HGW-BG-SS-02-03) collected from Soil Type 3 – Cut & Fill Land, Steep. Note that because of the limited number of background samples, the comparison of concentration ranges (minimum to maximum) in background samples to site samples were made based on pooling all of the background data together for the comparison.

5.3.3 Some detected concentrations tentatively identified as COPCs/COPECs in soil are below background concentrations in certain cases. In those cases involving exceedance of screening criteria but not background, weight of evidence is used to determine if those analytes are considered COPECs in a particular MRS. Screening values are by definition very conservative, and often screening values are below commonly occurring background concentrations. This indicates that the screening values are artificially low, and do not represent realistic screening values. Background concentrations of metals are utilized to assess the site if concentrations of metals are similar to background. The weight of evidence thus becomes comparison of site concentrations to both screening values and background before the chemical is labeled a COPEC (or COPC), and the pathway found complete. These instances are documented in the results sections below and conclusions are drawn based on the weight of evidence in each case. The detected background concentrations do not exceed the human health screening criteria.

5.4 Range Complex No. 1 (MRS 1)

5.4.1 As presented in Section 5.1.1, two explosives (DNT, NG) and six metals (antimony, barium, copper, lead, nickel, and zinc) are the MC of interest in MRS 1. Tables 5-1 and 5-2 include a summary of all laboratory data analyses including those analytes that are not associated with the munitions used in MRS 1. The discussion below focuses on explosives (DNT, NG) and one metal (barium) throughout the entire MRS 1, but screening for the remaining metals (antimony, copper, iron, lead, nickel, and zinc) is limited to the two samples in MRS 1 (HGW-SA-SS-02-01, HGW-SA-SS-02-02) collected from the Small Arms Range No. 1.

5.4.1 Sediment Pathway and Screening Results

5.4.1.1 Sediment exists in wetland areas within MRS 1 (Figure 2-4). The sediment pathway was viewed as a potentially complete pathway for human and ecological receptors for MC in the SS-WP (Appendix J). Discrete samples were collected from two locations on the southwestern portion of Fort H.G. Wright to evaluate the sediment pathway. Table 5-2 presents a summary of sediment sample results compared to residential and industrial soil human health screening values for MRS 1.

5.4.1.2 MCs that were associated with past munitions use at Fort H.G. Wright (DNT, NG, barium) did not exceed human health or ecological screening criteria. Therefore, there are no COPCs or COPECs identified in sediment for potential human or ecological receptors and the CSM pathway for sediment is incomplete (Appendix J).

5.4.2 Terrestrial Pathway and Screening Results

5.4.2.1 The FUDS contains natural barriers that include lush vegetation and rugged terrain. However, in the SS-WP (Alion 2006d), surface soil in MRS 1 was viewed as a potentially complete pathway for human and ecological receptors for MC. A total of 30 soil samples were collected from MRS 1 (including 5 background samples). Table 5-1 presents a summary of surface soil sample results compared to residential and industrial human health screening values as well as ecological screening values for MRS 1.

5.4.2.2 No MCs which were associated with past munitions use at MRS 1 exceeded human health screening criteria. Therefore, there are no COPCs identified for human health in surface soil at MRS 1 and the pathway is incomplete.

5.4.2.3 Antimony and lead were detected in two Small Arms Range No. 1 soil samples at concentrations that exceeded ecological screening criteria. However, each of these detected

concentrations in the two samples was within background concentrations for the FUDS, except for antimony in one sample which only slightly exceeded the maximum detected background concentration (0.98 J mg/kg vs. 0.71 J mg/kg). It is important to note that only five background samples have been taken for the establishment of background concentrations. It is expected that additional background samples would have clearly shown that the antimony concentrations onsite are similar to background. Therefore, no COPECs were identified for MRS 1 and the pathway is incomplete.

5.4.3 Air Pathway

5.4.3.1 The air migration pathway for MRS 1 has an extremely low potential, if any, for human and/or environmental receptors to come into contact with the MCs detected in surface soil (metals and explosives) because of the vegetative cover.

5.5 Small Arms Range No. 2 (AOC 1)

5.5.1 As presented in Section 5.1.1, two explosives (DNT, NG) and six metals (antimony, barium, copper, lead, nickel, and zinc) are the MC of interest for surface soil at AOC 1. Table 5-1 presents a summary of all laboratory data analyses including those analytes that are not associated with the munitions used at AOC 1.

5.5.1 Terrestrial Pathway and Screening Results

5.5.1.1 The FUDS contains natural barriers that include lush vegetation and rugged terrain. However, in the SS-WP (Alion 2006d), surface soil at AOC 1 was viewed as a potentially complete pathway for human and ecological receptors to MC. Two surface soil samples were collected from AOC 1. Table 5-1 presents a summary of surface soil sample results compared to residential and industrial human health screening values as well as ecological screening values for AOC 1.

5.5.1.2 No MCs which were associated with past munitions use at AOC 1 exceeded human health screening criteria. Therefore, there are no COPCs identified for human health in surface soil at AOC 1 and the pathway is incomplete.

5.5.1.3 Antimony and lead were detected in two Small Arms Range No. 2 samples at concentrations that exceeded ecological screening criteria. Accordingly, these two metals were initially identified as COPECs for AOC 1. However, both of these detected concentrations in the two samples were within background concentrations for the FUDS. Therefore, these metals

were removed from the list of COPECs for AOC 1 and the CSM pathway is incomplete for biota (Appendix J).

5.5.2 Air Pathway

5.5.2.1 The air migration pathway for AOC 1 has an extremely low potential, if any, for human and/or environmental receptors to come into contact with the MCs detected in surface soil (metals only) because of the vegetative cover.

Table 5-1 Summary of Soil Analytical Results

Sample Name:			USEPA Region IX PRG Screening Value (1)	USEPA Region IX PRG Screening Value (2)	Ecological Screening Values (3)	HGW-AA-SS-02-01	HGW-AA-SS-02-02	FD# 1	HGW-BB-SS-02-01	HGW-BB-SS-02-02	HGW-BC-SS-02-01	HGW-BC-SS-02-02	HGW-BD-SS-02-01
Sample Date:						1/16/2007	1/16/2007	1/16/2007	1/17/2007	1/17/2007	1/16/2007	1/16/2007	1/16/2007
Parent Name:								HGW-AA-SS-02-02					
MRS:						MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1
Analyte	**CAS**	**Unit**											
Explosives													
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	180	1800	NSL	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	mg/kg	0.61	6.2	NSL	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	mg/kg	0.72	2.5	30	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
2,6-DINITROTOLUENE	606-20-2	mg/kg	0.72	2.5	30	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	mg/kg	1.2	12	20	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	mg/kg	0.88	2.2	30	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	mg/kg	73	100	30	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	mg/kg	1.2	12	20	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	mg/kg	12	30	30	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	mg/kg	310	3100	NSL	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	mg/kg	2	10	40	0.04 U	0.04 U	0.02 J	0.04 U	0.04 U	0.04 U	0.016 J	0.04 U
NITROGLYCERIN	55-63-0	mg/kg	35	120	NSL	4 U	4 U	4 U	4 U	4 U	4 U	4 U	17
PETN	78-11-5	mg/kg	NSL	NSL	NSL	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	mg/kg	4.4	16	100	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	mg/kg	61	620	25	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	mg/kg	3.1	31	30	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Metals													
ALUMINUM	7429-90-5	mg/kg	7600	10000	pH < 5.5	1960 J	7390 J	1980 J	10800 J	5840 J	9260 J	5270 J	7390 J
ANTIMONY	7440-36-0	mg/kg	3.1	41	0.27	*0.29 J*	*0.66 J*	*0.43 J*	*0.98 J*	*1.7 J*	*0.41 J*	*0.47 J*	*0.63 J*
ARSENIC	7440-38-2	mg/kg	0.39	1.6	18	**0.78 J**	**2.1 J**	**0.69 J**	**4.6**	**4.2**	**2.3**	**0.96 J**	**3**
BARIUM	7440-39-3	mg/kg	540	6700	330	11.5 J	39.2 J	10.9 J	42	88.6	34.3 J	27.9 J	101 J
BERYLLIUM	7440-41-7	mg/kg	15	190	21	0.089 J	0.27	0.15 J	0.42	0.19 J	0.33	0.18 J	0.29
CADMIUM	7440-43-9	mg/kg	3.7	45	0.36	0.045 J	0.18 J	0.023 U	0.06 J	0.31 J	0.33 J	0.093 J	0.32 J
CALCIUM	7440-70-2	mg/kg	NUT	NUT	NUT	1260 J	2070 J	1260 J	1050	1960	1360 J	1360 J	3980 J
CHROMIUM	7440-47-3	mg/kg	22	64	81	4.8 J	10 J	4.9 J	12.1	11	10.3 J	6.1 J	9.8 J
COBALT	7440-48-4	mg/kg	140	1900	13	1	2.2	1	2.1	3.1	1.9	2	1.9
COPPER	7440-50-8	mg/kg	310	4100	28	16.7	13.1	14.9	*96.8*	*95*	14.6	7.2	13.2
IRON	7439-89-6	mg/kg	NUT	NUT	NUT	4420	8750	4410	11300	9980	11000	7160	11100
LEAD	7439-92-1	mg/kg	400	800	11	*26.3*	*39.4*	*25.9*	*107*	*160*	*36.5*	*16.3*	*185*
MAGNESIUM	7439-95-4	mg/kg	NUT	NUT	NUT	602	1670	640	1520	1480	1380	1380	1770
MANGANESE	7439-96-5	mg/kg	180	1900	500	76.3 J	168 J	74.8 J	**249**	158	125 J	116 J	**276 J**
MERCURY	7439-97-6	mg/kg	2.3	31	0.1	0.014 J	0.051	0.024 J	*0.13 J*	0.061 J	0.044	0.021 J	0.088
MOLYBDENUM	7439-98-7	mg/kg	39	510	2	0.18 J	0.39 J	0.083 U	0.44 J	0.32 J	0.58	0.24 J	0.35 J
NICKEL	7440-02-0	mg/kg	160	2000	38	5.2	5.7	6	7.1	6.9	5.3	3.7	5.3
POTASSIUM	7440-09-7	mg/kg	NUT	NUT	NUT	250	573	244	535	810	394	624	554
SELENIUM	7782-49-2	mg/kg	39	510	1	0.31 U	0.38 U	0.32 U	0.63 J	0.33 U	0.49 J	0.31 U	0.45 J
SILVER	7440-22-4	mg/kg	39	510	4.2	0.04 U	0.049 U	0.042 U	0.048 U	0.042 U	0.049 U	0.041 U	0.052 U
SODIUM	7440-23-5	mg/kg	NUT	NUT	NUT	104 J	146 J	89.9 J	149 J	165 J	127 J	121 J	257 J
STRONTIUM	7440-24-6	mg/kg	4700	10000	NSL	8.5	16.1	8.3	8.8	11.6	10.4	9.3	37.3
THALLIUM	7440-28-0	mg/kg	0.52	6.7	1	0.62 U	0.74 U	0.63 U	0.73 U	0.64 U	0.74 U	0.62 U	0.79 U
TITANIUM	7440-32-6	mg/kg	10000	10000	NSL	154 J	453 J	152 J	549	371	476 J	360 J	358 J
VANADIUM	7440-62-2	mg/kg	7.8	100	7.8	7	***18.2***	7.2	***25***	***14.5***	***17.2***	***12.3***	***16.4***
ZINC	7440-66-6	mg/kg	2300	10000	50	33.3	*51.4*	29.4	45.9	*187*	*67.8*	39.5	*127*
ZIRCONIUM	7440-67-7	mg/kg	NSL	NSL	NSL	7.8 J	16.7	7.9 J	21.4	11.1	15.7	10.7	19.9

(1) 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.
(2) 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.
(3) Ecological Screening Value refernces are found in Table 5-3.

BG=background sample
SB=subsurface soil
SS=surface soil
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.
UJ=Not detected, quantitation limit may be inaccurate or imprecise.
mg/kg=milligrams per kilogram
CAS=Chemical Abstract Service
NA=not available
NSL=No Screening Level
NUT=Essential Nutrient

Notes:
Shaded and bolded values represent exceedance of human health screening criteria.
Shaded and italicized values represent exceedance of ecological screening criteria.
Shaded, bolded and italicized values represent exceedance of both human health and ecological screening criteria.
Yellow shaded analytes are those associated with past munitions use.

Table 5-1 Summary of Soil Analytical Results

	Sample Name:		USEPA Region IX PRG Screening Value (1)	USEPA Region IX PRG Screening Value (2)	Ecological Screening Values (3)	HGW-BD-SS-02-02	HGW-BD-SS-02-03	HGW-BH-SS-01-01	HGW-BH-SS-02-02	HGW-BL-SS-02-01	HGW-BL-SS-02-02	HGW-BM-SS-02-01	FD# 2
	Sample Date:					1/16/2007	1/16/2007	1/17/2007	1/17/2007	1/17/2007	1/17/2007	1/16/2007	1/16/2007
	Parent Name:												HGW-BM-SS-02-01
	MRS:					MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1
Analyte	**CAS**	**Unit**											
Explosives													
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	180	1800	NSL	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	mg/kg	0.61	6.2	NSL	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	mg/kg	0.72	2.5	30	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
2,6-DINITROTOLUENE	606-20-2	mg/kg	0.72	2.5	30	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	mg/kg	1.2	12	20	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	mg/kg	0.88	2.2	30	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	mg/kg	73	100	30	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	mg/kg	1.2	12	20	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	mg/kg	12	30	30	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	mg/kg	310	3100	NSL	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	mg/kg	2	10	40	0.054 J	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.019 J
NITROGLYCERIN	55-63-0	mg/kg	35	120	NSL	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
PETN	78-11-5	mg/kg	NSL	NSL	NSL	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	mg/kg	4.4	16	100	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	mg/kg	61	620	25	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	mg/kg	3.1	31	30	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Metals													
ALUMINUM	7429-90-5	mg/kg	7600	10000	pH < 5.5	4730 J	9620 J	7210 J	9200 J	7890 J	10400 J	9290 J	8850 J
ANTIMONY	7440-36-0	mg/kg	3.1	41	0.27	*0.67 J*	*1.4 J*	*0.62 J*	*0.87 J*	*2.9*	*1.2 J*	*0.92 J*	*0.51 J*
ARSENIC	7440-38-2	mg/kg	0.39	1.6	18	**2.2 J**	**2.9**	**2.1 J**	**2.6 J**	**2.2 J**	**4.5**	**2.8**	**3**
BARIUM	7440-39-3	mg/kg	540	6700	330	40.3 J	36.8 J	22.3	46.6	36.6	32.6	88.5	80.3 J
BERYLLIUM	7440-41-7	mg/kg	15	190	21	0.23 J	0.35	0.25	0.31	0.29	0.38	0.36	0.35
CADMIUM	7440-43-9	mg/kg	3.7	45	0.36	0.05 J	***3.9***	0.028 U	0.039 J	0.028 J	0.027 U	0.13 J	0.035 J
CALCIUM	7440-70-2	mg/kg	NUT	NUT	NUT	1610 J	5730 J	1640	2250	1430	830	4150	4260 J
CHROMIUM	7440-47-3	mg/kg	22	64	81	6.2 J	13.6 J	9.5	12	9.9	10.3	12.8	11.8 J
COBALT	7440-48-4	mg/kg	140	1900	13	1.1	3	2.3	2.5	2.1	1.7	2.9	2.6
COPPER	7440-50-8	mg/kg	310	4100	28	15.2	*88*	9.8	10.7	*50.5*	*61.6*	22.8	20.3
IRON	7439-89-6	mg/kg	NUT	NUT	NUT	7670	12800	9120	10500	9770	12000	10200	9540
LEAD	7439-92-1	mg/kg	400	800	11	*107*	*132*	*29.9*	*34.8*	***403***	*111*	*69.2*	*61.1*
MAGNESIUM	7439-95-4	mg/kg	NUT	NUT	NUT	1220	2160	1930	2130	1600	1260	2080	2030
MANGANESE	7439-96-5	mg/kg	180	1900	500	**192 J**	**258 J**	173	**240**	**222**	131	**185**	174 J
MERCURY	7439-97-6	mg/kg	2.3	31	0.1	0.084	0.1	0.088 J	0.1 J	*0.11 J*	*0.18 J*	*0.19 J*	*0.22*
MOLYBDENUM	7439-98-7	mg/kg	39	510	2	0.41 J	0.4 J	0.39 J	0.4 J	0.32 J	0.48 J	0.64	0.35 J
NICKEL	7440-02-0	mg/kg	160	2000	38	3.3	8.1	6.4	6.7	6.6	5.7	7	6.9
POTASSIUM	7440-09-7	mg/kg	NUT	NUT	NUT	554	661	642	672	561	432	775	725
SELENIUM	7782-49-2	mg/kg	39	510	1	0.39 U	0.45 U	0.69 J	0.68 J	0.55 J	0.87 J	0.84 J	0.43 J
SILVER	7440-22-4	mg/kg	39	510	4.2	0.05 U	0.058 U	0.051 U	0.061 U	0.051 U	0.05 U	0.052 U	0.053 U
SODIUM	7440-23-5	mg/kg	NUT	NUT	NUT	246 J	303 J	438	191 J	251 J	171 J	181 J	170 J
STRONTIUM	7440-24-6	mg/kg	4700	10000	NSL	18.6	59.5	19.4	25.9	11.1	7.7	41.3	42.1
THALLIUM	7440-28-0	mg/kg	0.52	6.7	1	0.76 U	0.88 U	0.78 U	0.93 U	0.77 U	0.76 U	0.8 U	0.8 U
TITANIUM	7440-32-6	mg/kg	10000	10000	NSL	248 J	472 J	459	546	471	508	556	496 J
VANADIUM	7440-62-2	mg/kg	7.8	100	7.8	***12.7***	***22.4***	***21.8***	***22.8***	***20.5***	***23.6***	***22***	***21***
ZINC	7440-66-6	mg/kg	2300	10000	50	*53.8*	*275*	31.9	39.7	37	37.5	*80.5*	*69.7*
ZIRCONIUM	7440-67-7	mg/kg	NSL	NSL	NSL	12.2	18.3	18.7	22.4	18.6	18.1	23.3	17.9

(1) 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.
(2) 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.
(3) Ecological Screening Value refernces are found in Table 5-3.

BG=background sample
SB=subsurface soil
SS=surface soil
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.
UJ=Not detected, quantitation limit may be inaccurate or imprecise.
mg/kg=milligrams per kilogram
CAS=Chemical Abstract Service
NA=not available
NSL=No Screening Level
NUT=Essential Nutrient

Table 5-1 Summary of Soil Analytical Results

Sample Name:			USEPA Region IX PRG Screening Value (1)	USEPA Region IX PRG Screening Value (2)	Ecological Screening Values (3)	HGW-BM-SS-02-02	HGW-BX-SS-01-01	HGW-BX-SS-02-02	HGW-DT-SS-01-01	HGW-DT-SS-02-02	FD# 3	HGW-HF-SS-01-01	HGW-HF-SS-02-02
Sample Date:						1/16/2007	1/16/2007	1/16/2007	1/17/2007	1/17/2007	1/17/2007	1/17/2007	1/17/2007
Parent Name:											HGW-DT-SS-02-02		
MRS:						MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1
Analyte	**CAS**	**Unit**											
Explosives													
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	180	1800	NSL	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	mg/kg	0.61	6.2	NSL	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	mg/kg	0.72	2.5	30	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.091
2,6-DINITROTOLUENE	606-20-2	mg/kg	0.72	2.5	30	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	mg/kg	1.2	12	20	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	mg/kg	0.88	2.2	30	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	mg/kg	73	100	30	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	mg/kg	1.2	12	20	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	mg/kg	12	30	30	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	mg/kg	310	3100	NSL	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	mg/kg	2	10	40	0.04 U	0.04 U	0.04 U	0.04 U	0.013 J	0.04 U	0.04 U	0.0065 J
NITROGLYCERIN	55-63-0	mg/kg	35	120	NSL	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
PETN	78-11-5	mg/kg	NSL	NSL	NSL	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.005 U	0.2 U	0.2 U
RDX	121-82-4	mg/kg	4.4	16	100	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	mg/kg	61	620	25	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	mg/kg	3.1	31	30	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Metals													
ALUMINUM	7429-90-5	mg/kg	7600	10000	pH < 5.5	9770 J	4070 J	7000 J	11100 J	11100 J	10100 J	6280 J	5180 J
ANTIMONY	7440-36-0	mg/kg	3.1	41	0.27	*0.79 J*	*2.2 J*	0.37 U	*0.73 J*	*0.62 J*	*0.56 J*	*1 J*	*0.99 J*
ARSENIC	7440-38-2	mg/kg	0.39	1.6	18	**3.1**	**3.8 J**	**1.5 J**	**3.3**	**3.4**	**2.7**	**3.2**	**2.5 J**
BARIUM	7440-39-3	mg/kg	540	6700	330	47.3	87.5 J	11.2 J	48.7	42.1	43.7	32.1	34.7
BERYLLIUM	7440-41-7	mg/kg	15	190	21	0.37	0.14 J	0.21 J	0.39	0.39	0.35	0.22 J	0.18 J
CADMIUM	7440-43-9	mg/kg	3.7	45	0.36	0.026 U	*1.4 J*	0.1 J	0.11 J	0.026 U	0.088 J	0.14 J	0.17 J
CALCIUM	7440-70-2	mg/kg	NUT	NUT	NUT	2630	5250 J	1460 J	1920	1920	2200	1690	3150
CHROMIUM	7440-47-3	mg/kg	22	64	81	11.9	**25.9 J**	7.4 J	12.3	12.1	11	11.9	9.4
COBALT	7440-48-4	mg/kg	140	1900	13	3.1	3.8 J	1.8	2.6	2.6	2.5	1.9	1.6
COPPER	7440-50-8	mg/kg	310	4100	28	13.3	*59.5 J*	6.7	*85.4*	*42.7*	*39.2*	19.7	21
IRON	7439-89-6	mg/kg	NUT	NUT	NUT	11400	34100 J	7840	11900	11800	10900	11500	9320
LEAD	7439-92-1	mg/kg	400	800	11	*64.4*	*247 J*	*67.4*	*94.2*	*83.2*	*80.6*	*141*	*81.8*
MAGNESIUM	7439-95-4	mg/kg	NUT	NUT	NUT	1970	2230 J	1730	1820	1680	1570	1640	1700
MANGANESE	7439-96-5	mg/kg	180	1900	500	159	**205 J**	121 J	**181**	150	141	163	150
MERCURY	7439-97-6	mg/kg	2.3	31	0.1	0.068 J	*0.16 J*	0.042 J	*0.14 J*	*0.12 J*	0.1 J	*0.15 J*	*0.12 J*
MOLYBDENUM	7439-98-7	mg/kg	39	510	2	0.51 J	1.4 J	0.26 J	0.51 J	0.59	0.53	0.7	0.5 J
NICKEL	7440-02-0	mg/kg	160	2000	38	7	*39.9 J*	4.9	7.2	7	6.2	6.7	5.7
POTASSIUM	7440-09-7	mg/kg	NUT	NUT	NUT	699	942 J	580	689	511	530	711	729
SELENIUM	7782-49-2	mg/kg	39	510	1	0.63 J	0.72 J	0.42 J	0.8 J	0.66 J	0.5 J	0.6 J	0.92 J
SILVER	7440-22-4	mg/kg	39	510	4.2	0.048 U	0.091 J	0.053 U	0.053 U	0.048 U	0.045 U	0.059 U	0.058 U
SODIUM	7440-23-5	mg/kg	NUT	NUT	NUT	159 J	352 J	220 J	161 J	129 J	124 J	363	277 J
STRONTIUM	7440-24-6	mg/kg	4700	10000	NSL	27.1	60.5 J	16.7	13.1	15.2	17.1	19.6	37.1
THALLIUM	7440-28-0	mg/kg	0.52	6.7	1	0.73 U	1.2 UJ	0.81 U	0.8 U	0.72 U	0.69 U	0.9 U	0.89 U
TITANIUM	7440-32-6	mg/kg	10000	10000	NSL	561	254 J	393 J	613	606	565	442	355
VANADIUM	7440-62-2	mg/kg	7.8	100	7.8	***24.1***	***13 J***	***15.7***	***23.6***	***23.4***	***21.7***	***23.8***	***19.7***
ZINC	7440-66-6	mg/kg	2300	10000	50	*56.1*	*347 J*	31.3	*67.2*	*53.9*	*51.6*	*91.3*	*72.8*
ZIRCONIUM	7440-67-7	mg/kg	NSL	NSL	NSL	32.5	12.9 J	14.6	23.6	23.5	19.5	20.1	27.3

(1) 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.
(2) 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.
(3) Ecological Screening Value refernces are found in Table 5-3.

BG=background sample
SB=subsurface soil
SS=surface soil
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.
UJ=Not detected, quantitation limit may be inaccurate or imprecise.
mg/kg=milligrams per kilogram
CAS=Chemical Abstract Service
NA=not available
NSL=No Screening Level
NUT=Essential Nutrient

Table 5-1 Summary of Soil Analytical Results

Sample Name:			USEPA Region IX PRG Screening Value (1)	USEPA Region IX PRG Screening Value (2)	Ecological Screening Values (3)	HGW-HP-SS-02-01	HGW-HP-SS-02-02	HGW-SA-SS-02-01	HGW-SA-SS-02-02	HGW-SA-SS-02-03	HGW-SA-SS-02-04	HGW-BG-SS-02-01	HGW-BG-SS-02-02
Sample Date:						1/17/2007	1/17/2007	1/17/2007	1/17/2007	1/16/2007	1/16/2007	1/17/2007	1/17/2007
Parent Name:													
MRS:						MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1
Analyte	**CAS**	**Unit**											
Explosives													
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	180	1800	NSL	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	-	-
1,3-DINITROBENZENE	99-65-0	mg/kg	0.61	6.2	NSL	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	-	-
2,4-DINITROTOLUENE	121-14-2	mg/kg	0.72	2.5	30	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	-	-
2,6-DINITROTOLUENE	606-20-2	mg/kg	0.72	2.5	30	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	mg/kg	1.2	12	20	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	-	-
2-NITROTOLUENE	88-72-2	mg/kg	0.88	2.2	30	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	-	-
3-NITROTOLUENE	99-08-1	mg/kg	73	100	30	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	mg/kg	1.2	12	20	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	-	-
4-NITROTOLUENE	99-99-0	mg/kg	12	30	30	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	-	-
HMX	2691-41-0	mg/kg	310	3100	NSL	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	-	-
NITROBENZENE	98-95-3	mg/kg	2	10	40	0.04 U	0.0088 J	0.04 U	0.04 U	0.04 U	0.04 U	-	-
NITROGLYCERIN	55-63-0	mg/kg	35	120	NSL	4 U	4 U	4 U	4 U	4 U	4 U	-	-
PETN	78-11-5	mg/kg	NSL	NSL	NSL	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-
RDX	121-82-4	mg/kg	4.4	16	100	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	-	-
TETRYL	479-45-8	mg/kg	61	620	25	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	-	-
TNT	118-96-7	mg/kg	3.1	31	30	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	-	-
Metals													
ALUMINUM	7429-90-5	mg/kg	7600	10000	pH < 5.5	5390 J	9000 J	789 J	7910 J	3870 J	7120 J	7750 J	5810 J
ANTIMONY	7440-36-0	mg/kg	3.1	41	0.27	*1 J*	*0.78 J*	*0.47 J*	*0.98 J*	*0.65 J*	*0.5 J*	0.41 U	*0.71 J*
ARSENIC	7440-38-2	mg/kg	0.39	1.6	18	**2.1 J**	**3**	0.21 U	**2.1 J**	**1.9 J**	**2 J**	**2.5 J**	**2.7 J**
BARIUM	7440-39-3	mg/kg	540	6700	330	50	41.1	4.7	26.3	22.3 J	21.5 J	66.9 J	38.3 J
BERYLLIUM	7440-41-7	mg/kg	15	190	21	0.24	0.35	0.029 J	0.28	0.095 J	0.23	0.28	0.17 J
CADMIUM	7440-43-9	mg/kg	3.7	45	0.36	0.067 J	0.029 U	0.021 U	0.03 U	0.18 J	0.094 J	0.36 J	0.25 J
CALCIUM	7440-70-2	mg/kg	NUT	NUT	NUT	2010	1950	779	2050	2060 J	1150 J	6170 J	2530 J
CHROMIUM	7440-47-3	mg/kg	22	64	81	10	12.2	1.8	10.1	6.5 J	8.2 J	8.8 J	9.4 J
COBALT	7440-48-4	mg/kg	140	1900	13	1.5	2.5	0.26 J	2.7	1.2	2.2	1.8	1.9
COPPER	7440-50-8	mg/kg	310	4100	28	*40.4*	*52.3*	2.2	10.9	9.8	12.1	12.9	11
IRON	7439-89-6	mg/kg	NUT	NUT	NUT	7060	11000	2140	10500	5710	8160	8000	7960
LEAD	7439-92-1	mg/kg	400	800	11	*118*	*76.1*	8.2	*56.8*	*25.7*	*86.7*	*205*	*48.9*
MAGNESIUM	7439-95-4	mg/kg	NUT	NUT	NUT	1270	1700	384	2180	1130	1320	1960	1930
MANGANESE	7439-96-5	mg/kg	180	1900	500	122	144	37.7	**198**	80.8 J	123 J	153 J	160 J
MERCURY	7439-97-6	mg/kg	2.3	31	0.1	0.083 J	0.085 J	0.01 J	0.053 J	*0.13*	0.039	*0.24*	*0.11*
MOLYBDENUM	7439-98-7	mg/kg	39	510	2	0.21 J	0.42 J	0.078 U	0.37 J	0.45 J	0.44 J	0.39 J	0.48 J
NICKEL	7440-02-0	mg/kg	160	2000	38	4.8	7.5	1	6.8	4.4	4.6	6	6.1
POTASSIUM	7440-09-7	mg/kg	NUT	NUT	NUT	439	631	220	889	518	415	757	726
SELENIUM	7782-49-2	mg/kg	39	510	1	0.7 J	0.69 J	0.3 U	0.57 J	0.5 J	0.37 U	0.5 J	0.56 J
SILVER	7440-22-4	mg/kg	39	510	4.2	0.049 U	0.21 J	0.039 U	0.055 U	0.064 U	0.048 U	0.059 U	0.061 U
SODIUM	7440-23-5	mg/kg	NUT	NUT	NUT	156 J	172 J	112 J	237 J	206 J	134 J	167 J	249 J
STRONTIUM	7440-24-6	mg/kg	4700	10000	NSL	17.9	17.2	5.8	20.4	20	9.7	35.7	19.5
THALLIUM	7440-28-0	mg/kg	0.52	6.7	1	0.74 U	0.8 U	0.59 U	0.84 U	0.97 U	0.73 U	0.9 U	0.94 U
TITANIUM	7440-32-6	mg/kg	10000	10000	NSL	316	506	90.2	547	364 J	436 J	434 J	460 J
VANADIUM	7440-62-2	mg/kg	7.8	100	7.8	***17.2***	***23.1***	3.9	***23.5***	***16.2***	***17.5***	***20.5***	***21.5***
ZINC	7440-66-6	mg/kg	2300	10000	50	*52.9*	*128*	11	38.7	32	27.3	*103*	49.3
ZIRCONIUM	7440-67-7	mg/kg	NSL	NSL	NSL	15.8	20	5.6 J	33.7	12.4 J	14.9	14.7	18.5

(1) 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.
(2) 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.
(3) Ecological Screening Value refernces are found in Table 5-3.

BG=background sample
SB=subsurface soil
SS=surface soil
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.
UJ=Not detected, quantitation limit may be inaccurate or imprecise.
mg/kg=milligrams per kilogram
CAS=Chemical Abstract Service
NA=not available
NSL=No Screening Level
NUT=Essential Nutrient

Table 5-1 Summary of Soil Analytical Results

Sample Name:			USEPA Region IX PRG Screening Value (1)	USEPA Region IX PRG Screening Value (2)	Ecological Screening Values (3)	HGW-BG-SS-02-03	HGW-BG-SS-02-04	HGW-BG-SS-02-05
Sample Date:						1/17/2007	1/17/2007	1/17/2007
Parent Name:								
MRS:						MRS 1	MRS 1	MRS 1
Analyte	**CAS**	**Unit**						
Explosives								
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	180	1800	NSL	-	-	-
1,3-DINITROBENZENE	99-65-0	mg/kg	0.61	6.2	NSL	-	-	-
2,4-DINITROTOLUENE	121-14-2	mg/kg	0.72	2.5	30	-	-	-
2,6-DINITROTOLUENE	606-20-2	mg/kg	0.72	2.5	30	-	-	-
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	mg/kg	1.2	12	20	-	-	-
2-NITROTOLUENE	88-72-2	mg/kg	0.88	2.2	30	-	-	-
3-NITROTOLUENE	99-08-1	mg/kg	73	100	30	-	-	-
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	mg/kg	1.2	12	20	-	-	-
4-NITROTOLUENE	99-99-0	mg/kg	12	30	30	-	-	-
HMX	2691-41-0	mg/kg	310	3100	NSL	-	-	-
NITROBENZENE	98-95-3	mg/kg	2	10	40	-	-	-
NITROGLYCERIN	55-63-0	mg/kg	35	120	NSL	-	-	-
PETN	78-11-5	mg/kg	NSL	NSL	NSL	-	-	-
RDX	121-82-4	mg/kg	4.4	16	100	-	-	-
TETRYL	479-45-8	mg/kg	61	620	25	-	-	-
TNT	118-96-7	mg/kg	3.1	31	30	-	-	-
Metals								
ALUMINUM	7429-90-5	mg/kg	7600	10000	pH < 5.5	8860 J	6320 J	11400 J
ANTIMONY	7440-36-0	mg/kg	3.1	41	0.27	0.38 U	*0.66 J*	*0.51 J*
ARSENIC	7440-38-2	mg/kg	0.39	1.6	18	**2.1 J**	**2.2 J**	**3.9**
BARIUM	7440-39-3	mg/kg	540	6700	330	43.4 J	39.8 J	27.6 J
BERYLLIUM	7440-41-7	mg/kg	15	190	21	0.26	0.2 J	0.34
CADMIUM	7440-43-9	mg/kg	3.7	45	0.36	0.18 J	0.13 J	0.024 U
CALCIUM	7440-70-2	mg/kg	NUT	NUT	NUT	2180 J	1930 J	710 J
CHROMIUM	7440-47-3	mg/kg	22	64	81	11.9 J	8.7 J	16.6 J
COBALT	7440-48-4	mg/kg	140	1900	13	2.6	2	2.8
COPPER	7440-50-8	mg/kg	310	4100	28	8.7	11.7	8.8
IRON	7439-89-6	mg/kg	NUT	NUT	NUT	8950	7890	11600
LEAD	7439-92-1	mg/kg	400	800	11	*32.3*	*40.9*	*53.4*
MAGNESIUM	7439-95-4	mg/kg	NUT	NUT	NUT	1920	1450	1580
MANGANESE	7439-96-5	mg/kg	180	1900	500	171 J	162 J	153 J
MERCURY	7439-97-6	mg/kg	2.3	31	0.1	0.062	*0.13*	0.095
MOLYBDENUM	7439-98-7	mg/kg	39	510	2	0.46 J	0.34 J	0.5 J
NICKEL	7440-02-0	mg/kg	160	2000	38	6.2	6.2	6.9
POTASSIUM	7440-09-7	mg/kg	NUT	NUT	NUT	760	528	460
SELENIUM	7782-49-2	mg/kg	39	510	1	0.42 U	0.46 U	0.65 J
SILVER	7440-22-4	mg/kg	39	510	4.2	0.054 U	0.059 U	0.044 U
SODIUM	7440-23-5	mg/kg	NUT	NUT	NUT	159 J	156 J	136 J
STRONTIUM	7440-24-6	mg/kg	4700	10000	NSL	17.8	20	6.8
THALLIUM	7440-28-0	mg/kg	0.52	6.7	1	0.82 U	0.9 U	0.68 U
TITANIUM	7440-32-6	mg/kg	10000	10000	NSL	588 J	426 J	572 J
VANADIUM	7440-62-2	mg/kg	7.8	100	7.8	***21.5***	***20.6***	***26***
ZINC	7440-66-6	mg/kg	2300	10000	50	40.4	*57.8*	37.5
ZIRCONIUM	7440-67-7	mg/kg	NSL	NSL	NSL	18.9	15.5	21

(1) 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.
(2) 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.
(3) Ecological Screening Value refernces are found in Table 5-3.

BG=background sample
SB=subsurface soil
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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.
UJ=Not detected, quantitation limit may be inaccurate or imprecise.
mg/kg=milligrams per kilogram
CAS=Chemical Abstract Service
NA=not available
NSL=No Screening Level
NUT=Essential Nutrient

Sample Name:			USEPA Region IX PRG Screening Value (1)	USEPA Region IX PRG Screening Value (2)	Ecological Screening Values (3)	HGW-BD-SD-02-01	HGW-BD-SD-02-02
Sample Date:						1/16/2007	1/16/2007
Parent Name:							
MRS:						MRS 1	MRS 1
Analyte	**CAS**	**Unit**					
Explosives							
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	1800	18000	0.24	0.04 U	0.04 U
1,3-DINITROBENZENE	99-65-0	mg/kg	6.1	62	NSL	0.04 U	0.04 U
2,4-DINITROTOLUENE	121-14-2	mg/kg	7.2	25	0.09	0.04 U	0.04 U
2,6-DINITROTOLUENE	606-20-2	mg/kg	7.2	25	0.09	0.04 U	0.04 U
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	mg/kg	12	120	NSL	0.04 U	0.04 U
2-NITROTOLUENE	88-72-2	mg/kg	8.8	22	0.09	0.08 U	0.08 U
3-NITROTOLUENE	99-08-1	mg/kg	730	1000	0.09	0.08 U	0.08 U
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	mg/kg	12	120	NSL	0.04 U	0.04 U
4-NITROTOLUENE	99-99-0	mg/kg	120	300	0.09	0.08 U	0.08 U
HMX	2691-41-0	mg/kg	3100	31000	NSL	0.08 U	0.08 U
NITROBENZENE	98-95-3	mg/kg	20	100	NSL	0.027 J	0.021 J
NITROGLYCERIN	55-63-0	mg/kg	350	1200	NSL	4 U	4 U
PETN	78-11-5	mg/kg	NSL	NSL	NSL	0.2 U	0.2 U
RDX	121-82-4	mg/kg	44	160	NSL	0.08 U	0.08 U
TETRYL	479-45-8	mg/kg	610	6200	NSL	0.08 U	0.08 U
TNT	118-96-7	mg/kg	31	310	0.09	0.04 U	0.04 U
Metals							
ALUMINUM	7429-90-5	mg/kg	76000	100000	26000	5830 J	6820 J
ANTIMONY	7440-36-0	mg/kg	31	410	2	*2.2 J*	0.78 J
ARSENIC	7440-38-2	mg/kg	3.9	16	9.8	**5.2 J**	1.8 J
BARIUM	7440-39-3	mg/kg	5400	67000	NSL	16.9 J	17 J
BERYLLIUM	7440-41-7	mg/kg	150	1900	NSL	0.23 J	0.23 J
CADMIUM	7440-43-9	mg/kg	37	450	0.99	*1.4 J*	0.28 J
CALCIUM	7440-70-2	mg/kg	NUT	NUT	NUT	9950 J	1630 J
CHROMIUM	7440-47-3	mg/kg	220	640	43.4	21.8 J	9.7 J
COBALT	7440-48-4	mg/kg	1400	19000	50	3.9 J	1.5 J
COPPER	7440-50-8	mg/kg	3100	41000	31.6	*58.8 J*	13.3 J
IRON	7439-89-6	mg/kg	NUT	NUT	NUT	60000 J	6760 J
LEAD	7439-92-1	mg/kg	400	800	35.8	*55.2 J*	*40.5 J*
MAGNESIUM	7439-95-4	mg/kg	NUT	NUT	NUT	5480 J	2110 J
MANGANESE	7439-96-5	mg/kg	1800	19000	460	147 J	64.1 J
MERCURY	7439-97-6	mg/kg	23	310	0.18	*0.19 J*	0.053 J
MOLYBDENUM	7439-98-7	mg/kg	390	5100	NSL	6.7 J	0.48 J
NICKEL	7440-02-0	mg/kg	1600	20000	22.7	*22.9 J*	6.4 J
POTASSIUM	7440-09-7	mg/kg	NUT	NUT	NUT	1830 J	736 J
SELENIUM	7782-49-2	mg/kg	390	5100	2	1.3 UJ	0.58 UJ
SILVER	7440-22-4	mg/kg	390	5100	1	0.17 UJ	0.075 UJ
SODIUM	7440-23-5	mg/kg	NUT	NUT	NUT	23100 J	1210 J
STRONTIUM	7440-24-6	mg/kg	47000	100000	NSL	79.4 J	22.3 J
THALLIUM	7440-28-0	mg/kg	5.2	67	NSL	2.5 UJ	1.1 UJ
TITANIUM	7440-32-6	mg/kg	100000	100000	NSL	453 J	443 J
VANADIUM	7440-62-2	mg/kg	78	1000	NSL	20.9 J	16.4 J
ZINC	7440-66-6	mg/kg	23000	100000	121	*316 J*	108 J
ZIRCONIUM	7440-67-7	mg/kg	NSL	NSL	NSL	14.7 J	17.4 J

(1) USEPA Region IX Preliminary Remediation Goals (PRGs) Table, USEPA, December 2004. For non-carcinogens, value shown is equal to 1/10 the residential soil PR
For carcinogens the value shown is equal to the residential soil PRG value. To account for sediment exposure, the resulting values have been increased by a factor of ten.
(2) USEPA Region IX Preliminary Remediation Goals (PRGs) Table, USEPA, December 2004. For non-carcinogens, value shown is equal to 1/10 the industrial soil PRC
For carcinogens the value shown is equal to the industrial soil PRG value. To account for sediment exposure, the resulting values have been increased by a factor of ten.
(3) Ecological Screening Value refernces are found in Table 5-2.
BG=background sample
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.
UJ=Not detected, quantitation limit may be inaccurate or imprecise.
mg/kg=milligrams per kilogram
CAS=Chemical Abstract Service
NA=not available
NSL=No Screening Level
NUT= Essential Nutrient
Notes:
Shaded and bolded values represent exceedance of human health screening criteria.
Shaded and italicized values represent exceedance of ecological screening criteria.
Shaded, bolded and italicized values represent exceedance of both human health and ecological screening criteria.
Yellow shaded analytes are those associated with past munitions use.

6. SUMMARY AND CONCLUSIONS

6.0.1 Fort H.G. Wright was used as a coastal fortification for training and coastal defense purposes from 1900 through 1949. One MRS at Fort H.G. Wright was identified and addressed in this SI consistent with the MMRP Inventory in the DERP Fiscal Year 2005 Annual Report to Congress (DoD 2005). One range, identified as Range Complex No. 1, is associated with the Fort H.G. Wright FUDS. An AOC (Small Arms Range No. 2) identified during the TPP, which is located within MRS 1, also was addressed. A summary of the results and conclusions is presented below.

6.1 Range Complex No. 1 (MRS 1)

6.1.1 As presented in the MRS and CSM discussions, one MRS was identified within the FUDS. Thirteen subranges associated with MRS 1 have been designated with the following letters: A-Battery Clinton, B-Battery Butterfield, C-Battery Barlow, D-Battery Dutton, E-Battery Hamilton, F-Battery Marcy, G-Battery Hoffman, H-Battery Hoppock, I-Dynamite Battery, J-Battery #215, K-AMTB 913, L-AA Battery, and M-Small Arms Range No. 1. MEC discoveries included various 0.30-caliber casings and a live 37-mm shell reportedly found in the mid-1990s. No MEC or MD was found during the SI field reconnaissance. Given the past MEC discoveries and the limited SI reconnaissance compared to the overall size of the FUDS property, it is possible that MEC may remain within MRS 1. The MRS contains hilly terrain and there are no fences restricting access to the property.

6.1.2 No documented injuries from MEC have occurred since the FUDS was transferred by the GSA. Due to the nature of the past military activities conducted at Fort H.G. Wright, it is believed that the scale of MEC contamination would be relatively small. This is based on the nature of training activities that were conducted during the FUDS operation, as well as the closure activities of this coastal fortification by the DoD. The overall MEC risk is considered "low to moderate" because MEC (including a live round) has been found in the past, but there are no known or suspected burial areas and no impact areas other than the potential Small Arms Range No. 1 backstop.

6.1.3 Based on the results of soil and sediment sampling, no human health or ecological COPCs/COPECs were identified in MRS 1 (Table 6-1).

6.2 Small Arms Range No. 2 (AOC 1)

6.2.1 As presented in the MRS and CSM discussions, one additional AOC was identified which was not identified in USACE's range inventory. AOC 1 is located within MRS 1, and there are no reported discoveries of MEC at AOC 1. No MEC or MD was found at AOC 1 during the SI field reconnaissance. Given the past MEC discoveries within MRS 1 and the limited SI reconnaissance compared to the overall size of the FUDS property, MEC may remain within MRS 1, including AOC 1. There are no fences restricting access to the AOC 1 property.

6.2.2 No documented injuries from MEC have occurred since GSA transferred the FUDS property. Due to the nature of the past military activities conducted at Fort H.G. Wright, the extent of MEC contamination is estimated to be relatively small. This conclusion is based on the nature of training activities that were conducted while the FUDS was operational, as well as documentation of DoD dismantling/closure activities of this coastal fortification. The overall MEC risk at AOC 1 is considered "low" because MEC has not been found within the AOC itself but MEC (including a live round) has been found in the past within MRS 1. Also, there are no known or suspected burial areas and no impact areas at AOC 1 other than the Small Arms Range backstop area.

6.2.3 Based on the results of soil sampling, no human health or ecological COPCs/COPECs were identified in AOC 1 (Table 6-1).

Table 6-1. Summary of Human Health and Ecological Screening-Level Risk Assessment Results

Medium of Concern	Human Health COPCs[1]	Ecological COPECs (SLERA)[2]
	MRS 1 – Range Complex No. 1 (Including AOC 1 – Small Arms Range No. 2)	MRS 1 – Range Complex No. 1 (Including AOC 1 – Small Arms Range No. 2)
Surface Soil	No exceedances of EPA Region IX screening values	Two metals (antimony and lead) exceeded risk screening values; however, these MCs do not exceed the range of background concentrations, except for 1 of 4 antimony detections (at MRS 1 only) which only slightly exceeded the maximum background detection (0.98 J mg/kg vs. 0.71 J mg/kg). Based on this weight of evidence, neither constituent was identified as a COPEC
Sediment	No exceedances of EPA Region IX screening values	No exceedances of screening values

1 For the Human Health Risk Screening, EPA Region IX Preliminary Remediation Goals (PRGs) were used for soil and sediment comparisons. See Tables 5-1 and 5-2.
2 For Ecological Risk Screening, the screening values identified in Table 5-3 were applied.

7. RECOMMENDATIONS

7.1 The Fort H.G. Wright FUDS has one designated MRS (Range Complex No. 1) which included one additional AOC (Small Arms Range No. 2) that was not identified in USACE's range inventory.

7.2 The recommendations for each of the areas addressed in this SI are noted below:

- **MRS 1 (Range Complex No. 1) –**An RI/FS is recommended for this MRS. Additional studies should focus on MEC based on the MEC assessment, which indicates a low to moderate risk at MRS 1. This RI/FS for MEC should focus on the area where MEC has been found (*i.e.*, adjacent to the parade grounds near the AA Battery). Acceptable human health and ecological risks were identified based on the risk screening results.

- **AOC 1 (Small Arms Range No. 2) –** Additional studies should focus on MEC, based on the MEC assessment, which indicates a low risk at AOC 1. Although no MEC/MD was found on the ground surface at AOC 1 during SI field activities, AOC 1 is located within MRS 1 which has had historical evidence of MEC/MD, including a live 37-mm round. Acceptable human health and ecological risks were identified based on the risk screening results.

7.3 Neither a TCRA nor a NTCRA is recommended for MRS 1 and AOC 1.

7.4 Finally, the range inventory should be modified to include AOC 1 as a sub-range to MRS 1. Including AOC 1 as a sub-range will not increase the total acreage of MRS 1 because the AOC is already located within MRS 1.

8. REFERENCES

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APPENDIX A - SCOPE OF WORK

Located on CD.

APPENDIX B - TPP MEMORANDUM

- TPP Memorandum (Located on CD)
- DQO Verification Worksheets

Data Quality Objective Verification Worksheet			
Site: Fort H.G. Wright			
Project: FUDS MMRP SI Project Number **C02NY061001**			
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 and sediment. MC - Surface soil and sediment sampling.	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. MC: Sampling to include: 31 surface soil samples, 2 sediment samples and 5 background samples.	Yes__X__ No ____	

Reference Concentration of Interest or Other Performance Criteria	MEC: If historic data indicate the presence of MEC and one anomaly classified as of material potentially presenting and explosive hazard (MPPEH) or confirmed MEC is found with the magnetometer or if physical evidence indicating the presence of MEC is found during the visual inspection, then an RI/FS may be recommended. If no anomalies, MPPEH, or confirmed MEC are found, or if the UXO Technician indicates that there is no potential hazard from past use of munitions or MEC discoveries, then MEC found previously may be considered an anomaly and NDAI may be recommended. In each of these instances, all lines of evidence (e.g., historic data, field data, etc.) will be used to make a final decision for an NDAI or RI/FS. In both instances (RI/FS or NDAI), all lines of evidence (e.g., historic data, field data, background concentration of metals, etc. for both MEC and MC) will be used to make a final decision for an NDAI or RI/FS.	Yes__X__ No ____	
	MC: If SI findings/results exceed NYSDEC Recommended Soil Cleanup Objectives (TAGMs) (mg/kg), EPA Interim Eco-SSLs (mg/kg), EPA Region 9 Preliminary Remediation Goals (PRGs) or site-specific background levels and those exceedances result in a potential risk to receptors as identified through human health and ecological risk assessments, an RI/FS may be recommended for the site. If no exceedances are present and acceptable risks are identified for the receptors, then an NDAI may be recommended. In both instances (RI/FS or NDAI), all lines of evidence (e.g., historic data, field data, background concentration of metals, etc. for both MEC and MC) will be used to make a final decision for an NDAI or RI/FS. Screening values selected for this site are specified in the chemical-specific measurement quality objective (MQO) Tables.	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 (modified for nitroglycerin and PETN); Metals Methods– SW6010A, SW6020 (for zirconium), SW7471B (for mercury): Explosives Prep Methods – SW8330A and SW8330M (modified for nitroglycerin and PETN); Metals Prep Method – 3050B/3050M (modified for zirconium).	Yes__X__ No ____	

Data Quality Objective Verification Worksheet			
Site: Fort H.G. Wright			
Project: FUDS MMRP SI Project Number **C02NY061001**			
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 and subsurface soil.	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 (see Figure 1).	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, two actions may be initiated:	Yes__X__ No ____	
	TCRA- If there is a complete pathway between source and receptor and the MEC and the situation is viewed as an "imminent danger threat posed by the release or threat of a release, where cleanup or stabilization actions must be initiated within six months to reduce risk to public health or the environment", the Alion Team will immediately notify the Military Munitions Design Center Project Manager at USACE and the property owner. USACE will determine, with input from the Alion Team and stakeholders, whether or not a TCRA will be implemented.	Yes__X__ No ____	
	NonTCRA - A nonTCRA (NTCRA) may be initiated in response to a release or threat of release that poses a risk where more than six months planning time is available.	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: Fort H.G. Wright			
Project: FUDS MMRP SI Project Number **C02NY061001**			
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)[1].	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 and Subsurface soil	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.		
1, The HRS scoring may or may not be completed by EPA and is an activity separate from the SI process. Information is contained in the SI Report and its appendices to support HRS scoring.			

Data Quality Objective Verification Worksheet			
Site: Fort H.G. Wright			
Project: FUDS MMRP SI Project Number **C02NY061001**			
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 and subsurface soil.	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

-----Original Message-----
From: Shia, Corinne M [mailto:cshia@alionscience.com]
Sent: Monday, January 22, 2007 9:29 AM
To: O'Neill, Mike; Reese, Tim; Connet, Jane; Mitchell, Rusty W ; Azar, Roger ; Greene, Paul E NAB02; Parker, Jason; Tany.labeste@nan02.usace.army.mil; Follett, George C NAB02; julie.e.kaiser@nab02.usace.army.mil; Mitchell, Rusty W
Subject: FW: Ft H.G. Wright, Fishers Island Discovery

All:

NY State Police has indicated what the next step will be with respect to disposition of the flare. Refer to the email below.

Corinne Shia

-----Original Message-----
From: Kevin Drew [mailto:kdrew@troopers.state.ny.us]
Sent: Sunday, January 21, 2007 11:07 AM
To: Shia, Corinne M
Subject: Re: Ft H.G. Wright, Fishers Island Discovery

I am responding to Fishers Island Wed. January 24th and the flare will be relayed to Albany for disposal by NYSP Bomb Disposal Unit. Anything else let me know. Thanks.

>>> "Shia, Corinne M " <cshia@alionscience.com> 1/19/2007 11:46 AM >>>
Trooper Drew:

Per our phone conversation this morning, I am attaching photos documenting the discovery of a marine marker on Fishers Island, NY on January 17, 2004 by the Alion Science and Technology Field Team. Alion
is under contract to the U.S. Army Corps of Engineers to complete a site inspection related for the former Fort H.G. Wright.

The flare was discovered approximately 80 ft southeast of the New York State Police building located on Whistler Avenue. The item was found in an area just outside of the landscaped backyard of the state police building lying amongst field grass approximately 2-3 ft tall. The flare was surrounded by several rocks and an 8" diameter rusty metal ball (hollow) with a small metal handle that was suspected to be some type of float/buoy. It appeared that the rocks and float were purposely placed around the flare to serve as a makeshift marker.

The subject item is probably a marine marker designed to actuate when it hits salt water. The exterior of the flare was weathered and the flare was partially opened on its end. The body of the flare had numerous small holes indicating that it had been used/discharged. It is possible some red phosphorous still remains in the item. We are not sure how the item got there, however, the presence of a white rock monument indicates someone placed it there after it was moved from its original location.

Please contact me regarding any further information you might need. We would appreciate being notified of any follow up actions regarding the disposition of this item.

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-----Original Message-----
From: Shia, Corinne M [mailto:cshia@alionscience.com]
Sent: Thursday, January 18, 2007 4:02 PM
To: Azar, Roger
Cc: O'Neill, Mike; Reese, Tim; Connet, Jane; Mitchell, Rusty W ;
Greene, Paul E NAB02; Parker, Jason; Tany.labeste@nan02.usace.army.mil
Subject: RE: Fort HG Wright - Parachute Flare Discovery

All:

2:41 pm, January 18, 2007: C. Shia contacted Troop L HQ (Farmingdale, NY) at 631-756-3300 and informed Trooper Rodriguez of the discovery. I explained the purpose and nature of the field work and described what was found, where, and when and indicated data (e.g., GPS coordinates, pictures, etc.) could be provided, if requested. He took my name, organizational affiliation, and phone number and indicated that someone would contact me. I will follow up on any further discussions.

Corinne M. Shia
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From: Parker, Jason [mailto:jparker@eaest.com]
Sent: Thursday, January 18, 2007 10:57 AM
To: Azar, Roger
Cc: Shia, Corinne M ; O'Neill, Mike; Reese, Tim; Connet, Jane;
Mitchell, Rusty W
Subject: Fort HG Wright - Parachute Flare Discovery

Roger,

Attached are pictures of the parachute flare and the area where it was discovered during the second day of field work at Fort HG Wright. The exterior of the flare was weathered and the flare was partially opened on its end. The body of the flare had numerous small holes indicating that it had been used/discharged. However, based on our visual inspection, it could not be determined if the flare had been 'completely' discharged or not. The flare was discovered approximately 80 ft southeast of the New York State Police building located on Whistler Avenue. The item was found in an area just outside of the landscaped backyard of the state police building lying amongst field grass approximately 2-3 ft tall. The flare was surrounded by several rocks and an 8" diameter rusty metal ball (hollow) with a small metal handle that was suspected to be some type of float/buoy. It appeared that the rocks and float were purposely placed around the flare to serve as a makeshift marker.

If you need any other info, let me know. Thanks.

PS…According to the New York State Police website, Troop L – Zone 2 covers Nassau and Suffolk Counties (including Fishers Island). Should someone need it, their contact information is listed below.

Troop L Information

Counties: Nassau and Suffolk
Troop HQ
Address
Phone

Farmingdale
7140 Republic Airport, East Farmingdale, NY 11735-1597
631-756-3300

Zone 1 Stations

Address
Phone

Valley Stream
Southern State Parkway, Valley Stream, NY 11580
516-561-8883
Lake Success
1022 Marcus Avenue, Lake Success, NY 11514
516-352-6374

Zone 2 Stations

Address
Phone

Brentwood
800 Crooked Hill Road, Brentwood, NY 11717
631-231-5962

Fishers Island
P.O. Box 271, Fishers Island, NY 06390
631-788-7600

Riverside
234 Riverleigh Avenue, Riverside, NY 11901
631-208-9002

Jay Parker
EA Engineering, Science, and Technology, Inc.
Airport Professional Park
2350 Post Road
Warwick, Rhode Island 02886
Phone: 401-736-3440
Fax: 401-736-3423

George / Paul,

Attached is a picture of the parachute flare discovered during the second day of field work at Fort HG Wright. The exterior of the flare was weathered and the flare was partially opened on its end. The body of the flare had numerous small holes indicating that it had been used/discharged. Rusty Mitchell was our UXO guy in the field. Based on visual inspection, it could not be determined if the flare had been 'completely' discharged or not. The flare was discovered approximately 80 ft southeast of the New York State Police building located on Whistler Avenue. The item was found in an area just outside of the landscaped backyard of the state police building lying amongst field grass approximately 2-3 ft tall. The flare was surrounded by several rocks and an 8" diameter rusty metal ball (hollow) with a small metal handle that was suspected to be some type of float/buoy. It appeared that the rocks and float were purposely placed around the flare to serve as a makeshift marker. Rusty is under the impression that someone had picked up the flare and placed it there. He also had no concerns of explosive materials being present. He felt that the flare was expended.

Question: Do you guys feel that we need to contact the police and alert them to the presence of this flare (mind you the flare is sitting right behind the police station)? My guess is no, it is just MD; however, I will leave the call to you guys. Pictures and GPS location of the flare have been collected.

Awaiting your feedback.

Respectfully,

Roger

APPENDIX D - FIELD NOTES AND FIELD FORMS

- Daily Quality Control Reports
- Logbook
- Fieldsheets
- Chain of Custodies

Rite in the Rain
ALL-WEATHER WRITING PAPER

ENVIRONMENTAL FIELD BOOK

JAY PARKER
EA ENGINEERING
2350 POST ROAD
WARWICK, RI 02886
401-736-3440 ext. 218

MMRP FUDS SI
FORT H.G. WRIGHT
C02NY061001
QC Review Completed by:

CONTENTS

Reference Page Index

Location FORT H.G. WRIGHT, FISHERS ISLAND Date 1/16/07

Project / Client MMRP FUDS SI/USACE/ALION

CO2NY061001

06:00 MEETING AT HOTEL DISCUSSING SITE CONDITIONS AND FIELD WORK

ATTENDEES:

JAY PARKER
RUSTY MITCHELL
MIKE O'NEILL
DARRELL ANDERSON

JP
06:45 ARRIVED AT FISHERS ISLAND Ferry Dock, LOADED 2 vehicles + personnel onto Ferry. Ferry departed @ 7AM

07:00 CONDUCTED site safety meeting in truck ~~on~~ JP during Ferry ride over. RUSTY LED safety discussion, EA personnel added site specific info during the meeting.

0800 Exit Ferry + Find Benchmark

Trimble model #TSC1

Found Benchmark

station 8510719 Silver EEL (Found)

Fishers Island

41° 15' 15.311 N"

72° 01' 46.870 W"

(Rarely)

UTM

KNOWN Benchmark

41° 15.4' N

72 1.9' W

Headed to Bitter Marcy (BM)

Location FORT H.G. WRIGHT, Fishers Island Date 1/16/07

Project / Client MMRP/FUDS SI/USACE/ALION

CO2NY061001

	Coordinates
Soil Sample	
(0852) HGW-BM-SS-02-01	0748966 E NAD
7-Wheel Composite	4571277 N

Relocated Sample in front of Westerly Gun Mount (Firing point)

Hand Held (HH) GPS Waypoint #2

9:11 Soil Sample HGW-BM-SS-02-02

7 wheel Composite - Relocated in front of Easterly Gun Mount (Firing point)

748997.291 E

4571238.152 N

HH GPS Waypoint # 3

Subsurface Anomaly 0749004 E

HH GPS waypoint #4 4571232 N

Subsurface Anomaly 0749008

HH GPS Waypoint # 5 4571227

Subsurface Anomaly 0749002

HH GPS WP #6 4571222

Fort HG Weight, Fishers Island 1/16/07
NMRP FUDS SI/USACE/ALION
C02NY061001

Mandatory Path to AA Battery
Subsurface Anomaly 0749001
HH GPS WP #7 4571209
Cargo

Subsurface Anomaly
HH GPS WP #8 4571178 N
0749074 E

Subsurface Anomaly
HH GPS WP # 9 0749085 E
4571187 N

Subsurface Anomaly
HH GPS WP #10 0749110
4571245

GPS Trimble having problems - using HH
Arrived at AA Battery Location
Samples in SS WP and GPS 03 renumbered to avoid
1035AM Sample point HH GPS #11 0749212
HGW-AA-SS-02-01 4571255
In middle of and around firing point

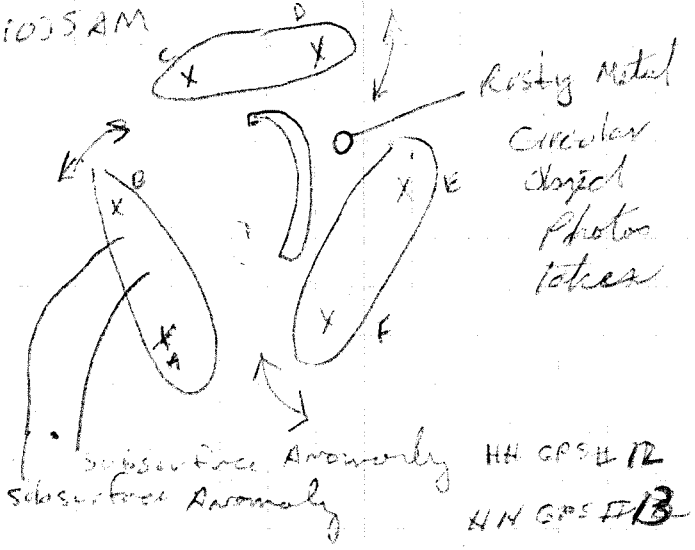
o = Sample 01

X = Sample 02

Jason Parker

Ft H.G. Wright, Fishers Island 1/16/07
NMRP FUDS SI/USACE/ALION
C02NY061001

Sample HGW-AA-SS-02-02
1035AM



HH GPS # 12
HH GPS # 13

A HH GPS # 14
B HH GPS # 15
C HH GPS # 16
D HH GPS # 17
E HH GPS # 18
F HH GPS # 19

* Note: Both samples relocated to AA Firing Point.

Both Samples Composite
01 - 7 subsamples composite
02 - 6 subsamples composite
Subsamples Renumbered HH GPS WP # 20

Jason Parker

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Location Ft H.G. Wright, Fishers Island Date 1/16/07

Project / Client MMRP FUDS SI / USACE / ALION

COZNY061001

Wondered Around Looking for Small Arms Range #2. Recon'd suspect firing point (near road) + suspect target berm, but did not find any evidence of Targets or parts. Will revisit the site later.

Went to bottom. Clinton noted a lot of Landscape equipment + supplies including Batteries, Trucks, bull dozers, Potting Soil, Coast of Maine Bark Bark, Miracle-Gro potting Soil, [illegible] Colston compost, plastic wood, concrete, peat moss, Slate, cable

Collected Composite Soil Sample (7 wheel)

HGW-BC-SS-02-01 12:20

collected near edge of Embankment

H'H GPS WP # 22 0749426 4571487

Location Ft. H.G. Wright, Fishers Island Date 1/16/07

Project / Client MMRP FUDS SI / USACE / ALION

COZNY061001

Collected HGW-BC-SS-02-02

(1244 PM) HH GPS WP#23 [0749434 4571442]

7-wheel composite

Location was downgradient from firing point over embankment. Area had been dug out. Photos taken of both sample locations

Small Arms

Traveled back to Range #2 collected soil samples.

HGW-SA-SS-02-04 (12:45 PM).

At Suspect target berm 12-14 ft high

7 wheel Composite Sample - No MD

HH GPS WP # 24 [0749443 4571313]

Collected second soil sample at suspect firing Point AT BASE of embankment/berm

HGW-SA-SS-02-03 (1300)

7 wheel composite sample - No MD

HH GPS WP #25 [0749369 4571332]

Jason Parker

FORT H.G. WRIGHT / Fishers Island 1/16/07
NMRP FUDS SI / USACE / ALION
C02NY001001

Walked around Small Arms range #1 area, no evidence of range berms, backstops or targets. Only one anomaly noted (HH GPS WP #26)
[41° 15.067' N, 72° 1.914' W → Zone 18. 0748687 N, 4570852 W @ 13:42]
in road along beach. No samples collected, left message w/ Alion PM to determine course of action.
NOTE: ASR AREA CHECKED, NO EVIDENCE OF THIS AOC.
Arrived @ Hwy 215 (BX in Surplus)

Walked around Battery Bunker area a lot of debris concrete, trash, rocks, TV, etc in front of Bunker area. Bunker Closed up.
Reconnaissance with Magnetometer
Some Surface / Subsurface Anomalies Attributed to debris (wire components) noted coordinates not recorded.
Found former gun emplacements
Circular subject foundation 3' step down. Collected HGW-BX-SS-02-01
1417 HH GPS WP #27 0748259
7-wheel composite 4570312

FT H.G. WRIGHT, Fishers Island 1/16/07
NMRP FUDS SI / USACE / ALION
C02NY001001

collected HGW-BX-SS-02-02
1432 HH GPS WP #29 0748251
4570800
7-wheel composite soil sample
Sample collected in front of Firing Point (about in').
Both locations were deviations from the SS-WP

* See note on following page

Arrived at supposed location of Battery Dynamite. Walked around point, interior of point. Surface water pond located adjacent to shore / point. Significant rubbish debris (styrofoam, beer bottles/cans, etc). No solid evidence / remains of Battery Dynamite. Identified timbers w/ large spikes AND BRICKS/FRAGMENTS broken adjacent to a concrete pad. ~~Determined this location was the only remains in the area. Most recently on top of the battery (1900) gun mount/ firing point~~ Collected HGW-BD-SS-02-01 (15:16), HH GPS WP #31 [0748205 N, 4570757 W]
7 wheel composite from the center of possible gun mounts location

Location: Fishers Island, H.G. Wright Date: 1/16/07

Project / Client: MMRP FUDS SI/USACE/ALION
CO2NY061001

Collected HGW-BD-SS-02-02 (15:33)
HH GPS WP# 32 [0748200 N
4570748 W]

7 wheel composite from area in front (@15') of gun mount where ~~gun~~ up suspected firing would have taken place

Collected HGW-BD-SD-02-01 (15:04)
HH GPS WP# 30 [0748175 N
4570737 W]

Collected this sediment grab sample from edge of surface water pond near point/shoreline. Various rubbish littered about, no evidence of any MD.

Collected HGW-BD-SD-02-02 (15:37)
HH GPS WP# 33 [0748235 N
4570797 W]

Jason Park

Collected this sediment sample from wet area approx 100' inland (towards Battery 215). No MD noted.

Further investigation revealed former location approximately 80' southeast of BD soil samples. Concrete battery with rail tracks extending

Location: Fort H.G. Weight, Fisher's Island Date: 1/16/07

Project / Client: MMRP FUDS SI/USACE/ALION
CO2NY061001

Back @ 10 FEET (RECOIL?). Sample collected.
HGW-BD-SS-02-03 (15:53)
HH GPS WP# 34 [0748199 N
* SEE NOTE AT END 4570733 W]

16:05 GPS Check @ benchmark
41° 15.25' N
72° 01.78' W
HH GPS WP# 35 + 36
↳ UTM ↳ Lat/Long

16:15 Arrived at Ferry Dock, dropped off EA vehicle and loaded onto Ferry. Ferry departure 16:45.

WEATHER - Mostly cloudy, windy. Temps around 38° F, wind chills down to 20° F

Jason Park

* NOTE:
Actual concrete battery remains found during meandering path reconnaissance. located south of surface water pond. Demolition/construction debris/concrete fragments/brick may have been associated w/ former boiler house that provided steam/air pressure to dynamite gun and/or B. Dynamite.

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Location: Fort HG. Wright, Fishers Island Date: 1/17/07

Project / Client: MMRP FUDS SI/USACE/ALION

CO2NY061001

06.35 Arrived at Fishers Island Ferry Dock

06:45 Loaded onto Ferry

07:00 Ferry departure from New London

08:00 Ferry arrived at Fishers Island

8:05 Arrived at Benchmark location set-up new trimble unit delivered yesterday. Trimble Model TSC1

Trimble Coordinates:

72° 01' 46.506 W

41° 15' 15.314 N (CHECK)

HH GPS Coordinates WP#37

72° 1.780'

41 15.256' (8.15)

Station 8510719 Silver Eel Pond

41° 15.4' N (known)

72° 1.8' W

08:15 Schoenstadt checked out ok.

08:30 Arrived at Battery Happock. Used for storage of miscellaneous boats repair and debris (sailboat, misc. tubs, cans, pallets, tanks, row boats) samples out in front of battery firing points.

Jean Foster

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Location: Ft HG Wright, Fishers Island Date: 1/17/07

Project / Client: MMRP FUDS SI/USACE/ALION

CO2NY061001

Relocated samples HGW-HP-SS-02-01 and HGW-SS-02-03 to in front of battery firing points

HGW-HP-SS-02-01 (8:44)

Coordinates 72°01'09.320" W

41° 15'.20.668" N

HH GPS WP # 38

[41° 15.344 N

72° 01.154 W]

7 wheel composite collected from "in front east gun mount.

No MEC or MD

HGW-HP-SS-02-02 (9:07)

Coord 72°01'10.124 W

41° 15'20.383 N

HH GPS WP#39 [41° 15.358 N

72° 01.170 W]

BOTH AREAS where Happack samples collected were HEAVILY overgrown w/ vegetation (BRIAR)

No MEC or MD noted.

7 wheel composite

Hillside sloped down to shore from Happock. Samples collected at top edge.

Jean Foster

Location Ft HG Wright, Fishers Island Date 1/17/06
Project / Client MMRP FUDS SI/USACE/ALION
COZNY061001

Moved to HGW-BG-SS-02-01 off
road exiting B Hoppock BG-4 located
up on hill behind stone building
on road (
Coord. 72° 01' 16.761" W
41° 15' 23.275" N
HH GPS WP # 40
[41° 15.388 N
72° 01.279 W]
HGW-BG-SS-02-04 (9:34)
No evidence of military disturbance

Moved to HGW-BG-SS-02-07
relocated sample to area on other side
of entrance road to B Clinton. Initial
area impacted by landscaping contractor
HGW BG-SS-02-01 (10:22)
Coord 72° 01' 16.764" W
41° 15 23.277" N
HH GPS WP # 41 [41° 15.426' N
72° 01.425' W]
NO MEC/MD noted

Jason Parker

Vegetated area not disturbed
by military activities
anomaly noted approx 10' east of BG-02-01

Location Ft HG Wright, Fishers Island Date 1/17/06

Project / Client MMRP FUDS SI/USACE/ALION
COZNY061001

Moved to HGW-BG-SS-02-02
area off road (approx 50') from B. Clinton
towards AA Battery. Area appears to
be free from military disturbance
in vegetated (trees >15ft) area
Coord. 72° 01' 26.747" W TIME = 10:26
41° 15' 20.315" N
HH-GPS WP #42 [41° 15.311' N
72° 01.445' W]
Surface anomaly noted approx
50' ~~west~~ west of HGW-BG-SS-02-02
no other evidence of MEC/MD

Relocated to HGW-BG-SS-02-03, behind
New York State Police building. Found
a parachute flare (possibly Mark 25) in
lightly ~~vegetated~~ area. Surrounded by NAVY
several ~~rocks~~ rocks (possibly to mark it) FLARE
not believed to be a concern (R. Mitchell)
possibly found somewhere else and
placed here w/ rocks around it to be
found. Metal Ball (8-10" diameter) appears
to be a float w/ small metal handle (holder)
not believed to be ordnance related.

Jason Parker

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Location Fort HG Wright, Fishers Island Date 1/17/07

Project / Client MMRP FUDS SI/USACE/ALION

COZNY061001

Relocated BG-02-03 to wooded area further back behind stockpile building (Trees @ 15')

HGW-BG-SS-02-03 (10:56)

Coord 72° 01' 31.333" W
41° 15' 21.157" N

HH GPS WP #43 [41° 15.370' N / 72° 01.523' W]

No military disturbance noted in area no other MEC/MD noted.

Moved to BG-07-05. Located in field approx 50' off Main Road in field (parade grounds) in front of former cantonment area. No anomalies or MEC/MD noted

HGW-BG-SS-07-05 (11:08)

Coord 72° 01' 37.064" W
41° 15' 21.582" N

HH GPS WP #44 [41° 15.362' N / 72° 01.618' W]

Low grass (less than 2' tall) throughout area). Several subsurface anomalies noted in field area during geophysical recon.

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Location Ft HG WRIGHT, Fishers Island Date

Project / Client MMRP FUDS/SI/USACE/ALION

COZNY061001

Moved to Battery Dutton, located west of benchmark location B. Dutton covered w/ vegetation and partially Back filled with soil and boulders. Sampling ~~per~~ locations positioned in front of former firing points.

HGW-DT-SS-02-01 (11:34)

Coord 72° 01' 50.697" W
41° 15' 14.855" N

HH GPS WP #45 [41° 15.250 N / 72° 01.848 W]

HGW-DT-SS-02-02 (11:58)

Coord. 72° 01' 49.580" W
41° 15' 14.911" N

HH GPS WP #46 [41° 15.251 N / 72° 01.829 W]

Battery Dutton noted to have been partially filled w/ misc. construction debris, boulders and fill material. Metal pipes and rusted metal parts noted in B. Dutton Samples collected in front of concrete in front (approx. 40'-50') of firing points.

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Location Ft HG Weight, Fishers Island Date 1/17/07

Project / Client MMRP FUDS SI / USACE / ALION

CO2NY061001

Geophysical recon conducted at B. Dutton. No anomalies noted 'outside' / around' battery. Recon not conducted within battery due to fill material, sloping grade and unsafe conditions.
NO MEC/MD noted. Sample locations moved slightly due to existing site conditions

ARRIVED AT B. HOFFMAN, parked at end of road and walked up from beach Heavily vegetated. Located 2 FIRING points of battery and positioned samples out in front of each.

HGW-HF-SS-02-02 (13:14)
Coord 72° 02' 06.276" W
41° 15' 21.535" N
HH GPS WP # 47 [41° 15.360' N, 72° 02.105' W]

No subsurface/surface anomalies noted no MEC/MD noted. Battery intact w/ ~~vegetation~~ overgrown vegetation throughout

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Location Ft Hg Weight, Fishers Island Date 1/17/07

Project / Client MMRP FUDS SI / USACE / ALION

CO2NY061001

HGW-HF-SS-02-01 (13:21)
Coord 72° 02' 06.144" W
41° 15' 21.813" N
HH GPS WP # 48 [41° 15.365' N, 72° 02.102' W]

No MEC/MD detected Sample locations relocated ~~to~~ due to incorrect location of Battery position. Actual Battery position located further south than anticipated

Moved to B. Hamilton. Parked at B. Barlow and traversed down beach to get access to B. Hamilton Significantly overgrown w/ vegetation (briars, bushes).

Located firing point and collected samples from embankment in front of firing point that sloped down to shoreline.

HGW-BH-SS-02-01 (13.56)
Coord 72° 02' 06.747 W
41° 15' 19.837 N
Wheel composite

Location FT HG WRIGHT, Fishers Island Date 1/17/07

Project / Client MMRP FUDS SI / USACE / ALION

C02NY061001

HH GPS WP #49 [41° 15.333" N
72° 02.110" W]

Trash and miscellaneous debris scattered amongst shoreline in front of battery, not associated w/ military debris. Geophysical reconnaissance did not reveal any anomolies.

NO MEC/MD NOTED

HGW-BH-SS-02-02 (14:09

Coord 72° 02' 05.608 W
41° 15' 18.259 N

HH GPS WP #50 [41° 15.366 N
72° 02.097 W]

Overgrown w/ vegetation 7 point composite sample taken from in front of firing point. on embankment sloping down to shore

NO MEC/MD NOTED.

Moved to B. Barlow, Battery used for waste management. Battery filled w/ fill material and demolition debris (concrete fragments, stone). Significant amount of stumps dumped (wood also) in and around outside of battery

Jason Parker

Location FT HG Wright, Fishers Island Date 1/17/07

Project / Client MMRP FUDS SI / USACE / ALION

C02NY061001

Located samples out in front of firing points approx 80' from former guns. Samples were collected in vegetated areas beyond stump/wood dumping area

HGW-BL-SS-02-01 (14:22)

Coord 72° 02' 05.283" W
41° 15' 16.419 N

HH GPS WP #51 [41° 15.276 N
72° 02.086 W]

Composite, 7 wheel collection

NO MEC/MD NOTED

HGW-BL-SS-02-02 (14:37)

Coord 72° 02' 04.905" W
41° 15' 14.912" N

HH GPS WP #52 [41° 15.252 N
72° 02.080 W]

NO MEC/MD NOTED

Located BL-SS-02-02 approx 150'-200' from firing point at bottom of hill. Significant stump/fill dumping prevented positioning sample any closer to firing point. Area was vegetated w/ sizable trees. Appears to have not been impacted by disposal activities above.

Jason Parker

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Location: Ft HG Wright, Fishers Island Date: 1/17/07

Project / Client: MMRP FUDS SI / USACE / ALION

COZNY061001

Moved to B Butterfield. Similar conditions as B. Barlow. Fill material, wood, stone dumped in front of firing points. Moved sample collection down approx 150' in front of firing point to area undisturbed and vegetated

HGW-BB SS-02-01 (14:53)

Coord 72° 02' 05.599" W
41° 15' 13.945" N

HH GPS WP #53 [41° 15.235 N / 72° 02.059 W]

No MEC or MD noted

Similar conditions to BB-SS-02-01 not as much dumping as 02-01. Moved sample out 15C from firing point.

HGW-BB-SS-02-02 (15:12)

Coord. 72° 02' 00.277 W
41° 15' 13.279 N

HH GPS WP #54 [41° 15.224 N / 72° 02.005 W]

4 WHEEL Composite sample

No MEC or MD.

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Location: Ft HG Wright, Fishers Island Date: 1/17/07

Project / Client: MMRP FUDS SI / USACE / ALION

COZNY061001

Moved Down to Small Arms Range #1. Collected (15:29)

HGW-SA-SS-02-01

Coord 72° 01' 54.154" W
41° 15' 03.715" N

HH GPS WP #55 [41° 15.063 N / 72° 01.902 W]

Sample located on embankment / berm in area where Small Arms Range #1 was located

HGW-SA-SS-02-02 (15:40)

Coord 72° 01' 53.303 W
41° 15' 05.331 N

HH GPS WP #57 [41° 15.09 N / 72° 01.555 W]

No MEC/MD noted.

Sample located in area where Small Arms Range believed to be. Actual location on small elevation rise approx 100 yds North of SA-02-01.

No MEC/MD noted, some debris washed up from tidal surges (non-military)

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Location Ft HG Wright, Fishers Island Date 1/17/07

Project / Client MMRP FUDS SI/USACE/ALION

COZN/061001

15:50 HH GPS Check

41° 15.257' N

72° 01.780' W

Trimble Check

72° 01' 46.844" W

41° 15' 15.346" N

✓ Check ok

16:00 Arrive at Fishers Island Ferry Dock for departure.

17:20 Called Mr. Richard Ahman (Fishers Island Waste Management) 631-788-7226. Left a voicemail on the answering machine in reference to the ammunition he found and showed the Corps + Alion Team during the TPP Meeting in April. I left my name and number and requested/asked if he would let me know and/or show me exactly where he found that piece of ordnance. I left my cell phone and office phone numbers in the message. I called twice and got voicemail both times,

Location Ft HG Wright, Fishers Island Date 1/17/07

Project / Client MMRP FUDS SI/USACE/ALION

COZN/061001

25

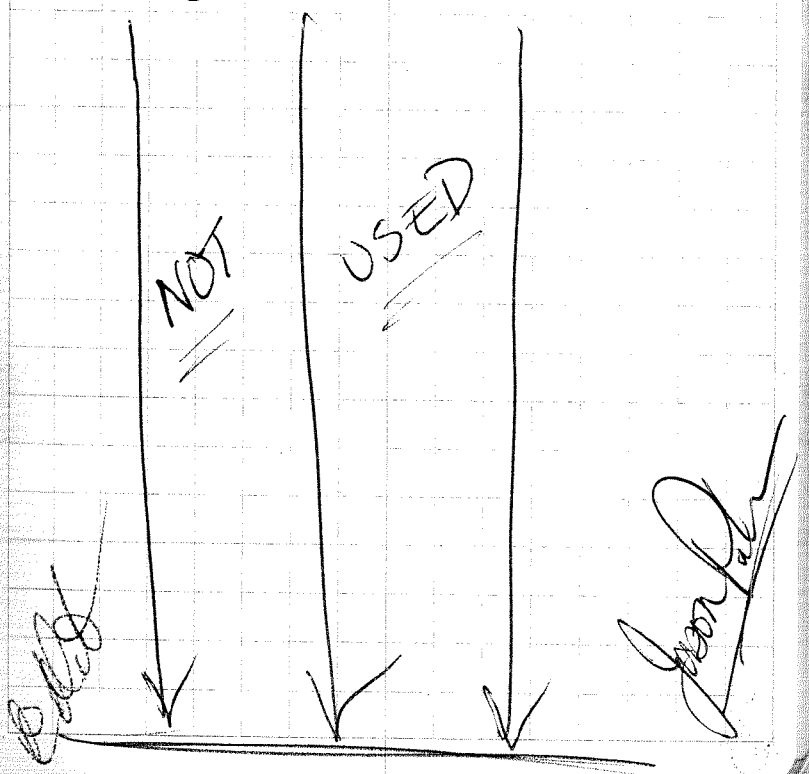
WEATHER (FROM TODAY):

Sunny + Clear, Windy

High Temps = 25°F, Low Temps = 13°F

Wind chill = -1°F

17:45 Return to New London, Fishers Island Ferry Dock.



Alion Science and Technology, Inc.

DAILY QUALITY CONTROL REPORT

Report Number:	1-16-07-01	**Date:** 1-16-07	
Project Name:	Fort H.G. Wright C02NY061001	**Contract Number:** W912DY-04-D-0017	
Location of Work:	Fishers Island, New York		
Description of Work:	Meandering path geophysical reconnaissance and sampling.		
Weather:	Mostly cloudy, windy	**Rainfall:** none	**Temperature:** **Min.** 22 **Max.** 38

1. Work performed today by Alion Team.

Meeting with project team to go over site rules/proceedures for accessing sampling locations

Health and Safety briefing

Recorded anomaly counts, locations, descriptions, if present while performing reconnaissance (meandering paths) and sample collection.

Reconnaissance Acreage / Discussion:

Reconnaissance was conducted in the meandering path fashion. Travel paths varied from the geophysical site reconnaissance figures in the SS-WP due to natural terrain and the addition of more reconnaissance to try and verify sample and battery locations.

Samples Collected:

HGW-BX-SS-02-01	HGW-SA-SS-02-03	HGW-BC-SS-02-01
HGW-BX-SS-02-01	HGW-SA-SS-02-04	HGW-BC-SS-02-02
HGW-BM-SS-02-01	HGW-AA-SS-02-01*	HGW-BD-SS-02-01
HGW-BM-SS-02-02	HGW-AA-SS-02-02*	HGW-BD-SS-02-02
HGW-AA-SS-02-01	*Numbering in SS-WP incorrect revised in field-see log book ** Added sample not in WP awaiting feedback from PM.	HGW-BD-SS-02-03*
HGW-AA-SS-02-02		HGW-BD-SD-02-01
Field Duplicate #1		HGW-BD-SD-02-02
Field Duplicate #2		HGW-AA-SS-02-01 QA

Field Tests:

Schonstedt checked ok.

Trimble-Benchmark confirmed to be within 1 meter. Handheld GPS benchmarked.

Calibration of Instruments:

None

Other:

None.

2. Work performed today by other subcontractors.

None.

3. Type and results of Control Phases and Inspection. (Indicate whether Preparatory – P, Initial – I, or Follow-Up – F and include satisfactory work completed or deficiencies with actions to be taken)

Preparatory phase inspections for field work were completed prior to mobilizing to Fishers Island in NY. Initial phase of inspections were completed upon site arrival. No follow-up inspections were completed today. Satisfactory work completed.

4. List type and location of tests performed and results of these tests.

None

5. List material and equipment received.

None.

6. Submittals reviewed. (Include Transmittal No., Item No., Spec/Plan Reference, by whom, and any action.

None.

7. Off-site surveillance activities, including action taken.

None.

8. Job Safety. (Report safety violations observed and actions taken)

No safety violations.

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

Performed meandering path geophysical reconnaissance in and around several former battery locations at Fort H.G. Wright located Fisher's Island, New York. Geophysical reconnaissance and sample collection was conducted at Battery Marcy, the AA Battery, Battery Clinton, Small Arms Range #2, Battery 215 and Battery Dynamite. No MEC or MD found during geophysical reconnaissance or sampling activities. No health and safety issues and/or violations during field work. Deviations from the work plan included general relocation of samples (majority of samples near batteries were collected downgradient of firing points based on existing site conditions). No samples were collected at the Small Arms Range #1, as no evidence of a small arms range (berms, backstops, targets, etc.) was identified during reconnaissance. It was noted by a stakeholder during the TPP Meeting that a small arms range did not exist in this location, although called out but not confirmed in the ASR. A call was made to the Alion PM to determine sampling activities in this area, field team to follow up with Alion PM tomorrow. Reconnaissance of Battery Dynamite revealed two surface water bodies and an area littered with debris and some rubble (concrete/brick fragments). Sediment samples were collected from each surface water body located near Battery Dynamite. Three soils samples (instead of two as called out in the work plan) were collected from the area containing Battery Dynamite as several areas of debris were identified. The field team observed visual evidence, (*i.e.* partially buried railroad ties that resembled an earthen platform, fractured concrete, brick fragments, and a concrete structure) that may have been associated with this former battery. It is noted that the exact location of the battery could not be confirmed from the ASR but that the location was confirmed based on evidence observed during the reconnaissance. The field team will review the ASR and discuss which of the two samples will be submitted for this area.

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

Quality Control System Manager (Sign and Print Name)

Alion Science and Technology, Inc.

DAILY QUALITY CONTROL REPORT

Report Number:	1-17-07-02	**Date:** 1-17-07	
Project Name:	Fort H.G. Wright C02NY061001	**Contract Number:** W912DY-04-D-0017	
Location of Work:	Fishers Island, New York		
Description of Work:	Meandering path geophysical reconnaissance and sampling.		
Weather:	Clear and Sunny, Cold, Windy	**Rainfall:** none	**Temperature:** **Min.** 13 **Max.** 25 Wind Chill = -1

1. Work performed today by Alion Team.

Meeting with project team to go over site rules/proceedures for accessing sampling locations

Health and Safety briefing

Recorded anomaly counts, locations, descriptions, if present while performing reconnaissance (meandering paths) and sample collection.

Reconnaissance Acreage / Discussion:

Reconnaissance was conducted in the meandering path fashion. Travel paths varied from the geophysical site reconnaissance figures in the SS-WP due to natural terrain and the addition of more reconnaissance to try and verify sample and battery locations.

Samples Collected:

HGW-BH-SS-02-01	HGW-SA-SS-02-01	HGW-BL-SS-02-01
HGW-BH-SS-02-02	HGW-SA-SS-02-02	HGW-BL-SS-02-02
HGW-BB-SS-02-01	HGW-HF-SS-02-01	HGW-DT-SS-02-01
HGW-BB-SS-02-02	HGW-HF-SS-02-02	HGW-DT-SS-02-02
HGW-BG-SS-02-01	HGW-BG-SS-02-02	HGW-BG-SS-02-03
HGW-BG-SS-02-04	HGW-BG-SS-02-05	HGW-HP-SS-02-01
Field Duplicate #3	HGW-DT-SS-02-01 QA	HGW-HP-SS-02-02
HGW-BL-SS-02-02 QA		

Field Tests:

Schonstedt checked ok.

Trimble-Benchmark confirmed to be within 1 meter. Handheld GPS benchmarked.

Calibration of Instruments:

None

Other:

None.

2. Work performed today by other subcontractors.

None.

3. Type and results of Control Phases and Inspection. (Indicate whether Preparatory – P, Initial – I, or Follow-Up – F and include satisfactory work completed or deficiencies with actions to be taken)

Preparatory phase inspections for field work were completed prior to mobilizing to Fishers Island in NY. Initial phase of inspections were completed upon site arrival. No follow-up inspections were completed today. Satisfactory work completed.

4. List type and location of tests performed and results of these tests.

None

5. List material and equipment received.

None.

6. Submittals reviewed. (Include Transmittal No., Item No., Spec/Plan Reference, by whom, and any action.

None.

7. Off-site surveillance activities, including action taken.

None.

8. Job Safety. (Report safety violations observed and actions taken)

No safety violations.

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

Performed meandering path geophysical reconnaissance in and around former battery locations at Fort H.G. Wright located Fisher's Island, New York. Geophysical reconnaissance and sample collection was conducted at Batteries Butterfield, Barlow, Dutton, Hamilton, Hoffman, and Hoppock, as well as at the Small Arms Range #1. Background surface soil samples were also collected for metals analysis at predetermined sampling locations. No health and safety issues and/or violations occurred during field work. No DOD related MEC or MD was found during geophysical reconnaissance or sampling activities. A suspect parachute flare was located during the reconnaissance of background sample HGW-BG-SS-02-03 behind the New York State Police building located on Whistler Avenue. Pictures of the flare were taken, GPS location and coordinates marked, and its description was recorded in the field log book. UXO Technician, Rusty Mitchell, determined that the flare was not related to past DOD operations at the FUDS. Deviations from the work plan included general relocation of samples (majority of samples near batteries were collected downgradient of firing points based on existing site conditions). Although reconnaissance of Small Arms Range #1 was performed on 1-16-07, no samples were collected, as the exact location of this area could not be identified in the field. The field team returned to this area today (1-17-2007) and collected surface soil samples from the suspect berm location (along the shore line and at an area which was elevated above the surrounding terrain along the shoreline). The location was approximately 100 yards away from the location noted in the SS-WP. Samples collected from Battery Barlow and Battery Butterfield were relocated approximately 150 ft in front of their associated firing points. Although only a slight modification (increased distance from firing points), this deviation was the result of the current use by Fishers Island Waste Management, directly in front of the batteries, as a dumping area for wood debris, stumps, landscaping material and fill. These samples were relocated to areas directly in front and at the bottom of the hill that slopes away from the firing points. No impacts from current operations were noted in the sampling locations.

Post Script Note (1-18-07): Conducted post-field work correspondence with CENAN to confirm that the surface soil samples collected in Small Arms Range #1 would be analyzed although no direct physical evidence of any existence of a small arms range was found. Prepared samples and Chains of Custody for shipment to laboratory for analysis. Delivered samples to FedEx for shipment to GPL Laboratory (7210A Corporate Court, Frederick, MD 21703) via Priority Overnight. Contacted GPL Laboratory (Paul Ioannides via email) to advise the lab that one (1) extra sample had been collected during field activities and included in the shipment to their laboratory. It was requested that soil sample HGW-BD-SS-02-02 NOT be analyzed and that sample HGW-BD-SS-02-03 be analyzed in its place.

Alion Science and Technology, Inc.

DAILY QUALITY CONTROL REPORT

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

Quality Control System Manager (Sign and Print Name)

SITE ENTRY AND EXIT LOG

Project/Site : FORT H.G. WRIGHT
Project No.: MMRP FUDS # C02NY001001

Date	Name	Representing	Time In	Time Out
1/16/07	Michael O'Neil	EA / Alion	8:00	16:45
1/16/07	Darnell Anderson	EA	8:00	16:45
1/16/07	C. Mitchell	HFA/Alion	8:00	16:45
1/16/07	Jay Parker	EA/Alion	8:00	16:45
1/17/07	Jay Parker	EA/Alion	8:00	16:45
1/17/07	C. Mitchell	HFA/Alion	8:00	16:45
1/17/07	Darnell Anderson	EA/Alion	8:00	16:45

HEALTH AND SAFETY PLAN REVIEW RECORD

SITE: FORT H.G. WRIGHT

EA Project No. 62023.02.0027

I have read the Health and Safety Plan (s) 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
Curtis Mitcher		ALION/HETA	1/16/07
Michael O'Neill		EA/ALION	1/16/07
Darnell Anderson		EA	1/16/07
Jay Parker		EA/ALION	1/16/07
Darnell Anderson		EA/ALION	1/17/07
Jay Parker		EA/ALION	1/17/07

DAILY SITE SAFETY JOURNAL

DATE: 11/16/07	PROJECT: HG WRIGHT
SUXOS: Mitchell	PM:
SSO: Mitchell	QCO:

AREA / ITEMS INSPECTED	SAT	UNSAT
Proper work attire (PPE)	✓	
Vehicle condition	✓	
Emergency equipment	✓	
Safe demolition procedures	N/A	
Field office, inside	N/A	
Field office grounds	N/A	

- [ ] Last Work Days Events
- [✓] Site Description
- [✓] Work Area Description
- [✓] Work Area Hazards
- [✓] On-Site Emergency
- [✓] Site Evacuation Procedures
- [✓] Emergency Response Personnel
- [✓] Emergency Telephone Numbers
- [✓] Directions to Hospital
- [✓] First Aid
- [✓] Heat / Cold Stress
- [ ] Asbestos Awareness & ID
- [ ] Ticks
- [✓] Safety Concerns
- [✓] Personnel Protective Equipment
- [✓] Safe Work Practices
- [✓] Emergency Response Plan
- [ ] Chemical Hazards
- [ ] Emergency Equipment, Location
- [ ] Emergency Equipment, by Type
- [ ] Emergency Decontamination
- [✓] Safe Work Practices - General
- [✓] Site specific OE Safety Precautions
- [✓] Site specific OE Identification Features
- [ ] Liquid Contaminates / Landfill Material
- [ ] Other _____

Comments:

SSO SIGNATURE: [signature]

F-13

DAILY SITE SAFETY JOURNAL
MEETING ATTENDEES
DATE: 1/16/2007

	Name	Affiliation
1	Darnell Anderson	EA
2	Mitchell Meier	EA
3	Sally Parker	EA
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DAILY SITE SAFETY JOURNAL
Page 1 of 2

DATE: 11/7/02	PROJECT: HG WRIGHT
SUXOS: Mitchell	PM:
SSO: Mitchell	QCO:

AREA / ITEMS INSPECTED	SAT	UNSAT
Proper work attire (PPE)	✓	
Vehicle condition	✓	
Emergency equipment	✓	
Safe demolition procedures	N/A	
Field office, inside	N/A	
Field office grounds Vehicle	✓	

[✓] Last Work Days Events
[✓] Site Description
[✓] Work Area Description
[✓] Work Area Hazards
[✓] On-Site Emergency
[✓] Site Evacuation Procedures
[✓] Emergency Response Personnel
[✓] Emergency Telephone Numbers
[✓] Directions to Hospital
[✓] First Aid
[✓] Heat / Cold Stress
[ ] Asbestos Awareness & ID
[ ] Ticks
[✓] Safety Concerns
[✓] Personnel Protective Equipment
[✓] Safe Work Practices
[✓] Emergency Response Plan
[ ] Chemical Hazards
[✓] Emergency Equipment, Location
[✓] Emergency Equipment, by Type
[ ] Emergency Decontamination
[✓] Safe Work Practices - General
[✓] Site specific OE Safety Precautions
[✓] Site specific OE Identification Features
[ ] Liquid Contaminates / Landfill Material
[ ] Other _____

Comments:

SSO SIGNATURE: [signature]

F-13

DAILY SITE SAFETY JOURNAL
MEETING ATTENDEES
DATE: 1/17/07
Page 2 of 2

	Name	Affiliation
1	Jay Parker	EA/ALIAU
2	Darnell Anderson	EA/Alion
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GPL LABORATORIES, LLLP

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

Contract #/Billing Reference:

1 of 4 Pgs.

Project: Fort H.G. Wright
Client: Alion Science + Technology
Send Results To: Corinne Shia
Address: 3975 Fair Ridge Suite 125 South
Fairfax, VA 22033
Phone: 703-259-5147

Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Metals (6010B)	Explosives (8330A)	PETN + NG (8330M)	Mercury (7471B)	Ignitability (1020)	CLIENT COMMENTS
HGW-AA-SS-02-01	1/16/07	10:30	Soil	DMA	X	X	X	X		SS = Soil
HGW-AA-SS-02-02	1/16/07	10:35	Soil	JP						SD = Sediment
HGW-BC-SS-02-01	1/16/07	12:20	Soil	DMA						Perform MS/MSD
HGW-BC-SS-02-02	1/16/07	12:44	Soil	DMA						at 5% each
HGW-BD-SS-02-01	1/16/07	15:16	Soil	JP						of samples
HGW-BD-SS-02-02	1/16/07	15:33	Soil	JP						processed as
HGW-BD-SS-02-03	1/16/07	15:53	Soil	MJD						per comments
HGW-BD-SD-02-01	1/16/07	15:04	Sediment	DMA						w/ Alion
HGW-BD-SD-02-02	1/16/07	15:37	Sediment	DMA						
HGW-BX-SS-02-01	1/16/07	14:17	Soil	DMA						
HGW-BX-SS-02-02	1/16/07	14:32	Soil	DMA						

Turnaround Time: Stnd
# of Containers: 2
Container Type: 8oz
Preservative Used: —
Type of Analysis:
Lab Cooler No.:

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
Daniel Ackerman	1/18 12:00	Fedex			

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

Project: Fort H.G. Wright
Client: Alion Science + Technology
Send Results To: Corinne Shia
Address: 3975 Fair Ridge Suite 125 South
Fairfax, VA 22033
Phone: 703-259-5143

Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Metals (6010B)	Explosives (8330 PETN NG)	Mercury (7471B)	Zinc Chloride (6020)	Lab Cooler No.	CLIENT COMMENTS
				Turnaround Time	Std					
				# of Containers	2					
				Container Type	4oz					
				Preservative Used	—	—	—	—		
HGW-BH-SS-02-01	1/17/07	13:56	Soil	DMA	X	X	X	X		SS = Soil
HGW-SA-SS-02-01	1/17/07	15:29		DMA						Perform MS/MSD
HGW-BM-SS-02-02	1/16/07	09:11		DMA						at 5% each
HGW-BM-SS-02-01	1/16/07	08:52		MJO						for the batch
HGW-SA-SS-02-02	1/17/07	15:40		DMA						of samples
HGW-BB-SS-02-01	1/17/07	14:53		DMA						processed as
HGW-BB-SS-02-02	1/17/07	15:12		DMA						per instructions
HGW-HF-SS-02-01	1/17/07	13:21		DMA						from Alion
HGW-HF-SS-02-02	1/17/07	13:14		DMA						
HGW-BL-SS-02-01	1/17/07	14:22		DMA						
HGW-BL-SS-02-02	1/17/07	14:37		DMA						
HGW-BH-SS-02-02	1/17/07	14:09	↓	DMA	↓	↓	↓	↓		

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
Darrell Anderson	1/18 12:00	Fedex			

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

3 of 4 Pgs.

Project: Fort H.G. Weight
Client: Alion Science + Technology
Send Results To: Corinne Shia
Address: 3975 Fair Ridge Suite 125 South
Fairfax, VA 22033
Phone: 703-259-5147

Turnaround Time: STANDARD
# of Containers: 2
Container Type: 8oz
Preservative Used: — — — —
Type of Analysis

Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Metals (6010B)	Explosives (8330A)	PETN + NG (8330 M)	Mercury (7471B) Zirconium (6020)	Lab Cooler No.	CLIENT COMMENTS
HGW-SA-SS-02-03	1/16/07	13:00	Soil	MJO	X	X	X	X		SS = SOIL
HGW-SA-SS-02-04	1/16/07	12:45	Soil	JP	↓	↓	↓	↓		PERFORM MS/MSD
HGW-BG-SS-02-01	1/17/07	10:00	Soil	DMA	X			X		AT 5% EACH
HGW-BG-SS-02-02	1/17/07	10:26	Soil	DMA	↓			↓		FOR THE BATCH
HGW-BG-SS-02-03	1/17/07	10:56	Soil	DMA	↓			↓		OF SAMPLES
HGW-BG-SS-02-04	1/17/07	9:34	Soil	DMA	↓			↓		PROCESSED AS PER
HGW-BG-SS-02-05	1/17/07	11:08	Soil	DMA	↓			↓		INSTRUCTIONS FROM
FD # 1	1/16/07	—	Soil	MJO	X	X	X	X		ALION.
FD # 2	1/16/07	—	Soil	DMA	↓	↓	↓	↓		
FD # 3	1/17/07	—	Soil	DMA	↓	↓	↓	↓		

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
Darnell Andrews	1/18 12:00	Fedex			

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

4 of 4 Pgs.

Project: FORT HG WRIGHT
Client: ALION SCIENCE + TECHNOLOGY
Send Results To: Corinne Shia
Address: 3975 Fair RIDGE Suite 125 South
Fairfax, VA 22033
Phone: 703-259-5147

Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Turnaround Time: STANDARD	# of Containers: 2	Container Type: 8oz	Preservative Used: —	Type of Analysis: METALS (6010B)	EXPLOSIVES (8330A)	PETN + NG (8330M)	MERCURY (7471B)	SELENIUM (6020)	Lab Cooler No.	CLIENT COMMENTS
HGW-DT-SS-02-01	1/17/06	11:34	Soil	DMA					X	X	X	X			SS = SOIL
HGW-DT-SS-02-02	1/17/06	11:58	Soil	DMA											PERFORM MS/MSD
HGW-HP B-SS-02-01	1/17/06	8:44	Soil	DMA											AT 5% EACH OF
HGW-HP-SS-02-02	1/17/06	9:07	Soil	DMA											SAMPLES PROCESSED
															AS PER INSTRUCTIONS
															FROM ALION

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
Darnell Andre	1/18 12:00	Fedex			

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 Mobile
900 Lakeside Drive

Mobile, AL 36693
phone 251-666-6633 fax 251-666-6696

Chain of Custody Record

SEVERN TRENT STL

Severn Trent Laboratories, Inc.

Client Contact	Project Manager: Corinne Shia	Site Contact: Corinne Shia	Date: 1/17/2006	COC No:
Alion	Tel/Fax: 703-259-5147	Lab Contact: Lyn Benkers	Carrier: FED EX	1 of 1 COCs
3975 Fair Ridge, Suite 125 South	Analysis Turnaround Time			Job No.
Fairfax, Virginia 22033	Calendar (C) or Work Days (W) STD			
(703) 259-5147	TAT if different from Below STANDARD			SDG No.
(703) 259-5212	☐ 2 weeks			
Project Name: Fort HG Wright-MMRP FUDS	☐ 1 week			
Site: Fort HG Wright	☐ 2 days			
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Metals (6010B)	Explosives (8330A)	PETN + NG (8330M)	Mercury (7471B)	Zirconium (6020)	Sample Specific Notes:
HGW-DT-SS-02-01 QA	1/17/07	11:34	Soil	Comp	2		X	X	X	X	X	NO Preservative
HGW-BL-SS-02-02 QA	1/17/07	14:37	Comp	Soil	2		↓	↓	↓	↓	↓	↓
HGW-AA-SS-02-01 QA	1/16/07	10:35	Comp	Soil	2		↓	↓	↓	↓	↓	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 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:
Darnell Anderson	EA/Alion	1/18-13:00	Fedex		
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

APPENDIX E - PHOTO DOCUMENTATION LOG

APPENDIX E - PHOTOGRAPHIC LOG

Project/Site : MMRP SI for Fort H.G. Wright
Project No.: C02NY061001/USACE

Date	Photo ID	Description[1]
1/16/07	E.1	Visual and geophysical reconnaissance and sample collection at Battery Marcy.
1/16/07	E.2	Visual and geophysical reconnaissance and sample collection at the AA Battery. (Note: circular concrete gun mount buried in the center of photo)
1/16/07	E.3	Surface soil sampling at Battery Clinton (in front of firing point)
1/16/07	E.4	View of suspect small arms range backstop at Small Arms Range No. 2.
1/16/07	E.5	View of former Dynamite Battery.
1/16/07	E.6	Remnants of a brick chimney near the Dynamite Battery. Chimney remnants most likely associated with former boiler house that provided steam for the Dynamite Battery.
1/16/07	E.7	Wood debris located between boiler house brick chimney remnants and Dynamite Battery.
1/16/07	E.8	View of possible backstop associated with suspect Small Arms Range No. 1.
1/17/07	E.9	View of miscellaneous marine and boat repair material being stored at Battery Hoppock.
1/17/07	E.10	Location of background sample HGW-BG-SS-02-04 west of Battery Hoppock at the top of a steep embankment.
1/17/07	E.11	View of backfilled concrete and soil backfilled into Battery Dutton.
1/17/07	E.12	View of gun emplacement at Battery Hoffman.
1/17/07	E.13	View of gun emplacement at Battery Hamilton.
1/17/07	E.14	View of gun emplacement at Battery Barlow used by Fishers Island Waste Management for household yard waste disposal. (Note: stumps, branches and brush backfilled into battery)

Date	Photo ID	Description[1]
1/17/07	E.15	Another view of household yard waste disposal stockpiles at Battery Barlow.
1/17/07	E.16	View of concrete gun emplacement at Battery Butterfield. (Note: Fishers Island Waste Management garage and operations in the background)

[1] Field Observations reference Table 4-1.

Photo E.1 – Visual and geophysical reconnaissance and sample collection at Battery Marcy.

Photo E.2 – Visual and geophysical reconnaissance and sample collection at the AA Battery. (Note: circular concrete gun mount buried in the center of photo)

Photo E.3 – Surface soil sampling at Battery Clinton (in front of firing point)

Photo E.4 – View of suspect small arms range backstop at Small Arms Range No. 2.

Photo E.5 – View of former Dynamite Battery.

Photo E.6 – Remnants of a brick chimney near the Dynamite Battery. Chimney remnants most likely associated with former boiler house that provided steam for the Dynamite Battery.

Photo E.7 – Wood debris located between boiler house brick chimney remnants and Dynamite Battery.

Photo E.8 – View of possible backstop associated with suspect Small Arms Range No. 1.

Photo E.9 – View of miscellaneous marine and boat repair material being stored at Battery Hoppock.

Photo E.10 – Location of background sample HGW-BG-SS-02-04 west of Battery Hoppock at the top of a steep embankment.

Photo E.11 – View of backfilled concrete and soil backfilled into Battery Dutton.

Photo E.12 – View of gun emplacement at Battery Hoffman.

Photo E.13 – View of gun emplacement at Battery Hamilton.

Photo E.14 – View of gun emplacement at Battery Barlow used by Fishers Island Waste Management for household yard waste disposal. (Note: stumps, branches and brush backfilled into battery)

Photo E.15 – Another view of household yard waste disposal stockpiles at Battery Barlow.

Photo E.16 – View of concrete gun emplacement at Battery Butterfield. (Note: Fishers Island Waste Management garage and operations in the background)

APPENDIX F - ANALYTICAL DATA

- Screening Tables
- ADR Library
- ADR EDDs
- EDMS
- Analytical Summary Reports
- Analytical Data Reports
- SEDD Deliverable

Located on CD.

APPENDIX G - ANALYTICAL DATA QA/QC REPORT

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

Located on CD.

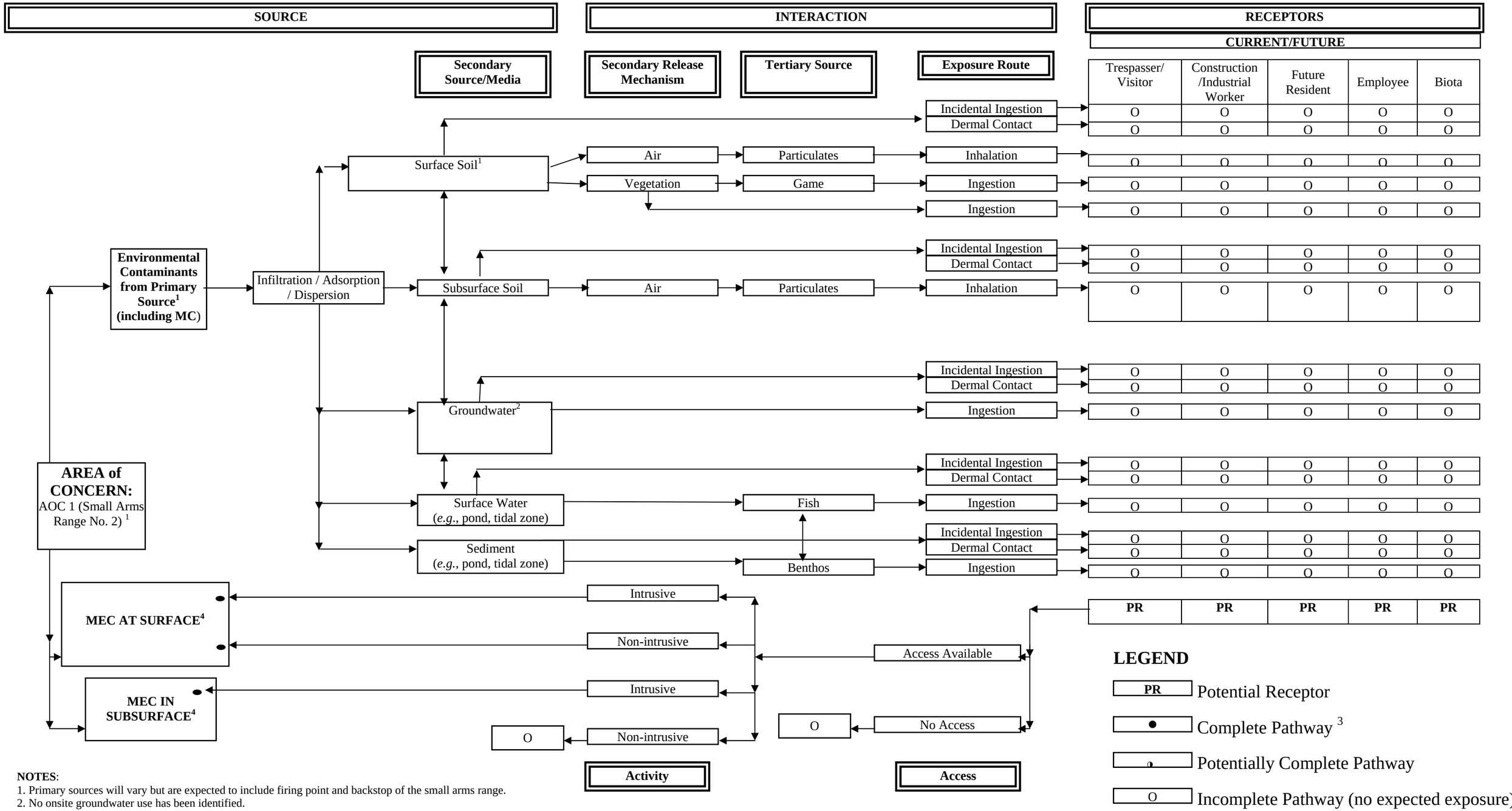
APPENDIX H - GEOGRAPHIC INFORMATION SYSTEMS DATA

Located on CD.

APPENDIX I - GEOPHYSICAL DATA

Appendix not used.

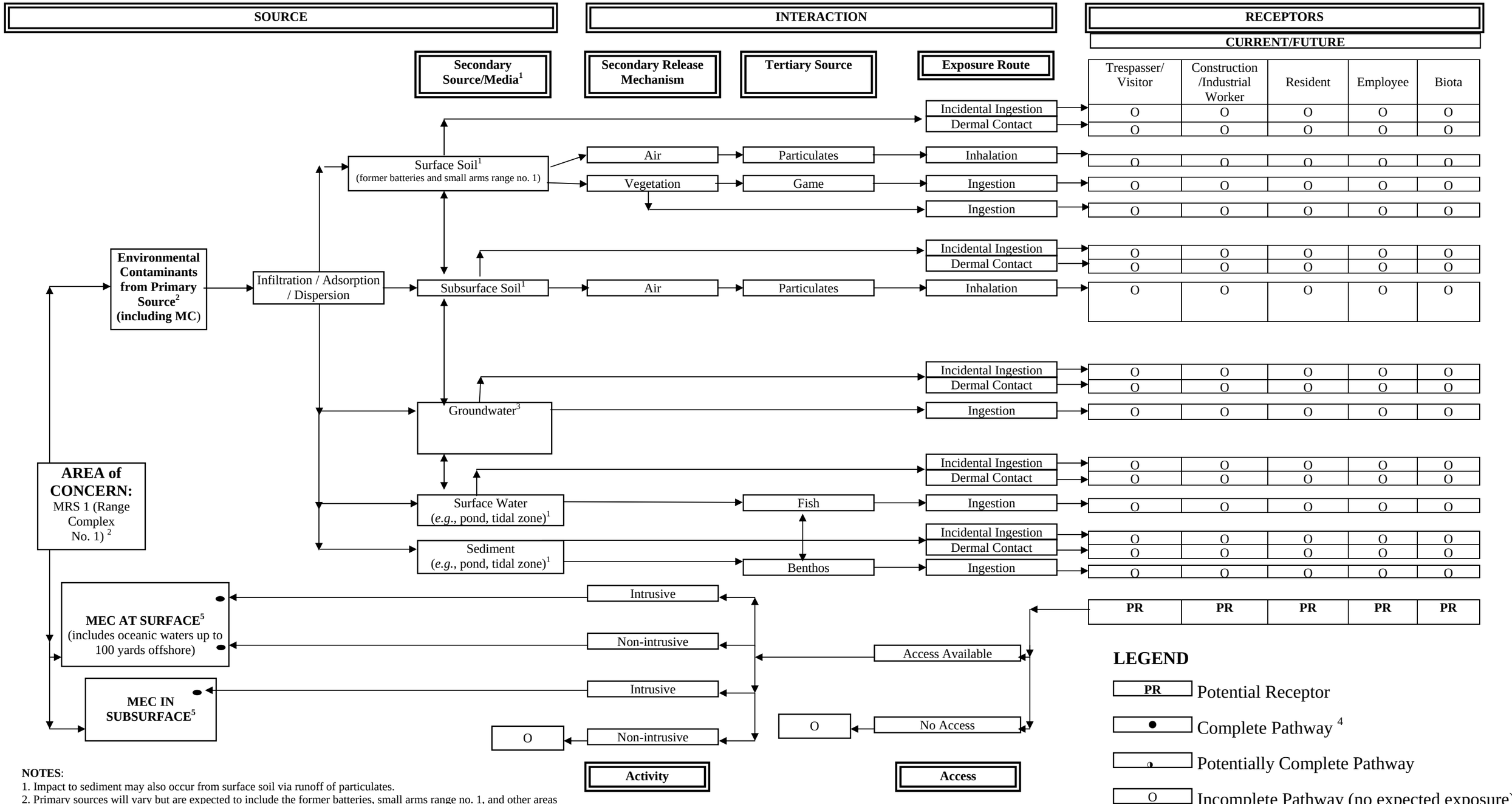
APPENDIX J - CONCEPTUAL SITE MODEL



NOTES:
1. Primary sources will vary but are expected to include firing point and backstop of the small arms range.
2. No onsite groundwater use has been identified.
3. 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.
4. Interaction between a potential receptor and MEC has two components: access and activity
5. AOC 1 was identified by stakeholders during the TPP meeting (Alion 2006a) and was not part of the ASR Range Inventory; therefore, AOC 1 was investigated but not included in the MRSPP.
6. The CSM has evolved during the SI process to reflect the current understanding following the SI of the source, pathway and receptors potentially affected by MC and MEC.

DIAGRAM OF THE INTEGRATED CONCEPTUAL SITE MODEL FOR AREA OF CONCERN NO. 1 (AOC 1), AT FORT H. G. WRIGHT MMRP FUDS SITE [5, 6]

Source: U.S. Army Corps of Engineers (USACE). 2003. *Conceptual Site Models for Ordnance and Explosives (OE) and Hazardous, Toxic, and Radioactive Wastes (HTRW) Projects.* EM1110-1-1200.



NOTES:

1. Impact to sediment may also occur from surface soil via runoff of particulates.
2. Primary sources will vary but are expected to include the former batteries, small arms range no. 1, and other areas where MEC was historically used.
3. No onsite groundwater use has been identified.
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.
6. For the MMRP SI at Fort H.G. Wright, MRS 1 includes the land associated with the batteries and small arms range no. 1 along with tidal water up to 100 yards beyond mean high tide.
7. The CSM has evolved during the SI process to reflect the current understanding following the SI of the source, pathway and receptors potentially affected by MC and MEC.

LEGEND

- PR — Potential Receptor
- ● — Complete Pathway [4]
- ◐ — Potentially Complete Pathway
- O — Incomplete Pathway (no expected exposure)

DIAGRAM OF THE INTEGRATED CONCEPTUAL SITE MODEL FOR RANGE COMPLEX NO. 1 (MRS 1), AT FORT H. G. WRIGHT MMRP FUDS SITE [6, 7]

Source: U.S. Army Corps of Engineers (USACE). 2003. *Conceptual Site Models for Ordnance and Explosives (OE) and Hazardous, Toxic, and Radioactive Wastes (HTRW) Projects.* EM1110-1-1200.

APPENDIX K - MUNITIONS RESPONSE SITE PRIORITIZATION PROTOCOL RESULTS

Table A
MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from DoD databases, such as RMIS. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the MRS summary, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental non-munitions related contaminants found at the MRS (e.g., benzene, trichloroethylene), and any potentially exposed human and ecological receptors. Include a map of the MRS, if one is available.

Munitions Response Site Name: MRS 1 – Range Complex No. 1

Component: U.S. Army

Installation/Property Name Fort H.G. Wright

Location (City, County, State): Southold, Suffolk County, New York

Site Name (RMIS ID)/Project Name (Project No.): Fort H.G. Wright (C02NY061001R01)/(C02NY061001)

Date Information Entered/Updated: August 2007

Point of Contact (Name/Phone): Tany Labeste, (917) 790-8330

Project Phase (check only one):

❑ PA	☑ SI	❑ RI	❑ FS	❑ RD
❑ RA-C	❑ RIP	❑ RA-O	❑ RC	❑ LTM

Media Evaluated (check all that apply):

▫ Groundwater	☑ Sediment (human receptor)
☑ Surface soil	▫ Surface Water (ecological receptor)
☑ Sediment (ecological receptor)	▫ Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM (by type of munition, if known) or munitions constituents (by type, if known) known or suspected to be present): The site consisted of World War I and World War II coastal defense fortifications that stored/used conventional munitions (e.g., 0.30- and 0.50-caliber cartridges, 37-mm, 3-in., 90-mm, 5-in., 6-in., 155-mm, 10-in., 12-in., and 15-in. cartridges and associated projectiles). The site also stored 32-in. spherical mines. USACE programmatic range documents identified one range, Range Complex No. 1, at the Fort H.G. Wright FUDS (USACE 2004b). Range Complex No. 1 consists of one MRS comprised of the following thirteen subranges: AA Battery, Battery Butterfield, Battery Clinton, Dynamite Battery, Battery Hamilton, Battery Barlow, Battery Marcy, Battery 215, Battery Dutton, Battery Hoffman, Battery Hoppock, AMTB 913, and Small Arms Range. Munitions associated with this MRS are summarized on Table 2-2 of the Site Inspection [SI] Report).

Description of Pathways for Human and Ecological Receptors: Surface Soil and Sediment.

Description of Receptors (Human and Ecological): Receptors include site workers, residents, construction workers, recreational users, trespassers, and biota.

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the score(s) that correspond with **all** munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions, small arms, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	◆ All UXO that are considered likely to function upon any interaction with exposed persons [e.g., submunitions, 40mm high-explosive (HE) grenades, white phosphorus (WP) munitions, high-explosive antitank (HEAT) munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions]. ◆ All hand grenades containing energetic filler. ◆ Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.	30
High explosive (used or damaged)	◆ All UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." ◆ All DMM containing a high-explosive filler that have: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	25
Pyrotechnic (used or damaged)	◆ All UXO containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades). ◆ All DMM containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades) that have: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	20
High explosive (unused)	◆ All DMM containing a high explosive filler that: ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability.	**15**
Propellant	◆ All UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ◆ All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: ▪ Damaged by burning or detonation ▪ Deteriorated to the point of instability.	15
Bulk secondary high explosives, pyrotechnics, or propellant	◆ All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor), that are deteriorated. ◆ Bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.	10
Pyrotechnic (not used or damaged)	◆ All DMM containing a pyrotechnic fillers (i.e., red phosphorous), other than white phosphorous filler, that: ▪ Have not been damaged by burning or detonation ▪ Are not deteriorated to the point of instability.	10
Practice	◆ All UXO that are practice munitions that are not associated with a sensitive fuze. ◆ All DMM that are practice munitions that are not associated with a sensitive fuze and that have not: ▪ Been damaged by burning or detonation ▪ Deteriorated to the point of instability.	5
Riot control	◆ All UXO or DMM containing a riot control agent filler (e.g., tear gas).	3
Small arms	◆ All used munitions or DMM that are categorized as small arms ammunition [Physical evidence or historical evidence that no other types of munitions (e.g., grenades, subcaliber training rockets, demolition charges) were used or are present on the MRS is required for selection of this category.].	**2**
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0
MUNITIONS TYPE	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).	**15**

Table 1
EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the score(s) that correspond with **all** munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions, small arms, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space provided.

Munitions, including 0.30- and 0.50-caliber cartridges, 37-mm, 3-in., 90-mm, 5-in., 6-in., 155-mm, 10-in., 12-in., and 15-in were stored/used onsite. Previous MEC discoveries in Range Complex No. 1 (**MRS 1**) include 30- and 50-caliber spent casings, two live 30-caliber rounds, as well as one live 37-mm round (see Section 2.5 of the SI Report). See Sections 2.1 and 4.3.1 and Table 2-2 of the SI Report (USACE 2003 and 2004b).

Table 2
EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the score(s) that correspond with **all** sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range, practice munitions, small arms, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Former range	◆ The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include: impact or target areas, associated buffer and safety zones, firing points, and live-fire maneuver areas.	10
Former munitions treatment (i.e., OB/OD) unit	◆ The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8
Former practice munitions range	◆ The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6
Former maneuver area	◆ The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5
Former burial pit or other disposal area	◆ The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	5
Former industrial operating facilities	◆ The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4
Former firing points	◆ The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	**4**
Former missile or air defense artillery emplacements	◆ The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2
Former storage or transfer points	◆ The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2
Former small arms range	◆ The MRS is a former military range where only small arms ammunition was used [There must be evidence that no other types of munitions (e.g., grenades) were used or are present to place an MRS into this category.].	**1**
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0
SOURCE OF HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	**4**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Source of Hazard*** classifications in the space provided.

Coastal batteries with overlapping range fans for adjacent batteries. Two suspect Small Arms Ranges were also present within the MRS (one of which is an AOC and not addressed in this MRSPP). See Sections 2.1, 2.2, and 4.3.1 and Table 2-2 of the SI Report (USACE 2003 and 2004b).

Table 3

EHE Module: Location of Munitions Data Element Table

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the score(s) that correspond with **all** locations where munitions are located or suspected of being found at the MRS.

Note: The terms *surface, subsurface, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	◆ Physical evidence indicates that there are UXO or DMM on the surface of the MRS ◆ Historical evidence (e.g., a confirmed incident report or accident report) indicates there are UXO or DMM on the surface of the MRS.	**25**
Confirmed subsurface, active	◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. ◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.	20
Confirmed subsurface, stable	◆ Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. ◆ Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.	15
Suspected (physical evidence)	◆ There is physical evidence (e.g., munitions debris, such fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS.	**10**
Suspected (historical evidence)	◆ There is historical evidence indicating that UXO or DMM may be present at the MRS.	**5**
Subsurface, physical constraint	◆ There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM.	2
Small arms (regardless of location)	◆ The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability [There must be evidence that no other types of munitions (e.g., grenades) were used or are present at the MRS to place an MRS into this category.].	**1**
Evidence of no munitions	◆ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).	**25**

Historical documentation and interviews performed as part of the SI indicate that a variety of conventional munitions were used at the site including small arms and large caliber artillery, as well as mines. Previous MEC discoveries in MRS 1 included 30- and 50-caliber spent casings, two live 30-caliber rounds, as well as one live 37-mm round (see Section 2.5 of the SI report). No MEC or MD was found during the January 2007 SI field sampling activities (USACE 2003 and 2004b).

Table 4

EHE Module: Ease of Access Data Element Table

DIRECTIONS: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to any explosive materiel. Circle the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the Primer.

Classification	Description	Score
No barrier	◆ There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible).	**(10)**
Barrier to MRS access is incomplete	◆ There is a barrier preventing access to parts of the MRS, but not the entire MRS.	8
Barrier to MRS access is complete but not monitored	◆ There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5
Barrier to MRS access is complete and monitored	◆ There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	0
EASE OF ACCESS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	**10**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ease of Access*** classification in the space provided.

The Fort H.G. Wright FUDS is open to municipal employees and recreational users 24 hours a day with no physical restrictions preventing access to the site. There are private residences within the MRS along Whistler Avenue and Winthrop Drive. See Sections 2.3.4 and 4.3.1of the SI Report.

Table 5

EHE Module: Status of Property Data Element Table

DIRECTIONS: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

Classification	Description	Score
Non-DoD control	◆ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies.	**(5)**
Scheduled for transfer from DoD control	◆ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the rule is applied.	3
DoD control	◆ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year.	0
STATUS OF PROPERTY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Status of Property*** classification in the space provided.

The FUDS property is now owned by several entities, including the Town of Southold, which operates the Elizabeth Field airfield. Former batteries at the site are located on property that is currently owned by the Fishers Island Garbage and Refuse District and the Town of Southold. The remainder of the site is owned by numerous federal, state, and private entities and is used for commercial, industrial (warehousing), residential, and educational purposes (USACE 2003). See Sections 2.1, 2.3.3, and 2.3.4 of the SI Report.

Table 6

EHE Module: Population Density Data Element Table

DIRECTIONS: Below are three classifications of population density and their descriptions. Determine the population density per square mile in the vicinity of the MRS and circle the score that corresponds with the associated population density.

Note: If an MRS is located in more than one county, use the largest population density value among the counties. If the MRS is within or borders a city or town, use the population density for the city or town, rather than that of the county.

Classification	Description	Score
> 500 persons per square mile	◆ There are more than 500 persons per square mile in the county in which the MRS is located, based on U.S. Census Bureau data.	5
100–500 persons per square mile	◆ There are 100 to 500 persons per square mile in the county in which the MRS is located, based on U.S. Census Bureau data.	**(3)**
< 100 persons per square mile	◆ There are fewer than 100 persons per square mile in the county in which the MRS is located, based on U.S. Census Bureau data.	1
POPULATION DENSITY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**3**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Density*** classification in the space provided.

The population of Southold has 20,599 people with 8,461 households and 5,804 families residing in the Town of Southold (U.S. Census Bureau 2000). The population density was 148.1 per square kilometer (km^2) (383.5 per square mile [mi^2]). Section 2.3.3 of the SI Report.

Table 7

EHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the population near the hazard. Determine the number of inhabited structures within two miles of the MRS boundary and circle the score that corresponds with the associated population near the known or suspected hazard.

Note: The term *inhabited structures* is defined in Appendix C of the Primer.

Classification	Description	Score
26 or more inhabited structures	◆ There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	**(5)**
16 to 25 inhabited structures	◆ There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4
11 to 15 inhabited structures	◆ There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3
6 to 10 inhabited structures	◆ There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2
1 to 5 inhabited structures	◆ There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1
0 inhabited structures	◆ There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0
POPULATION NEAR HAZARD	**DIRECTIONS:** Record **<u>the single highest score</u>** from above in the box to the right (maximum score = 5).	**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Near Hazard*** classification in the space provided.

<u>The Fishers Island Union Free School and numerous residences are located within 200 ft of the FUDS. Refer to Sections 2.3.3 and 2.3.4 of the SI Report.</u>

Table 8

EHE Module: Types of Activities/Structures Data Element Table

DIRECTIONS: Below are five classifications of activities and/or inhabited structures near the hazard and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and circle the score(s) that correspond with **all** the activities/structure classifications at the MRS.

Note: The term *inhabited structure* is defined in Appendix C of the Primer.

Classification	Description	Score
Residential, educational, commercial, or subsistence	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	**5**
Parks and recreational areas	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	**4**
Agricultural, forestry	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3
Industrial or warehousing	◆ Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	**2**
No known or recurring activities	◆ There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1
TYPES OF ACTIVITIES/STRUCTURES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Types of Activities/Structures*** classifications in the space provided.

The Fishers Island Union Free School and numerous residences are located within 200 ft of the FUDS. Refer to Sections 2.3.3 and 2.3.4 of the SI Report.

Table 9

EHE Module: Ecological and/or Cultural Resources Data Element Table

DIRECTIONS: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resource classifications at the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the Primer.

Classification	Description	Score
Ecological and cultural resources present	◆ There are both ecological and cultural resources present on the MRS.	**5**
Ecological resources present	◆ There are ecological resources present on the MRS.	3
Cultural resources present	◆ There are cultural resources present on the MRS.	3
No ecological or cultural resources present	◆ There are no ecological resources or cultural resources present on the MRS.	0
ECOLOGICAL AND/OR CULTURAL RESOURCES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**5**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classification in the space provided.

There are several threatened and endangered species on the MRS as well as areas of cultural significance (Alion 2006). Refer to Sections 2.3.8 and 3.2 of the SI Report.

Table 10
Determining the EHE Module Rating

DIRECTIONS:

1. From Tables 1–9, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.
4. Circle the appropriate range for the **EHE Module Total** below.
5. Circle the **EHE Module Rating** that corresponds to the range selected and record this value in the **EHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
Explosive Hazard Factor Data Elements			
Munitions Type	Table 1	15	19
Source of Hazard	Table 2	4	
Accessibility Factor Data Elements			
Location of Munitions	Table 3	25	40
Ease of Access	Table 4	10	
Status of Property	Table 5	5	
Receptor Factor Data Elements			
Population Density	Table 6	3	18
Population Near Hazard	Table 7	5	
Types of Activities/ Structures	Table 8	5	
Ecological and /or Cultural Resources	Table 9	5	
EHE MODULE TOTAL			77

EHE Module Total	EHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	**C**
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected Explosive Hazard
EHE MODULE RATING	**C**

Table 11
CHE Module: CWM Configuration Data Element Table

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the score(s) that correspond to **all** CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO, CWM/DMM, physical evidence,* and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, explosive configuration either UXO or damaged DMM	The CWM known or suspected of being present at the MRS is: ◆ Explosively configured CWM that are UXO (i.e., CWM/UXO). ◆ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged.	30
CWM mixed with UXO	◆ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged, or nonexplosively configured CWM/DMM, or CWM not configured as a munition, that are commingled with conventional munitions that are UXO.	25
CWM, explosive configuration that are undamaged DMM	◆ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20
CWM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS is: ◆ Nonexplosively configured CWM/DMM. ◆ Bulk CWM/DMM (e.g., ton container).	15
CAIS K941 and CAIS K942	◆ The CWM/DMM known or suspected of being present at the MRS is CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11.	12
CAIS (chemical agent identification sets)	◆ Only CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10
Evidence of no CWM	◆ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	**0**
CWM CONFIGURATION	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).	**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space provided.

CWM is not present at the MRS (Section 2.4.2 of the SI and USACE 1996 and 2004a).

TABLES 12 THROUGH 19 EXCLUDED AS PER CX GUIDANCE

Table 20
Determining the CHE Module Rating

DIRECTIONS:

1. From Tables 11–19, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.
4. Circle the appropriate range for the **CHE Module Total** below.
5. Circle the **CHE Module Rating** that corresponds to the range selected and record this value in the **CHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
CWM Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Sources of CWM	Table 12		
Accessibility Factor Data Elements			
Location of CWM	Table 13		
Ease of Access	Table 14		
Status of Property	Table 15		
Receptor Factor Data Elements			
Population Density	Table 16		
Population Near Hazard	Table 17		
Types of Activities/ Structures	Table 18		
Ecological and /or Cultural Resources	Table 19		
CHE MODULE TOTAL			0

CHE Module Total	CHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected CWM Hazard
CHE MODULE RATING	**Alternative Rating: No Known or Suspected CWM Hazard**

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Evaluation Note: No Samples Collected

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	**Not Applicable (N/A)**

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Groundwater MC Hazard ☑

Table 22

HHE Module: Surface Water – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for human endpoints present in the surface water, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Evaluation Note: No Samples Collected

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		**Not Applicable (N/A)**

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Human Endpoint) MC Hazard ☑

Table 23

HHE Module: Sediment – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the site's sediment and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for human endpoints present in the sediment, select the box at the bottom of the table.

Evaluation Note: No Exceednces of Screening Criteria

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right maximum value = H).	**Not Applicable (N/A)**

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Human Endpoint) MC Hazard ☑

Table 24

HHE Module: Surface Water – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the surface water, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Evaluation Note: No Samples Collected

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	**Not Applicable (N/A)**

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard ☑

Table 25

HHE Module: Sediment – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the sediment, select the box at the bottom of the table.

Evaluation Note: No Exceedances of Screening Criteria.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios

CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	**Not Applicable (N/A)**

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard ☑

Table 26
HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** for each medium together, including additional contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Evaluation Note: No MC hazards

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratio
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		**Not Applicable (N/A)**

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Soil MC Hazard ☑

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Only use this table if there are more than five contaminants present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: Remember not to add ratios from different media.

Media	Contaminant	Maximum Concentration	Comparison Value	Ratio

Table 28
Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard, Migration Pathway, and Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the reference provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A-G)
Groundwater (Table 21)	N/A	N/A	N/A	N/A	N/A
Surface Water/Human Endpoint (Table 22)	N/A	N/A	N/A	N/A	N/A
Sediment/Human Endpoint (Table 23)	N/A	N/A	N/A	N/A	N/A
Surface Water/Ecological Endpoint (Table 24)	N/A	N/A	N/A	N/A	N/A
Sediment/Ecological Endpoint (Table 25)	N/A	N/A	N/A	N/A	N/A
Surface Soil (Table 26)	N/A	N/A	N/A	N/A	N/A

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box below.

Note:

An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

Evaluation Note: N/A=not applicable

HHE MODULE RATING	**N/A**

HHE Ratings (for reference only)	
Combination	**Rating**
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected MC Hazard

Table 29
MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS priority is the single highest priority; record this number in the **MRS or Alternative Priority** box at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	**B**	2	**A**	2
B	3	**C**	3	**B**	3
C	**4**	**D**	4	**C**	4
D	5	**E**	5	**D**	5
E	6	**F**	6	**E**	6
F	7	**G**	7	**F**	7
G	8			**G**	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	
MRS or ALTERNATIVE PRIORITY				**4**	

APPENDIX L - REFERENCE COPIES

Located on CD