FINAL

REMEDIAL INVESTIGATION REPORT

Camp Hero, Montauk, New York

Revision: 0

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF EXHIBITS

LIST OF FIGURES (APPENDIX A)

LIST OF TABLES (APPENDIX B)

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ACRONYMS AND ABBREVIATIONS

%	percent
°C	degrees Centigrade
°F	degrees Fahrenheit
µg/L	micrograms per liter
ACWS	Aircraft Control and Warning Squadron
ADR	automated data review
amsl	above mean sea level
AOC	area of concern
AST	aboveground storage tank
ATSDR	Agency for Toxic Substances and Disease Registry
BaP PAHs	benzo(a)pyrene equivalent polycyclic aromatic hydrocarbons
BERA	baseline ecological risk assessment
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	chemical of concern
COPEC	chemical of potential ecological concern
COPC	chemical of potential concern
CP	Commissioner Policy
CSM	conceptual site model
cy	cubic yard
DD	Decision Document
DGM	Digital Geophysical Mapping
DL	detection limit
DNA	deoxyribonucleic acid
DO	dissolved oxygen
DoD	Department of Defense, United States
DSA	data sensitivity analysis
DU	decision unit
EE/CA	Engineering Evaluation/Cost Analysis
ELCR	excess lifetime cancer risk
ELLE	Eurofins Lancaster Laboratories Environmental, LLC.
EMCX	Environmental and Munitions Center of Expertise
EODT	Explosives Ordnance Disposal Technology, Inc.
EPC	exposure point concentration
ERA	Ecological Risk Assessment

FPH	fuel pump house
FPS	Fixed-Pulse Radar-Surveillance
FS	Feasibility Study
ft	foot or feet
FUDS	Formerly Used Defense Site
gal	gallon
GC	gas chromatography
GIABS	gastrointestinal absorption factor
HHRA	Human Health Risk Assessment
HI	hazard index
HMW	high molecular weight
HTRW	hazardous, toxic, and radioactive waste
HTW	hazardous and toxic waste
ID	identification
IDW	investigation-derived waste
in	inch
ITRC	Interstate Technology and Regulatory Council
JV	joint venture
L/kg	liter per kilogram
lb	pound
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LIF	Laser Induced Fluorescence
LMW	low molecular weight
LNAPL	light non-aqueous phase liquid
LOD	limit of detection
LOQ	limit of quantification
m^3	cubic meter
MCL	maximum contaminant level
MDC	maximum detected concentration
MEC	munitions and explosives of concern
mg/kg	milligram per kilogram
mg/L	milligram per liter
ML	Montauk loam
mm Hg	millimeter of mercury
mm	millimeter
MNA	monitored natural attenuation
MS	matrix spike

MSD	matrix spike duplicate
mS/cm	millisiemen per centimeter
mV	millivolt
NAD	North American Vertical Datum
NAPL	non-aqueous phase liquid
NAVD	North American Vertical Datum
NAVFAC	Naval Facilities Engineering Command
ND	non-detect
NDAI	No DoD Action Indicated
NFA	no further action
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
NTU	nephelometric turbidity unit
NY	New York
NYCRR	New York Codes, Rules, and Regulations
NYNHP	New York Natural Heritage Program
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSOPRHP	New York State Office of Parks, Recreation and Historic Preservation
NSZD	Natural Source Zone Depletion
OE	ordnance and explosives
ORP	oxidation-reduction potential
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PDT	project delivery team
PID	photoionization detector
PP	Proposed Plan
ppm	part per million
PSE	preliminary screening evaluation
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RAGS	Risk Assessment Guidance for Superfund
RE	reference emitter
RG	remedial goal
RI	Remedial Investigation
RPD	relative percent difference

SAP	Sampling and Analysis Plan
SEA	stream exposure area
SIM	selected ion mass spectrometry
SLERA	screening-level ecological risk assessment
STARS	Spills Technology and Remediation Series
STB	Suspected Tank B
SVOC	semivolatile organic compound
TCL	target compound list
TEA	terminal electron acceptor
TOC	total organic carbon
TOGS	Technical & Operational Guidance Series (NYSDEC)
TSCA	Toxic Substances Control Act
TSERAWG	Tri-Service Environmental Risk Assessment Working Group
TU	toxic unit
UCL	upper confidence limit
U.S.	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fisheries and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank
UU/UE	unlimited use and unrestricted exposure
UVOST®	Ultraviolet Optical Scanning Tool
UXO	unexploded ordnance
VOC	volatile organic compound
WDS	waste disposal system
WP	Work Plan
WSL	Whitman sandy loam

EXECUTIVE SUMMARY

This Remedial Investigation (RI) Report is being submitted by the United States Army Corps of Engineers (USACE) for the former Camp Hero (the site) located in Montauk, New York. This RI Report was completed under the Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS) for Hazardous, Toxic, and Radioactive Waste (HTRW), Project Number C02NY002403. Work conducted under the DERP FUDS program is compliant with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986.

The former Camp Hero was utilized by the Department of Defense (DoD) for various activities from 1942 to 1982 and is now a New York State Park. The primary objectives of the RI are to identify and summarize the nature and extent of potential releases and impacts in site media from former military operations, and to subsequently quantify whether potentially unacceptable risks are posed to human and ecological receptors associated with potential exposure to chemicals from these historical operations. The RI used data obtained from approximately 1,300 soil, sediment, surface water, and groundwater samples collected between May 2016 and June 2017. The RI indicated that PAHs posed potentially unacceptable risks in surface soil at DU11 and DU12 and sediment at SEA03 and SEA08; however, PAHs were eliminated from further evaluation using multiple lines of evidence provided in the uncertainty assessments of the human health risk assessment (HHRA) and ecological risk assessment (ERA). The lines of evidence indicated that the risk results for DU11 surface soil were driven by one elevated concentration and were overestimated and the PAHs in surface soil at DU12 and sediment at SEA03 and SEA08 are not attributed to a CERCLA release[1]. Therefore, the Camp Hero FUDS will proceed to a Proposed Plan indicating no further action (NFA) under CERCLA. A non-CERCLA related historical release of petroleum at decision unit (DU) 01 requires further evaluation under the New York State Department of Environmental Conservation (NYSDEC) Spills Response Program.

The Camp Hero RI began with a comprehensive review of available information prior to the start of field investigations. The records review identified 45 potential areas of concern (AOCs) that included, but is not limited to, former waste disposal and coal storage areas, abandoned drum locations, formerly documented and alleged underground storage tanks (USTs) and above ground

[1] A CERCLA release can be defined broadly to include a situation where a hazardous substance escapes into the environment from its normal container. A CERCLA release, as used in the context of this RI, means Department of Defense activities that may have resulted in "spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance or pollutant or contaminant)" (CERCLA § 101(22)).

storage tanks (ASTs), and a Motor Pool building. Two additional AOCs were established during field investigation, for a total of 47 AOCs.

Three sequential phases of field investigation (Phase I, II, and III) were completed as part of the RI field work. The Phase I investigation (May to June 2016) was conducted as a CERCLA Site Inspection-level investigation with the primary objective of determining the presence or absence of potential impacts at the 47 AOCs from former DoD activities. The Phase II RI field investigation (November to December 2016) was primarily focused on the former Building 203 AOC (now DU01), where petroleum impacts to the subsurface were identified during the Phase I effort. The objectives of Phase II were to delineate the extent of petroleum impacts at this location including residual light non-aqueous phase liquid (LNAPL). The Phase II RI field investigation activities also included the installation, development, and sampling of permanent background monitoring wells for the collection of sitewide background groundwater data as well as conducting a sitewide surface water drainage survey and habitat surveys of multiple AOCs.

A Preliminary Screening Evaluation (PSE) was completed after completion of the Phase II investigation using the Phase I and II data to determine whether any of the AOCs required further assessment as part of the Phase III RI field effort. A total of 25 AOCs were determined to warrant NFA. The remaining 22 AOCs were grouped into 18 geometric decision units (DUs) for the Phase III field investigation. Streams in the vicinity of the DUs were grouped into eight stream exposure areas (SEAs) for the assessment of surface water and sediment.

The Phase III RI field investigation was accomplished by collecting an unbiased, representative dataset for surface and subsurface soil within each DU and surface water and sediment within each SEA. The investigation also included the collection of sitewide groundwater samples and background surface water and sediment. The Phase III effort was specifically designed to support the risk assessments and address data gaps from previous phases.

LNAPL was identified in the subsurface at the former Building 203 (DU01) where two large USTs and associated contaminated soils were previously removed in 1993. Data collected during the RI field investigation delineated the vertical and horizontal extent of LNAPL, indicated the LNAPL is stable and not recoverable, and that natural processes are depleting the LNAPL source mass. Despite the presence of LNAPL, chemicals of concern (COCs) representing human health and ecological risk under CERCLA were not identified in soil, groundwater, surface water, or sediment at DU01. Because no COCs presenting risk were identified at DU01 during the risk evaluation, NFA for DU01 is required under the CERCLA program. However, a NYSDEC Pollution Complaint Number (PC-1602757) is open for the LNAPL identified at this DU. Therefore, the LNAPL at DU01 will be addressed under the NYSDEC Spills Response Program.

A potability analysis was conducted as part of the RI and concluded that the perched groundwater is not a feasible water supply source due to poor quantity and water quality. Further, the perched groundwater lenses beneath Camp Hero are not hydraulically connected to drinking water resources in Suffolk County. There is not an indication that the deep aquifer beneath Camp Hero, which is separated from the perched groundwater lenses by a continuous confining layer of at least 100 feet thick, has been compromised by DoD activities. Glacial till with confining layers of silt and clay separates the perched groundwater and the deep aquifer. This layer ranges in thickness from approximately 130 feet thick in the central portion of Camp Hero to 100 feet thick along the seaside bluffs.

Comprehensive baseline human health and ecological risk assessments were completed, which included comparisons of media concentrations of chemicals against applicable human health or ecological screening levels and site-specific background threshold values, quantitative risk calculations, a site and background population means comparison, a geochemical statistical evaluation for metals, and additional characterization of polycyclic aromatic hydrocarbons (PAHs), including PAH forensics and PAH source evaluation. Based on these evaluations, there were no COCs identified that could be attributed to a CERCLA release. Per the CERCLA process, no further assessment or response action is warranted for any DU, SEA, or sitewide groundwater.

In conclusion, based on this RI, there are no unacceptable CERCLA-related risks to human health or the environment. Therefore, a Proposed Plan will be prepared to indicate that NFA is appropriate for the Camp Hero FUDS under CERCLA.

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