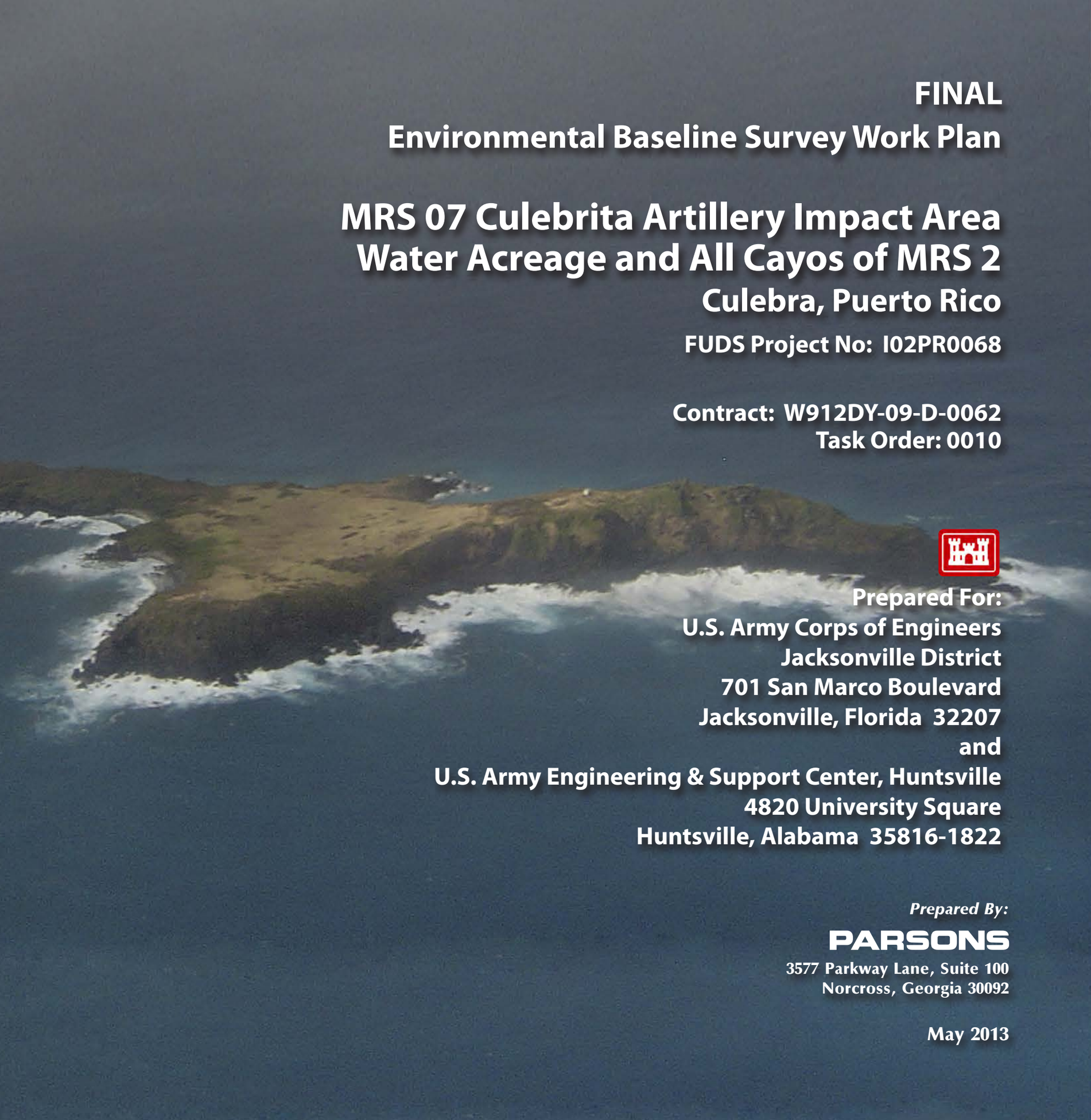

FINAL
Environmental Baseline Survey Work Plan

MRS 07 Culebrita Artillery Impact Area Water Acreage and All Cayos of MRS 2

Culebra, Puerto Rico

FUDS Project No: I02PR0068

Contract: W912DY-09-D-0062
Task Order: 0010

Prepared For:
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May 2013

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May 9, 2013

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Subject: Contract W912DY-09-D-0062, Task Order 0010, FUDS Project No. I02PR0068, MRS 07 Culebrita Artillery Impact Area Water Acreage and All Cayos of MRS 2, Final Environmental Baseline Survey Work Plan, May 2013

Dear Mr. Belew,

Please find enclosed 4 copies with CDs of the Final Environmental Baseline Survey Work Plan for the subject project for your review. Copies have been distributed as indicated below in accordance with the Performance Work Statement.

If you have any questions or comments, please contact me at (678) 969-2410.

Sincerely,
Parsons

Patricia T. Berry
Project Manager

C: Tom Freeman, CESAJ, 6 copies w/CDs
Matt Tucker, USA, 1 copy w/CD

FINAL

MRS 07 CULEBRITA ARTILLERY IMPACT AREA WATER ACREAGE AND ALL CAYOS OF MRS 2 CULEBRA, PUERTO RICO

ENVIRONMENTAL BASELINE SURVEY WORK PLAN

prepared for:

U.S. ARMY CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
and
U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE

Contract No. W912DY-09-D-0062
Task Order No. 0010
FUDS Project No. I02PR0068

prepared by:

PARSONS

May 2013

Revision: 0

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Patricia T. Berry
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(Signature) **(Date)**

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ACRONYMS AND ABBREVIATIONS

AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
ASI	Aqua Survey, Incorporated
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESAJ	USACE Jacksonville District
CFR	Code of Federal Regulation
DID	Data Item Description
DDESB	Department of Defense Explosives Safety Board
DFW	Definable Feature of Work
DGPS	Differential GPS
DMM	Discarded Military Munitions
DN	Deficiency Notice
DNER	Department of Natural and Environmental Resources
DA	Department of the Army
DoD	Department of Defense
DQO	Data Quality Objective
EBS	Environmental Baseline Survey
EBSR	Environmental Baseline Survey Report
EM	Electromagnetic
EM	Engineer Manual
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
EPP	Environmental Protection Plan
ESA	Endangered Species Act
EZ	Exclusion Zone
FUDS	Formerly Used Defense Site
GIS	Geographical Information System
GPS	Global Positioning System
HE	High Explosive
HTRW	Hazardous, Toxic, and Radioactive Waste
IAW	In Accordance With
IHO	International Hydrographic Organization
ISO	Industry Standard Object
LLP	Lessons Learned Program
MBS	Multi-beam Bathymetry Survey
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
MRS	Munitions Response Site
NAD83	North American Datum of 1983
NMFS	National Marine Fisheries Service

NOAA	National Oceanic and Atmospheric Administration
NWR	National Wildlife Refuge
OE	Ordnance and Explosives
OESS	OE Safety Specialist
OSHA	Occupational Safety and Health Administration
PDA	Personal Digital Assistant
PDT	Project Delivery Team
PLS	Professional Licensed Surveyor
PM	Project Manager
POC	Point of Contact
PPE	Personal Protective Equipment
PR	Puerto Rico
PREQB	Puerto Rico Environmental Quality Board
PSR	Periodic Status Report
PWS	Performance Work Statement
QC	Quality Control
QCP	Quality Control Plan
RI/FS	Remedial Investigation/Feasibility Study
ROV	Remotely Operated Vehicle
RTK-DGPS	real-time kinematic differential GPS
SI	Site Inspection
SS	Snorkeling Supervisor
SSHP	Site Health and Safety Plan
SP	Snorkeling Plan
SOP	Standard Operating Procedure
SOW	Statement of Work
SSS	Side Scan Sonar
TIFF	Tagged Image File Format
TM	Technical Manager
TO	Task Order
TP	Technical Paper
TPP	Technical Project Planning
UIT	Underwater Investigation Team
USACE	U.S. Army Corps of Engineers
USAESCH	U.S. Army Engineering and Support Center, Huntsville
USA	USA Environmental, Incorporated
USCG	United States Coast Guard
USFWS	U.S. Fish and Wildlife Service
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance
UXOQCS	Unexploded Ordnance Quality Control Specialist
UXOSO	Unexploded Ordnance Safety Officer
UXOTIII	Unexploded Ordnance Technician III

WP	Work Plan

1.0 INTRODUCTION

1.1 PROJECT AUTHORIZATION

Parsons Government Services Inc. (Parsons) has prepared this Environmental Baseline Survey (EBS) Work Plan (WP) for Munition Response Sites (MRS) 07 Culebrita Artillery Impact Area Water Acreage and all Cayos of MRS 02, Culebra, Puerto Rico (PR) (Formerly Used Defense Site [FUDS] Project Number I02PR0068) under Contract No: W912DY-09-D-0062, Task Order (TO) 0010, from the U.S. Army Engineering and Support Center, Huntsville (USAESCH).

1.2 PURPOSE AND SCOPE

The primary purpose and scope is to perform an in-depth study designed to gather the data necessary to determine the underwater habitat within the Culebra Island MRSs 07 and 02 (water acreage). This WP has been prepared to address the water portions of MRSs 07 and 02.

This WP outlines the following field activities:

1. Phase IA: Hydrographic Surveys (Deployment of Multi-beam Bathymetry Survey (MBS) and Side Scan Sonar [SSS] systems)
2. Phase IB: Underwater Visual Survey (Underwater video/still camera systems and snorkeling)

All activities involving work in areas potentially containing Munitions and Explosives of Concern (MEC) hazards will be conducted in full compliance with USAESCH, U.S. Army Corps of Engineers (USACE), Department of the Army (DA), and Department of Defense (DoD) requirements regarding personnel, equipment, and procedures, and with Occupational Safety and Health Administration (OSHA) Standard 29 Code of Federal Regulation (CFR) Part 1910. This work is being conducted in support of a Remedial Investigation/Feasibility Study (RI/FS) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

1.3 WORK PLAN ORGANIZATION

1.3.1 GUIDANCE DOCUMENTS

This WP follows the directions of Data Item Description (DID) WERS-001.01, Work Plans. DIDs followed in the preparation of the WP and sub plans are listed in Table 1-1.

Table 1-1: Data Item Descriptions

DID	DID Title
WERS-001.01	Work Plans
WERS-004.01	Geophysics
WERS-005.01	Accident Prevention Plan
WERS-007.01	Geospatial Information and Electronic Submittals
WERS-011.01	Accident / Incident Reports
WERS-012.01	Personnel Qualifications Certification Letter
WERS-014.01	Reports / Minutes, Record of Meeting
WERS-015.01	Telephone Conversations / Correspondence Records
WERS-016.02	Periodic Status Report (PSR)

1.3.2 WP ORGANIZATION

This WP has been divided into Chapters 1 through 10 with associated documents provided either as appendices herein or as standalone documents. Together, the WP and associated documents present the project history, work elements, and requirements in an organized manner. Table 1-2 describes the general structure and organization of this WP. References are frequently made between various sections in the WP and the associated documents.

Table 1-2: Work Plan Structure

Chapter Number	Descriptor	Information
1	Introduction	A statement of the project objectives, project authorization, purpose and scope; summary of work plan organization, project location, and site descriptions.
2	Technical Management Plan	Summary of project objectives, project organization, communication and reporting, project deliverables, project schedule, public relations support, subcontractor management, and management of field operations.
3	Field Investigation Plan	Describes the approach and procedures that will be followed in performing the hydrographic, underwater visual surveys, and reporting activities, and includes discussion of project goals and data quality objectives (DQOs).
4	Quality Control Plan (QCP)	Describes the standard processes that will be used to monitor, inspect, and control daily field activities to ensure quality performance, processes to correct quality issues, quality control of contract deliverables, and QC reporting requirements.
5	Explosives Management Plan	An Explosives Management Plan is not required for the EBS field work. This chapter serves as a placeholder only.
6	Environmental Protection Plan	Describes the approach, methods and operational procedures that will be employed during onsite activities to protect the natural environment.
7	Property Management Plan	A Property Management Plan is not required for the EBS field work. This chapter serves as a placeholder only.
8	Interim Holding Facility Siting Plan for Recovered Chemical Warfare Materiel	An Interim Holding Facility Siting Plan for Recovered Chemical Warfare Materiel is not required for this TO. This chapter serves as a placeholder only.
9	Physical Security Plan for Recovered Chemical Warfare Sites	A Physical Security Plan for Recovered Chemical Warfare Sites is not required for this TO. This chapter serves as a placeholder only.
10	References	Citation of documents referenced within this WP.

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The following appendices are included in this WP:

APPENDIX A	Performance Work Statement
APPENDIX B	Site Maps
APPENDIX C	Points of Contact
APPENDIX D	Accident Prevention Plan
APPENDIX E	Reserved
APPENDIX F	Forms
APPENDIX G	Reserved
APPENDIX H	Resumes
APPENDIX I	Technical Project Planning Memorandum
APPENDIX J	Project Schedule
APPENDIX K	Standard Operating Procedures
APPENDIX L	Reserved
APPENDIX M	USACE Standard Operating Procedures for Endangered Species Conservation
APPENDIX N	Snorkeling Plan
APPENDIX O	Reserved
APPENDIX P	Reserved
APPENDIX Q	Reference Documents

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1.4 PROJECT LOCATION

The project location is Culebra Island, PR, MRS 07 (Cayo Culebrita) and MRS 02 (surrounding cayos: Cayo Lobo, Cayo Lobito, El Mono, Cayo Del Agua, Cayo Yerba, Cayo Raton, Cayo Alcarraza, Cayo Los Gemelos, Cayo Piedra Stevens, Cayo Tiburon, Cayos Geniqui, and Cayo Sombrerito), all located approximately three-quarter miles off the northern, western, and eastern coasts of Culebra Island. MRS 07 covers the northern portion of Cayo Culebrita. However, this project includes investigation of the underwater areas surrounding the southwestern and southern boundaries of Cayo Culebrita.

1.5 SITE DESCRIPTION

1.5.1 LOCATION

The site location is described in section 1.4 and shown in Figure 1-1.

1.5.2 TOPOGRAPHY

The Culebran Islands are underlain by both intrusive and extrusive volcanic rock of Upper Cretaceous age. The volcanic rock exhibits little or no porosity because of compaction and filling of the pores with quartz and calcite.

Cayo Culebrita (MRS 07) is comprised of sandy beaches, irregular rugged coastlines and steep hills.

Most of the MRS 02 Cayos are smaller islands comprised of solid volcanic rock.

1.5.3 CLIMATE

The weather on Culebra Island is generally warm year round due to its tropical marine climate. Yearly average rainfall is approximately 36 inches. The months of August through November are considered the wet season, and the driest months are January through April. Yearly daily temperatures average 80°F year round with an average maximum of 86°F and an average low of 74°F. Winds are generally from the east-northeast during November through January and from the east during February through October. Yearly average wind speed is 8 knots. Hurricane season is from June through November, and severe hurricanes hit Culebra every 10 to 20 years. The yearly average rainfall for Culebra is provided in Table 1-3.

Table 1-3: Average Rainfall, Culebra Island

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
mm	**48.6**	**34.6**	**37.7**	**51.7**	**91.2**	**80.9**	**78.5**	**98.2**	**119.1**	**122.6**	**104.2**	**62.8**	**931.1**
inches	1.9	1.4	1.5	2.0	3.6	3.2	3.1	3.9	4.7	4.8	4.1	2.5	36

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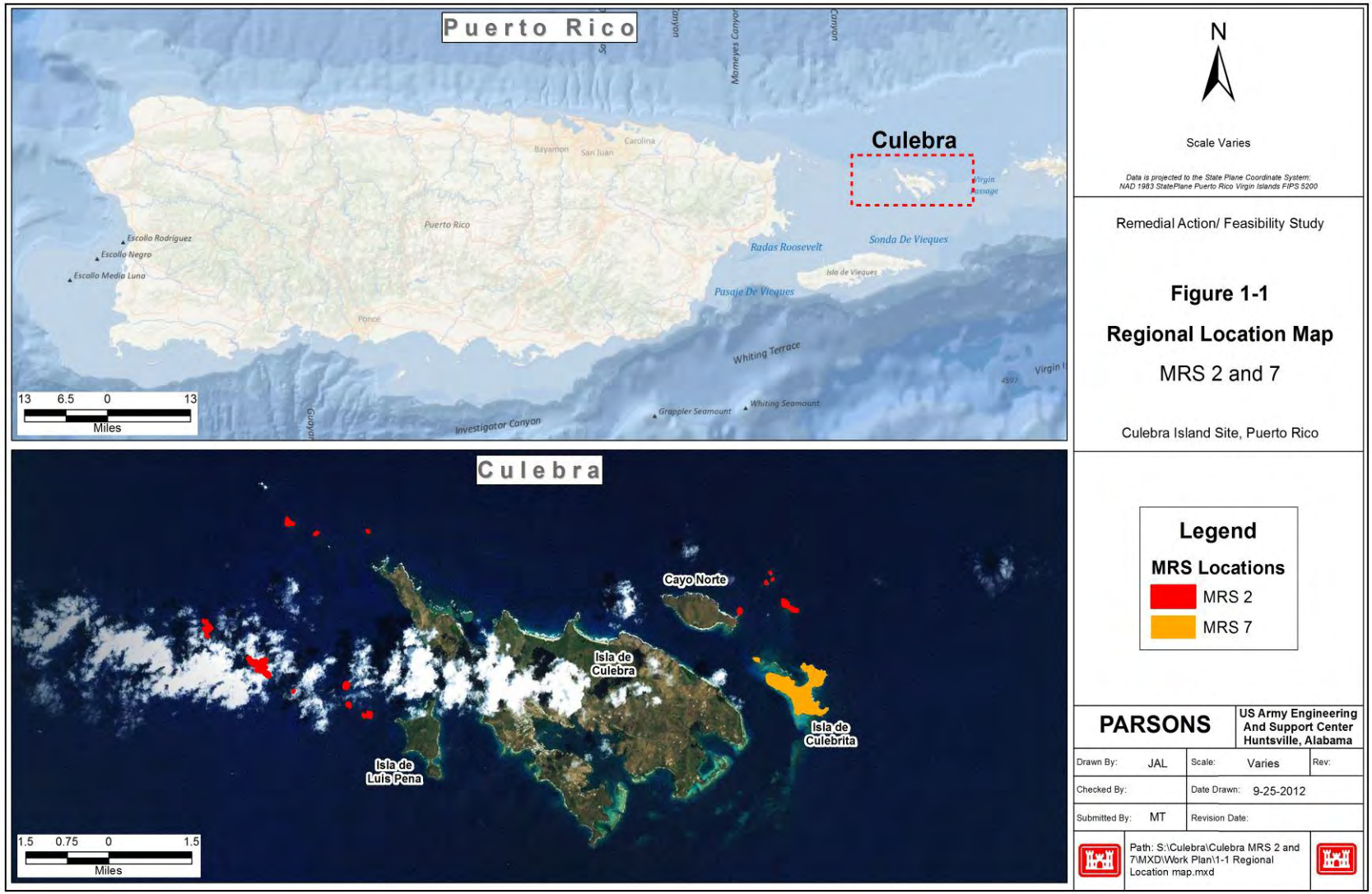

Figure 1-1: Location Map of MRSs 07 and 02 Boundaries

1.5.4 SENSITIVE ENVIRONMENTS

The main island of Puerto Rico and its associated islands support 75 federally listed threatened and endangered species consisting of 26 animals and 49 plants. Among this diverse group of fauna and flora are multiple species that are known to exist, potentially exist, or temporarily use areas within the Culebra Island, such as migratory birds. Of the 75 federally listed species, nine are known or are suspected to occupy Culebra Island and/or the associated cayos. In addition to the federally listed species, two state-listed species are known to occupy Culebra Island and the associated cayos (MRSs 07 and 02). The federally and state-listed species include both terrestrial and marine life. The federally listed species of most concern for the wildlife refuge are the brown pelican, green sea turtle, hawksbill sea turtle, leatherback sea turtle, and loggerhead sea turtle. Due to declining populations, the elkhorn and staghorn corals in the surrounding waters are federally listed threatened and endangered species (refer to Appendix M). In addition to the species listed under the Endangered Species Act (ESA), the Center for Biological Diversity petitioned the National Marine Fisheries Service (NMFS) on 20 October 2007 to list 83 species of corals as threatened or endangered under the ESA and to designate critical habitat for these corals. NMFS received and reviewed the petition and determined that the requested listing actions may be warranted for 82 of the 83 coral species. The completed status review and management report (NOAA Technical Memorandum NMFS-PIFSC-27) was issued in September of 2011. All of the Atlantic coral species have the potential to be found in waters around Culebra.

According to the National Wildlife Refuge (NWR) System, portions of Culebra Island and 22 of the associated cayos are considered NWR area. Luis Peña Channel is a Department of Natural and Environmental Resources (DNER) reserve. The three largest cayos within MRS 07 and MRS 02 are Culebrita, Cayo Norte (privately owned), and Luis Peña. These cayos resemble Culebra in that they all have sandy beaches, rugged coastline, and gentle to steep hills. Vegetation ranges from moderate to extremely dense. The smaller cayos are primarily solid rock with sparse or no vegetation. A few of the smaller cayos have small beaches; however, most are rugged rock all around.

According to the Puerto Rico DNER, the conservation priority areas for Culebra and associated cayos are as follows:

- Designated Critical Habitat
- All of the lagoons on Culebra
- Monte Resaca
- All beaches around Culebra
- The designated critical habitat area for the Virgin Islands Boa
- Flamenco Peninsula
- Puerto del Manglar
- Los Canos
- Punta Soldado
- Bahia (also called “Ensenada”) Cementerio
- All cayos and cayos around Culebra
- The Culebra NWR
- The Canal Luis Peña Natural Reserve

1.6 SITE HISTORY

Spain ceded all of Puerto Rico to the United States in 1898 following the Spanish American War. The public lands in the Culebra Island Archipelago were placed under the control of the U.S. Department of Navy in 1901. The Culebra Island Archipelago was used for training purposes by the U.S. Navy and U.S. Marines, and was later used by the North Atlantic Treaty Organization. The U.S. Marines used portions of Culebra Island as a training facility from 1902 through 1941. Culebra Island was used as a bombing and

gunnery range from 1935 through 1975. To support the increased training needs during Viet Nam operations, the Navy acquired additional training areas on cayos east and west of Culebra Island for use as air-to-ground ranges. Live ordnance operations reached their peak in 1969 as the fleet was training pilots for Viet Nam. Aircraft bombing and strafing of the Flamenco Peninsula ended around 1970, while the use of live rounds for naval gunfire support training ended in 1971. Subsequent naval support training was conducted using quieter practice rounds until ordnance use was terminated on September 30, 1975. Between 1975 and 1982, the facilities were turned over to the General Services Administration.

During military use of the land, the island was inhabited by many residents centralized around the town of Dewey on the west central portion of the island. Currently, the site includes municipal, residential, and recreational areas. Most of the main island of Culebra, as well as Cayo Norte, are privately owned, while the surrounding cayos are managed by the U.S. Fish and Wildlife Service (USFWS). The PR DNER also manages land and adjacent water areas on Culebra.

1.7 LAND USE

1.7.1 MRS 07 CAYO CULEBRITA ARTILLERY IMPACT AREA

MRS 07 covers the northern portion of Cayo Culebrita. The Cayo is managed by the USFWS (land portion) and DNER (shoreline areas that are within maritime terrestrial zone). Water areas are DNER jurisdiction; the USFWS and NMFS only have jurisdiction in the water as it relates to ESA resources. Residential areas do not exist on Culebrita, however many people visit the beach and water areas frequently. The Culebrita Lighthouse is the only structure on Culebrita; it functions as a historical attraction and is not occupied.

1.7.2 MRS 02 SURROUNDING CAYOS

MRS 02 cayos are managed by the USFWS as part of the Culebra NWR. Residential areas do not exist on any of these islands. Most of the cayos are inaccessible due to steep terrain from the water's edge. Scuba divers frequently access the water acreage surrounding these cayos.

1.8 INITIAL SUMMARY OF RISK FROM MEC

1.8.1 MRS 07 CAYO CULEBRITA ARTILLERY IMPACT AREA

MRS 07 includes the northern portion of Culebrita as well as Cayo Botella. The Marines used this 375-acre area as an artillery impact area between 1936 and the late 1940s. The United States and the United Kingdom used Cayo Botella for an aircraft bombing/rocket target in 1969. Munitions included 20mm projectiles, Mk 44 and Mk 45 flares, live and practice bombs up to 500 pounds, and 2.75-inch rockets as well as British bombs and rockets. Culebrita beaches are used recreationally and many boats visit the island each year. Culebrita was part of the land designated for use by the U.S. Navy in 1900; it was reported excess in 1972. The water acreage surrounding MRS 07 experiences rough sea action that could cause changes in bottom conditions, therefore increasing the likelihood of MEC migration.

1.8.2 MRS 02 SURROUNDING CAYOS

MRS 02 includes the surrounding islands of Cayo Lobo, Cayo Lobito, El Mono, Cayo Del Agua, Cayo Yerba, Cayo Raton, Cayo Alcarraza, Cayo Los Gemelos, Cayo Piedra Stevens, Cayo Tiburon, Cayos Geniqui, and Cayo Sombrerito, encompassing approximately 660 acres. The U.S. Navy conducted fleet maneuvers and FLEXs on MRS 02 between 1923 and 1941. During these exercises, the surrounding cayos were heavily bombarded with high explosive (HE) bombs, projectiles, and rockets, as well as illumination and practice rounds. Training continued through the 1950s and 1960s, and in the early 1960s aerial bombardment was expanded from Los Gemelos and Alcarazza to most of the cayos on the east and west side of Culebra. Training continued until 1975. The water acreage surrounding most of the cayos experiences rough sea action that could cause changes in bottom conditions, therefore increasing the likelihood of MEC migration.

2.0 TECHNICAL MANAGEMENT PLAN

2.1 PROJECT OBJECTIVES

The objective of this project is to document, in the form of an EBS Report (EBSR), the various underwater biological habitats that reside within the water portions of MRSs 07 and 02. The EBSR will be utilized by project stakeholders to establish the parameters for conducting subsequent RI/FS field activities (Underwater Surveys and Intrusive Investigations) within MRSs 07 and 02.

2.2 PROJECT ORGANIZATION

For this project to be successful, close coordination and cooperation between the stakeholders, community, regulators, and technical support personnel must occur. Figure 2-1 depicts the organizational structure of the Parsons' project team with respect to the USACE. Other team members include the Culebra site stakeholders. The roles of these team members are described below.

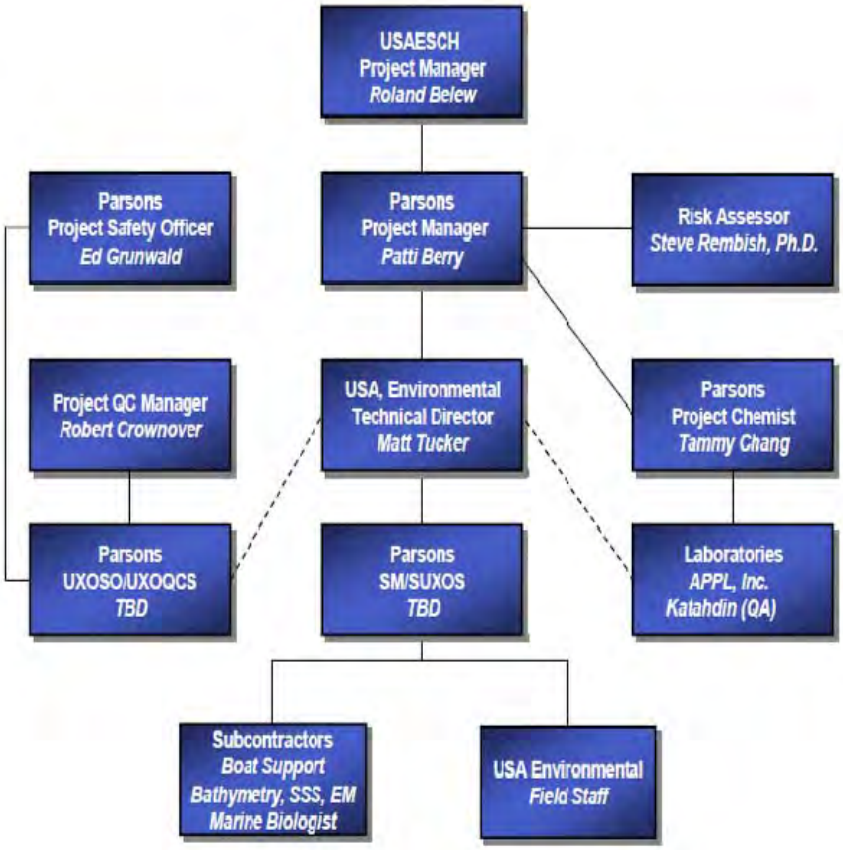

Figure 2-1: Project Management Organization

2.2.1 PROJECT STAKEHOLDERS

The stakeholders are the individuals and organizations directly impacted by the survey activities and the utilization of the resulting EBSR data. Stakeholders include (but are not limited to):

- Puerto Rico Department of Natural and Environmental Resources (PR DNER)
- Puerto Rico Environmental Quality Board (PREQB)
- United States Environmental Protection Agency (USEPA)
- Culebra NWR
- US Fish and Wildlife Service (USFWS)
- National Oceanic and Atmospheric Administration (NOAA)
- National Marine Fisheries Services (NMFS).
- U.S. Coast Guard (USCG)
- Restoration Advisory Board

The stakeholders listed above participate in the Technical Project Planning (TPP) process.

2.2.2 U.S. ARMY CORPS OF ENGINEERS (USACE), JACKSONVILLE DISTRICT

USACE Jacksonville District is the project management and funding agency for this project. USACE Jacksonville District responsibilities include review of project plans and documents, coordinating with the news media and the public, and coordinating with national, state and local regulatory agencies on issues pertaining to protection of ecological and cultural resources

2.2.3 U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE (USAESCH)

USAESCH is the lead technical agency for this project. USAESCH responsibilities include procurement of contract services, review and coordination of project plans and documents, and supporting USACE Jacksonville District in working with the news media, the public, and the regulators. USAESCH provides technical expertise for MEC activities. As the technical Project Manager (PM), USAESCH is responsible for controlling the budget and schedule. As the contracting agency, USAESCH is responsible for directing the contractor.

2.2.4 PARSONS GOVERNMENT SERVICES INC. (PARSONS)

Parsons is the prime contractor to USAESCH for this project. Parsons will provide staff and subcontractors to perform all aspects of field work and provide oversight of field sampling activities. Parsons will assign project personnel based on management and technical experience and abilities. Parsons will subcontract to USA Environmental, Inc. (USA) for conducting hydrographic and visual surveys. Parsons will prepare and submit data reports in accordance with (IAW) relevant USACE guidance and applicable DIDs. The Parsons PM is Ms. Patti Berry.

2.2.5 USA ENVIRONMENTAL, INC. (USA)

USA is the first tier subcontractor providing project field work and document support to Parsons. USA provides oversight of the technical aspects of the Phase I field activities and provides technical input for project deliverables. The USA Technical Manager (TM) oversees the second tier subcontractor performing Phase I A field work (hydrographic surveys) and self-performs Phase IB (visual surveys). The USA TM is Mr. Matt Tucker.

2.2.6 AQUA SURVEY INC (ASI).

ASI is a second tier hydrographic subcontractor for this project. ASI will provide personnel and equipment to perform all hydrographic surveys to include MBS and SSS. ASI will conduct all work under USA TM oversight. The ASI PM is responsible for the coordination of the overall field work with Parsons/USA. The

ASI PM is Mr. William Rottner. The ASI TM is Mr. Mark Padover. The ASI TM oversees work conducted by ASI marine technicians and is responsible for data processing Quality Control (QC), and performance system audits. Mr. Padover is also a qualified Marine Biologist and will be supporting underwater habitat identification in support of the EBS activities. The TM will coordinate all data submittals with the Parsons/USA PM/TM and Project Engineer.

2.3 PROJECT PERSONNEL

2.3.1 PARSONS PROJECT MANAGER

The PM (Ms. Patti Berry) is responsible for monitoring overall progress of the TO, preparing monthly progress reports, and ensuring that resources are available. The PM maintains close communication with USAESCH to assess client satisfaction with Parsons' performance on this TO.

2.3.2 PROJECT SAFETY OFFICER

The Project Safety Officer (Mr. Ed Grunwald) is responsible for reviewing and updating the Accident Prevention Plan (APP) and verifying compliance with the plan. The Project Safety Officer is the contact for regulatory agencies on matters of health and safety. The Project Safety Officer verifies compliance with the APP and Site Safety and Health Plan (SSHP) by auditing project activities and instituting corrective actions.

2.3.3 PROJECT QUALITY CONTROL MANAGER

The Project QC Manager (Mr. Robert Crownover) is responsible for reviewing and updating the Quality Control Plan (QCP) and verifying compliance with the plan. The Project QC Manager verifies compliance with the QCP by auditing project activities and instituting corrective actions.

2.3.4 USA TECHNICAL MANAGER

The TM (Mr. Matt Tucker) provides logistical support for all field activities in addition to providing technical and report writing support to ensure the technical quality of deliverables to USAESCH. The TM coordinates field activities with the Underwater Visual Survey Team and second tier subcontractors.

2.3.5 GEOGRAPHICAL INFORMATION SYSTEMS (GIS) MANAGER

The GIS Manager (Mr. Jeff Lewis) is responsible for management and control of the project GIS. The GIS Manager will direct GIS operations occurring locally and remotely, and is responsible for control of data included in and used as part of the project GIS.

2.3.6 SITE MANAGER/SENIOR UNEXPLODED ORDNANCE SUPERVISOR (SM/SUXOS)

The Site Manager/Senior Unexploded Ordnance (UXO) Supervisor (SM/SUXOS) is responsible for onsite administration, coordination, and site operations. The SM/SUXOS will manage all field operations, including site preparation and environmental surveys. The SM/SUXOS will be the primary facilitator on site to coordinate with PR DNER, USFWS, the Refuge Manager, the USCG, and local Culebra agencies for site control and environmental surveys.

2.3.7 UXO SAFETY OFFICER/UXO QUALITY CONTROL SPECIALIST (UXOSO/UXOQCS)

The UXOSO/UXOQCS is responsible for overseeing the site QC Plan in all field operations. The UXOSO/UXOQCS will be trained in QC techniques methodology and be qualified as a UXO Technician III (UXOTIII). The UXOSO/UXOQCS coordinates with the TM for daily operations and maintains a direct line of communication to the PM and SM/SUXOS. The UXOSO/UXOQCS reports directly to the Project QC Manager.

2.3.8 UNDERWATER VISUAL SURVEY TEAM

The Underwater Visual Survey Team consists of a Remotely Operated Vehicle (ROV) Operator and a UXOTIII. The ROV Operator will be qualified to operate the ROV (VideoRay Pro-3), underwater digital video camera, and positioning equipment. The UXOTIII will provide munitions identification support as well as aiding with equipment logistics. The Underwater Visual Survey Team will undergo site-specific training prior to underwater investigation activities.

2.3.8.1 Underwater Visual Survey Team Boat Support Personnel

Personnel assigned to support operations consist of the boat captain and crew, provided by a local subcontractor to conduct water transportation services.

2.3.9 SNORKELING TEAM

A 4-person snorkeling team will conduct supplemental surveys within shallow water environments where vessels pose a risk to safety and marine habitat or sensitive underwater environments. The snorkeling team composition is as follows:

- Snorkeling Supervisor (1)
- UXO Technician/Survey Snorkeler (1)
- Marine Biologist/Survey Snorkeler (1)
- Support/Safety Vessel Operator (1).

2.3.10 SNORKELING SUPERVISOR

The Snorkeling Supervisor (SS) will report directly to the TM on issues pertaining to the field operations. The SS will have the following operations and safety/health related responsibilities:

- Reviewing and becoming familiar with the site Snorkeling Plan (SP) included in Appendix N and the overall SSHP included in Appendix D of this WP
- Ensuring that all snorkeling and support personnel review and are aware of the guidelines and procedures reflected in the SP and the overall SSHP
- Coordinating and overseeing all snorkeling operations
- Coordinating the assignment of personnel during snorkeling operations
- Ensuring implementation of project quality and safety and health procedures
- Assessing weather and site conditions to ensure that safe and effective snorkeling can be accomplished
- Identify potential problem areas, including safety and health matters, and instituting corrective measures.

2.3.11 SECOND TIER SUBCONTRACTORS

2.3.11.1 Caribbean Marine Services

Parsons/USA will contract with Caribbean Marine Services to provide water transportation support. Caribbean Marine Services out of Culebra, Puerto Rico operates boats that are inspected and licensed by the USCG and the Puerto Rico Public Service Commission. Parsons/USA will rely on Caribbean Marine Services to provide rubber dinghies or small vessels for access into shallow water areas.

2.3.11.2 Aqua Survey, Incorporated (ASI)

ASI is the hydrographic subcontractor for this project. ASI will provide personnel and equipment to perform all hydrographic surveys to include MBS and SSS. ASI will conduct all work under USA TM oversight. The ASI TM is responsible for the coordination of the overall field work with Parsons/USA. The ASI PM is Mr. William Rottner. The ASI TM is Mr. Mark Padover. The ASI TM oversees work conducted by ASI marine technicians and is responsible for data processing QC, and performance system audits. Mr. Padover is a qualified Marine Scientist and will be supporting underwater habitat identification in support of the EBS activities. Mr. Padover is also a qualified sea turtle/marine mammal observer.

2.3.11.3 Sea Turtle and Marine Mammal Observer

Rolando Soler, local biologist, will be contracted as the lead sea turtle and marine mammal observer. Mr Soler has completed coursework requirements and is current on his marine mammal observer certification and is a qualified turtle monitor per Appendix M.

2.4 PROJECT COMMUNICATION AND REPORTING

Communications for this project will generally flow along the lines established by the organization depicted previously in Figure 2-1. All communications between Parsons and the USAESCH will primarily be directed through the respective USAESCH PM or Contracting Officer. Communication directly between Parsons and other government entities associated with this project will only occur with USAESCH PM concurrence.

2.5 PROJECT DELIVERABLES

This section provides a brief description of the required deliverables for this Phase of the Remedial Investigation/Feasibility Study (RI/FS). A detailed description of project deliverables is provided in the current version of the Performance Work Statement (PWS) (Appendix A). Deliverable data will be submitted to USAESCH and USACE Jacksonville District (CESAJ) no later than the close of the business day indicated in the project schedule. Electronic data will be submitted in formats consistent with USAESCH software and systems, as defined in the PWS.

2.5.1 ENVIRONMENTAL BASELINE SURVEY WORK PLAN

A Draft, Draft Final, and Final EBS WP will be prepared IAW DID WERS-001.01. Parsons/USA team members will perform a peer review of each section of the WP followed by an overall review by the Parsons QC Manager prior to submittal to confirm the overall quality and completeness of each document. Review comments received on the Draft and Draft Final versions will be incorporated and formal, annotated responses will be provided for each comment. Parsons will include a CD with each hard copy document submitted.

2.5.2 PHASE 1A INTERIM DATA DELIVERABLE (HYDROGRAPHIC DATA AND REALIGNED VISUAL SURVEY TRANSECTS)

Upon completion of the hydrographic survey field work (Phase 1A), Parsons will prepare and submit an interim field data deliverable consisting of the raw hydrographic data and proposed transect realignment analysis maps for utilization in the underwater visual survey field work (Phase 1B). As a part of the EBS effort, hydrographic data will be used to identify sea floor conditions and benthic habitats along the proposed visual survey transects. Ultimately, this data will be used to screen the appropriate deployment platforms for geophysical instruments in subsequent phases of the project.

2.5.3 ENVIRONMENTAL BASELINE SURVEY REPORT

Parsons/USA will prepare and submit an EBSR to the USACE for review and approval. The EBSR documents the various underwater biological habitats (including critical habitat and identified endangered and threatened species) that reside within the water portions of MRSs 07 and 02. In anticipation of the seven coral species being added to the ESA this year (2013), the EBSR will include identification and location of areas containing these species. The EBSR will be utilized by project stakeholders to establish the parameters for conducting subsequent RI/FS field activities (underwater geophysical surveys and intrusive investigations) within MRSs 07 and 02. The EBSR will include an International Hydrographic Organization (IHO), Order 1, hydrographic survey that covers 100% of the accessible water acreage of MRSs 07 and 02. Accessible water acreage areas are defined as areas that the survey vessel can safely access while accomplishing surveys that meet IHO Order 1 metrics in a safe manner and as to protect resources. Hydrographic surveys will consist of MBS and SSS data (maps). In addition to the hydrographic data, the EBSR will include documentation and analysis of the underwater habitats located within the proposed MEC and munitions constituents (MC) investigation areas of each MRS. Comparative analysis will be conducted by a qualified marine scientist who will evaluate visual survey data collected from underwater cameras and ROV. Visual data will be compared to documented underwater benthic habitat descriptions for Puerto Rico (Kendall, et al, 2001). The EBSR will include a recommended RI transect design for conducting subsequent underwater geophysical surveys and intrusive investigations within the documented underwater habitat. The recommended RI transect design will take into consideration the locations of critical habitat and endangered species within the vicinity of the RI transects. All efforts will be made to locate RI transects away from these critical areas. Concurrence of the EBSR by project stakeholders will be achieved prior to conducting follow on investigations within the underwater areas of MRSs 07 and 02.

2.6 PROJECT SCHEDULE

The project schedule presents the logical sequence of tasks, deliverable due dates, and anticipated number of days to complete each task. The schedule will be updated monthly and will be included in the monthly PSRs prepared and submitted IAW DID WERS-016.02. The schedule is included in Appendix J.

2.7 PERIODIC REPORTING

PSRs will be prepared IAW WERS-016.02. This report will be submitted monthly when fieldwork is not being performed, and weekly when fieldwork is underway.

2.8 COSTING AND BILLING

The budget for the project was negotiated with the USAESCH pursuant to award of the TO. The Parsons PM is responsible for submitting monthly reports to the USAESCH PM along with the invoice that documents the work performed during the corresponding billing period. Requests for payment will be based on completion of performance milestones as defined in the monthly PSR.

2.9 PROJECT PUBLIC RELATIONS SUPPORT

Public relations support will include participation in up to three public meetings to be held on the Island of Culebra. These meetings are in addition to the TPP meetings. The third meeting will be held specifically for the Proposed Plan. Parsons will prepare and deliver briefings, graphics, maps, posters, presentations, and support of question and answer sessions. When required, Parsons will prepare invitation letters, fact sheets, and meeting notices. Parsons will obtain the meeting sites, perform public notification and prepare any correspondence necessary to meeting the objectives of this task. To ensure the quality of public meetings, Parsons will coordinate with the USACE public relations officer or other appropriate USACE representative on all matters of public relations.

2.10 SUBCONTRACT MANAGEMENT

Before subcontract work is performed at the site, Parsons will negotiate and prepare subcontracts that will detail all necessary and appropriate terms and conditions, including the statement of work (SOW). Once the subcontract is executed, Parsons will perform periodic reviews to ensure that contractual requirements and milestones are met. These reviews will cover contractual progress, technical progress, and cost and schedule status. Parsons' technical staff will review data generated by the subcontractor as part of subcontract deliverables.

Parsons will maintain overall supervisory responsibility for all operations. Subcontractors will work under the direction and oversight of Parsons/USA's PM/TM Team and will be monitored by Parsons' UXOSO/UXOQCS. The USA TM will schedule all operational activities and a strict accounting will be made of actions performed and activities completed. Throughout their operations, subcontractors will coordinate their operational schedules with USA's TM, and strictly adhere to this WP and associated APP.

2.11 MANAGEMENT OF FIELD OPERATIONS

The Parsons PM and USA TM will coordinate field operations with survey teams. The Parsons Safety Manager and Quality Manager will remain off site but will be available by telephone for consultation on issues of safety or quality. The GIS Manager, who is responsible for control of data included in and used as part of the project GIS, will also be available by telephone for consultation.

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3.0 FIELD INVESTIGATION PLAN

3.1 OVERALL APPROACH TO ENVIRONMENTAL BASELINE SURVEY ACTIVITIES

3.1.1 PRELIMINARY PROJECT GOALS

The preliminary project goal is to document the various underwater biological habitats that reside within the water portions of MRSs 07 and 02 in order to establish the parameters for conducting subsequent RI/FS field activities (underwater geophysical surveys and intrusive investigations) within MRSs 07 and 02. Based on this preliminary project goal, site characterization goals are as specified in DQO Step 2 of Table 3-1.

3.1.2 DATA QUALITY OBJECTIVES (DQOS)

DQOs are qualitative and quantitative statements that clarify project objectives, define the appropriate type of data, and specify the tolerable levels of potential decision errors that are used as the basis for establishing the quality and quantity of data needed to support decisions. These project specific statements describe the intended data use; the data need requirements; and the means to achieve acceptable data quality for the intended use. DQOs established for the EBS activities meet the USEPA *QA/G-4HW* Guidance's 7 step DQO criteria. Table 3-1 presents the Project DQOs for the EBS activities.

Table 3-1: Project Data Quality Objectives for the Environmental Baseline Survey Report

DQO STEPS	MRS LOCATIONS
Water acreage of MRS 02 and MRS 07	
1. State the Problem	The overarching problem is determining the nature and extent of MEC/MC within the accessible[1] areas of the underwater portions of MRSs 02 and 07 while minimizing disturbance to endangered and threatened species and sensitive underwater environments within the investigation footprint. An initial Baseline Survey effort (Phase I) will be required in order to establish the parameters for conducting subsequent RI/FS field activities (Underwater Electromagnetic (EM) Surveys and Intrusive Investigations) within MRSs 02 and 07.
2. Identify the Goal of the Study	• Document the bathymetry within the water portions of the MRSs; • Document and verify the types of benthic habitats that are located within the proposed MEC and MC investigation areas of each MRS; • Identify and locate (map) coral, sea grass, sandy areas, essential fish habitats, and endangered and threatened species, as well as other marine habitats (as designated by the Caribbean Fishery Management Council) within the underwater portions of the MRSs; • Investigate and document suspected MEC items that may be located on the surface of the seafloor within the MRSs; • Develop a minimum mapping unit (area) to be mapped as habitat such that the data can be used with existing maps; and • Establish a RI transects design for conducting subsequent underwater geophysical surveys and intrusive investigations that considers the locations of sensitive habitat and endangered and threatened species.
3. Identify Information Inputs	• Collection of multi-beam bathymetry and SSS data (IHO Order I Hydrographic Survey); • Collection and analysis of underwater visual survey data (underwater camera systems deployed by vessels or snorkelers with integrating positioning using GPS);

DQO STEPS	MRS LOCATIONS
Water acreage of MRS 02 and MRS 07	
	• Analysis of documented Puerto Rico/Caribbean benthic habitats, and endangered/ threatened species, and corals proposed for listing as threatened or endangered and their locations within the investigation footprints; • Locations of suspected surface MEC items within accessible[1] water areas, of the MRS boundary.
4. Define the Boundaries of the Study	The MRS boundary defines the population to be sampled and the decision units to which the data will be applied. Step-out visual investigations may be required to modify/expand MRS boundary in areas where MEC has been identified on the seafloor. The population for this project consists of the underwater (benthic) areas of MRSs 02 and 07. The boundary may be reconfigured to relocate inaccessible investigation acreage to the underwater areas of eastern Culebrita.
5. Develop a Decision Rule	Data gathering requirements for completing an EBSR will be considered met after the following items have been achieved: • A hydrographic survey within the accessible[1] water areas for MRSs 02 and 07 is completed. Hydrographic surveys will be conducted from a vessel in waters no less than 4-ft depth (measured to limit of depth accessed by a ROV, Underwater Camera, SSS, or MBS equipment). No vessel surveys will be conducted in areas where corals are observed within 3-ft of the water's surface. • Depths less than 4-ft will be surveyed by a snorkeling team but no snorkel surveys will be conducted in areas where corals are within 2-ft of the water's surface. • Hydrographic survey data meeting the IHO standards noted in Table 3-2 are sufficient to plan follow on Phase II and Phase III investigations. • The benthic habitats and endangered/threatened species within the accessible[1] underwater areas of MRSs 02 and 07 have been mapped. The anticipated survey areas are established along idealized transects in the approved EBS WP. • Step-out visual investigations within the MRS boundary will be conducted in a 100-ft (horizontal) radius around MEC items located along the idealized visual transects (spaced at 51 meters). If additional MEC are located within the first step out, an additional 100-ft radius will be visually investigated. Step outs will stop when crossing overlapping step-out areas or if no additional MEC are located within a 100-ft radius. • For MEC items located within 100 horizontal feet from the MRS boundary, the initial step out will be 100-ft, the second 100-ft (if required), and the PDT will be consulted if additional step outs are needed. • If access is restricted by coral reefs or other features exposed to the water surface that do not allow for survey activities to be safely conducted, the PDT will be consulted.
6. Specify Performance or Acceptance Criteria	• Measurable decision errors are limited to the field and analytical QC processes identified in the EBS WP for survey coverage. Work will be performed in accordance with established SOPs for underwater surveys. • Acceptable survey data for hydrographic surveys will be coverage of all accessible[1] areas of the water portions of each MRS. • The completed hydrographic survey meets IHO Order I parameters as defined in the yellow column of Table 3-2 and meets the quality standards outlined in the Quality Control Plan (Chapter 4 of the EBS WP). • Acceptable underwater visual survey coverage will be stationed on idealized

DQO STEPS	MRS LOCATIONS
Water acreage of MRS 02 and MRS 07	
	geophysical transects spaced at 51 meters (RI design) for subsequent EM-61 deployment (Phase II) based on the hydrographic survey data. VSP parameters are based on expected target size and munition type. Width of visual coverage (corridor along transects) will vary depending on conditions.
7. Develop the Detailed Plan for Obtaining Data	Data collection procedures and associated QC measurements are included in the EBS WP. A combination of Visual Sample Plan and visual analysis of accessible[1] areas within the investigation footprints were used to develop the transect design reflected in the EBS WP. Hydrographic data collected during Phase 1A will be utilized to refine the transect locations for the visual survey conducted in Phase 1B.

Footnotes:
[1] *For the purposes of this DQO: "accessible" means:*

- For Vessels: *That access to the water portions of the MRS are <u>not</u> hindered by water depth, shallow rock or coral formations, or unsafe sea state conditions (consistently rough seas).*
- For Snorkeling Personnel: *That access to the water portions of the MRS are <u>not</u> hindered by or unsafe sea state conditions (consistently rough seas).*

Table 3-2: **IHO Minimum Standards for Hydrographic Surveys**

ORDER	**Special**	**1**	**2**	**3**
Examples of Typical Areas	Harbors, berthing areas, and associated critical channels with minimum underkeel clearances	Harbors, harbor approach channels, recommended tracks and some coastal areas with depths up to 100 m	Areas not described in Special Order and Order 1, or areas up to 200 m water depth	Offshore areas not described in Special Order, and Orders 1 and 2
Horizontal Accuracy (95% Confidence Level)	2 m	5 m + 5% of depth	20 m + 5% of depth	150 m + 5% of depth
Depth accuracy for Reduced Depths (95% Confidence Level) (1)	a = 0.25 m b = 0.0075	a = 0.5 m b = 0.013	a = 1.0 m b = 0.023	Same as Order 2
100 % Bottom Search	Compulsory	Required in selected areas	May be required in selected areas	Not applicable
System Detection Capability	Cubic features > 1 m	Cubic features > 2 m in depths up to 40 m; 10% of depth beyond 40 m	Same as Order 1	Not applicable
Maximum Line Spacing	Not applicable, as 100% search compulsory	3 x average depth or 25 m, whichever is greater	3-4 x average depth or 200 m, whichever is greater	4 x average depth

ORDER	Special	1	2	3
Horizontal control	**Primary control:** 1 part in 100,00 for ground survey methods; 10 cm at 95% confidence level for geodetic satellite methods. **Secondary control:** 1 part in 10,000 for ground survey methods; 50 cm for geodetic satellite methods.	Same as Special	Same as Special	Same as Special
Position of fixed aids to navigation and features significant to navigation	2 m at 95% confidence level	Same as Special	5 m at 95% confidence level	Same as Order 2
Position of Natural Coastline	10 m at 95% confidence level	20 m at 95% confidence level	Same as Order 1	Same as Order 1
Mean position of floating aids to navigation	10 m at 95% confidence level	Same as Special	20 m at 95% confidence level	Same as Order 2
Position of Topographical Features	10 m at 95% confidence level	20 m at 95% confidence level	Same as Order 1	Same as Order 1
Tidal Observations	Error not to exceed Γ 5 cm at 95% confidence level	Error not to exceed Γ 10 cm at 95% confidence level	Same as Order 1	Same as Order 1; no tides applied in depths > 200 m
Bottom Sampling	10 times line spacing; denser in anchorages	10 times line spacing	Same as Order 1	Same as Order 1; not required in depths > 200 m
Tidal Stream Observations	Measure at 3 and 10 m below the surface. Observations at hourly intervals for not less than 15 days; 29 days or more preferred. Measure to nearest 0.1 knot and 10 degrees at 95% confidence level.	Same as Special	Done only if they are of sufficient strength to affect surface navigation.	Same as Order 2

(1) To calculate the error limits for depth accuracy the corresponding values of a and b listed above have to be introduced into the formula Γ□(a squared + (b *d) squared) with:
a constant depth error, i.e. the sum of all constant errors
b*d depth dependent error, i.e. the sum of all depth dependent errors
b factor of depth dependent error
d depth

3.1.3 DATA INCORPORATION INTO THE ENVIRONMENTAL BASELINE SURVEY REPORT

Field data and GIS data will be incorporated into the EBSR in accordance with DID WERS-007.01. Maps will be submitted which show the locations of the areas searched, the search pattern, and the significant findings, as well as significant surface features within and adjacent to each MRS. Personal Digital Assistant (PDA) Global Positioning System (GPS)/Data Collection equipment will be used to record location data. A waypoint, brief description, and digital photograph will be electronically recorded for any MEC related items. Locations and descriptions of ground scars, craters, vegetation, and terrain will also be recorded, and a tabulated list of MEC items located in the field will be provided.

3.2 ENVIRONMENTAL BASELINE SURVEY AREAS

The EBS field activities will be conducted within the water portions of MRSs 07 and 02. Figure 3-1 through Figure 3-5 depict the respective EBS coverage areas.

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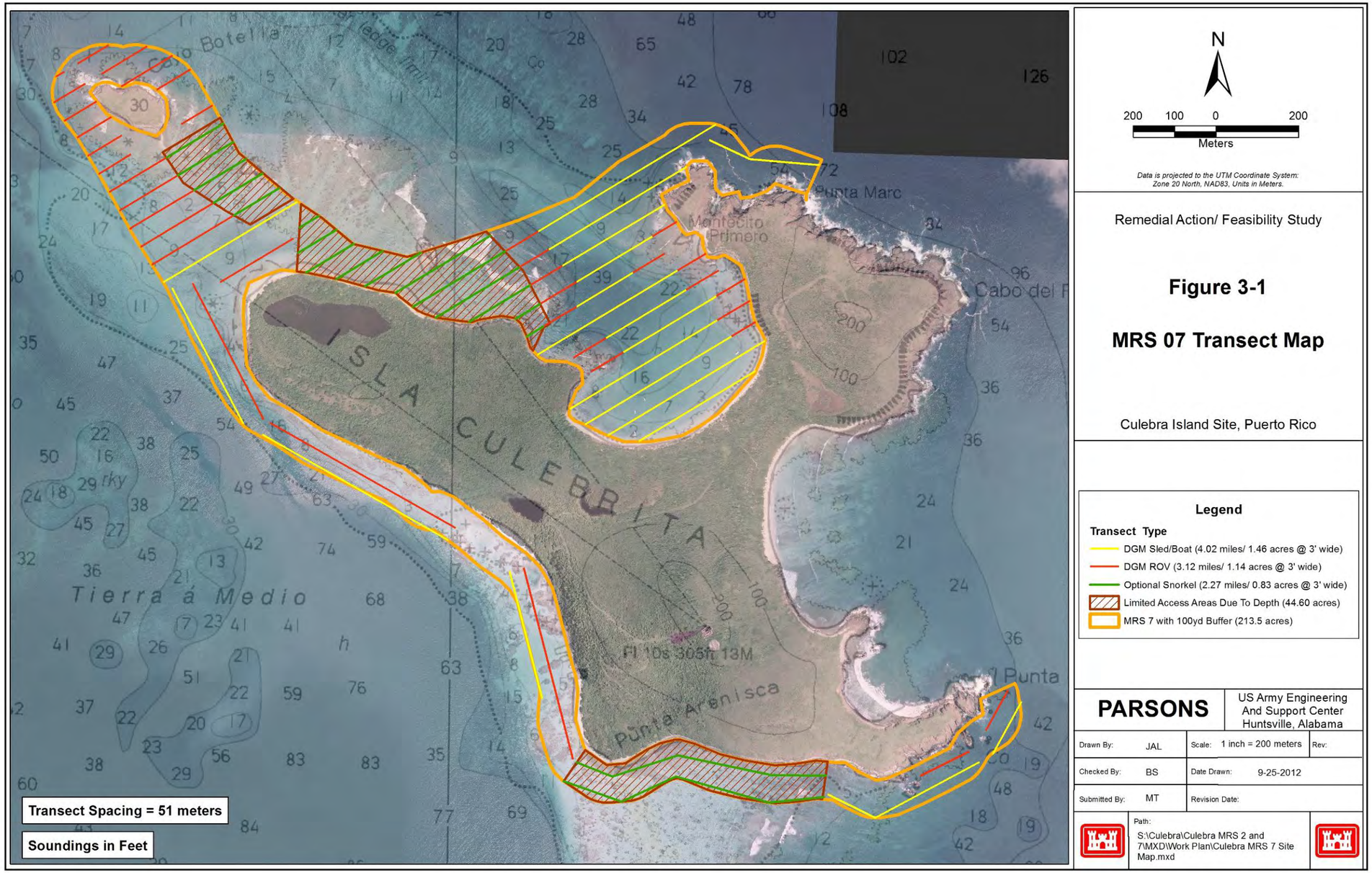

Figure 3-1: MRS 07 Environmental Baseline Survey Coverage Map

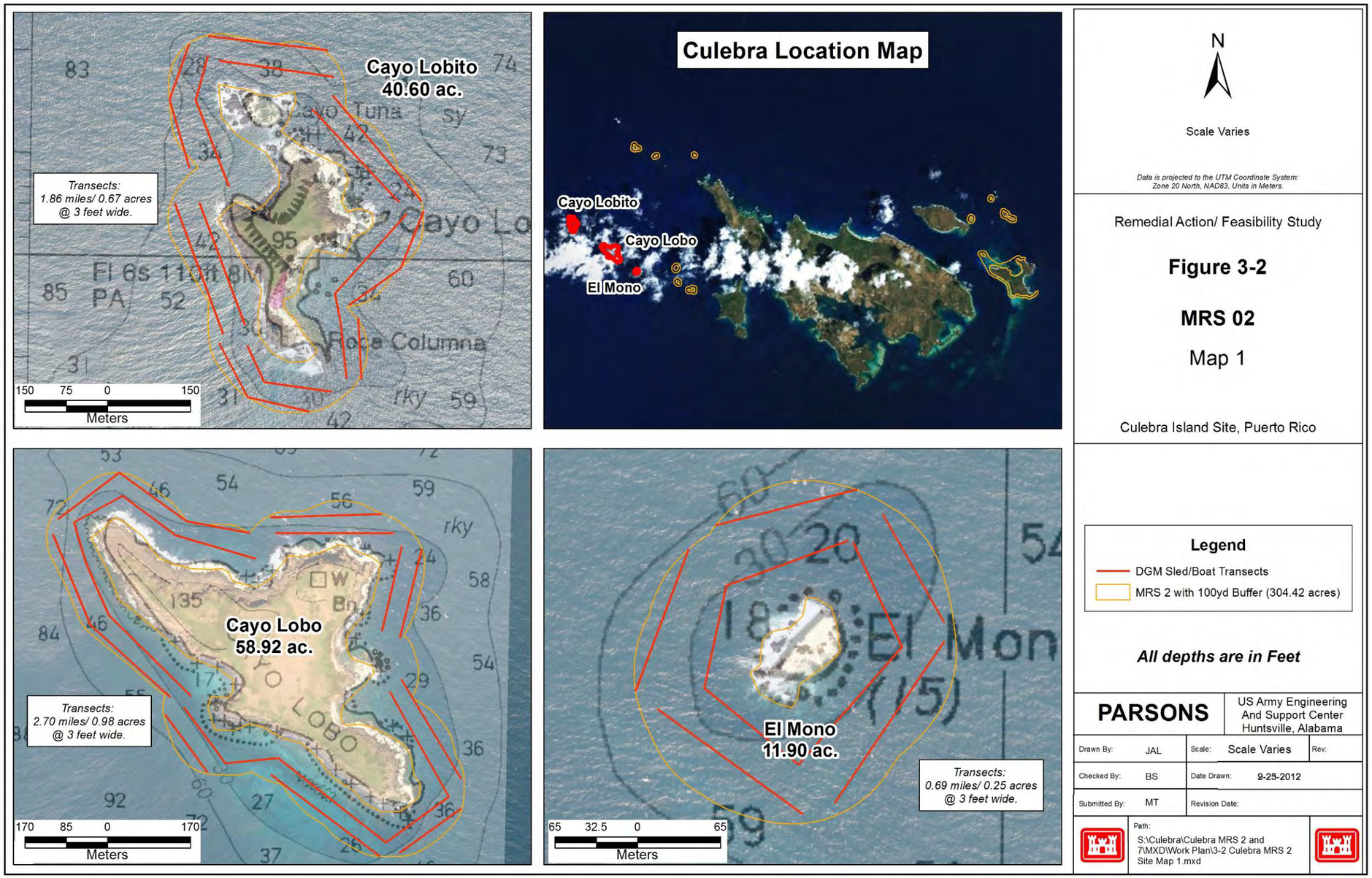

Figure 3-2: MRS 02 Environmental Baseline Survey Coverage Map 1

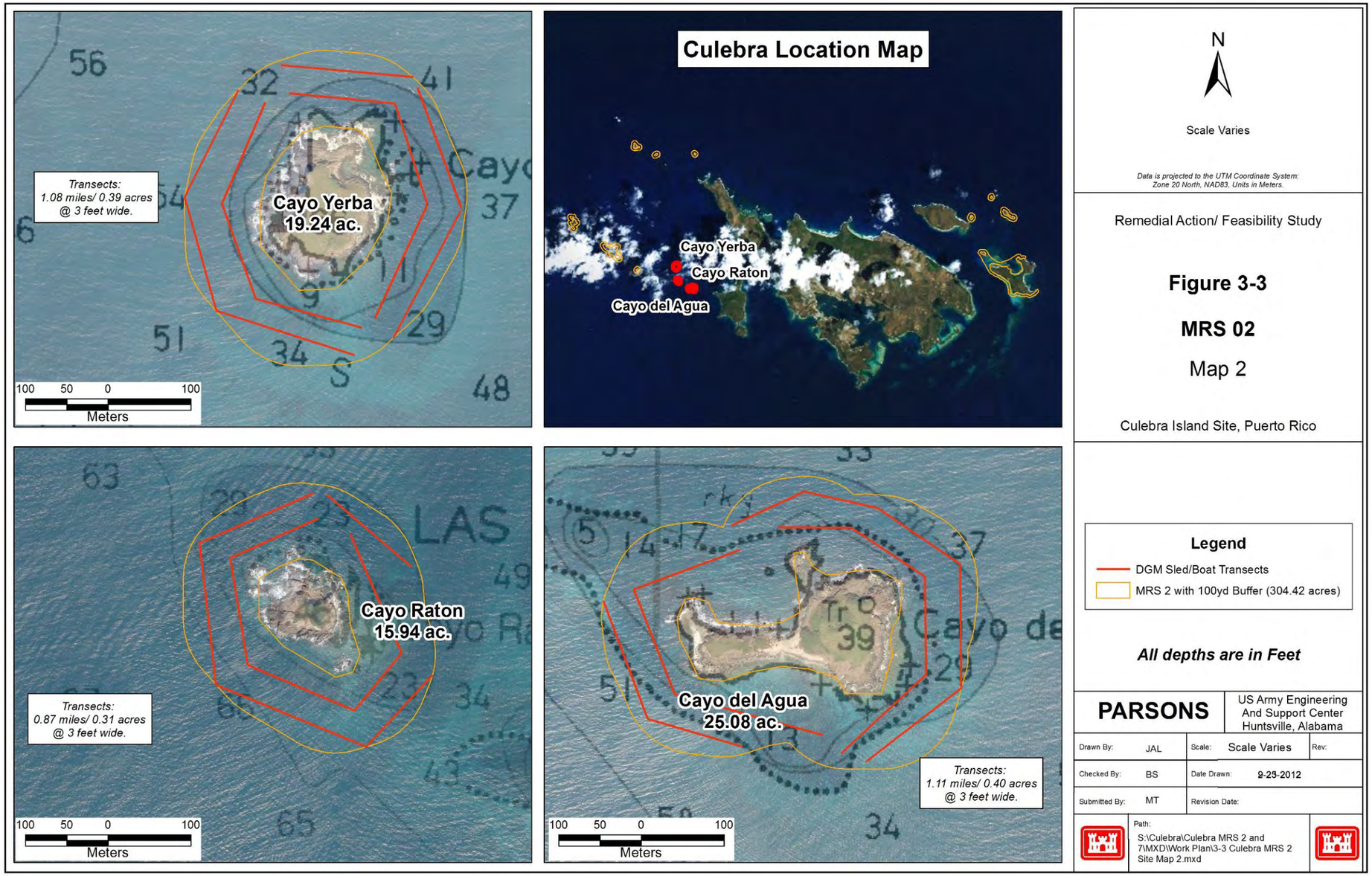

Figure 3-3: Environmental Baseline Survey Coverage Map 2

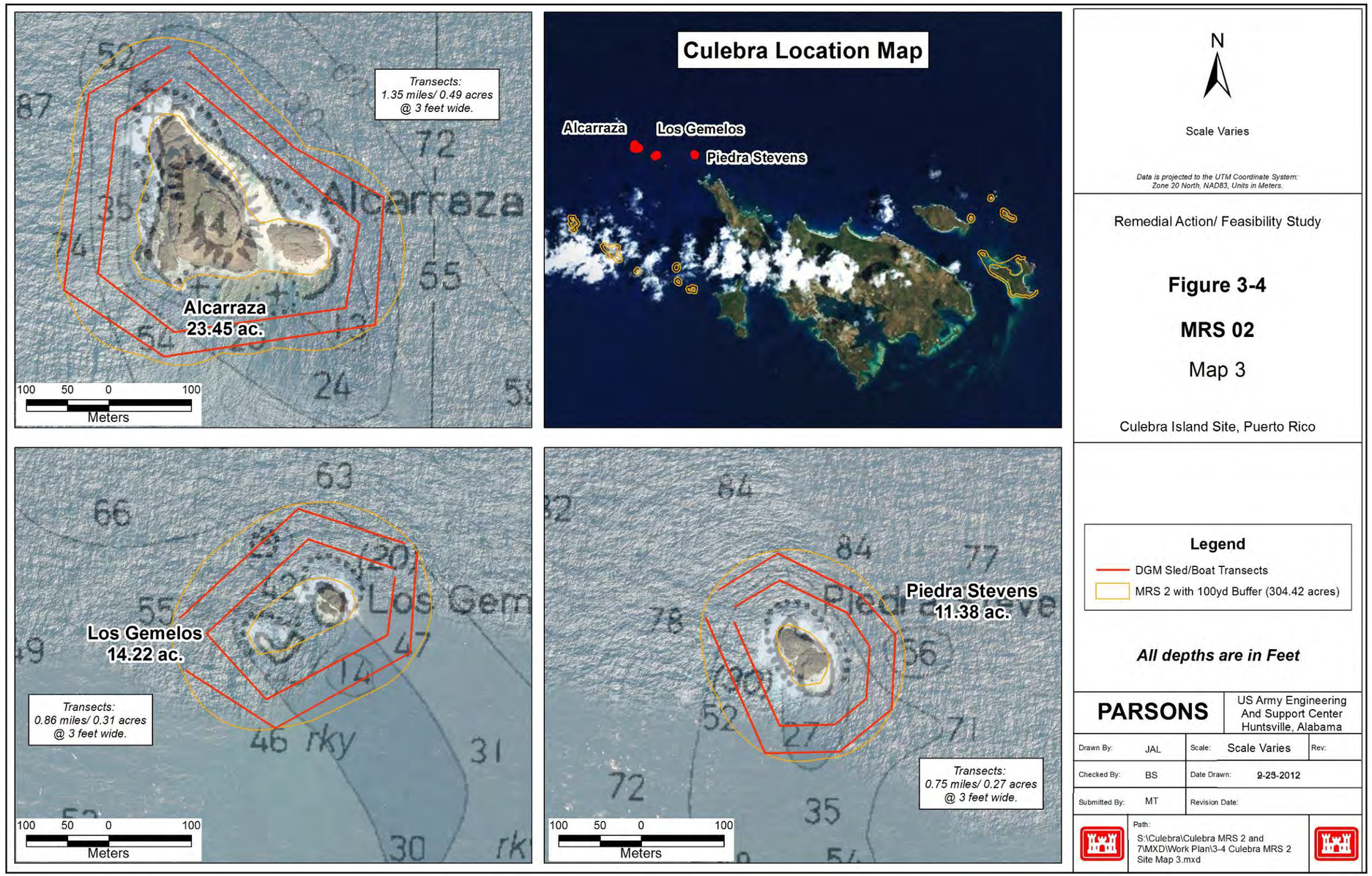

Figure 3-4: Environmental Baseline Survey Coverage Map 3

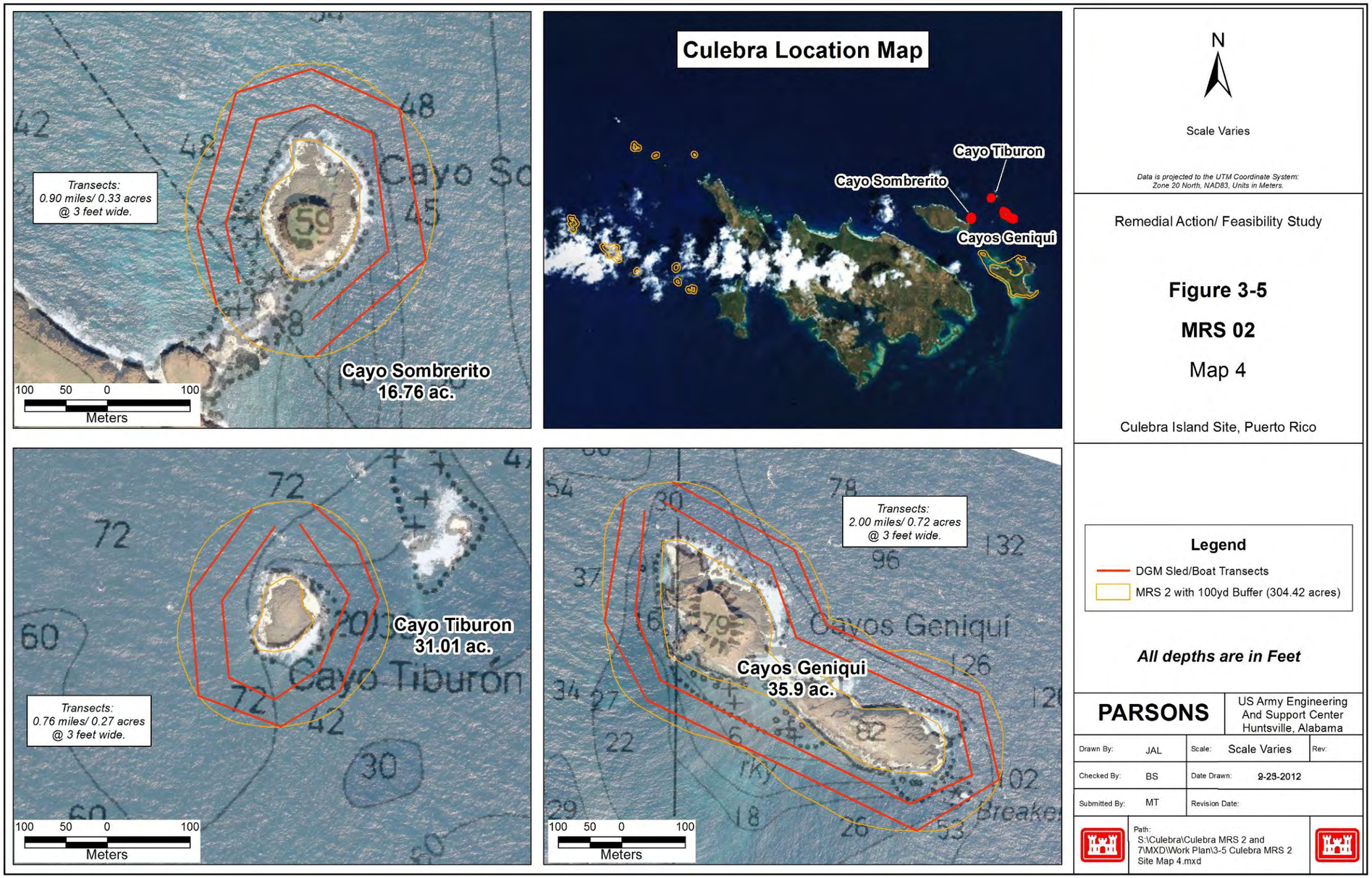

Figure 3-5: Environmental Baseline Survey Coverage Map 4

3.3 HYDROGRAPHIC SURVEY

Parsons/USA will subcontract to ASI to conduct hydrographic surveys including MBS and SSS survey. Hydrographic surveys will meet the DQOs stated in Table 3-1. The primary use of the collected hydrographic data will be to create benthic maps for referencing in subsequent project activities (underwater geophysical and intrusive investigations). Hydrographic data will be used to determine the appropriate geophysical survey platform to be deployed in subsequent investigation areas. The data from the preliminary survey and previous underwater visual surveys will be used to refine geophysical survey transects to minimize environmental impact.

Hydrographic surveys conducted on survey vessels will be limited to areas and depths as defined in Table 3-1 and will meet the IHO Order 1 Standard. Data from all shallow water depths will be collected by a snorkeling team as part of the shallow water survey activities outlined in Section 3.5 of this WP.

Hydrographic surveys will be conducted aboard a 30-ft fiberglass UNIFLITE (Parker type hull) with a 10-ft wide beam and drafts 2.5-ft. The vessel Captain is licensed by the USCG to operate 100-ton vessels. All safety equipment is certified by the USCG. The survey vessel has a forward cabin where equipment can be stored and utilized in case of rain or bad weather. An on-board 5 kW diesel generator will supply the required power. The survey vessel utilizes a Garmin 3010 GPS with radar and depth finder. In addition, a 17-ft Boston Whaler center console boat will serve as a support vessel to aid with GPS survey equipment (signal repeater) and to provide exclusion zone control while conducting surveys (to protect towfish cables from being cut by other vessels). All boats will utilize existing mooring buoys or will utilize the anchoring procedures outlined in this WP and Appendix M. Beach/turtle nest monitoring will be conducted in accordance with Appendix M.

3.3.1 MULTI-BEAM BATHYMETRY SURVEY AND SIDE SCAN SONAR

MBS and SSS technologies will be utilized to collect the data necessary to produce the hydrographic survey. Surveys will be conducted from a vessel within the water areas of each MRS in order to determine the actual water depths within the survey area and detect potential hazards (coral reefs or rock outcrops) for the geophysical survey equipment (Underwater EM System). A multi-beam fathometer will be deployed to collect water depth data. A SSS system will be used to acoustically image the seafloor to detect the presence of obstructions, debris, and help locate environmentally sensitive areas. Data from these surveys and previously collected underwater visual survey data will be used to refine EM survey transects to minimize environmental impact as well as to help assure the appropriate geophysical equipment is deployed during subsequent RI field work. Hydrographic data will also be used to create benthic maps for referencing in other project activities.

3.3.2 HYDROGRAPHIC SURVEY PROCEDURES

The following paragraphs present the procedures for conducting MBS and SSS activities. A review of the appropriate Standard Operating Procedures (SOPs) including operational and endangered species mitigation procedures will be conducted prior to commencement of survey work. Appendix K contains the operational SOPs related to conducting survey activities. Appendix M contains the *SOPs for Endangered Species Conservation and their Critical Habitat during underwater investigations at DERP-FUDS property No. I02PR0068, Culebra Island, Puerto Rico (CESAJ, 2012)*. Adherence to these SOPs will be strictly enforced.

3.3.2.1 Pre-Survey Preparation

Prior to commencing MBS operations, the survey team will review applicable ESA requirements (Appendix M) related to conducting MBS and SSS activities. The survey team will then assemble the data acquisition computer, real-time kinematic differential GPS (RTK-DGPS), and fathometer. At dockside, the team will verify that each component is installed on the vessel correctly, is working individually, and that the survey control software is receiving data from both instruments. The MBS transducer will be hard

mounted using an adaptable rigid aluminum pole with fore and aft stays. Checks for offsets, if any, will be made between GPS antenna and transducer location.

The RTK-DGPS base station will be established on a control point (certified by a PR Professional Licensed Surveyor [PLS]) located near the project site prior to the vessel leaving dock. All required position QC checks will be performed prior to conducting survey activities.

Prior to conducting MBS survey activities, a comprehensive MBS calibration will be carried out to calibrate the different components of the multi-beam system. The multi-beam calibration accurately measures the angular mounting components of the correction sensors (roll, pitch, and yaw) - errors in these measurements can lead to inaccurate surveys. The calibration test is a data collection and processing procedure to calibrate these angles along with position system latency. Calibrations should be done, at a minimum, at the start and finish of a survey, or whenever the sounder is turned off or conditions in the survey area change. A patch test will be conducted at the start of the survey or if a change in setup is made. A daily QC check will include cross check lines at the end of survey. A check will be conducted for both MBS and SSS speed and will be monitored and remain equal to or less than 4 knots for 90 percent of the time.

Prior to conducting SSS survey activities, the survey team will power up the SSS software and send power to the tow fish and do a "rub" test to ensure both transducers are functioning. The survey team will run a test line and review the quality of the records. Adjustments to gain towfish height, layback, or boat speed may be necessary to obtain the best records possible. On a daily basis, the survey team will tow the sensor past a known target such as a navigational buoy, piling, or other object to ensure the target is detected. Another pass will be made on the same target in the opposite direction to ensure the position at which the target is detected is the same in order to check the layback measurements/calculations.

3.3.2.2 Data Collection Activities

MBS data collection activities will be conducted from the survey vessel within the accessible water areas of each MRS (waters deeper than 4 ft). SSS data will be collected concurrently with MBS along the same survey lines. Survey lines will be established by the survey team based on project maps (Figures 3-1 through 3-5) and NOAA nautical charts. Survey lines will be input into GIS and tracked with the RTK-DPS system by the survey team and vessel operator to ensure survey coverage is adequately maintained during the survey. Coverage will be determined by real-time review of data collected. Data holidays will be tracked as data is collected. Additional transects will be added at that moment to fill in the gaps. Survey lane spacing based on depth will be used as a guideline but due to the possibility of varying depths in a given transect review of data collected will dictate final transects. The target for MBS transect data overlap is a 10%. Survey coverage will meet the project DQOs for 100% coverage of the accessible water areas within the MRS. The survey team will conduct surveys in accordance with the operational SOPs located in Appendix K. Survey equipment (MBS fathometer/SSS towfish) will not exceed 4-ft in depth or be deployed in areas were corals are observed within 3-ft of the water's surface. For survey areas contained in waters shallower than 4 ft. depth, data will be collected by a snorkeling team as described in Table 3-1 and Section 3.5 of this WP.

3.3.2.2.1 MBS Operation

During survey operations all correction sensor and multi-beam data will be time tagged and logged with the data acquisition system. Two sound velocity profiles will taken by a sound velocimeter to determine the speed of sound in seawater. Correction sensor calibration factors and sensor offsets will be applied as needed during data collection. Sound velocity profile data and tide corrections will be applied at the survey start and as needed real-time.

The survey team will ensure that the line to be surveyed is the active line. Tidal corrections will be recorded if it is not being done automatically. The Vessel operator will begin the approach to the line with sufficient space to ensure a straight entry. The survey team will begin logging data at the start of each survey line. Checks will be periodically made to ensure the data is logging. At the end of the survey line,

logging will be stopped. The previous survey line should increment or decrement to the next survey line to be run.

3.3.2.2.2 SSS Operation

SSS data will be collected concurrently with MBS along the same survey lines. The SSS towfish will be deployed to the appropriate altitude prior to running survey lines. The optimal altitude is based on the range to be used. The towfish should be towed at an altitude above the bottom equal to 8-20 percent of the range which conforms to the USACE guidance and allows for more flexibility on SSS altitude. Given that the cable is being adjusted by hand rather than winch, real time minute adjustments are not possible in order to keep a constant height above bottom. The amount of cable fed out will be measured with each additional meter taken in/out (as required) for layback calculations. Layback should be set either using the Hypack Towfish driver or manually calculating the layback and entering this into the survey software and SSS software. At no time will the towfish be deployed within 4 vertical feet of coral, however the towfish can be operated closer to seagrass beds than 4 vertical feet (within 1-2 ft as long as operator can raise the depth rapidly if there are areas with coral heads or other structures in seagrass beds). The vessel operator will constantly monitor and stay clear of coral reef areas. The winch operator/cable tender will be in constant communication with the surveyors. He will also be able to see towfish altitude data from the SSS unit. In shallow waters the SSS will be suspended below the bow of the vessel as near to the surface as possible. This will allow it to have a maximum detection range on both sides without interference from the hull of the vessel. Data will be collected at all times possible while the SSS towfish is deployed.

An Edgetech 4125, Klein 3900, or approved equal dual frequency SSS unit will be used with a 400/900 kHz high resolution towfish. Range scale will be initially set to 50 meters for general surveying. In shallow water areas or areas of special interest, the range will be decreased to 25 meters. Across track resolution for the unit is 2.3 cm at 400 kHz and 1.5 cm at 900 kHz. Horizontal beam width is 0.46° at 400 kHz and 0.28° at 900 kHz.

The survey team will begin logging data at the start of each survey line. Checks will be periodically made to ensure the data is logging. Logging will be stopped at the end of the survey line. The previous survey line should increment or decrement to the next survey line to be run.

3.3.2.2.3 Vessel Operation Practices

The vessel operator will carry and consult appropriate NOAA nautical charts, NOAA benthic habitat maps, and aerial photographs (Figure 3-1 through Figure 3-2) to locate potential coral reefs, colonized hard bottom, and seagrass areas. Combining information from aerial photographs with hydrographic data will help to ensure that nautical charts are accurate. The vessel operator and survey team will maintain a vigilant watch for coral reefs, colonized hard bottom, and seagrass areas to avoid running aground or striking protected species. Real-time data (e.g., GPS with nautical chart and depth finder on boat) will be continuously observed to verify water depths and vessel location. From the water's surface, some coral areas may appear golden-brown. These areas will be avoided to keep from running aground. The vessel operator will stay at a minimum the depths specified in Table 3-1 to avoid accidental grounding, propeller wash, and propeller scarring. Vessels will be maintained away from areas with corals and sea grasses. Operations will be conducted in such a manner that bottom scour or propeller dredging will be avoided at all times. The vessel operator and survey team will consult Appendix M, which provides further details on endangered species and critical habitat mitigation measures related to vessel and equipment operation.

3.3.2.3 Hydrographic Data Processing and Data Deliverables

3.3.2.3.1 Processing Multi-beam Data:

Following the survey, the multi-beam data will be processed and X, Y, Z files and color shaded relief geotiffs will be created. Processing the multi-beam data will include applying tide corrections based on RTK-DGPS elevations or a manual tide file and sound velocity corrections to the raw data. Offsets will be adjusted if they were not accounted for in acquisition or something changed during the survey. The data will then be checked for outliers in both the multi-beam and positioning data in both profile and swath modes. These erroneous data points will be removed and all good data points will be kept. Once all corrections have been made, an appropriate cell size will be determined and data will be reduced to make file sizes manageable without compromising targets of interest. The X, Y, Z file will then be used to create a TIN model and color shaded relief geotiffs for integration into GIS software and further interpretation.

3.3.2.3.2 Processing SSS Data:

Following the survey, the individual SSS records will be played back and imported into Chesapeake Technologies Sonar Wiz Map processing software. Each individual file is bottom tracked through a combination of automated bottom tracking as well as manual inspection of the tracks to insure accurate results. Following bottom tracking, a file or area of a file is found where the bottom is uniform across the swath. In this area, gains are adjusted to level out the intensities of bottom response across the swath. These gain settings are applied to the rest of the file and other data collected. Results are reviewed and minor adjustments may be made to create a uniform mosaic. Layback corrections are applied to the navigation, if not already accounted for during data acquisition. Layback accuracy is checked by reviewing the records for an isolated object and comparing its plotted location on overlapping survey lines acquired in opposite directions. This QC check will be conducted daily. The SSS mosaic is output as a single or multiple geotiffs depending on survey area size as well desired output resolution.

The results of the MBS and SSS survey will be combined in GIS software and analyzed to create maps showing simplified bottom type/habitat classifications. All GIS information will be transmitted to the GIS Manager for incorporation into the project GIS database. Targets of interest might include any potential ordnance items, hazards to navigation, etc.

3.4 UNDERWATER VISUAL SURVEY

Upon completion of hydrographic field activities and acceptance of the Phase 1A deliverable (adjusted transect map), the Underwater Visual Survey Team (Phase 1B) will conduct an underwater visual survey within the water areas of each MRS in order to collect data that satisfy the project DQOs. Data collected during Phase 1B will be combined with data collected in Phase 1A to produce the EBS Report. Visual and positional data will be collected using a combination of a GPS-integrated underwater video system and VideoRay ROV Pro-3 system. The ROV will be coupled with a GPS integrated smart tether. The underwater visual survey will be conducted in accordance with the ROV SOP contained in Appendix K and the environmental mitigation measures set forth in Appendix M.

Where water depths and site conditions allow access by small boat, a pole/hull-mounted underwater video camera will be deployed and monitored as the vessel progresses down each transect. The boat will be accurately maneuvered through the use of a RTK-DGPS-integrated PDA displaying the transect line, while a UXO Technician monitors the video display. Digital video footage is recorded onto a lap top computer, noting the latitude and longitude of the camera position. The ASI marine biologist will monitor the video feed to make preliminary notes of the various underwater benthic habitats. The UXO technician will note any suspected MEC items that may be encountered during the survey. In addition, a post survey review of the video footage will be conducted by the ASI marine biologist, who will compare the visual data to documented underwater benthic habitat descriptions for Puerto Rico (Kendall, et al, 2001).

Items that reflect characteristics of MEC items will be reacquired and investigated further with the ROV, as required, in order to capture the position, record video footage of the item, and document the

surrounding underwater environment. Procedures for ROV operations are detailed in the ROV SOP located in Appendix K.

Where water depths and site conditions do not allow access by small boat, a visual survey will be completed using the VideoRay ROV deployed from shore or support boat situated in deeper surrounding waters.

3.4.1 UNDERWATER STEP OUT PROCEDURE

In the event that a suspected MEC item is encountered along each transect, an expanded survey will be completed within an estimated 100-foot radius of the item (200 ft diameter; 31,415 sq ft; 0.72 acres). The expanded survey is intended to identify any additional MEC items located in close proximity, which may indicate the previous presence of a waterborne target or concentrated aiming point. USACE will be notified in the event that a MEC item is observed and further investigation may be required.

If an additional item/s is located, one additional 100-foot radius will be surveyed (from the position of the item most distant from the initial point) in order to characterize the boundary of the potential area of concentration. The step out process will continue out as far as the MRS boundary. The PDT will approve any step outs located outside of the MRS boundary.

3.4.2 VESSEL OPERATION PRACTICES

The vessel operator will carry and consult appropriate NOAA nautical charts, NOAA benthic habitat maps and aerial photographs (Figure 3-1 through Figure 3-5) to locate potential coral reefs, colonized hard bottom, and seagrass areas. Combining information from aerial photographs with hydrographic data will help to ensure that nautical charts are accurate. The vessel operator and survey team will maintain a vigilant watch for coral reefs, colonized hard bottom, and seagrass areas to avoid running aground or striking protected species. Real-time data (e.g. GPS with nautical chart and depth finder on boat) will be continuously observed to verify water depths and vessel location. From the water's surface, some coral areas may appear golden-brown. These areas will be avoided to keep from running aground. The vessel operator will stay at a minimum of 4 feet from the bottom of the vessel to the top of coral areas to avoid accidental grounding, propeller wash, and propeller scarring. Vessels will be maintained away from areas with corals and sea grasses. Operations will be conducted in such a manner that bottom scour or prop dredging will be avoided when corals or sea grasses are present. The vessel operator and survey team will consult Appendix M, which provides further details on endangered species and critical habitat mitigation measures related to vessel and equipment operation.

3.5 SHALLOW WATER INVESTIGATION AREAS (SNORKELING OPERATIONS)

The primary purpose of snorkeling operations is to collect supplemental EBS data (i.e., depth soundings and visual survey, etc.) within shallow water areas (between 2-ft to 4-ft depths) of the MRSs. No snorkel surveys will be conducted in areas where corals are within 2-ft of the water's surface. Snorkeling activities are to satisfy the project DQOs as established by Table 3-1 by filling in the data gaps from Phase 1A activities (vessel Bourne MBS/SSS surveys). The SP, included in Appendix N, reflects the procedures and methods Parsons/USA will utilize to safely perform snorkeling surveys of the shallow underwater environment in support of subsequent RI activities. In addition to the SP, the snorkeling teams will review all ESA requirements outlined in this WP and in Appendix M. Snorkelers will be briefed on the physical hazards that may be encountered while conducting snorkeling activities such as fire corals, fire worms, etc.

The following is a listing of MRSs intended for underwater survey and investigation within Culebra Island, Puerto Rico:

- MRS 02 Surrounding Cayos
- MRS 07 Culebrita Artillery Impact Area

Snorkeling operations will be focused within these MRSs, and maps reflecting the location, boundaries, water depth, and specific transects are presented in Figures 3-1 through 3-5. Encountered water depths are not expected to be deeper than 4 feet of salt water.

Snorkeling operations will be conducted in order to complete the following tasks:

- Visual surveys of the seafloor to survey marine habitat types
- Visual survey of suspected MEC items
- Collection of related underwater data (water depth, site conditions, etc.)

Snorkelers will complete surveys of the seafloor, advancing along the required distance of idealized transect lines while visually surveying a 5-ft-wide path. Snorkelers will utilize a hand held GPS enabled PDA and handheld depth sounder to collect and record depth information along the survey transects. Snorkelers will also be equipped with underwater digital cameras to photograph the underwater habitat.

In the event that a suspected MEC item is encountered during visual target investigation along each transect, the item will be marked through use of a GPS unit, and the following procedures will be followed:

At no time will the suspected MEC item be handled by hand or with equipment. Locations of suspected MEC items will be reported to USACE. At no time will locations of items be shared outside of the Parsons/USA project team.

- An expanded survey will be completed within an estimated 100-ft radius of the item (200 ft in diameter)
- If an additional item/s is located, one additional 100-ft radius will be surveyed (from the position of the item most distant from the initial point) in order to characterize the boundary of the potential area of concentration.
- No additional expansions of the area will be completed following this second survey.

The expanded survey is intended to identify any additional MEC items located in close proximity, which may indicate the previous presence of a waterborne target or concentration area.

All snorkeling will be planned and performed with the highest consideration of personnel safety, and will account for site weather conditions, surf zone elements, and sufficient support assets.

3.5.1 SAFETY BRIEFS AND SUPERVISOR CHECKS

Parsons/USA will routinely conduct four distinct team safety and operations briefs during execution of snorkeling operations as described in the SP (Appendix N):

- Pre-Snorkeling brief
- Snorkeling Supervisor's Checklist
- Daily Safety Brief
- Post-Snorkeling Debrief

The Pre-Snorkeling Brief will be completed prior to each snorkeling evolution, while a Daily Safety Brief will be completed prior to commencement of each work day. The SS will provide these briefs, highlighting both snorkeling and MEC related safety precautions.

The daily briefs will focus on the specific hazards anticipated at each work site during that day's operations and the safety measures that will be used to eliminate or mitigate those hazards. The briefs will also include review of the ESA avoidance procedures detailed in Appendix M and endangered species training identified in Section 6.3.3.2. Review of applicable Activity Hazard Analysis (AHA) sheets, contained in Attachment 2 of the SP, will also be conducted. The briefs will also refer to other operations within the area whose proximity may have safety ramifications.

As work progresses and the team's location changes within a site, or from site-to-site, any corresponding changes in anticipated hazards or emergency procedures will be reviewed.

In addition, the SS may hold a safety stand-down at any time a degradation of safety or a safety issue that warrants a review is noted.

3.5.2 SUPPORT/SAFETY VESSEL

A support/safety vessel will maneuver in proximity to the snorkelers, with the distance dependent on the conditions/state of the snorkeling site. Maneuvering of the vessel where snorkelers are working will be done in a way such that the vessel operates in a manner (i.e., in adequate depths, doesn't anchor, etc.) that protects natural resources while still supporting the snorkelers. The vessel operator will carry and consult appropriate NOAA nautical charts, NOAA benthic habitat maps and aerial photographs (Figures 3-1 through 3-5) to locate potential coral reefs, colonized hard bottom, and seagrass areas as previously described.

The support/safety vessel will be available during all snorkeling operations in order to quickly respond to any emergencies. If an injured snorkeler is capable of climbing onto the support/safety vessel, the individual will do so and be taken to a shore based location where emergency response personnel will be summoned. If an injured snorkeler is not capable of climbing onto the support/safety vessel, a ring buoy or throw bag will be deployed, and with the assistance of the second snorkeler/assistant, the individual will be carefully towed back to a shore-based location, as required.

3.6 GEOSPATIAL INFORMATION AND ELECTRONIC SUBMITTALS

This chapter details procedures that Parsons/USA will use to perform mapping and GIS integration during the EBS field activities. This plan was developed in accordance with DID WERS-007.01.

3.6.1 ACCURACY

Parsons/USA will establish survey control on the site using Class I, Third Order control monuments. The horizontal control will be based on either the English or the metric system and reference the North American Datum of 1983 (NAD83) and the Universal Transverse Mercator (UTM) Grid System. Any control points established or recovered will be constructed of iron or steel pins, concrete monuments, or other permanent construction method meeting the standards found in Engineer Manual (EM) 1110-1-1002. This construction will ensure recoverability for any current or future work at the site. Parsons/USA will use a PLS registered in Puerto Rico to install control points. The northing and easting (X and Y) coordinates for all control points will be presented in a certified letter or drawing at the completion of the project. The PLS will provide all required data and include the project-specific coordinate system, datum, and units (e.g., UTM Coordinate System, Zone 17 North, NAD83, and units in meters).

3.6.2 GIS INCORPORATION

The GIS database will be maintained at the USA corporate office located in Oldsmar, Florida. The GIS Manager will manage the database, which is used to store preliminary and final or published versions of the project GIS data. The GIS manager will also coordinate positional data generated by ASI's MBS/SSS team. This database is the official project repository of GIS data, including unprocessed feature and attribute data sources that may be used outside the GIS. The Oldsmar-based database is the main location for processing data sources into draft and final GIS products, as well as for production work.

The GIS Manager will produce ArcGIS Projects in accordance with the PWS and DID WERS-007.01, and will update the GIS as often as necessary to enable planning and coordination of daily, weekly, and monthly activities. The ArcGIS project will be prepared in ArcGIS 9.x format and be compatible with ArcGIS 9.1.

Suspected underwater MEC items will have the original coordinates documented within the GIS. The layers will be completely independent and produce a concise picture of all clearance activities completed

during this contract. Supporting tabular data will be provided in Microsoft Excel and/or Microsoft Access format at the completion of the project.

Throughout the project, Parsons/USA will build the GIS database upon existing data and integrate the field data into the system. To enhance accuracy of the field data, Parsons/USA through ASI will collect the field data using a ruggedized handheld GPS and electronic data collection system, as required. Project data will be downloaded on site on a daily basis and digitally transferred to Parsons and USA's home offices on at least a weekly basis. Upon receipt of the field data, the GIS Manager will perform an accuracy inspection of the data and import this data into the project GIS.

All GIS data will be in ESRI Shapefile or Geodatabase format. Raster data such as orthophotography will be in Tagged Image File Format (TIFF) or MrSID- compliant format. Associated databases will be in Microsoft Excel format.

3.6.3 PLOTTING

All control points recovered or established will be plotted at the appropriate scale for the parcel being described. Parcels less than 10 acres will be plotted at 1:200. Parcels 10-100 acres will be plotted at 1:600 (1" = 50'). Parcels larger than 100 acres will be plotted at 1:2400 (1" = 200'). A sheet index for the project will be prepared that includes enough of the planimetric data to indicate the sheet's geographical location in the project area. This index will be shown on each map with the current sheet crossed-hatched or heavily outlined. If required, a separate sheet file may be utilized for the index.

3.6.4 MAPPING

The location, identification, coordinates, and elevations of all control points recovered or established at the site will be plotted on a map. Control points will be identified on the map by its name and number and the final adjusted coordinates and elevations. The coordinates for points of interest will be shown to the closest 1-ft. Maps will have a revision block, title block, index sheet layout, legend, grid lines, scale bar, and a true north arrow. In general, the direction of north will run from the bottom of the file to the top, with no skew. A legend showing the standard symbols used for mapping will be on the map as well as a map index showing the site in relation to all other sites within the project boundary.

3.6.5 DIGITAL DESIGN DATA

All GIS Data will be delivered in ESRI Shapefile format. A READ ME file will be included with delivered data, which will contain basic information about each Shapefile.

3.6.6 COMPUTER FILES AND DIGITAL DATA SHEETS

All final document files will be delivered to USAESCH in IBM and MS Office compatible formats. The drawing and plot data will be provided in the UTM Coordinate System, NAD83, and units in meters. GIS data will be submitted in ESRI Arc Map-compatible format. Raster data, such as USGS Topographic Quadrangles or Orthophotography will be provided in either TIFF or MrSID format. All ArcGIS project files (.mxd) will be supplied with the appropriate final report. In addition to GIS data and project files, maps will be delivered in PDF format for viewing without modification.

All final GIS data generated from this project will conform to the Spatial Data Standards for Facilities, Infrastructure and Environment.

3.7 PERSONNEL QUALIFICATIONS

As required by the specific task, all Parsons/USA and ASI personnel will complete the OSHA 40-hour training course for hazardous waste site workers and an 8-hour refresher course, as appropriate. Management and supervisory personnel will also complete supervisory training and refresher training as required by CFR 1910.120 e (4) & (8). Additional site-specific training, in accordance with 29 CFR 1910.120, EM 385-1-1 (USACE Safety and Health Requirements Manual), and ER 385-1-92 (Safety and

Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste [HTRW] Activities) will be provided to all personnel upon their initial mobilization. A Medical Surveillance Program is in place with the latest examination within the last 12 months.

In addition and in accordance with Appendix M, personnel assigned as marine observers will be qualified to monitor sea turtles and marine mammals and will follow/enforce the established mitigation procedures in the ESA SOP that include providing briefings for vessel and towfish operators.

3.7.1 UXO PERSONNEL QUALIFICATIONS

The Parsons/USA Underwater Visual Survey Team will include a UXOTIII. UXO personnel must meet the requirements set forth in DoD Explosives Safety Board (DDESB) Technical Paper (TP) 18, Personnel/Work Standards. UXO personnel will be U.S. citizens and graduates of the U.S. Naval EOD School, Eglin AFB, Florida; the U.S. Army Bomb Disposal School, Aberdeen Proving Ground, Maryland; the U.S. Naval EOD School, Indian Head, Maryland; the EOD Assistants Course, Redstone Arsenal, Alabama; the EOD Assistants Course, Eglin AFB, FL or a DoD-Certified equivalent course. Credit for the EOD experience while assigned to the National Guard or Reserve will be based on the actual documented time spent on active duty, not on the total time of service.

3.7.2 SNORKELING PERSONNEL QUALIFICATIONS

All UXO technicians, marine scientist, and other personnel functioning as survey snorkelers will be qualified as open water divers by a nationally recognized organization, to include the following:

- Professional Association of Diving Instructors
- National Association of Underwater Instructors
- U.S. Navy Diving and Salvage Training Center
- U.S. Forest Service Snorkel Safety Program.

In addition, all UXO Technician/survey snorkelers will also meet the applicable requirements of DDESB TP-18 for the related position as previously described.

The SS will maintain personnel files on each snorkeler, to include copies of qualifications, training records, and certificates of qualifications that support the individual's placement and position. Prior to initial assignment or any change in duties/assignment, the SS will review the individual's qualifications, training records, and certificates to ensure that the individual is qualified to perform required tasks.

3.8 TIME CRITICAL REMOVAL ACTIONS

The procedures outlined in this WP apply to conducting field activities associated with the EBS. Should circumstances justify the need for a Time Critical Removal Action, Parsons/USA will develop procedures at the direction of the Contracting Officer in accordance with USACE guidance.

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4.0 QUALITY CONTROL PLAN

4.1 INTRODUCTION

Parsons recognizes that the USACE is responsible for quality assurance (QA); however, Parsons also has a QA process that starts with top management's commitment and involvement. The process provides a permanent and workable system that allows each employee to understand the job performance expected. The Parsons QA and improvement process ensures that every employee is supported by the actions, procedures, tools, and training required to perform a job according to the requirements. By promoting teamwork and by focusing attention on the solutions, the quality of work can be increased and assured throughout the project.

Parsons Corporation Quality Policy

We are committed to providing quality services and products. We will, as a corporation and as individuals, meet the mutually agreed-to requirements the first time and strive for continuous improvement of our work processes.

The Parsons' QA Policy is based on the work and concepts of several recognized authorities on quality management in the United States, especially Mr. Philip Crosby, Dr. W.E. Deming, and Dr. J.M Juran. These three experts each have different methods of addressing and resolving problems. Parsons has taken unique portions of their concepts and has tailored them to corporate work processes. As a result, Parsons has placed a greater emphasis on the actual elements pertaining to work processes, project requirements, and lessons learned from past performances. These concepts have been developed into a systematic and practical approach for improving quality.

Generally, Parsons' QA Policy relies on four fundamentals, termed the "absolutes of quality". They answer these questions:

- What is quality? Conformance to Requirements
- How do we achieve it? *Prevention*
- What is our performance standard? *Zero defects*
- How can we measure quality? *Cost of Doing Things Wrong*.

The Quality Control (QC) process provides a permanent and workable system that allows each employee to understand the job performance expected within the assigned task. The QC and improvement process ensures that the training, actions, procedures, and tools support every employee according to the requirements and in such a manner that we protect the environment and minimize the impact of the project activities. Checklists have been developed to ensure that critical elements are addressed and that QC checks are documented for compliance with the WP, SOPs, policies and procedures. By promoting teamwork and by focusing attention on the solutions, the quality of work is increased and assured throughout the project.

This QC Plan (QCP) provides the procedures and methods to be used for the field activities within the selected work areas. This plan addresses organizations and responsibilities, DQOs, QC test methods, audit procedures and pass/fail criteria, field operations, equipment testing maintenance and calibration, QC inspections, and of generated records reporting procedures. The QCP outlines procedures to ensure all personnel meet the qualification requirements and receive the site-specific training to perform the duties of the job for which they were hired and site-specific training requirements for visitors. The QCP also describes how lessons learned are captured, documented and submitted to the Government.

Parsons will use the data collected during the overall EBS activities for inclusion in the Final EBSR at the completion of this phase (Phase I) of the project.

4.2 QUALITY MANAGEMENT STRUCTURE

The following paragraphs describe the organizational structure of the Parsons/USA Quality Management Team during operations at the project site. Names and qualifications of site personnel will be provided prior to mobilization.

4.2.1 PROJECT QUALITY CONTROL MANAGER

The Project QC Manager is responsible for reviewing and updating the QCP and verifying compliance with the plan. The Project QC Manager verifies compliance with the QCP by auditing project activities and instituting corrective actions. For this project, the UXOSO and UXOQCS is a dual-hatted position. The Project QC Manager has the following responsibilities:

- Preparation of project QC policies and procedures
- Ensuring timely submission of contract deliverables
- Providing training and assistance to the site project UXOSO/UXOQCS
- Reviewing employee qualification records to ensure accuracy
- Conducting periodic field audits of sites, programs, and projects project activities to ensure QC compliance.

4.2.2 PROJECT MANAGER

The PM is responsible for the overall performance during this project. The PM will develop and implement the site WP and also has the following responsibilities:

- Serve as primary point of contract with the USACE PM
- Monitor project performance, safety, quality, cost, and schedule
- Ensure timely submission of contract deliverables
- Report directly to the Program Manager

4.2.3 SITE MANAGER/SENIOR UXO SUPERVISOR (SM/SUXOS)

The SM/SUXOS is responsible for the day-to-day field operations at the project site. The SM/SUXOS reports directly to the TM and has the following responsibilities:

- Implementation of work plan and QC policies and procedures
- Reporting to the TM on effectiveness, adequacy, and status of the project
- Ensuring the timely submission of contract deliverables
- Coordinating with project personnel for site tasking and schedules
- Reviewing any failures and implementing corrective actions
- Implementing additional guidelines used to assist in the development of site and task specific policies and procedures.

4.2.4 UXO SAFETY OFFICER/UXO QUALITY CONTROL SPECIALIST (UXOSO/UXOQCS)

The UXOSO/UXOQCS is responsible for overseeing the site QCP in all field operations. The UXOSO/UXOQCS will be trained in QC techniques methodology and be qualified as a UXOTIII. The UXOSO/UXOQCS coordinates with the TM for daily operations and maintains a direct line of communication to the PM and SM/SUXOS. The UXOSO/UXOQCS reports directly to the Project QC Manager and has the following responsibilities:

- Reviewing, implementing, and enforcing the QCP
- Coordinating with the USACE QA representative to ensure DQOs are appropriate for the task being performed
- Coordinating with the Project QC Manager to ensure QC procedures are appropriate in demonstrating validity sufficient to meet QC objectives
- Performing periodic audits of USA's performance under the contract
- Assisting the Project QC Manager in Root Cause Analysis
- Recommending to the PM and Project QC Manager any actions to be taken in the event of a QC failure
- Maintaining a Lessons Learned log
- Has STOP WORK authority for issues regarding QC and safety at the project site
- Conducting QC inspections of documents, work in progress, work performed, and monitoring; Recording and reporting the results to the appropriate personnel
- Ensuring classification of MEC-related items
- Advising the SM/SUXOS and Survey Teams on all QC-related site matters
- Reporting non-compliance with QC criteria to the project personnel and the Project QC Manager.

4.3 DATA QUALITY OBJECTIVES

Data obtained during the EBS field operations must support the decision-making process. Consequently, data must be of a sufficient quantity and quality to make defensible decisions to provide an acceptable level of certainty for the decision maker(s). The project DQOs are identified in Table 3-1.

4.4 QUALITY CONTROL TEST METHODS AND AUDIT PROCEDURES

This section discusses QC methods and procedures used during project operations.

4.4.1 INSPECTIONS

Parsons/USA will conduct inspections to verify whether quality-related activities comply with this QCP. A list of the audit procedures based on the Definable Features of Work (DFWs) is provided in Table 4-1. Internal inspections will address activities performed by the project team. External inspections will address activities performed by project subcontractors, laboratories, and equipment and material suppliers.

The UXOSO/UXOQCS will implement the three-phase control process for each of the DFW in Table 4-1 to audit/inspect the subtasks for compliance with the approved WP, SOPs, and DQOs. The three-phase control process includes the preparatory, initial, and follow-up phase audits/inspections. The inspections are documented using the QC Surveillance Forms prepared for each DFW (located in Appendix F).

4.4.1.1 Preparatory Phase

A preparatory phase inspection is performed prior to the beginning of work on each DFW. The UXOSO/UXOQCS will review the DFW scope and applicable specifications (DQOs) and verify that the necessary resources, controls and conditions are in place and compliant with the WP before the work activities begin.

4.4.1.2 Initial Phase

The UXOSO/UXOQCS performs an initial phase inspection for each DFW once a representative sample of the work has been completed. The purpose of this inspection is to check the preliminary work for compliance with procedures and contract specifications, to verify through inspection and testing the

acceptable level of workmanship. The UXOSO/UXOQCS will review the preparatory phase QC Surveillance Forms to check for omissions and resolve any differences of interpretation by project personnel and the contract requirements.

4.4.1.3 Follow-up Phase

The UXOSO/UXOQCS performs a follow-up phase inspection periodically while work progresses for each DFW. The frequency of the follow-up phase is specified by DFW in Table 4-1. The purpose of the inspection is to ensure continuous compliance and an acceptable level of workmanship. The UXOSO/UXOQCS will observe the same activities as under the initial inspection and ensure that discrepancies between site practices and approved specifications are identified and resolved. Corrective actions for unsatisfactory conditions or practices will be verified by the UXOSO/UXOQCS prior to continuing work on the affected DFW.

The inspection program is established to provide the following:

- An objective and independent evaluation of compliance with established policies and procedures (WP, SOPs, AHAs, etc.)
- A mechanism for verifying the implementation of corrective actions recommended as the result of inspections.

Personnel performing QC inspections are knowledgeable about and have received training in QC techniques and methodologies, this QCP, and applicable regulations. They will also be technically knowledgeable of the processes being inspected. Inspections will be performed in accordance with written procedures or checklists. Personnel performing QC inspections will not have direct responsibilities in the areas they are assessing.

System and performance inspections will be undertaken. System inspections will evaluate the components of the QC system including evaluating items such as approach and adequacy of the preparation step, inspection of the schedules and plan delivery dates, and tracking systems for QC activities. Performance inspections evaluate actual QC activities such as design control, on-site data gathering, calibration and control, inspection and testing activities, and documentation.

Inspecting QC personnel will document inspection results, which will be reviewed by the PM. When unsatisfactory or nonconforming conditions or items are found, the responsible organization will implement corrective actions in a timely manner. Previously unsatisfactory areas will be re-inspected to ensure that satisfactory corrective actions have been completed. The results of the inspections will be shared with the team with regard to needed rework and lessons learned.

Records of all inspections will be maintained and controlled as QC records.

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Table 4-1: Definable Features of Work Audit Procedures

Definable Feature of Work	Reference	Audit Procedures	QC Phase	Frequency of Audit	Pass/Fail Criteria	Action if Failure Occurs
1. Mobilization of Equipment, Supplies, and Personnel & Site Training	WP Section 3.7	Visual Observation and Document Review	PP/IP/FP	Once and Follow-up as Required	All personnel required for the work activities have been identified, are available, and meet the requirements and qualifications for the positions or waivers from the USAESCH have been obtained.	Document deficiency and report to SM/SUXOS for resolution, follow-up to verify compliance before personnel are assigned project tasks
	WP Section 3.7	Visual Observation and Document Review	PP/IP/FP	Once and Follow-up as Required	All personnel are properly trained and certified to operate equipment and machinery.	Document deficiency and report to SM/SUXOS for resolution, follow-up to verify compliance before personnel operate equipment and machinery
	WP and APP	Document Review	PP/IP/FP	Once and Follow-up as Personnel are added	All field personnel have reviewed the WP and the APP.	Document deficiency and report to SM/SUXOS for resolution, follow-up to verify compliance before personnel commence assigned project tasks
	APP	Document Review	PP/IP/FP	Once and Follow-up as Personnel are added	All personnel have signed the Employee Sign-off Forms for the SSHP, the Certificate of PPE training and that all AHAs have been completed.	Document deficiency and report to SM/SUXOS for resolution, follow-up to verify compliance before personnel commence assigned project tasks
	APP	Document Review	PP/IP/FP	Once and Follow-up as Material is Introduced to Project	Material Safety Data Sheets are available onsite for all hazardous materials used or encountered onsite	Document deficiency and report to SM/SUXOS for resolution, follow-up to verify compliance before personnel are exposed to the hazardous material of concern
	WP Section 2.6 Project Schedule	Visual Observation and Document Review	PP/IP/FP	Once and Follow-up as Required	All equipment is received on island as needed to support the project schedule.	Document deficiency and report to SM/SUXOS for resolution

Definable Feature of Work	Reference	Audit Procedures	QC Phase	Frequency of Audit	Pass/Fail Criteria	Action if Failure Occurs
	WP Sections 3.3 and 3.4	Visual Observation and Document Review	PP/IP/FP	Once and Follow-up as Required	All required equipment is functional, properly calibrated, and complies with contract specifications.	Document deficiency, ensure any faulty equipment is pulled from service and report to SM/SUXOS for resolution, follow-up to verify compliance
	WP Section 2.2	Document Review	PP/IP/FP	Once	Coordination is performed with personnel on Culebra, FWS, DNER, PREQB, the U.S. Coast Guard, FAA and USAESCH.	Document deficiency and report to SM/SUXOS for resolution prior to initiating project tasks
2. Preparation of the Work Areas and Staging Areas	WP Section 2.11	Document Review	PP/IP/FP	Once and Follow-up as Required	Coordination with support facilities has been conducted.	Document deficiency and report to SM/SUXOS for resolution prior to initiating project tasks
	SSHP	Visual Observation and Document Review	PP/IP/FP	Daily	Work zones and exclusion zones (EZ) are properly established.	Document deficiency and report to SM/SUXOS for resolution prior to initiating project tasks
	SSHP	Visual Observation and Document Review	PP/IP/FP	Weekly	Break and rest areas established in accordance with reference.	Document deficiency and report to SM/SUXOS for resolution prior to initiating project tasks
3. Hydrographic Surveys	WP Section 3.3 and SOPs (App. K)	Visual Observation and Document Review	PP/IP/FP	Daily as Required	Pre-operations checks performed on MBS and SSS equipment and positioning equipment used to collect data	Document deficiency and report to SM/SUXOS for resolution, follow-up to verify compliance
	WP Section 3.3 and SOPs (App. K)	Visual Observation and Document Review	PP/IP/FP	Daily as Required	Hydrographic survey data collection activities	Document deficiency and report to SM/SUXOS for resolution, follow-up to verify compliance
	WP Section 3.3 and SOPs (App. K)	Visual Observation and Document Review	PP/IP/FP	Daily as Required	Post-operations checks of MBS/ SSS equipment and positioning equipment	Document deficiency and report to SM/SUXOS for resolution, follow-up to verify compliance

Definable Feature of Work	Reference	Audit Procedures	QC Phase	Frequency of Audit	Pass/Fail Criteria	Action if Failure Occurs
4. Underwater Visual Investigation	App K SOPs	Visual Observation and Document Review	PP/IP/FP	Daily as Required	Pre-operations checks performed on ROV and other equipment used to collect underwater data	Document deficiency and report to SM/SUXOS for resolution, follow-up to verify compliance
	WP Section 3.4	Visual Observation and Document Review	PP/IP/FP	Daily as Required	Expanded survey conducted on MEC like items using the ROV	Document deficiency and report to SM/SUXOS for resolution, follow-up to verify compliance
	App K SOPs	Visual Observation and Document Review	PP/IP/FP	Daily as Required	Post-operations checks performed on ROV and other equipment used to collect underwater data	Document deficiency and report to SM/SUXOS for resolution, follow-up to verify compliance
	WP Section 3.5 and SOPs (App N)	Visual Observation and Document Review	PP/IP/FP	Daily as Required	Pre-operations checks performed on PDA/GPS and other equipment used to collect underwater data	Document deficiency and report to SS for resolution, follow-up to verify compliance
	WP Section 3.5 and SOPs (App N)	Visual Observation and Document Review	PP/IP/FP	Daily as Required	Expanded survey conducted within identified shallow water coverage areas.	Document deficiency and report to SS for resolution, follow-up to verify compliance
	WP Section 3.5 and SOPs (App N)	Visual Observation and Document Review	PP/IP/FP	Daily as Required	Post-operations checks performed on PDA/GPS and other equipment used to collect underwater data	Document deficiency and report to SS for resolution, follow-up to verify compliance
5. Project Reporting and Submittals	WP Section 2.7 and PWS	Visual Observation and Document Review	PP/IP/FP	Weekly	PSRs are reviewed for accuracy and thoroughness IAW the PWS	Document deficiency and report to SM/SUXOS for resolution, follow-up to verify compliance
	WP Section 2.7 and PWS	Visual Observation and Document Review	PP/IP/FP	Prior to submittal of report	The records of telephone conversations, written correspondence concerning this TO and meeting minutes are attached to the PSR IAW DID WERS-016.02	Document deficiency and report to SM/SUXOS and PM for resolution, follow-up to verify compliance

4.4.2 DEFICIENCY MANAGEMENT

All deficiencies or nonconforming conditions (as defined in the pass/fail criteria in Table 4-1) discovered during inspections or other QC functions will be noted on a Deficiency Notice (DN) form. The DN will identify, at a minimum, any corrective action required, the individuals reviewing and approving the actions, and the actions taken to prevent recurrence. A DN Log will be maintained to document and track corrective actions to closure and be included in the EBSR. The UXOSO/UXOQCS will be responsible for tracking deficiencies to closure and reporting their status on daily reports and log forms (see Appendix F for the DN and DN Log forms).

4.4.2.1 Root Cause Analysis

The UXOSO/UXOQCS will conduct a root cause analysis to determine if the failure is the result of the process, procedures, equipment and/or personnel and to what extent of previously performed work may have been affected by the failure. The UXOSO/UXOQCS will provide his findings to the PM and Project QC Manager with suggested or required corrective actions. Once approved by management, the team will implement the corrective actions. The Root Cause Analysis and corrective actions will be attached to the weekly QC report. Figure 4-1 illustrates the flow of the root cause and effect process that the UXOSO/UXOQCS will use to determine failure causes.

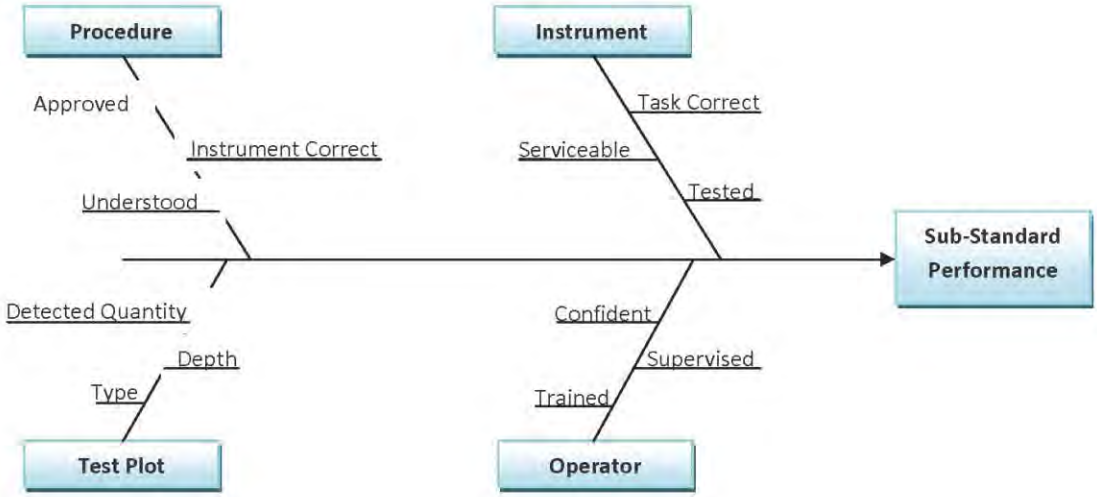

Figure 4-1: Cause and Effect Process

4.4.2.2 Corrective Actions

Following the root cause analysis and approval of corrective actions by management, project personnel will implement these actions to correct the problem. Potential remedies to be considered may include the following:

- Supplemental training of personnel
- Changes of equipment or modification of equipment currently in use
- Acquisition of supplemental equipment

- Implementation of new procedures or modification of existing procedures
- Changes in QC procedures.

The UXOSO/UXOQCS will document the application of the corrective actions on the DN. Through follow-up phase surveillance, the UXOSO/UXOQCS will verify that the corrective action implemented has rectified the deficient condition and is sufficient to prevent recurrence.

4.5 FIELD QUALITY CONTROL INSPECTIONS, AUDITS AND REPORTS

The UXOSO/UXOQCS is responsible for verifying that site personnel perform operational checks of instruments and equipment prior to using them onsite. The UXOSO/UXOQCS will periodically check the project logbooks listed below to ensure the log entries are complete and accurate. Inspections will be performed daily at random, with unscheduled checks of the site in general to ensure personnel accomplish all work as specified in the Work Plan. The UXOSO/UXOQCS will utilize the process outlined in Figure 4-2, Quality Control Process, and Table 4-1, Definable Features of Work Audit Procedures, to ensure all field tasks meet quality standards prior to submittal for the QA process. The UXOSO/UXOQCS will submit a report to the Site Manager detailing the results of these checks.

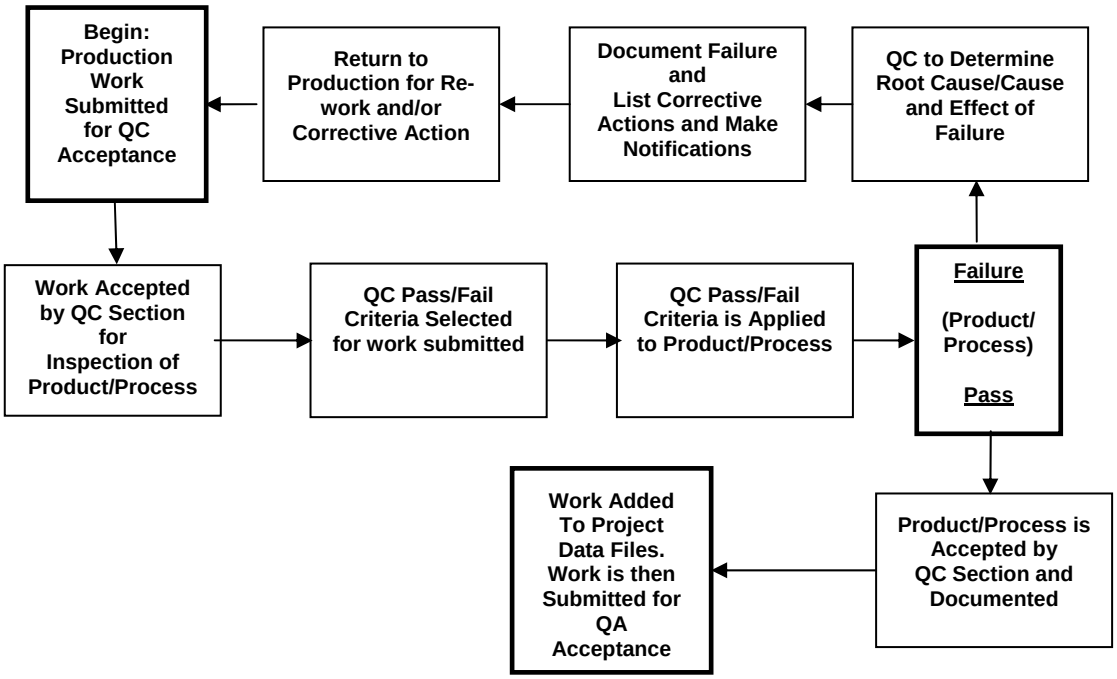

Figure 4-2: Quality Control Process

4.5.1 EQUIPMENT TESTING PROCEDURES AND FREQUENCY

Instruments and equipment, such as navigational, video, and data analysis and transfer systems, used to gather and generate site specific data (e.g., GPS, MBS/SSS data parameters) to support the field activities, will be tested with sufficient frequency and in such a manner as to ensure that accuracy and reproducibility of results are consistent with the manufacturer's specifications. Instruments or equipment failing to meet the standard will be repaired, recalibrated, or replaced. Replaced instruments or equipment must meet the same specifications for accuracy and precision as the item removed from service. Operator proficiency will also be evaluated regularly for proper instrument set up, operation, survey technique, and data transfer. Items such as cellular telephones and radios will be tested for serviceability

at the start of each workday. Results of these tests will be recorded in the Daily Log. Items failing these tests will be repaired or replaced prior to operations commencing.

4.5.2 CALIBRATION

The UXOSO/UXOQCS will coordinate with the ASI survey team to check and ensure that MBS and SSS equipment are calibrated or recalibrated in accordance with the applicable SOPs and manufacturer's recommendation or owner's manuals. Calibrations will be completed on a prescribed schedule and the calibration results recorded in the daily field logbook.

Recalibration will be performed as necessary with the reason for the recalibration and the results recorded in the daily field logbook.

4.5.3 MAINTENANCE

The UXOSO/UXOQCS will check field logbooks to ensure that maintenance of vehicles and equipment are performed on a regular schedule and in accordance with the manufacturer's recommendation or owner's manual for equipment requiring regular upkeep.

Parsons/USA will coordinate scheduled maintenance of the following equipment in accordance with manufacturer recommendations or the owner's manual.

- Vehicles
- Vessels (Boats)
- VideoRay Pro -3 ROV
- MBS Fathometer Equipment
- SSS Towfish Transponder
- Data Acquisition Systems
- Personal Protective Equipment (PPE)
- Communications Equipment
- RTK-DGPS Equipment and PDA
- Emergency Equipment.

Replacement equipment will meet the same specifications for accuracy and sensitivity as the equipment removed from service. Repair or replacement of parts will meet the manufacturers' requirements, specifications, and recommendations and will be installed by personnel authorized to replace parts or make repairs. Records pertaining to the testing, repair, or replacement of instruments and equipment will be documented by and maintained on site by the UXOSO/UXOQCS.

4.5.4 LOGS AND RECORDS

Activity Logs will be maintained daily, as applicable; all entries will be in ink. Logbooks will be bound and pages consecutively numbered. Logbooks and records may be supplemented by the use of preprinted forms (e.g., safety inspection forms, tailgate safety briefings, etc). These forms help to ensure uniformity of activities being conducted, inspected, and reviewed. Forms are located in Appendix F of the work plan.

4.5.5 UXO QUALITY CONTROL REPORT

The UXOSO/UXOQCS prepares daily QC Report and a weekly QC Report (the report forms are located in Appendix F). These documents are kept on-site. The weekly QC Report is submitted to the PM for distribution to the appropriate personnel. This report includes the following information:

- The periodic assessments of work performed
- Significant QA/QC problems and corrective actions taken
- Conformance or non-compliance issues
- Work progress
- Lessons learned, and change recommendations
- Signature of the UXOSO/UXOQCS.

4.5.5.1 Daily Journal

The Daily Journal will be maintained by the SM/SUXOS; this journal provides a summary of all operations conducted on site, to include:

- Date and recorder of information
- Start and end time of work activities
- Work stoppage
- Visitors and escorts
- Weather conditions
- Changes to the work plan, SSHP, policies or procedures
- Injuries and /or illnesses
- Safety briefings
- MEC encountered
- Relevant events and training
- Signature of the SM/SUXOS.

4.5.5.2 Field Logbooks

The Field Logbooks are maintained by the Supervisory Personnel. These logbooks are used to record site activities and field data. Logbooks are maintained in a neat and legible manner and provide a historic record of site activities, to include:

- Date and team location
- Personnel and work performed
- Equipment and instrument checks
- Injuries and/or illnesses
- Changes to work instructions
- Work stoppage
- Visitors
- Other relevant events
- Signature of Supervisor.

4.5.5.3 Safety Logbook

The UXOSO will maintain the Safety Logbook. This logbook is used to record all safety matters associated with the project site, including:

- Safety briefings and/or meetings
- Training
- Safety inspections and audits performed

- Work stoppage due to safety issues
- Visitors
- Accidents, incidents, and near misses with corrective action taken
- Site control measures
- Other relevant events
- Date and teams checked
- Signature of the UXOSO.

4.5.5.4 Quality Control Logbook

The QC Logbook will be maintained by the UXOSO/UXOQCS. This logbook is used to record all QC matters associated with the project site, including:

- Equipment testing and results
- QC inspections performed
- Work stoppage due to QC issues
- Equipment monitoring results
- Non-conformance reporting
- Other relevant events
- Date and teams checked
- Signature of UXOSO/UXOQCS.

4.5.5.5 Training Records

Training records will be maintained by the PM. These records contain any licenses, permits, certificates, or other qualifying data, to include:

- Date and nature of training
- Personnel attending and instructor(s)
- Visitor training and briefings
- Signature of instructor, SM/SUXOS, and UXOSO/UXOQCS.

4.5.5.6 Underwater MEC and Anomaly Records

The underwater MEC records are individually prepared records for each operating team. These records are prepared by the SM/SUXOS, and are used to record data on MEC encountered. These records also include:

- Date and target identifier
- Identification of item(s) located
- Classification
- Depth encountered
- Type, condition, and location of any MEC encountered
- Disposition of MEC
- Other relevant data
- Signature of Supervisor.

4.5.5.7 Photographic Logbook

The Photographic Logbook will be maintained by the SM/SUXOS. This logbook is used to record all photographs taken on the project site. These photographs are used to document MEC encountered, and before, during, and after work and/or site conditions. Photographs will include:

- Date and time taken
- Unique identifying number(s) relating to the Photographic Logbook
- Location photograph was taken
- Brief description of the subject matter.

4.5.6 DAILY REVIEW OF FIELD DATA

During daily field activities or at least once daily, the UXOSO/UXOQCS will review field data to ensure accurate classification and documentation of MEC related items. This review will allow for reconstruction of what an item was and whether or not its classification is correct.

4.6 CONTRACT SUBMITTAL QUALITY CONTROL PROCESS

Documents required under this contract will be developed and maintained by a project team consisting of the Parsons PM, USA TM, GIS Manager, Project Safety Officer, and Project QC Manager. These team members will contribute their corporate knowledge and experience to the documents to ensure technical quality.

- The Parsons PM will take the lead in development of contract documents, and will schedule a peer review and a QC review in sufficient time to meet project milestones for delivery of submittals
- The USA TM will provide technical writing support to develop the documents and will review completed documents to ensure accuracy and completeness
- The PM will review and supply information and documents to ensure accuracy and completeness of procedures and reports
- The GIS Manager will develop digital database and maps, overlays of beaches, and other spatial data. The GIS Manager will prepare all drawings or maps needed for submittals, and will perform QC of survey data
- After the project team has performed a review of documents, the Project QC Manager will perform a QC review to ensure overall quality and completeness.

Comments on submitted documents will be directed by project personnel to the appropriate subject matter expert for resolution.

Changes to the final WP will be submitted to the Parsons PM immediately upon approval. The Parsons PM will be responsible for ensuring that the changes are posted to the hard copy on file and that all field personnel are made aware of the changes.

4.7 FIELD QUALITY CONTROL INSPECTIONS, AUDITS, AND REPORTS

Project QC inspections, audits, and reports are divided into hydrographic and underwater visual surveys conducted at the site. Personnel responsible for the inspections, reviews, corrections, and reports are identified in the following paragraphs.

The UXOSO/UXOQCS is responsible for the accomplishment of operational checks of instruments and equipment by site personnel. The appropriate log entries will be made. Inspections will be performed daily at random, with unscheduled checks of the site in general to ensure personnel accomplish all work as specified in the WP. The UXOSO/UXOQCS will utilize the process outlined in Figure 4-2, Quality Control

Process, and Table 4-1, DFW, to ensure all field tasks meet quality standards prior to submittal for the QA process. The UXOSO/UXOQCS will submit a report to the Site Manager detailing the results of these checks.

4.7.1 VISUAL CLASSIFICATION OF MEC-RELATED ITEMS

To ensure accurate classification of MEC-related items (with respect to their explosive hazard), as the information is used to make decisions about the response action, Parsons/USA will inspect suspect MEC and classify these items in accordance with Table 4-2. The list is not all inclusive, but reflects the types of MEC related material that may be encountered at the project site. The numbers in the table refer to footnotes that are found on the next page. It is important to read the footnotes, as they provide additional information of importance to understanding.

Table 4-2: Classifications of MEC-Related Items

	Classification Following Inspection:					
	Presents Explosive Hazards			Does Not Present Explosive Hazards		
	MEC					
Type of Material	UXO	DMM (1)	MC (2)	MC (3)	Munitions Debris	Other
Used military munitions, on a range, fired	X				X	
Unused military munitions, on a range, apparently discarded		X			X	
Used military munitions, in a burial pit, on a former range	X(4)				X	
Unused military munitions, in a burial pit on a former range		X(4)			X	
Explosives in the soil			X(5)	X		
Target from a range (other than small arms range)	X(6)	X(6)	X(6)			X(7)
Remnants of munitions from a former range	X(8)	X(8)	X(8)		X(9)	

Footnotes:

(1) Discarded Military Munitions (DMM): Munitions generally considered as DMM include: buried munitions; un-recovered kick outs from open detonations; munitions left behind or discarded accidentally during munitions-related activities; munitions intentionally disposed of without authorization during munitions-related activities. Munitions removed from storage for the purpose of disposal that are awaiting disposal are not DMM.

(2) Munitions Constituents: MC is both (a) an explosive; and (b) present in sufficient concentrations to present explosive hazards.

(3) This is MC that is either (a) not an explosive (e.g., lead, beryllium, and cadmium); or (b) an explosive not present in sufficient concentrations to present explosive hazards.

(4) Although military munitions in a burial pit will normally be DMM, some may be UXO. For explosives safety reasons, munitions in a burial pit should be approached as UXO until assessed by technically qualified personnel (e.g., Explosive Ordnance Disposal (EOD) personnel, UXO-qualified personnel) and determined that they are not UXO or that they do not present explosive hazards similar to UXO.

(5) Explosive soil is typically found in sumps and settling lagoons for explosives-laden wastewater, and in and around drainage ditches and pipes that carry the wastewater to such sumps and lagoons.

(6) A target is a type of range-related debris. Although a target is not MEC, it may contain UXO, DMM, or MC. Prior to its release from DoD control, its explosives safety status must be documented.

(7) A target's explosives safety status must be documented and any demilitarization required to remove its military characteristics must be performed prior to its release from DoD control.

(8) UXO, DMM, or MC may be found on operational ranges and on former ranges (previously referred to as closed, transferring or transferred ranges). An inspection of the material will determine into which category this material falls. For example, if a projectile breaks apart on impact, one could find (a) a sheared-off fuze, which would be UXO or (b) explosive filler, which would be MC that broke away from the projectile's open body. If during an open detonation of an unserviceable munitions that is conducted on an operational range, the donor charge detonates, but the munitions being destroyed breaks up, but does not detonate, the remnants of the munitions would be DMM or, if explosive residue (e.g., clumps of TNT), MC.

(9) Fragments, while munitions debris, may be evidence of HE usage at the site. For such fragments, Parsons/USA will indicate evidence of HE in its classification. After determination of its explosives safety status, scrap metal from used munitions on a range that is documented as safe would, after any demilitarization required removing its military characteristics, be available for release from DoD control. In additions to these DoD requirements, other regulatory criteria may apply.

4.8 QUALIFICATIONS AND TRAINING

4.8.1 EMPLOYEE QUALIFICATIONS

The SM/SUXOS will maintain personnel files on each employee at the project site. These files include copies of necessary license, permits, training records, certificates of qualifications, and resumes that support the employee's placement and position. Prior to an employee's initial assignment or before any change in duties or assignment the PM will review the employee's files to ensure necessary qualifications are met. All site records and documentation are subject to inspection and review by the UXOSO/UXOQCS.

- Site UXO personnel must meet the minimal qualifications as outlined in DDESB TP-18, dated 20 December 2004.
- Dive personnel must also meet the requirements set forth in the PWS, USACE requirements, and applicable sections of 29 CFR 1910.120, Subpart T.

4.8.2 EMPLOYEE TRAINING AND SITE SPECIFIC REQUIREMENTS

Parsons/USA ensures that only qualified and properly trained personnel are assigned to positions on project sites. Prior to mobilization of personnel, Parsons/USA ensures that training required by Parsons/USA, OSHA 29 CFR 1910.120, and the EM 385-1-1 has been completed for all personnel assigned to the project as shown in Table 4-3 below.

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Table 4-3: Training

Training Course	Personnel Attending
40-Hour HAZWOPER Training	All personnel who have not previously received this training or who do not qualify for certification through documented experience or training equivalent to that in paragraphs (e)(1) through (e)(4) of 29 CFR 1910.120.
8-Hour Supervisor Course	All management and supervisory personnel. This includes the SM/SUXOS, UXOSO/UXOQCS, and UXOTIIIs.
8-Hour Refresher Course	All site personnel, except those who have completed their initial 40-Hour HAZWOPER training within the past year.
First Aid and Cardiopulmonary Resuscitation (CPR) Training	At least two site personnel will have current first aid and CPR training.
30-Hour OSHA Construction Safety Course	Training Requirement for UXOSO IAW with EM 385-1-1, Section 01.A.17

In addition, prior to the start of operations all personnel will receive the following as a minimum:

- Familiarization with the WP and its policies and procedures
- APP/SSHP/AHA/SOP orientation
- Emergency Response Plan training
- PPE training
- Environmental considerations peculiar to the operations on the project site
- Instruction and training on equipment usage and safe work practices
- Daily safety training outlining the day's activities.
- Visitors to the site will be provided with a site orientation and safety briefing prior to entering the exclusion area (while onsite, visitors will be escorted at all times by a UXO Technician).

Training is conducted by the SM/SUXOS, UXOSO/UXOQCS, or other designated personnel and records of attendance are maintained on site. Certificates of Training are issued when applicable.

4.9 LESSONS LEARNED PROGRAM

As required by ER 1110-1-12, Parsons/USA will develop a Lessons Learned Program (LLP) to provide for the exchange of information regarding problems that may occur during the RI activities on this project site.

4.9.1 LESSONS LEARNED OBJECTIVE

The objective of the LLP is to capture and share experience or recognized potential problems or better business practices to:

- Prevent the recurrence of repetitive design/execution deficiency
- Clarify interpretation of regulations or standards
- Reduce the potential for mistakes in high risk/probability areas of concern

- Pass on information specific to an installation or project
- Promote a good work practice that should be ingrained for repeat application
- To promote efficient and cost-effective business practice.

4.9.2 TEAM RESPONSIBILITIES

The Parsons/USA project team will be responsible for identifying and submitting lessons learned for review and approval. Parsons/USA project team members will consider how their experiences might be appropriate for the LLP.

4.9.3 PROJECT MANAGEMENT RESPONSIBILITY

The PM will review and approve all lessons learned for submittal to the USACE PM for potential discussion with the PDT during After Action Reviews.

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5.0 EXPLOSIVES MANAGEMENT PLAN

NOT APPLICABLE

This plan is required only when explosives will be utilized. Parsons/USA will not use explosives in the execution of the EBS field activities.

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6.0 ENVIRONMENTAL PROTECTION PLAN

6.1 GENERAL

This Environmental Protection Plan (EPP) has been specifically developed to address environmental protection issues associated with performing EBS field activities at MRSs 07 and 02. Specifically, this plan is intended to provide adequate procedures to safeguard the environmental condition of land and water in and around each MRS, beaches and access routes, and to mitigate and/or minimize the environmental impact from Parsons/USA's operations.

Appendix M contains the revised *SOPs for Endangered Species Conservation and their Critical Habitat during Underwater Investigations at DERP-FUDS Property No. I02PR0068, Culebra Island, Puerto Rico (CESAJ, 2012)*. These SOPs provide specific procedures for DERP-FUDS operations in Culebra and surrounding cayos and is being referenced by section into this EPP. **Adherence to these SOPs will be strictly enforced.**

6.1.1 DEFINITIONS

For the purposes of this plan, the definitions of “Environmental Protection” and “Environmental Impact” are as follows:

- **Environmental Protection**: Preservation of the environment in its natural state to the greatest extent possible.
- **Environmental Impact**: Disturbance, damage, and/or contamination of the soil, air, and/or water. Breakage/abrasion from snorkelers, breakage/abrasion from operation of towfish and other instruments, accidental groundings and potentially accidental spills fall under this definition.

6.1.2 ENVIRONMENTAL GOALS

The work at MRSs 07 and 02 is being performed to gather the data necessary to:

- Document the bathymetry within the water portions of the MRSs;
- Document and verify the types of benthic habitats that are located within the proposed MEC and MC investigation areas of each MRS (documented along transects);
- Investigate and document suspected MEC items that may be located on the surface of the seafloor within the MRSs; and
- Establish a RI transects design for conducting subsequent underwater geophysical surveys and intrusive investigations which takes into consideration the locations of critical habitat and endangered species.

The following are environmental goals of the project:

- Perform operations in a manner that minimizes the disturbance of corals, sea grasses, sediment, and other underwater vegetation
- Leave the investigation footprint areas in as near a natural condition as operationally possible.

To accomplish these goals, Parsons/USA will implement procedures to control air and/or noise pollution; manage site-wastes; and control water pollution throughout this project. These procedures will focus on preventing contaminants from leaving the source, from entering potential contaminant transport pathways, and from reaching receptors.

6.1.3 ENVIRONMENTAL COORDINATION

The Parsons/USA project team will coordinate all land resources management, waste management, pollution control, and abatement activities with the on-site USACE Ordnance and Explosives Safety Specialist (OESS), and USFWS, NOAA NMFS, and PR DNER personnel.

6.2 ENVIRONMENTAL RESOURCES AND EFFECTS

6.2.1 ENVIRONMENTAL SURVEY

Prior to beginning site activities, Parsons' SM/SUXOS and UXOSO/UXOQCS, along with representatives of the USFWS Ecological Service, NOAA NMFS, and the USACE OESS, will conduct a joint environmental survey, and develop a layout plan of the operating area on each MRS to document conditions of areas in and adjacent to the site of the work and access routes. The following items will also be identified on the layout plan: wetlands endangered and protected species or habitats, and cultural or historical resource areas.

6.3 ENDANGERED /THREATENED SPECIES

The purpose of this section is to provide a general description of threatened and endangered species that are known to occur or have the potential to occur in the waters around Culebra Island and adjacent cayos. Section 3.0 of Appendix M of the EBS WP includes a detailed description of the following species: Loggerhead (Caretta caretta), Green (Chelonia mydas), Leatherback (Dermochelys coriacea) and Hawksbill (Eretmochelys imbricata) sea turtles, West Indian manatee (Trichechus manatus manatus), Humpback (Megaptera novaeangliae), Finback (Balaenoptera physalus), Sei (Balaenoptera borealis), Sperm (Physeter macrocephalus) and Blue (Balaenoptera musculus) whales and Elkhorn (Acropora palmata) and Staghorn (Acropora cervicornis) coral.

6.3.1 SPECIES OF CORALS PROPOSED FOR LISTING UNDER THE ENDANGERED SPECIES ACT (ESA)

In addition to the species listed under the ESA, the Center for Biological Diversity petitioned NMFS on 20 October 2007 to list 83 species of corals as threatened or endangered under the ESA and to designate critical habitat for these corals. NMFS received and reviewed the petition and determined that the requested listing actions may be warranted for 82 of the 83 coral species. The proposed listing determinations were issued under Federal Register Notice Volume 77, No. 236, in December of 2013 (identified as NOAA–NMFS–2010–0036). All of the proposed Atlantic coral species have the potential to be found in waters around Culebra. These species are: Endangered – Staghorn coral (*Acropora cervicornis*), Elkhorn coral (*Acropora palmata*), Pillar Coral (*Dendrogyra cylindrus*), Boulder Star Coral (*Montastraea annularis*), Boulder Star Coral (*Montastraea faveolata*), Mountainous Star Coral (*Montastraea franksi*), and Rough Cactus Coral (*Mycetophyllia ferox*); Threatened - Lamarck's Sheet Coral (*Agaricia lamarcki*) and Elliptical Star Coral (*Dichocoenia stokesii*). Section 3.02.1 of Appendix M of the EBS WP includes a detailed description of each of these coral species.

6.3.2 MEASURES TO AVOID OR MINIMIZE POSSIBLE IMPACTS TO THE ENVIRONMENT

The following paragraphs present the measures that will be implemented to avoid or minimize impacts to threatened or endangered species and their habitat during underwater investigation activities. Because the proposed action consists of data collection, no intrusive work will be performed and munitions disposal is not considered. Adverse impacts to protected species or their habitats are not expected.

6.3.3 GENERAL CONSERVATION MEASURES

6.3.3.1 Date of Commencement

Parsons/USA will provide to the USACE a written notification of the date of commencement of underwater investigation work and a detailed description of the work to be implemented based on the WP that will be coordinated and reviewed by the TPP Team. USACE will provide the date of commencement to the TPP Team at least 10 days prior to initiating fieldwork.

6.3.3.2 Training/Briefing

Prior to initiating work, all personnel will receive training or briefings regarding the importance of endangered species, their characteristics, how they can be identified, potential and critical habitats, types of material in which they may hide, actions to take if they are sighted, and avoidance measures to be followed as detailed in the SOPs. This training or briefing will be prepared and offered by qualified personnel (e.g., biologist, marine biologist, environmental scientist, among others). Parsons/USA will submit their qualifications to the USACE for review and approval. The training or briefing will also include safety and emergency procedures.

6.3.3.3 Civil and Criminal Penalties

Parsons/USA will instruct all personnel associated with the project of the potential presence of threatened or endangered species. All personnel will be advised that there are civil and criminal penalties for harming, harassing, killing or otherwise altering the natural behavior or condition of threatened or endangered species protected under the ESA, the Puerto Rico Wildlife Law, and the Regulation to Govern the Endangered and Threatened Species of the Commonwealth of Puerto Rico. ESA gives both the USFWS and NMFS responsibility for enforcing its provisions. The Commonwealth regulations to protect endangered and threatened species are enforced by the PR DNER.

6.3.3.4 Qualified Personnel

Each team performing underwater investigation work will be accompanied on the boat, but not necessarily in the water, by qualified and experienced personnel (e.g., biologist, marine biologist, environmental scientist, among others) in order to identify the presence or absence of threatened or endangered species. Parsons/USA will submit their qualifications to the USACE. The snorkelers can request to the designated and qualified personnel on the boat to enter in the water to identify and determine if a suspected threatened or endangered species is present in the study area. The sea turtle and marine mammal observer will meet the qualifications noted in Appendix M.

6.3.3.5 Coordination

All related work will be coordinated with the TPP Team prior to initiation. Parsons will provide a preliminary schedule and the areas (including the proposed transects and grids) where investigation will be performed and all the equipment to be used. Changes to the schedule and working areas will be provided to the TPP Team. Parsons/USA will make any required project notifications to the appropriate USACE personnel, who will in turn notify the regulators and resource agencies.

6.3.3.6 Reports

Parsons/USA will maintain a log detailing endangered or threatened species sightings in terrestrial and marine habitats. The log will include, but is not limited to, the following information: date and time, location coordinates using a GPS unit, species, one or more photographs if possible, and any actions taken (e.g., species identification and distance from working area, reasons to cease operation, reasons to determine that operation may be resumed, among others) during the work period. All data will be provided to USACE to be shared with the TPP Team.

6.3.3.7 Detonation Activities

Because the proposed action consists of data collection and characterization of benthic habitats, intrusive investigation or munitions detonations will not be conducted under this phase. If MEC items are identified during underwater work, they will be left in place and GPS coordinates of the MEC's location will be recorded. MEC locations will be shared with the TPP Team as "Privilege and Confidential." Due to public safety concerns, the MEC location will not be released to the public. Based on the EBS results, additional SOPs or other conservation measures may be developed that will be closely coordinated with the TPP Team for follow-on investigation phases and disposal activities.

If the SM/SUXOS determines that weather conditions are unsafe (e.g., heavy rain, strong wind and rough seas), underwater investigation will not be conducted in order to minimize the potential for accidental groundings.

Underwater investigation activities will be conducted during day time hours (7:00am-5:00pm) only.

If during underwater activities Parsons/USA observes items that may have historic or archeological value, Parsons/USA will obtain GPS coordinates of the items' locations and notify the USACE of the observation. In consultation with the State Historic Preservation Officer, the USACE will use this information to assess the significance of the items in compliance with the National Historic Preservation Act.

6.3.4 STAGING AREA AND SEA TURTLE NESTING MONITORING

The sea turtle nest monitoring will be limited to the areas used by Parsons/USA personnel. The beach monitoring efforts, consisting of nest sightings and identification, will avoid any sea turtle nests that are encountered. Any nest encountered will be clearly marked (e.g., using flagging). All personnel will stay at least 26 feet (8 meters) away from the marked area to avoid impacts to the nest(s). All nest sightings and actions taken will be documented.

Staging areas will not require any removal of coastal vegetation. These areas will consist of temporary tents or similar structures that can be easily removed.

Any areas proposed for use as a staging area that form part of the Culebra NWR will be closely coordinated with the refuge manager. Points of contact (POCs) are provided in Appendix C.

The smaller offshore cayos will not be used as staging areas; only cayos that can be safely accessed by boats will be identified for use. Temporary mooring buoys will be employed to access staging areas to avoid repeated anchoring and impacts to marine bottom as per SOPs.

Monitoring will be conducted daily by qualified personnel (e.g., biologist, marine biologist, environmental scientist, among others) to identify the potential presence of new nests or sea turtle tracks during the activity period (refer to Appendix M for detailed information).

If sea turtle nests are found, Parsons/USA personnel will notify USACE, who will notify the USFWS Boquerón Endangered Species Specialist, NMFS Boquerón Office, and the PR DNER POCs. If agreed, the nest locations will be clearly marked and the staging area will be relocated. This information will be documented as described in this section.

6.3.5 CORAL AND SEAGRASS AVOIDANCE MEASURES

Prior to initiation of field activities the SM/SUXOS will receive a boating safety briefing and information regarding location and identification of coral reefs, colonized hard bottom, and sea grass (refer to Part 4.1.2 of the SOPs in Appendix M) for more information). Also, the information contained in these SOPs and its Appendices, and the types of actions that constitute a violation to the 4(d) rule (50 CFR Part 223) will be discussed.

The vessel operator will carry and consult appropriate NOAA nautical charts, NOAA benthic habitat maps and aerial photographs to locate potential coral reefs, colonized hard bottom, and seagrass areas.

Combining information from aerial photographs with live depth soundings and hydrographic data will help to ensure that nautical charts are accurate.

Real-time data (e.g., GPS with nautical chart and depth finder on boat) will be continuously observed to verify water depths and vessel location.

The vessel operator and SM/SUXOS will maintain a vigilant watch for coral reefs, colonized hard bottom, and seagrass areas to avoid running aground or striking protected species.

From the water's surface, some coral areas appear golden-brown. These areas should be avoided to keep from running aground. The operator will stay at a minimum of 3-ft from coral to water's surface.

If no moorings are available, the vessel will be anchored in unvegetated sandy areas away from corals, so the anchor, chain, and line do not contact or damage coral.

Vessels will be maintained away from areas with corals. Operations will be conducted in such a manner that bottom scour or prop dredging will be avoided when corals are present.

The following actions are prohibited:

- Walking on, sitting on, or standing on coral
- Collecting coral (dead or alive)
- Anchoring on coral
- Touching coral with hands or equipment
- Discharging any pollutant or contaminant
- Dumping trash

6.3.5.1 Anchoring

Anchoring on established seagrass beds will be avoided as much as possible (IAW Appendix M), however, if the need to anchor within sea grass is not avoidable, Parsons/USA field teams will attempt to anchor small boats only in areas with sand bottoms in waters with depths of at least 4 feet, and avoid anchoring directly on sea grass to the maximum extent practicable. The ROV and underwater camera will be utilized to survey the underwater area to ensure the condition of the sea floor is known prior to anchoring. If mooring buoys are available, these will be used rather than weighing anchor.

If required to anchor within seagrass areas in order to complete effective underwater survey, the following procedures will be utilized:

- Anchor will be lowered from the support boat in a controlled manner, and the boat will complete minimal maneuvering to seat the anchor into the sea floor
- During retrieval, the support boat will slowly advance on the anchor line
- Once the support boat is over the anchor, vertical pressure will be exerted on the line in order to break the seating of the anchor from the sea floor
- The anchor will quickly be retrieved in a vertical direction through the water column, with the support boat performing minimal maneuvering.

All actions will be executed to avoid dragging the anchor across the sea floor during insertion/extraction to minimize impact to seagrass beds.

If during the underwater investigation work any coral is injured, whatever activity causing the damage will be stopped, the injured coral will be left in place and the USCG, NMFS Boquerón Office, and PR DNER POCs will be immediately notified. If listed corals are injured, the Parsons/USA PM will also contact the NOAA Office of Law Enforcement at 1-800-853-1964. The following information will be provided:

- The time, date, and location (latitude/longitude) of the incident.

- The name and type of the vessel involved.
- The vessel's speed during the incident.
- A description of the incident.
- Water depth.
- Environmental conditions (e.g., wind speed and direction, sea state, cloud cover, and visibility).
- The type of coral or description, if possible.
- A description of the damage caused to any coral, if possible.

If the vessel runs aground, the operator will perform the following:

- Turn off the engine.
- Do not try to use the engine to power off the reef, hard bottom, or sea grass.
- Raise the propeller, and allow the boat to drift free.
- Radio the Coast Guard, Marine Patrol or VHF Channel 16 for assistance.
- If any coral or sea grass is injured the Parsons/USA PM will follow the procedures described in Part 4.3.9 of the SOPs in Appendix M.

6.3.6 MARINE MAMMALS AND SEA TURTLES AVOIDANCE MEASURES

Vessel strike avoidance measures were also provided in Appendix A, page 12, items 1-6. These measures have been updated and for the purpose of underwater investigation activities, Parsons/USA's personnel will follow and implement the avoidance measures provided under this section.

A marine biologist, trained to observe sea turtles and marine mammals, will instruct all personnel associated with the underwater investigation work of the potential presence of marine mammals (e.g. manatees and whales) and sea turtles and the need to avoid collisions with these species. Parsons/USA will be held responsible for any marine mammal and sea turtle harmed, harassed, or killed as a result of underwater activities (including vessel operations supporting these activities) and general boating activities needed to go to and from the study areas. All appropriate precautions will be followed and the operator will avoid excessive speed.

All vessels associated with the underwater investigations will operate at "no wake/idle" speeds at all times while in waters where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes whenever possible. Boats used to transport personnel will be shallow-draft vessels, preferably of the light-displacement category, where navigational safety permits.

Mooring bumpers will be placed on all vessels wherever and whenever there is a potential for marine mammal or sea turtle to be crushed between two moored vessels. The bumpers will provide a minimum stand-off distance of four feet.

The vessel operator and Underwater Investigation Team (UIT) will maintain a vigilant watch for marine mammals and sea turtles to avoid striking sighted protected species.

If a marine mammal or sea turtle is sighted within 300 feet (100 yards) of the project area, all appropriate precautions will be implemented by Parsons/USA to ensure protection of these species. These precautions will include the operation of all moving equipment no closer than 150 feet (50 yards) of a marine mammal or sea turtle. If a marine mammal or sea turtle is closer than 150 feet (50 yards) to moving equipment or the study area, the equipment will be shut down and all activities will cease to ensure protection of the species. Underwater activities will not resume until the marine mammal(s) or sea turtle(s) have left the study area naturally. Animals will not be herded away or harassed into leaving.

When marine mammals or sea turtles are sighted while a vessels is underway, the operator will remain parallel to the animal's course. The vessel operator will avoid excessive speed or abrupt changes in direction until the animal has left the area.

The vessel operator will reduce vessel speed to 10 knots or less when mother/calf pairs, groups, or large assemblages of marine mammals are observed near an underway vessel, when safety permits. A single marine mammal at the surface may indicate the presence of submerged animals in the vicinity; therefore, prudent precautionary measures will be exercised. The vessel will attempt to route around the animals, maintaining a minimum distance of 300 feet whenever possible.

Marine mammals and sea turtles may surface in unpredictable locations or approach slowly moving vessels. When an animal is sighted in the vessel's path or in close proximity to a moving vessel and when safety permits, the vessel operator will reduce speed and shift the engine to neutral. Vessel operator will not engage the engines until the animals are clear of the area.

Monitoring: The UIT will monitor for the presence of marine mammals and sea turtles.

All sightings and actions taken will be reported.

Injured or Dead Protected Species Reporting: Any collisions or sighting of any injured or incapacitated marine mammals or sea turtles will be reported immediately to the USACE, USFWS, NMFS, and PR DNER and information listed in Part 4.3.9 of the SOPs in Appendix M will be provided. For additional contact information, please refer to Appendix M of the WP.

- Report stranded marine mammals to Southeast U.S. Stranding Hotline: (305) 862-2850
- Report stranded sea turtles to the NMFS Southeast Regional Office: (727) 824-5312
- NMFS Boquerón Office: (787) 851-3700
- USFWS Boquerón Office: (787) 851-7297
- USFWS Culebra NWR Office: (787) 742-0115
- PR DNER: (787) 645-5593

6.3.7 SNORKELING OPERATIONS

All underwater investigation work will be conducted by qualified and trained snorkelers and will be planned in a manner that avoids direct impacts to threatened or endangered species and sensitive habitats within the project area. Anchoring practices described in subparagraph 6.3.5.1 will be implemented.

Prior to initiation of daily operations the UIT will check the weather conditions, inspect the vessel and verify that all the required equipment is available, in good condition, working correctly, and calibrated. Parsons/USA will maintain a log detailing equipment inspections.

The UIT will make sure that underwater conditions (e.g. visibility, current speeds) and weather are suitable for diving to ensure safety for divers and for sensitive underwater habitats.

Based on dive site conditions, the amount of snorkelers in the water will be determined by Parsons/USA.

The following general "best practices" will be followed:

- The point of entry and exit will be carefully selected to avoid coral or underwater sensitive areas.
- Snorkelers will make sure that all equipment is well secured before entering in the water.
- Snorkelers will make sure that they are neutrally buoyant at all times.
- Safe distance from coral areas to be provided in the WP will be maintained.
- Good finning practice and body control will be followed to avoid accidental contact with coral or stirring up the sediment.

- Snorkelers will stay off the bottom and will never stand or rest on corals or other sessile benthic invertebrates.

6.3.8 SURVEY EQUIPMENT

To support or supplement the underwater investigation activities the following equipment, but not limited to, will be used from the survey vessel: ROV, SSS towfish, underwater cameras, marking buoys and floats, and GPS. Parsons/USA will provide and specify the type of equipment to be used and their recommended safety depths to avoid impacts to endangered and threatened species. Proper operation of equipment will be reviewed prior to use. Snorkeling teams will utilize handheld equipment operated from the surface. Equipment such as digital cameras, GPS/PDA, and portable depth sounders will be affixed to a kickboard or will be attached to the snorkeler at all times.

All equipment will be used in a manner to avoid physical contact or harassment of any protected species and will not interfere with snorkeling operations. Hand-held equipment that will be carried by snorkelers will not contact corals or disturb the bottom or sea grasses in the area.

Site conditions, marine structures present, real-time information and existing water depth will be constantly monitored by trained operators to determine the appropriate use of equipment needed to minimize the risk of physical contact with protected species and sensitive habitats.

Any unintentional injury to protected species during diving operations will be reported immediately.

6.3.9 SPILL CONTROL AND PREVENTION

All fueling and maintenance of vehicles will be performed offsite at appropriate commercial or private facilities. If a severe leak of fuel or other fluids such as antifreeze or transmission fluid occurs in the field because of a tank puncture or a ruptured line, the following procedures will be implemented.

- Promptly berm the site with dirt so that the fuel or fluid does not spread along the ground surface.
- Apply oil-absorbing material such as sorbent booms, sawdust or kitty litter to the spill.
- Report the spill to National Response Center at 1-800-424-8802 and follow their instructions for cleanup. It is anticipated that this cleanup usually will involve digging up and drumming contaminated soil, and subsequently disposing of it in an approved landfill. Spills of gasoline into the sea water will be reported to the USEPA or State EPA through approved channels.
- The fuel tank will not be filled to more than about three-quarters full to prevent overfilling in the field.

6.3.10 ALL STORAGE AREAS

No storage areas are anticipated within any of the MRS water areas.

6.3.11 VEHICULAR ACCESS ROUTES

Parsons/USA personnel entering and exiting the work sites will use existing roads and easements. Off-road vehicle travel will be kept to a minimum, and prior to establishing any off-road routes necessary to gain access to sites, consideration will be given to the possible consequences resulting from the channeling of run-off water in ruts. Additionally, local agencies, USFWS, and the USACE OESS will be notified and approval from proper authority will be obtained prior to initiating off-road travel or operations. In such cases, the following measures will be taken to minimize the environmental effects.

- Personnel will remain at the off-road site until investigations are completed for the day. For example, field crews will not start work at an off-road site, leave for a lunch break, and subsequently return to finish the job.
- Any ruts or new roads or tracks that are created by field activities will be restored. The ruts will be filled in and leveled.

- In a situation where the area is wet and rut damage to the environment is certain, the crews will drive on roads and paths to a point as close to the site as possible, and then walk the remaining distance to the site.

6.3.12 TREES AND SHRUBS PROTECTION AND RESTORATION

It is unlikely that any trees will be removed during the EBS field work. Therefore, no provisions for tree restoration are required.

6.3.13 TEMPORARY FACILITIES

Parsons/USA will not establish a site trailer command post. Trash will be collected and dumpsters will be dumped or removed, as appropriate.

6.3.14 DECONTAMINATION AND DISPOSAL OF EQUIPMENT

This project does not involve any hazardous materials or hazardous wastes.

6.3.15 MINIMIZING AREAS OF DISTURBANCE

Procedures for minimizing areas of disturbance are described throughout this EPP and include such measures as:

- Complying with the procedures in Appendix M.

6.4 PROCEDURES FOR POST-ACTIVITY CLEANUP

All wastes will be removed from each site immediately upon completion of each day's field activities. Therefore, no post-activity cleanup will be required.

6.5 AIR MONITORING PLAN

Air monitoring is not being performed during this investigation. Parsons and USA work procedures are designed to minimize vapors, gases, and particulate emissions.

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7.0 PROPERTY MANAGEMENT PLAN

NOT APPLICABLE

This plan is required only when government property is used. Parsons will not use government property in the execution of the EBS.

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8.0 INTERIM HOLDING FACILITY SITING PLAN FOR RECOVERED CHEMICAL WARFARE MATERIEL

NOT APPLICABLE

Not authorized by the Performance Work Statement.

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9.0 PHYSICAL SECURITY PLAN FOR RECOVERED CHEMICAL WARFARE MATERIEL SITES

NOT APPLICABLE

Not authorized by the Performance Work Statement.

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10.0 REFERENCES

The following are references applicable to this project. Parsons/USA will comply with applicable Federal, State, and local requirements. Following all applicable requirements and regulations listed in the following publications will ensure the safety and health of onsite personnel and the local community.

10.1 U.S. ARMY CORPS OF ENGINEER GUIDANCE DOCUMENTS

- EM 200-1-4. Environmental Quality – Risk Assessment Handbook, 1999.
- EM 1110-1-1002. Engineering and Design – Survey Markers and Monumentation, 1990.
- EM 1110-1-4007. Engineering and Design – Military Munitions Response Actions, 2007.
- EM-1110-1-100 Engineering and Design – Conceptual Site Models for Ordnance and Explosives (OE) and Hazardous, Toxic, and Radioactive Wastes (HTRW) Projects, 2003.
- EM 385-1-97 Explosives Safety and Health Requirements Manual
- EM 385-1-1. Safety and Health Requirements Manual, 2008.
- ER 200-3-1. Environmental Quality – Formerly Used Defense Sites (FUDS) Program Policy, 2004.
- ER 385-1-92. Safety - Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities, 2007.
- ER 1110-1-12. Engineering and Design – Quality Management, 2006.
- EP 1110-1-18. Military Munitions Response Process, 2006.
- EP 1110-3-8. Engineering and Design – Public Participation in the Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS), 2004.
- EP 1110-1-24. Establishing and Maintaining Institutional Controls for Ordnance and Explosives Projects, 2000.
- EP 75-1-2. Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities
- EP 75-1-4. Recurring Reviews on Ordnance and Explosives (OE) Response Actions, 2003.
- SOPs for Endangered Species Conservation and their Critical Habitat during Underwater Investigations at DERP-FUDS Property No. I02PR0068, Culebra Island, Puerto Rico, CESAJ, 2012.

10.2 U.S ARMY DOCUMENTS

- Army MMRP, Remedial Investigation / Feasibility Study Guidance, 2007.
- TM 60A 1-1-31, Explosive Ordnance Disposal Procedures, 1994.
- AR 385-64, Ammunition and Explosives Safety Standards, 1999.
- AR 190-11, Physical Security of Arms, Ammunition and Explosives, 2006.

10.3 DEPARTMENT OF DEFENSE DOCUMENTS

- DOD 6055.9-M, Ammunition and Explosive Safety Standards
- DOD 4145.26-M, Contractor's Safety Manual for Ammunition and Explosives
- DDESB TP-18, Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel

10.4 OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OSHA 1994 *General Industry Standards*, 29 CFR 1910 and *Construction Industry Standards*, 29 CFR 1926; especially 1910.120/29CFR 1926.65-*Hazardous Waste Site Operations and Emergency Response*.

10.5 U.S. ENVIRONMENTAL PROTECTION AGENCY

Risk Assessment Guidance for Superfund (RAGS), 1989.

10.6 FEDERAL REGULATION

- Code of Federal Regulations (CFR)
  - 33 CFR 320 Wetlands Protection Act
  - 40 CFR 300 National Oil and Hazardous Substances Pollution Contingency Plan (NCP) 1993.
  - 49 CFR Parts 100-199 Transportation.
  - 62 Federal Register 6622, 1997 Military Munitions Rule.
- Fish and Wildlife Coordination Act 16 U.S.C. 661 et seq.
- Endangered Species Act 16 U.S.C. 1531-154.
- Migratory Bird Treaty Act 16 U.S.C. 703-712.
- National Historic Preservation Act 16 U.S.C. 1470.
- Clean Water Act 33 U.S.C. 1151 et seq., 1251 et seq., 40 U.S.C. 3906 et seq.
- Comprehensive Environmental Response, Compensation, and Liability Act 42 U.S.C. 9601-11050.
- U.S. Fish & Wildlife Service, Culebra National Wildlife Refuge, undated.

10.7 OTHER DOCUMENTATION/SURVEYS AND STUDIES

- Kendall, M.S.1, M.E. Monaco1, K.R. Buja1, J.D. Christensen1, C.R. Kruer2, and M. Finkbeiner3, R.A. Warner1. 2001. (On-line). Methods Used to Map the Benthic Habitats of Puerto Rico and the U.S. Virgin Islands URL: http://biogeo.nos.noaa.gov/projects/mapping/caribbean/startup.htm. Also available on U.S. National Oceanic and Atmospheric Administration. National Ocean Service, National Centers for Coastal Ocean Science Biogeography Program. 2001. (CD-ROM).Benthic Habitats of Puerto Rico and the U.S. Virgin Islands. Silver Spring, MD: National Oceanic and Atmospheric Administration.

    1. NOAA National Ocean Service, Biogeography Branch; N/SCI 1, SSMC4; 0205 East West Highway; Silver Spring, MD 20710

    2. P.O. Box 753; Sheridan, MT 59749

    3. NOAA Coastal Services Center, 2234 South Hobson Avenue; Charleston, SC 29405