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LIST OF ATTACHMENTS

- Attachment 1 USA Environmental Inc. Diving Safe Practices Manual
- Attachment 2 Personnel SCUBA and Snorkeling Certifications (note: this attachment will be complete once the dive team has been identified)
- Attachment 3 Air Source Certification

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ACRONYMS AND ABBREVIATIONS

ACDE	Association of Commercial Diving Educators
APP	Accident Prevention Plan
AHA	Activity Hazard Analysis
ASR	Archives Search Report
CFR	Code of Federal Regulation
CGA	Coast Guard Administration
CMS	Caribbean Marine Services
cu	cubic
DAN	Divers Alert Network
DDC	District Diving Coordinator
DDESB	Department of Defense Explosives Safety Board
DNER	Department of Natural and Environmental Resources
DoD	Department of Defense
DOT	Department of Transportation
DQO	Data Quality Objective
DS	Diving Supervisor
DSOP	Dive Standard Operating Procedure(s)
EBS	Environmental Baseline Survey
EM	Electromagnetic
EMP	Emergency Management Plan
EOD	Explosive Ordnance Disposal
ESA	Endangered Species Act
ESP	Explosives Site Plan
°F	Degrees Fahrenheit
FSW	Feet of Seawater
ft	foot (feet)
FUDS	Formerly Used Defense Site
GPS	Global Positioning System
GSA	General Services Administration
ISO	Industry Standard Object(s)
IVS	Instrument Verification System
MC	Munitions Constituents
MDAS	Material Documented as Safe
MEC	Munitions and Explosives of Concern
MOB	man overboard
MPPEH	Material Potentially Presenting an Explosive Hazard
MRS	Munitions Response Site(s)
NAUI	National Association of Underwater Instructors
NATO	North Atlantic Treaty Organization
ORM	Operational Risk Management
OSHA	Occupational Safety and Health Administration

PADI	Professional Association of Diving Instructors
PFD	personnel flotation device
PR	Puerto Rico
PWS	Performance Work Statement
QC	Quality Control
RCC	Rescue Coordination Center
RI/FS	Remedial Investigation/Feasibility Study
ROV	Remotely Operated Vehicle
SCUBA	Self Contained Underwater Breathing Apparatus
SOP	Standard Operating Procedure
SS	Snorkeling Supervisor
SUXOS	Senior Unexploded Ordnance Supervisor
TPP	Technical Project Planning
USACE	U.S. Army Corps of Engineers
USA	USA Environmental, Incorporated
USAESCH	US Army Engineering and Support Center, Huntsville
USBL	ultra-short baseline
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
UXO	Unexploded Ordnance
UXOQCS	Unexploded Ordnance Quality Control Specialist
UXOSO	Unexploded Ordnance Safety Officer
VHF	Very High Frequency
WP	Work Plan

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1.0 PROJECT OBJECTIVES

The Dive Operations Plan is an appendix to the Work Plan (WP) for Culebra Island, Puerto Rico (Formerly Used Defense Site (FUDS) Project Number I02PR0068) under Contract No: W912DY-07-D-0062, Task Order No. 0010, from the U.S. Army Corps of Engineers (USACE), Engineering and Support Center, Huntsville (USAESCH).

This Dive Operations Plan reflects the procedures and methods Parsons will utilize to perform underwater operations in support of a Remedial Investigation (RI)/Feasibility Study (FS) of the intended investigation sites.

This RI/FS is designed to perform an in-depth study to gather the data necessary to determine the nature and extent of known contamination at the sites, assess risk to human health and the environment, and establish criteria for cleaning up the sites.

1.1 PURPOSE AND SCOPE

This RI is being performed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and is part of the overall Remedial Action Process. The primary purpose and scope is to perform an underwater investigation operation which completes a combined land and underwater RI. The underwater investigation is to determine the nature and extent of possible contamination of MPPEH/MC resulting from DoD use, located both on and below the surface of the seafloor. The end goal is to gain acceptance of a Decision Document (DD) for the areas investigated.

1.2 PROJECT LOCATION

Project location is Culebra Island, 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. Figure 1-1 provides the site location for each MRS. For additional site description see Section 1 of the Work Plan.

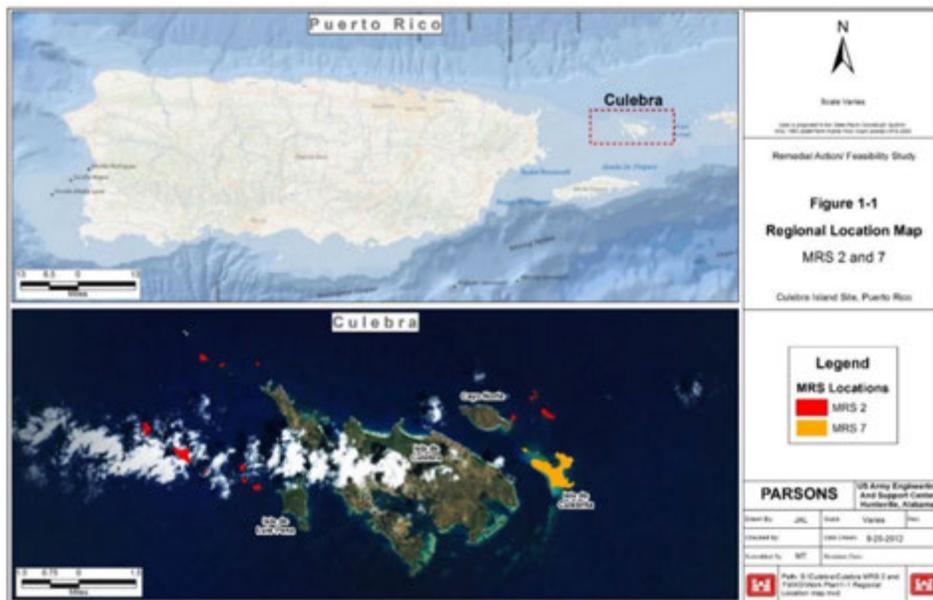


Figure 1-1: Culebra Location Map

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2.0 DIVING OPERATIONS PLAN

The following section describes the Diving Operations Plan which provides a general overview of the tasks to be performed for the Underwater RI/FS MRS 02 and MRS 07.

If, for any reason, the dive plan is altered in mission, depth, personnel, or equipment, the USACE District Diving Coordinator (DDC) will be contacted in order to review and accept the alteration prior to actual operation (Ref EM 385-1-1 Section 30).

2.1 UNDERWATER OPERATIONS

Underwater operations within the MRS 02 and 07 boundaries will be completed during three phases of work:

- Phase 1: Environmental Baseline Survey (EBS) with EBS Report (completed on October 2013 and not considered to be part of this Dive Operation Plan)
- Phase 2: Underwater Geophysical Survey
- Phase 3: Underwater Intrusive Investigations and Environmental Sampling

Phase 2 and 3 will utilize the following systems/equipment and be comprised of the listed actions:

- Unexploded Ordnance (UXO) Divers with SCUBA
- VideoRay Underwater Remotely Operated Vehicle (ROV)
- Underwater Geophysics (underwater EM 61 and underwater analog metal detectors)
- Snorkel operations
- Dive vessel with support boat
- Remote raise tow and beach (or relocate to a suitable underwater site for disposal) MEC/MPPEH items per Explosives Site Plan (ESP)
- MEC/MPPEH Explosive Disposal Operations

SCUBA dives will be conducted in order to complete the following RI/FS tasks:

- Installation of underwater Instrument Verification System (IVS) associated with the Electromagnetic (EM) geophysical survey
- Visual and analog metal detector assisted surveys of the seafloor
- Excavation of chosen subsurface anomalies
- Explosive disposal operations of underwater MEC/MPPEH items
- Collection of marine sediment samples

Snorkeling will be conducted in order to complete the following RI/FS tasks:

- To push the EM Float along the assigned DGM transects
- Visual and analog metal detector assisted surveys of the seafloor
- To assist in the placement of anchors, buoys, and clumps on the seafloor to ensure there is not impact to critical habitat (CH).
- To perform other water borne operations in which SCUBA is not required.

The Dive Supervisor (DS) will determine the number of divers required to complete each task, though no more than three divers is anticipated to be in the water at any given time. Applicable requirements for tending the dive team, such as with a witness float will be dependent on the team structure, site conditions, and ensuring the safety of diving personnel.

Underwater operations may also include a VideoRay ROV, which may be utilized to support and/or supplement diving operations, and to provide underwater video when divers using cameras are not practical.

2.1.1 PHASE 2 UNDERWATER GEOPHYSICAL SURVEY (TRANSECTS)

Phase 2 field activities will consist of performing geophysical surveys along the re-aligned RI transects established during Phase 1 (See Work Plan Appendix B, Figures B-1 through B-13). The objective of these activities will be to collect EM anomaly data while creating the least amount of impact possible to the CH.

For transects containing Listed Threatened or Endangered Species, the survey methodology used will be employed in a manner to cause minimal impact to the underwater environment. The underwater EM geophysical coil will be deployed using two types of system platforms. As there is not a single EM system that will meet the objectives of the data quality objectives (DQOs) multiple platforms will be used to survey the designated areas.

The system used in any given area will depend primarily on depth of water and habitat type present. Based on the analysis of all of the EBS data, USA has assigned proposed EM platforms to each of the RI transects/segments based on benthic habitat. Work Plan Appendix B, Figures B-14 – B-18 illustrate the EM platform deployment for MRS 02 and 07, with each color coded to indicate the proposed EM platform that will be used. Descriptions of each EM platform are provided in the following subparagraphs, and methods/procedures for deployment are contained in Appendix K, Diving Standard Operating Procedure (DSOP) 12.

2.1.1.1 EM Floating Platform (Snorkelers support is required)

An EM Floating Platform (see Figure 2-1) system is intended for use during surveys of the following:

- Along approximately 7.19-miles of underwater transects
- In shallow water areas where contact with the bottom is not desired. There are two configurations for the EM Float. The large float is rafted alongside the tow vessel or towed and does not require snorkeler support. The small float is pushed/towed by snorkelers. Both systems are linked to the tow vessel by the DGM cables and strain relief line and are monitored by computer as the DGM information is collected.

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Figure 2-1: EM Floating Platform

2.1.1.2 EM ROV (No diver support required)

An EM ROV system (see Figure 2-2) is intended for use during surveys of the following:

- Along approximately 16.91-miles of underwater transects
- In areas with coral that is too deep for the floated system, or in areas containing coral heads with high relief

The ROV is equipped with a pressure sensor, altimeter, pitch sensor, roll sensor, and video cameras so real time monitoring of the coil and ROV dynamics will be monitored to ensure no threatened or endangered species are disturbed during the survey. The EM coil will be mounted in front of the ROV so it will be visible in the camera view at all times, so as to visually monitor objects ahead of station. Positive control will be maintained of the ROV at all times as it is maneuvered around bottom types/obstacles (coral heads/ boulders). Accurate positioning for the ROV and coil will be supplied by an ultra-short baseline (USBL) system set up between the survey vessel and the ROV system.



Figure 2-2: EM ROV Platform

2.1.1.3 Instrument Verification Strip (IVS) (Dive Team support required)

Under the direction of the Site Geophysicist, Parsons will establish IVSs to perform underwater EM transects, and a land based IVS for the Analog metal detectors and the Diver Deployed EM System which will be used during analog and dig phases of work. The IVS design can be found in the Work Plan Section 3.2.2.4.

- The EM IVS will be established for the use of the DGM platforms during phase 2. Three IVSs will be placed by divers during Phase 2. The site will have been surveyed by the DGM team to be free of metal debris however as an added level of safety the divers will perform anomaly avoidance while burying the ISOs. There will not be any underwater IVSs established for Phase 3.
- The location of the first and last ISO items will be initially marked with weighted buoys dropped from the surface. The divers will then go down and attach a measured line between the clumps. The line will be drawn taut and the ISOs will then be buried per the IVS design. Following construction of the IVS, the clumps and buoys, will be recovered but the measured line will be anchored in place as a highway line for a visual reference to be used by the DGM team.
- During Phase 3 a land based IVS will be established on MRS 09 Beach or suitable site in an area free from metal debris. The UXO SCUBA divers will process through the land IVS with their analog metal detectors per the Phase 3 Work Plan.

2.1.2 PHASE 3: INTRUSIVE INVESTIGATIONS AND ENVIRONMENTAL SAMPLING

2.1.2.1 Visual and Analog Instrument Aided Transect Survey with Intrusive Investigation (Dive Team support is required)

The visual and analog instrument aided transect surveys will be used when the above EM 61 platform options are not suitable due to site conditions, or when additional transects have been added to bound a

MEC high density area. Analog transect surveys will be executed during the Phase 3 Intrusive Investigations and Environmental Sampling.

Transect segments that were not completed by one of the EM 61 platform methods will be completed by defining SCUBA transect segments to be surveyed/investigated. These transect segments will fill in and complete a transect by executing an instrument aided visual survey with the use of the Minelab Excalibur, White's, or an equivalent detector (see Figure 2-3). A floating line suspended between two clumps/buoys used in a jack stay configuration will be suspended high enough in the water column to be used as a guide for the divers to stay on course within the transect, but not too close in contact with the corals or ocean floor. The following general statements apply to the SCUBA transect segments:

- When swimming over unconsolidated sediments an analog metal detector will be used to identify anomalies which may not be visible.
- Any anomalies discovered in unconsolidated sediments during these transect segments will be investigated by hand, and at the time of discovery. The depth of excavation will be limited to the capability of the diver and the type of sediment. Depth of excavations will not exceed 24 inches.
- If seagrass is present, intrusive investigation in seagrass areas will follow the procedures identified in the Work Plan, Appendix K (Supplemental Standard Operating Procedures for endangered Species Conservation and their Critical Habitat –See para 4.3.4).
- The MEC/MPPEH item will undergo further investigation after the transects have been completed. Should an MEC/MPPEH item be discovered during the analog/visual survey on rock or coral bottoms as much detail will be gathered at that time without touching the munition or the habitat that surrounds the item.
- Should an anomaly be investigated and it is determined to be non-munition related debris, the item will be brought to the surface for proper disposal in a local landfill. The item to be recovered must be of size and nature that it can be easily brought to the surface by a diver. If the item has become part of the CH it will not be removed and will remain in place.



Figure 2-3: UXO SCUBA Diver using a Minelab Excalibur

2.1.2.2 Underwater Intrusive Investigations

Phase 3 consists of conducting underwater intrusive investigations of selected anomalies located along the transects that were mapped as part of Phase 2. Parsons anticipates utilizing UXO SCUBA divers to

perform intrusive investigations of these anomalies. As investigation of the anomalies will potentially involve handling MEC/MPPEH items, all precautions will be taken to ensure safe operations will be executed. For the purposes of the RI, all anomalies will be treated as MEC until determined to be Material Documented as Safe (MDAS) or non-munition debris.

Prior to the intrusive investigations effort, a qualified marine scientist will provide training on Appendix K, “*Supplemental SOP for Endangered Species Conservation and their Critical Habitat, DERP-FUDS Property No. I02PR0068, Culebra Island, Puerto Rico* (CESAJ, February 2014)”, to educate the field team on the protective actions and avoidance measures applicable to the project. Following the initial training the marine scientist will reinforce the guidelines within the SOP during the daily tailgate safety brief.

Selected DGM transect targets within high density areas will be investigated by the UXO SCUBA divers. The intrusive investigation will determine if the high density area is MEC related. If the high density area is determined to contain MEC transect segments for additional intrusive investigation will be added at half the distance between the planned DGM transects and on either side of the high density area. Additional transects radiating out from the high density area may also be required to further determine the extent of the high density area. The additional transect segments and radial transects will be executed by analog and dig.

To mark a MEC item to be investigated, or an anomaly selected to be excavated, use the following steps as a guide:

- Marking the position of a known MEC item that is on the surface of the seafloor.
 - Trimble Pro-XRT DGPS antenna is to be mounted over the gunnel of either the port or starboard side of the vessel.
 - As the vessel approaches the known GPS coordinate, it maintains its heading while maintaining a speed which is fast enough to maintain the bearing but slow enough to limit errors when the clump is lowered into the water.
 - The navigator, who is watching the monitor, will tell the helmsman to correct headings as needed during the approach. The gunnel which has the Pro-XRT DGPS antenna mounted should pass directly over the MEC item and the navigator will instruct the UXOT assigned to lower the clump and buoy. This will be done as quickly as possible. If the area is known to be sand or grass the clump may consist of a mushroom anchor and 8 inch buoy (approx. size). If the area is known to have corals that are not on the List of Threatened or Endangered Species then soft diver weights with a peanut buoy attached will be used. If the Phase 1 survey results indicates Listed Species of Coral are present in the area to be marked, an untended snorkeler with a waterproof GPS such as the Garmin GPS map 76cx or similar will snorkel over the EM MEC item and will lower the soft diver weight to the bottom as close to the mark as possible while avoiding corals and MEC.
 - When the UXO SCUBA divers enter the water, a larger clump with buoy may be taken down to replace the peanut buoy, if used, providing a more substantial mark. The divers will place the clump as close to the MEC as possible without impacting the MEC or corals.
- Marking the position of an anomaly selected to be excavated, use the following steps as a guide:
 - Trimble Pro-XRT DGPS antenna is to be mounted over the gunnel of either the port or starboard side of the vessel.
 - As the vessel approaches the known GPS coordinate, it maintains its heading while maintaining a speed which is fast enough to maintain the bearing but slow enough to limit errors when the clump is lowered into the water.
 - The navigator who is watching the monitor will tell the helmsman to correct headings as needed during the approach. The gunnel which has the Pro-XRT DGPS antenna mounted should pass directly over the anomaly and the navigator will instruct the UXOT assigned to drop the clump and buoy. This will be done as quickly as possible. If the area is known to be

- sand or grass the clump will consist of a mushroom anchor and 8 inch buoy (approx. size). If the area is known to have corals that are not on the List of Threatened or Endangered Species then soft diver weights with a peanut buoy attached will be used. If the Phase 1 survey results (see Appendix B, Figures B-16 and B-17) indicates Listed Species of Coral are present in the area to be marked, an untended snorkeler with a waterproof GPS such as the Garmin GPS map 76cx or similar will snorkel over the EM MEC item and will lower the soft diver weight to the bottom as close to the mark as possible while avoiding corals and MEC.
- When the UXO SCUBA divers enter the water, a larger clump with buoy may be taken down to replace the peanut buoy, if used, providing a more substantial mark. The divers will ensure they don't place the clump on corals.

The EM anomalies within the high density transect segments selected for investigation will be marked by lowering a clump with buoy as close as possible to the transect anomaly GPS coordinates (as described above). The dive boat will use Trimble Pro-XRT DGPS to mark the anomaly but an error of up to 10 ft can be expected due to sea state, winds, currents and the drift of the mark. If the EM anomaly is not located within the 10 ft radius of the clump it will be considered a no find. A no find rate greater than 15% will flag a root cause analysis.

- Underwater man portable EM sensor. This system will be used as an alternate means to investigate DGM anomalies but will not be used on consolidated hardbottoms or areas where it could cause damage to corals. Reacquisition of an EM anomaly will follow the process of marking the location as described above, UXO SCUBA divers deploying with the man portable EM sensor searching closest to the clump (the clump may have to be temporarily moved so as not to interfere with the EM sensor), and then gradually moving outward until the largest EM anomaly within a 10 foot radius is located. The UXO SCUBA diver will excavate next to the contact until the item is uncovered and identified. If the EM anomaly is MEC, it will be photographed; the surroundings will be filmed, paying particular attention to corals. The DGM anomaly location will be used as the EM anomaly position.
- Underwater White or suitable substitute. The analog metal detectors if the primary means for investigating DGM anomalies during Phase 3. To mark the EM anomaly from the vessel, the steps provided for marking a GPS coordinate in coral and rock bottom types will be used. No excavation will take place in rock and coral. If the EM anomaly is on the surface of the coral and rock it will be investigated. If the EM anomaly is MEC it will be photographed, the surroundings will be filmed paying particular attention to corals, the DGM anomaly location will be used as the EM anomaly position. If the EM anomaly is determined to be subsurface (underneath coral or rock) it is to be recorded as such. The full 10 foot radius will be investigated with the Analog instrument.
- Post-intrusive DGM review. Post intrusive DGM review will be performed as an operational check. The Site Geophysicist (e.g. ASI's Geophysicist) will review the intrusive results reported for each selected anomaly. If, in their judgment, the reported object (size, weight, burial depth, quantity) agrees with the DGM signature, then a "pass" for the intrusive results will be recorded. If they believe that the reported object does not meet the DGM signature, the Geophysicist will flag the target for re-investigation by the intrusive team. The Site Geophysicist will review all reported No Finds. A No Find rate greater than 15% in an MRS will flag a root cause analysis and Client notification.

Intrusive investigation in seagrass areas will follow the procedures identified in Appendix K (*Supplemental SOP for Endangered Species Conservation and their Critical Habitat, DERP-FUDS Property No. I02PR0068, Culebra Island, Puerto Rico* (CESAJ, February 2014) – See Section 4.3).



Figure 2-4: Diver Deployed EM System

2.1.2.3 Reacquire and Investigation of Suspected MPPEH items from Phase 1.

Suspected MPPEH items that were captured on video during Phase 1 will be reacquired by using the Trimble Pro-XRT DGPS to get the vessel as close to the recorded positions. Boat motion, current and wave action will limit the accuracy of the reacquisition. The Phase 1 camera GPS location or the Phase 2 DGM anomaly location will be recorded as the MPPEH/MEC position. UXO SCUBA divers will search immediately around the clump and continue their search outward until the suspect MPPEH has been located. If it is not located within 10 ft of the clump, the suspect MPPEH will be marked a second time using a new clump, leaving the original clump in place as a reference. Once the suspect MPPEH has been located, the UXO SCUBA divers will investigate and document the location, type and position of the MPPEH item. If it is determined to be MPPEH/MEC, a risk analysis will be performed. If the item is MD, it will be removed. If the anomaly is deemed MPPEH or MEC and unacceptable to move, it will be marked by a clump to assist in the reacquisition during the disposal phase of work. If the item cannot be located or identified as the Phase 1 anomaly it will be noted.

2.1.2.4 Inspection Class ROV Operations (No diver support required)

An inspection class ROV, separate from the EM ROV platform, may be used for a collection of optional underwater tasks, depending upon the situation, site conditions, and on-site determinations made by Parsons field managers. Situations where the ROV may be used to supplement underwater operations include, but are not limited to, the following:

- Visual investigations
- Visual surveys
- Quality Control (QC) and safety observations
- Post MEC/MPPEH explosive disposal verifications

As applicable, a peanut buoy (small buoy with small lead weight) will be laid at the anomaly GPS coordinate or general location to be investigated. The ROV Investigation Team will then dive the ROV on

the anomaly/location, providing video of the targeted anomaly and the surrounding marine habitat. The ROV has a tethered range of 550-ft, and possesses a forward looking sonar and video. Data is captured via a computer located on the surface. The ROV also possesses real time GPS navigation with corrected position fixes through the GPS antennas located on the unit's tether (see Figure 2-5).



Figure 2-5: Video Ray

2.1.2.4.1 Risk Analysis

A risk analysis will be developed for each MEC/MPPEH. The risk analysis will take into account human health and safety, Natural Resources as described within the Appendix K: "*Supplemental SOP for Endangered Species Conservation and their Critical Habitat, DERP-FUDS Property No. 102PR0068, Culebra Island, Puerto Rico* (CESAJ, February 2014)". The analysis will also provide recommendations and options for the removal and disposal of the munition. In relation to any encountered MEC/MPPEH item, no actions will be completed to remove, explosively dispose of, or leave in place (if leave in place, the risk analysis will recommend with or without cement encapsulation and will provide justification) without USACE notification and concurrence. MEC will only be moved or disposed of during the last phase of the project.

2.1.2.4.2 Underwater Explosive Disposal Operations

Should underwater explosive disposal operations be required to address MEC/MPPEH, the requirements are set forth within the Phase 3 Work Plan Section 3 and the ESP.

2.1.2.5 Environmental Sampling

As part of the underwater investigation of the Culebra Island RI activities, marine sediment samples will be collected from the coastal waters and marine inlets to evaluate the presence of Munitions Constituents (MC) resulting from Department of Defense (DoD) activities. The location and number of the samples collected will be determined by MEC/MD findings during intrusive operations. Refer to The Phase 3 Work Plan Appendix E Sampling and Analysis Plan for additional information.

- A marine sediment sample will be collected by a UXO SCUBA diver each time a new munition type is found (i.e., 4.2-inch mortar, 5-inch projectile, BDU-33 practice bomb, etc.). For additional underwater findings of an already sampled munition type, samples will be collected at a rate of 10%.

- Samples will be collected beneath the munition if the item has been determined that it is acceptable to move, otherwise, the sample will be collected adjacent to the munition. It is anticipated that any MC exceedances encountered will be highly localized. Therefore, each sample collected will have a companion step out sample collected at a distance of 4-feet from the initial sample.
- Sediment samples will be collected from a depth interval of 0 to 6 inches in areas where sufficient media is present. The amount of sufficient media is anticipated to be in areas with one inch or more of sediment.
- Samples will only be collected in unconsolidated sediments. If only coral, rocks, or bedrock are present, no samples will be collected. All efforts will be made not to harm or harass species located directly adjacent to sample locations.
- QA/QC samples consisting of Field Duplicates, QA Splits, MS/MSD, Equipment Blanks and Temperature Blanks will be collected at the frequency stipulated in Table E-1 of the FSP, Appendix E.1. When using the hand auger (with disposable sleeve), one equipment blank will be collected per MRS.

Two sampling procedures are planned and will be chosen based on the strength of current/wave action at the sample collection area. If the current/wave action at the sample location is non-existent to mild (i.e. in inlets and at depths deeper than influence of wave action), and results in minimal dissipation of particles, samples will be collected with a disposable plastic hand trowel and placed in a zip-loc bag for transport to the surface. If the current/wave action is strong enough to significantly dissipate particles upon collection, a hand auger with a plastic sleeve will be used to collect samples.

2.1.2.6 Diving Platform

Caribbean Marine Services (CMS), as a subcontractor to USA, will provide the boat services for SCUBA and Snorkeling Operations. The vessel "Soluzion" is a US Coast Guard (USCG) Inspected 29-ft long small boat with a beam of 9 ft (see Figure 2-5). Alternate vessels to "Soluzion" may be used should it be required. The replacement vessel will be able to meet similar capabilities as the primary vessel. This vessel will be used for all SCUBA and Snorkeling tasks. CMS also will provide a 17-ft (see Figure 2.5) and a 22-ft work boat in supporting roles, to shuttle equipment or provide perimeter security. A USCG Captain will be operating the Snorkel and SCUBA Dive vessel at all times.

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Figure 2-5: Vessels to be used in Support of the RI Fieldwork

During SCUBA and snorkeling operations the support/safety vessel will remain in proximity to the SCUBA divers or snorkelers, with the distance dependent on the conditions of the site.

The support/safety vessel will be ready to respond to any emergency.

The support/safety vessel will also display a standard red/white dive flag to indicate the presence of personnel in the water performing SCUBA diving or snorkeling.

The support/safety vessel will be equipped with all USCG required equipment for the size of the vessel. Very High Frequency (VHF) radios will be in good working condition. The vessel will also have a throw bag and/or ring buoy attached to at least 70 ft of line, and will be capable of performing a rescue of

SCUBA divers or snorkeler in an emergency situation. The vessel, or the support work boats, will also be used to warn other vessels that approach the site of the presence of SCUBA divers or snorkelers, and direct them away from the site.

2.2 PROJECT AND FIELD MANAGEMENT

The Parsons Management Team will provide overall management of field operations, as well as provide corporate oversight of safety and quality control programs, meeting the requirements identified in the Performance Work Statement (PWS).

2.2.1 PROJECT MANAGER

The Project Manager will provide administrative management for all Parsons employees, vendors and tiered subcontractors. The Project Manager will also generate and submit operational, personnel, and performance reports to the Parsons Corporate Office. In performing the underwater operations management function, this individual reports directly to the Parsons Program Manager.

2.2.2 SITE MANAGER/SENIOR UXO SUPERVISOR

The Site Manager (Phase 2) or Senior UXO Supervisor (SUXOS) (Phase 3) will supervise all field activities while on the work site. The Site Manager and SUXOS will ensure conformance to the RI/FS Work Plan and all of the associated plans. For Phase 3 (Intrusive Investigation), the SUXOS will be SCUBA Dive Qualified. The Site Manager and SUXOS will report administratively and operationally to the Project Manager.

2.2.3 DIVING SUPERVISOR

The Project Manager will designate the Diving Supervisor in writing. The Diving Supervisor is a USA employee. During diving operations, the Diving Supervisor will have the operational authority and responsibility to conduct the dive operations per the RI/FS Work Plan, Dive Operations Plan, and USA Dive Safe Practices Manual. The Diving Supervisor will report administratively and operationally to the SUXOS.

2.2.4 UXO SAFETY OFFICER (UXOSO)

Phase 2 and 3 RI field work will utilize a UXOSO and a UXO Quality Control Specialist (UXOQCS) as a combined position UXOQCS/UXOSO. The UXO QCS/UXOSO is a Parsons employee. This section defines the UXOQCS/UXOSO duties as the UXOSO. The UXOSO has responsibility for enforcement of the overall safety aspects of the Remedial Investigation field work. The UXOSO will provide daily safety briefs and conduct safety audits of all activities in the Diving Phase of the Project. The UXOSO will be responsible to the Parsons Director of Safety for all safety related issues. The UXOSO will have stop work authority in any matter related to the safety of personnel and equipment involved with the project. Specific duties will include:

- Daily Safety Brief,
- Daily Safety Inspections,
- Weekly Safety Audit,
- Conducting initial site safety orientation training,
- Periodic safety training on relevant safety subjects,
- Completing appropriate Accident Investigation and Accident/Incident Reports, as required
- Acting in an advisory capacity with the Project Manager on safety related issues
- Working directly with the Dive Supervisor and SUXOS to ensure safe completion of operational tasks.

2.2.5 TECHNICAL DIVING TECHNICIANS

Technical diving technicians are divers such as biologist, technical specialists and diving personnel that are required to participate in diving operations but are not exposed to the risks of DGM Intrusive Investigations. Technical diving technicians will not be part of a UXO diving team when the divers will be handling or may come into contact with MEC. Technical diving technicians will be accompanied by a UXO Diving Technician and will be attached to the UXO Diving Technician with a buddy line. The Technical Diving Technicians will be certified in SCUBA by one of the following:

- Professional Association of Diving Instructors (PADI)
- National Association of Underwater Instructors (NAUI)
- U.S. Navy Diving and Salvage Training Center
- U.S. Forest Service Snorkel Safety Program.
- Other nationally accepted diving training program (acceptance will be determined by the DDC).

2.2.6 UXO DIVING TECHNICIANS

USA UXO divers will be qualified and designated, in writing. They will be current in diving qualifications, periodicity, and have current diving medical certification. All USA UXO Diving Supervisors, UXO Diver Technicians, and Tenders will be certified in SCUBA by one of the following agencies:

- A commercial diving School
- A military School
- A Federal School (e.g., USACE)
- An Association of Commercial Diving Educators (ACDE)-accredited school.

Each dive team member will have the experience or training necessary to perform assigned tasks in a safe and healthful manner.

Each dive team member will have experience or training in the following:

- A graduate of U.S. Naval Explosive Ordnance Disposal (EOD) School, if engaged in munitions response diving operations;
- The use of tools, equipment and systems relevant to assigned tasks;
- Techniques of the assigned diving mode, diving operations and emergency procedures.
- All dive team members will be trained in cardiopulmonary resuscitation and first aid (American Red Cross or equivalent).

Parsons/USA will not require a dive team member to be exposed to hyperbaric conditions against the employee's will, except when necessary to complete decompression or treatment procedures.

2.2.6.1 Standby Diver

A standby diver is required for all SCUBA diving operations. The standby diver will be equipped with the same equipment as the primary diver. The Diving Supervisor may act as the standby diver tender.

2.2.6.1.1 Standby Diver Qualifications

The standby diver will be a fully qualified diver, assigned for back-up or to provide emergency assistance, and will be ready to enter the water immediately. A standby SCUBA diver will don all equipment and be checked by the Diving Supervisor. The standby diver may then remove the mask and fins and have them ready to don immediately for quick deployment. At the discretion of the Diving Supervisor, the standby diver may also remove the SCUBA tank. The standby diver will receive the same briefings and

instructions as the working diver, will monitor the progress of the dive, and will be fully prepared to respond if called upon for assistance.

2.2.6.2 Buddy Diver

A buddy diver is the diver's partner for a SCUBA diving operation. The buddy divers are jointly responsible for the assigned mission. Each diver will track of depth and time during the dive. Each diver will watch out for the safety and well-being of his buddy and will be alert for symptoms of diving illness. A diver will keep his buddy within sight and not leave his buddy alone except to obtain additional assistance in an emergency. If visibility is limited, a buddy line will be used to maintain contact and communication. If SCUBA divers get separated and cannot locate each other, both divers will surface immediately.

2.2.6.3 Diver Tender

The tender is the surface member of the diving team who works closely with the diver on the bottom. At the start of a dive, the tender will check the diver's equipment and air supply for proper operation and will dress the diver. Once the diver is in the water, the tender will constantly tend the lines (as applicable) to eliminate excess slack or tension. The tender will exchange line-pull signals with the diver, will keep the Diving Supervisor informed of the line-pull signals and amount of tending line over the side, and will remain alert for any signs of an emergency.

2.2.6.3.1 Diver Tender Qualifications

The tender should be a qualified diver. When circumstances require the use of a non-diver as a tender, the Diving Supervisor will ensure that the tender has been thoroughly instructed in the required duties. If a substitute tender is to be employed during an operation, the Diving Supervisor must make certain that the substitute is adequately briefed before assuming duties.

2.2.7 SNORKELERS

All UXO technicians, marine biologists, and other personnel functioning as survey snorkelers will be qualified as open water divers by a nationally recognized organization, such as one of the following:

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

The USA Snorkeling Supervisor (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.

2.2.8 FIELD TEAM COMPOSITION

Underwater RI Field Teams will consist of the following personnel:

- Phase 2: Underwater Geophysical Survey
 - EM Float
 - UXOQCS/UXOSO
 - (2-3) EM ROV or EM Sled or EM Cart Operators
 - Small Boat Coxswain/s
 - Team Biologist

- Geophysicist-Project
- SUXOS
- Snorkelers (UXO Technicians are not required) trained in the use of the EM 61 Float system to guide the EM Float (*two Snorkelers*)
- Phase 3: Visual and Analog Instrument aided transect Survey with intrusive investigation (to be used when EM options are not suitable due to site conditions)
 - SUXOS
 - Dive Supervisor (Dive Supervisor/recorder)
 - UXO Diving Qualified QCS/SO
 - UXO Diving Qualified Technician II/III (Standby Diver)
 - Small Boat Coxswain/s
 - UXO Diving Qualified Technician II/III (two divers, one tender)
- Phase 3: Reacquire and Intrusive Investigation Phase
 - ROV Visual Investigation
 - UXOQCS/SO
 - UXO Technician II/III (ROV Operator)
 - UXO Technician II/III (ROV Tender)
 - Small Boat Coxswain/s
 - SUXOS manages all field operations and is not required to be on the vessel but will maintain direct communication
 - SCUBA Intrusive Investigation Team
 - SUXOS
 - Dive Supervisor (Dive Supervisor/recorder)
 - UXO Diving Qualified QCS/SO
 - UXO Diving Qualified Technician II/III (Standby Diver)
 - Small Boat Coxswain/s
 - UXO Diving Qualified Technician II/III (two divers, one tender)
 - SCUBA Biota Survey Team
 - SUXOS
 - Dive Supervisor (Dive Supervisor/recorder)
 - UXO Diving Qualified QCS/SO
 - Marine Scientist Dive Qualified
 - UXO Diving Qualified Technician II/III (Standby Diver)
 - Small Boat Coxswain/s
 - UXO Diving Qualified Technician II/III (two divers, one tender)
 - Snorkeling Operations
 - SUXOS
 - UXOQCS/UXOSO
 - Snorkelers (two snorkelers)
 - Underwater Demolition Team (SCUBA)
 - SUXOS
 - Dive Supervisor (Dive Supervisor/recorder)

- UXO Diving Qualified QCS/SO
- UXO Diving Qualified Technician II-III (Standby Diver)
- Small Boat Coxswain/s
- UXO Diving Qualified Technician II-III (two divers, one tender)
- Puerto Rico Certified Blaster

2.2.9 ASSIGNED TEAM PERSONNEL

Below, Table 2-1 reflects the related snorkeling positions, and personnel assigned to those positions:

Table 2-1: Assigned Team Personnel

Position	Name 1	Name 2	Name 3	Name 4	Name 5	Name 6
SUXOS (DV)	TBD					
Dive Supervisor	TBD					
UXOQCS/SO (DV)	TBDn					
UXO TECH (DV)	TBD	TBD	TBD	TBD	TBD	TBD
Biologist	TBD	TBD				
Snorkeler	TBD	TBD	TBD			
Small Boat Coxswain	TBD	TBD	TBD	TBD	TBD	

2.3 METHOD OF FIELD OPERATION

2.3.1 SCUBA

Normal working dive limit: 100-fsw. Diving operations must stay within no-decompression limits. Sea state is normally limited in wave height to 4 feet, and current to 1 knot maximum. Current greater than 1 knot requires Operational Risk Management (ORM) analysis. At a minimum, the divers(s) must be tended or have a witness float.

2.3.1.1 SCUBA Divers Equipment

At a minimum, each diver must be equipped with the following items to safely conduct an open-circuit SCUBA dive:

- Independent emergency “bail-out” cylinder with separate regulator and pressure gauge with a minimum 30 cu ft of air
- Face mask
- Buoyancy compensator devise capable of keeping the diver face up, and oral and manual activated inflation device and an exhaust valve
- Weight belt or weight assembly capable of quick release
- Knife
- Swim fins
- Submersible pressure gauge
- Submersible wrist watch
- Depth gauge
- SCUBA cylinder with Octopus regulator

- Protective Clothing. A diver needs some form of protection from cold water, from heat loss during long exposure in water of moderate temperature, and from the hazards posed by marine life and underwater obstacles. Wet suit, dive skins, or other suitable clothing that covers the torso and legs to at least the knees will be worn.
- Each SCUBA diver will wear a safety harness with a positive buckling device, attachment point for a line, and a lifting point to distribute the pull force of the line over the diver's body while maintaining the body in a heads-up vertical position when unconscious or inert.
- A timekeeping device will be used for recording diving times for all SCUBA diving operations. Each dive supervisor and diver will have a timekeeping device. When two-way voice communications are used, the dive supervisor, at a minimum will have a timekeeping device.

SCUBA air cylinders will comply with the following requirements:

- Air cylinders of seamless steel or aluminum that meet United States Department of Transportation (DOT) 3AA and DOT 3AL specifications are approved for used on USACE projects.
- Each cylinder used on USACE projects must have identification symbols stamped into the shoulder of the tank.
- SCUBA tanks used on USACE projects must be visually inspected internally at least annually, and hydrostatically tested at least once every 5 years in accordance with DOT and the United States Coast Guard Administration (CGA) regulations; test dates will be stamped into the shoulder of each tank.

SCUBA cylinders will be refilled as required by a local, recreational dive provider. The USA Dive Supervisor will ensure that the local facility maintains an inspection/sampling certificate for applicable air purity standards (see Attachment 3).

2.3.2 SNORKELING

Snorkeling team will be made up of no less than two persons; snorkeler, and observer/assistant. Additional support personnel may be required based on site hazards and conditions. Snorkeling team plans and procedures will be developed and enacted by the Dive Supervisor who will be qualified and experienced in snorkeling.

Each snorkeler will be equipped with a professional grade diving mask and snorkel. Snorkelers will wear apparel which provides appropriate environmental protection. The apparel must include fins.

Snorkeling will only be done on the surface of the water. No submerging or diving of any kind will be permitted. Untethered, scientific snorkeling, and snorkeling in waters greater than 5-feet deep has been allowed by special request to the DDC for this project (approval documentation is available upon request). Snorkeling during this project will include the following:

- Appropriate AHAs
- The snorkelers must be escorted by a boat. The boat, when in waters deeper than 5 feet, must remain within 50 ft of the snorkelers
- Two snorkelers will work as both observer/assistants to each other and will remain within 50 ft of each other
- Snorkelers must wear a device providing a minimum of 15.5 pounds (7 kg) of positive buoyancy (Type III personnel flotation device (PFD), fully inflated snorkeling vest, etc.).
- A throw device that can reach out to 70 feet is available on the boat for emergencies
- Areas of extreme water velocity and turbulence will be avoided

2.3.3 FIRST AID AND EMERGENCY EQUIPMENT

The following list of equipment is in addition to the USCG required safety and emergency equipment that will be on a vessel:

- First Aid Kit meeting the requirements of Section 3, OSHA 29 CFR
- An O2 resuscitation system capable of delivering oxygen for 30 minutes, or until emergency medical assistance can be administered (UXO Divers must maintain their current O2 Provider certification)
- A Stokes Litter or backboard with floatation capability

2.3.4 ANTICIPATED DAILY ACTIVITIES

Working hours are anticipated to start as early as possible each day. Waterwork cannot begin prior to 0700 but much of the morning preparation may be completed prior to 0700 if the SUXOS deems necessary. By starting the workday early, it provides the opportunity to get as much of the fieldwork completed prior to the trade winds picking up in the late morning (1030 – 1100 AM). Work hours will usually be 10-hour workdays. Completion of the fieldwork will depend on condition of the weather/ocean, and the work schedule will need to remain flexible.

The SUXOS will have the latitude to change the work schedule to encompass whatever the day's weather will allow, but will stay within USACE regulations for allowable workdays and stand-down periods. The SUXOS will be expected to take advantage of all weather related opportunities. In some cases working on the leeward side of the work sites may be the only opportunity to complete tasks. The SUXOS will reserve the leeward side of the work sites for days when the windward side is unsafe to work due to weather conditions.

Daily activities should include:

- Conduct pre-operations notifications. This includes: USACE, Puerto Rico Medical Center, St Thomas Hyperbaric Chamber, Culebra Police Department, USCG and FAA (contact for demolition coordination). Phone numbers are located in Section 3: "The Emergency Management Plan".
- Arrival at boat pier or ramp (depending on the operations being conducted)
- Check out boat condition, required USCG safety equipment, fuel, battery, etc.
- Inspect equipment to be used for the day's evolutions and equipment load out
- Ensure all personnel are present prior to departure (Geophysics/ROV/SCUBA Operations etc)
- Daily Tailgate Safety Brief by UXOSO
- Pre-Dive Brief by Dive Supervisor (SCUBA Only)
- Refresher from Team Biologist on natural resource concerns for the projected work sites
- Personnel assignments
- If applicable, proceed to the IVS and perform checks
- Depart for work site
- Conduct any scheduled safety exercises (MOB, Fire on Board, Injured diver etc)
- Perform work/tasks
- Dive Supervisor completes dive records or daily work logs
- Return to launch site (Side Scan Sonar/ROV/SCUBA Operations only)
- Clean/stow equipment, refuel as necessary
- Debrief daily activity, preview next day's activities.

2.3.5 WATER CONDITIONS

Anticipated water surface and subsurface conditions consist of the following:

- Water temperature ranges from 78 °F to 81 °F in winter months to 82 °F to 84 °F in summer months
- Tides range from 0.5 to 2 ft
- Underwater visibility from 15 to 60 ft
- Currents - see description below
- Surface conditions - see description below.

Given the varying geographic locations of the waterborne areas of each MRS, current and surface wave conditions will fluctuate.

The prevailing winds emanating from the east-northeast typically result in windward sites having more robust wave action than those on the leeward side of Culebra. The diving depths for the established transects do not exceed 100-feet of seawater (fsw) per nautical charts. The largest percentage of the diving will be conducted in waters 50-fsw and less.

The majority of the intended dive sites experience minimal current. Tidal currents of less than 1-knot can be expected on both MRS. It is anticipated that current speeds within the channels that separate the main landmass of Culebra from the neighboring island will increase during mean low and mean high tide tidal flows.

2.3.6 SENSITIVE MARINE HABITAT

Each dive site may contain sensitive underwater elements, consisting of corals, sea grasses, and a collection of fish, turtles, and other species. Table 2-2 lists the Culebra Marine Natural Resource Concerns.

Table 2-2: Culebra Marine Natural Resource Concerns

Listed Threatened or Endangered Species	
Loggerhead Sea Turtle (<i>Caretta caretta</i>)	Lamarck's Sheet Coral (<i>Agaricia lamarcki</i>)
Green Sea Turtle (<i>Chelonia mydas</i>)	Boulder Star Coral (<i>Montastraea annularis</i>)
Leatherback Sea Turtle (<i>Dermochelys coriacea</i>)	Mountain Star Coral (<i>Montastraea faveolata</i>)
Hawksbill Sea Turtle (<i>Eretmochelys imbricata</i>)	<i>Montastraea franksi</i>
Antillean Manatee (<i>Trichechus manatus</i>)	Pillar Coral (<i>Dendrogyra cylindrus</i>)
Humpback Whale (<i>Megaptera novaeangliae</i>)	Elliptical Star Coral or Pineapple Coral (<i>Dichocoenia stokesii</i>)
Fin or Finback Whale (<i>Balaenoptera physalus</i>)	Rough Cactus Coral (<i>Mycetophyllia ferox</i>)
Sei Whale (<i>Balaenoptera borealis</i>)	Bonfish (<i>Albula spp.</i>)
Sperm Whale (<i>Physeter macrocephalus</i>)	Dusky Shark (<i>Carcharhinus obscurus</i>)
Blue Whale (<i>Balaenoptera musculus</i>)	
Elkhorn Coral (<i>Acropora palmata</i>)	
Staghorn Coral (<i>Acropora cervicornis</i>)	
Nassau Grouper (<i>Epinephelus striatus</i>)	
Goliath grouper (<i>Epinephelus itajara</i>)	
Sea horses (<i>Hippocampus spp.</i>)	

Section 6 of the RI/FS Work Plan, along with Appendix K, "*Final Supplemental SOP for Endangered Species Conservation and their Critical Habitat with Draft Addendum 1, DERP-FUDS Property No. I02PR0068, Culebra Island, Puerto Rico* (CESAJ, ~~February-November~~ 2014)", ~~of the Work Plan,~~ discusses the concerns, guidance, and methods for conducting underwater operations around sensitive habitat, and avoidance procedures for ~~Listed or Proposed to be~~Listed Threatened or Endangered Species.

~~It is anticipated that the presence of these species may impact work tasks defined within the RI/FS Work Plan. The Technical Project Planning process has identified scenarios in which the RI/FS Work Plan, to include this Dive Operations Plan, will not provide suitable solutions to adequately protect the species identified in Table 2-2 in all scenarios. If the field team determines the procedures identified in the Work Plan or Appendix K, "*Final Supplemental SOP for Endangered Species Conservation and their Critical Habitat with Draft Addendum 1, DERP-FUDS Property No. I02PR0068, Culebra Island, Puerto Rico* (CESAJ, ~~February-November~~ 2014) may not provide adequate protection for those species identified in Table 2-2, the field team will contact the PM and the PM will inform the USACE of the field team's concerns. The USACE will coordinate with the Regulator and Stakeholders to identify solutions. In these cases in which species from Table 2-2 have been identified to potentially be at risk during a procedure or portion of the field work, additional guidance will be required from the government prior to proceeding with the specific task which may have a negative impact on the natural resource identified.~~

2.3.7 FIELD SCHEDULE

The field schedule is provided for review and planning purposes. The dates are approximate and may shift depending on the review periods of the work plans, additional needs for coordination with Stakeholders or Regulators, weather, or other unplanned impacts to the schedule. Table 2-3 provides the field schedule for both Phase 2 and 3 fieldwork.

Table 2-3: Field Schedule

Mobilization Phase II DGM Team	TBD
U/W EM Survey	TBD
U/W EM Survey Demobilization	TBD
Mobilization Phase III Intrusive Investigation DDC Mobilization	TBD
U/W Intrusive Investigation/ MC Sampling	TBD
Demobilization	TBD

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3.0 EMERGENCY MANAGEMENT PLAN

As required in Section 30.A.19 of EM 385-1-1 (Safety and Health Requirements Manual), the Emergency Management Plan (EMP) specific to the Culebra RI/FS MRS 02 and 07 project site is provided as follows:

3.1 LOCATION AND PHONE NUMBERS FOR THE NEAREST RECOMPRESSION CHAMBERS

Table 3-1: Contact Information for Recompression Chambers located in Puerto Rico

Primary Chamber	Alternate Chamber
Puerto Rico Medical Center Centro Medico San Juan, PR Puerto Rico Medical Center PO Box 2129 787-777-3535/3827 (phone) ext: 6476/6475/6068 787-777-3702 (fax) hiperbarica@asempr.org Director: Juan Angel Nazario, M.D 24hr Phone: 787 390-3243 Chamber #: 787 777-3535 x6475 or 6481 Office #: 787 777.3700	Schneider Regional Medical Center, 9048 Sugar Estate St Thomas, Virgin Islands 00802 340-776-8311

3.1.1 EMERGENCY CONTACT INFORMATION

Table 3-2: Contact Information for the US Coast Guard Rescue Coordination Center (RCC)

U.S. Coast Guard RCC (24 hour Regional Contacts for Emergencies)			
RSC San Juan (Sub-Center of RCC Miami)	Commander Sector San Juan San Juan, Puerto Rico	Southeast portion of the Caribbean Sea	(787)289-2042/2041 VHF Channel 16

Table 3-3: Emergency Telephone Numbers

Emergency Telephone Number	911
Culebra Police	787-742-3501
Culebra Hospital and Local Ambulance	787-742-3511/0001
Divers Alert Network (DAN) telephone number*	919-684-9111
DAN Medical Information Line	919-684-2948
*DAN's Emergency Hotline staff members are on call 24 hours a day, 365 days a year, to provide information, assist with care coordination and evacuation assistance.	
Key Project Personnel:	
Roland Belew (PM - USACESCH)	256-895-9525
Thomas Freeman (PM – USACE, SAJ)	904-232-1040
Kelly Enriquez (Project Geo – USAESCH)	256-895-1373
Teresa Carpenter (Technical Manager - USAESCH)	256-895-1659
Wilberto Cubero (PM and Environmental Scientist – USACE, SAJ)	904-232-2750
Patti Berry (PM-Parsons)	678-969-2410/404-673-9158
TBD (UXOSO – Parsons)	
Thomas Bourque (PM – USA Environmental)	941-746-5375/808-255-2320

3.1.2 DIRECTIONS TO CULEBRA HOSPITAL

A local medical facility and ambulance service is available on the island of Culebra, and is capable of treating urgent medical issues. Directions to the local medical facility on Culebra:

- Located near the island ferry landing, at the end of C. William Font street
- C. William Font Street extends up the hill, past the collection of local government buildings
- The medical building is identified by a Red Cross symbol, and is marked by a “Recetas” (prescriptions) sign

Figure 3-1 indicates the location of the Culebra Hospital:

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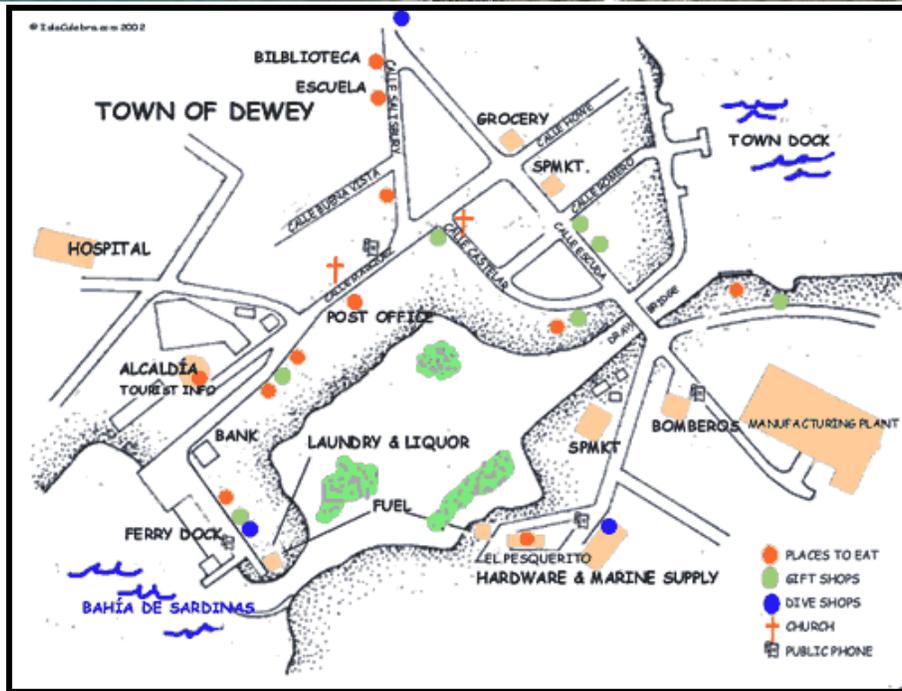


Figure 3-1: Directions to Culebra Hospital

Any injury will first be addressed on-site by First Aid/cardiopulmonary resuscitation (CPR) qualified personnel. As required, injured divers who cannot perform physical functions will be extracted from the water unto land and/or the dive platform by the safest means possible. This procedure may range from placement of the injured diver onto a floating backboard, or hand lifting the diver from the water.

Once recovered, the DS will direct the commencement of immediate medical treatment, and assign specific tasks to individual team members as applicable.

The DS will work with local emergency support units to ensure the fastest care at the closest medical facility for all injuries.

3.1.3 EMERGENCY COMMUNICATIONS:

The following emergency communication procedures will be used for the Culebra RI/FS MRS 02 and 07.

- Prior to the commencement of each workday when snorkeling operations are planned, the UXOSO will ensure that communication element (phone and VHF radio) are functioning, in order to contact local agencies required to support an emergency medical situation.
- The dive boat and support boats will be equipped with cellular telephones and VHF Radios. Cellular telephone service is available at the project site, however, if there is a failure in this means of communication, the VHF radio will be used to contact support personnel on the shore who will then notify emergency first responders.

3.1.4 EMERGENCY PROCEDURES

The Dive Supervisor will be responsible for coordinating all SCUBA diving related injuries and will make assignments for the dive team and crew to provide assistance. The vessel will be under the control of the Captain and the vessel's Captain is ultimately responsible for the welfare and safety of all personnel and the vessel. During a diving related injury there will be a clear separation of authorities: The Dive Supervisor will be responsible for the injured diver/snorkeler and the Captain of the Vessel will be responsible for ensuring the injured diver or snorkeler is expedited safely to the nearest harbor for transport via medivac or ambulance. The Dive Supervisor and the vessel's Captain will coordinate their roles prior to field operations beginning.

The following subsections reflect immediate actions relating to injuries and hazardous events.

3.1.4.1 Injured SCUBA Diver or Snorkeler Actions

The support/safety vessel will be available during all diving and snorkeling operations in order to quickly respond to any emergencies. If an injured diver/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 diver/snorkeler is not capable of climbing onto the support/safety vessel, the diver/snorkeler will be placed on a floating spine board and the crew will pull the diver/snorkeler onto the vessel or the diver/snorkeler may be lifted without the backboard into the vessel if no further injury will occur.

3.1.4.2 Unconscious Diver/Snorkeler

- In the event of an unconscious diver/snorkeler the boat will immediately be notified by the swim partner by waving his/her hands over his/her head when on the surface.
- The swim partner will provide an immediate assessment of the condition of the diver/snorkeler while moving the unconscious diver/snorkeler into deeper water for boat pick up.
- If conditions allow, the second diver/snorkeler will provide rescue breathing or apply direct pressure on wounds while waiting for the boat vessel to complete its approach. At a minimum, the second diver/snorkeler will ensure the unconscious diver/snorkeler's head remains out of the water at all times.

- Upon arrival of the boat, a line will be secured around the unconscious diver/snorkeler to ensure the victim does not float away from the vessel. The vessel will be shut down while the unconscious diver/snorkeler is brought next to the vessel. The vessel Captain needs to ensure enough seaway as the vessel will be adrift.
- The second diver/snorkeler will assist putting the unconscious diver/snorkeler on the spine board if needed. If the unconscious diver/snorkeler can be pulled aboard the vessel without the use of the spine board, and without further injury, then the spine board will not be required.
- Once the unconscious diver/snorkeler is on the vessel initial first aid/stabilization will take place and emergency first responder agencies will be notified. The boat will immediately head to the closest harbor for ambulance pick up or medivac. In all cases first aid/stabilization procedures will be provided and will continue until emergency response personnel arrive.

3.1.4.2.1 Injured and Unconscious Diver/Snorkeler Drills

On the first day of diving or snorkel operations the team will perform the deployment and recovery of SCUBA divers or snorkelers. Proper deployment (using the dive ladder at all times for boarding or entering the water) will be demonstrated and the Vessels Captain will rehearse picking up the snorkelers in the safest manner for the vessel used. Engines must be in idle and shut down prior to divers/snorkelers making their final approach to the vessel. In most cases it is always a best practice for the captain to place the boat just upwind/up-current of the snorkelers to allow the vessel to drift down onto the snorkelers.

- Recovery procedures will be rehearsed in a safe environment (bay or protected area with no sea state) prior to field operations being conducted. The recovery training scenarios will be the recovery of an injured diver/snorkeler and the recovery of an unconscious diver/snorkeler. The rehearsals will continue until a safe means is perfected for completing each scenario. Approval that a suitable solution for recovery has been attained and well-rehearsed resides with the DDC, or the UXOSO in the case of the snorkeler rehearsals. Rehearsals will be witnessed by the UXOSO and the UXOSO will log the training events.
- Refresher training on the diver/snorkeler recovery operations will be conducted as stated above on the first day of each week in which diving or snorkeling is to be conducted.
- The SCUBA drills will be witnessed by the DDC during the SCUBA training phase, and once the SCUBA Dive Team is cleared for operations, the drills will be witnessed by the UXOSO, The snorkeler drills will be witnessed by the UXOSO

3.1.4.3 Injuries Requiring Recompression Treatment

In the event a diver suffers an injury requiring recompression treatment, the injured diver may require marine or air transport to the Hyperbaric Chamber located at the *Puerto Rico Medical Center* (see Figure 3-2)

For these cases where air transport is required, the USA Dive Supervisor will complete the following procedures:

- Immediately place the individual on Emergency Oxygen supply.
- Contact USCG RCC via VHF Channel 16, or the numbers listed within the table, to request support and explain the diving emergency.
- Ensure the first responder is notified of the diver-related injury and the need for additional emergency oxygen.
- Transport the injured diver to the designated extraction point, and notify the response unit of this location (name of site or latitude/longitude coordinates).
- Maintain a record of the injured diver's time/depth profile, to be provided to the treatment facility.

- Ensure the injured diver is accompanied to the treatment facility by another member of the dive team.
- Direct the helicopter crew to fly at an altitude of 1,000 ft or less if possible to avoid further complications.



Figure 3-2: Recompression Chambers Locations

The requirement to transport divers requiring recompression treatment by aircraft entails unique planning elements. The USA DS will pre-identify an air extraction point that is within close proximity to the dive location, and be prepared to communicate this location to medical response teams as required during response to an injury. The following considerations will apply.

- Extraction point should be an open area, free of overhead power lines that would restrict helicopter maneuverability.
- Dive team will carry a handheld GPS unit in order to capture latitude/longitude coordinates of extraction point.

If initial transport of injured diver to an extraction point is not possible, air extraction by lift basket is possible but should be considered a last resort due to increased risk to the dive team and air crew.

Complete records of the event will be generated, and will include the following:

- Description of work being accomplished/information on possible cause
- Descriptions of signs and symptoms (including depth and time of onset)
- Description and results of treatment
- Name, address, and phone number of attending physician.

3.1.4.4 Discovery of Fire

- On-site personnel will immediately enact firefighting actions
- If the fire is on a vessel supporting diving/snorkeling personnel, the Dive Supervisor will assess if directing the divers/snorkelers to the vessel will place them in danger, or if it is safer for the divers/snorkelers to remain in the water while the vessel's Captain directs firefighting actions
- Once firefighting efforts are complete, all diving/snorkeling operations will be terminated until the proper operations of all associated equipment can be verified, personnel safety is assured, and confirmation is achieved that a re-flash of the fire will not occur.

3.1.4.5 Adverse Weather Conditions

- The vessel's Captain will suspend boat operations in adverse weather conditions if he/she feels the safety of the vessel and crew are at risk. The Dive Supervisor will suspend diving or snorkeling operations if adverse weather conditions could pose a risk to the UXO team. The UXOSO can terminate any field operations if he/she feels conditions are not safe. If the vessel is able to relocate to another work site which will allow for safe operations, or if the vessel can move out of the weather pattern and allow it to pass by without risk to the vessel and crew, then operations will be resumed.
- For lightning conditions, all personnel will exit the water and seek shelter within land-based vehicles/structures. It may be possible if the lightning is far enough away, for the vessel to head to safe harbor outside of a 10-mile radius from the storm, and then move back to operations when the storm passes.
- The UXOSO will determine when weather conditions will safely allow diving/snorkeling operations to re-commence.

3.1.4.6 Internal Safety Inspections

The assigned UXOSO will conduct daily safety inspections of site operations, equipment condition, and personnel adherence to safety standards.

3.1.4.7 Injury/Illness of Boat Crew While Snorkelers are in the Water

Emergencies involving the safety of the vessel and crew are under the authority of the vessel's Captain but at no time should the Captain's actions increase risk or put crew or passengers safety in question. When an injury happens to crew or passengers on the vessel, the emergency assignments to respond to an injured boat crew member resides with the Captain. CPR training will be required for Parsons personnel and subcontractors that are participating in field operations. The Captain may designate any personnel not inflicted with an injury to provide assistance. The Diving Supervisor will stand in for the vessel's Captain should the Captain be incapacitated. The severity of the injury or illness will be evaluated by the assigned person to provide first aid and the Vessel's Captain will determine to abort operations or not and transit back to the closest safe harbor or to the vessel's home port. Emergency notifications will be made per this document and the Accident Prevention Plan (APP). If divers or snorkelers are in the water they will be recalled back to the vessel. The pickup of the divers/snorkelers should follow normal practices.

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4.0 GENERAL REFERENCES

The following are references applicable to diving operation conducted in support of the RI/FS. 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 on-site personnel and the local community.

4.1 US ARMY CORPS OF ENGINEERS

- US Army Corps of Engineers, Safety and Health Requirements Manual, EM-385-1-1, 15 September 2008

4.2 U.S. NAVY

- U.S. Navy Diving Manual, Revision 6, 15 April 2008

4.3 OSHA

- OSHA 29 CFR 1910, Subpart T- Commercial Diving Operations

4.4 DoD

- DoD 6055.9-STD, Ammunition and Explosive Safety Standards
- DDESB TP-18, Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel

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