Draft Final
Proposed Plan
Buckroe Beach
Formerly Used Defense Site
Hampton, Virginia

USACE FUDS Property No. C03VA1011

December 2012

U.S. Army Corps of Engineers

Draft Final

PROPOSED PLAN

Buckroe Beach
Formerly Used Defense Site

Hampton, Virginia

U.S. Army Corps of Engineers
Norfolk District
Norfolk, Virginia

USACE FUDS Property No. C03VA101

US Army Corps of Engineers ®
Norfolk District

U.S. ARMY CORPS OF ENGINEERS, NORFOLK DISTRICT, ANNOUNCES PROPOSED PLAN

INTRODUCTION

This **Proposed Plan (PP)** concerning the Buckroe Beach at Hampton City, Virginia is being submitted for public review and comment. This proposed plan presents information supporting a No Further Remedial Action Plan with the recommendation that Land Use Controls **(LUCs)** are necessary to protect human health and the environment following the munitions removal action conducted in the summer of 2004. This document includes a summary of the site investigations, munitions removal activities, and confirmation sampling that led to this recommendation that LUCs are the preferred remedy at this site. Figure 1 shows the location of Buckroe Beach in the Hampton area and its proximity to Fort Monroe. This Proposed Plan summarizes information found in the **Remedial Investigation (RI) and Feasibility Study (FS)** for Buckroe Beach (September 2009). This Proposed Plan has been prepared in accordance with the requirements of the **Comprehensive Environmental Response, Compensation, and Liability Act** (**CERCLA**), sometimes referred to as **Superfund**. A final decision on the need for additional action or a remedy will be made after reviewing and considering all information submitted during the 30-day **public comment period**. This Proposed Plan may be modified based on any new information acquired during the designated public comment period. Therefore, the public is encouraged to review and comment on all information presented in this Proposed Plan.

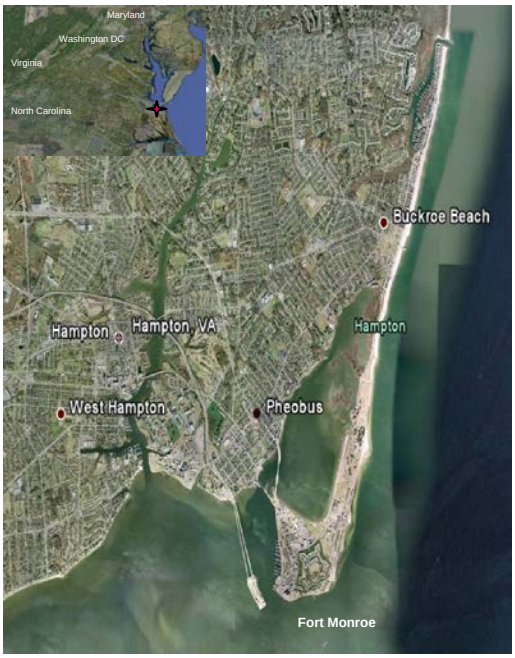

Figure 1: Buckroe Beach Location Map

This document has been prepared by U.S. Army Corps of Engineers (USACE), the lead agency for investigating, reporting, making response action decisions, and executing response actions regarding munitions at Buckroe Beach. The USACE has cooperated closely with the Virginia

Department of Environmental Quality and the City of Hampton in selecting the appropriate LUC for Buckroe Beach. During the course of Focused Feasibility Study (FFS), USACE discussed and evaluated three LUCs mainly to assess the feasibility, capability and willingness of the local government (City of Hampton) to assume this responsibility in order to implement and enforce the proposed recommendation. These LUCs were evaluated and compared to nine evaluation criteria established by the U.S. Environmental Protection Agency (U.S.EPA), which are described in Table 1.

LUCs are being proposed to further strengthen the removal action conducted in 2003-2004 by minimizing the risk of people from coming into contact with any remaining munitions and explosives of concern (**MEC**) and munitions debris (**MD**) that may remain buried underneath the sand and/or may resurface during future storm season, digging or excavation. LUC protects human health and the environment according to standards set forth under the Formerly Used Defense Sites (**FUDS**) program.

The City of Hampton has implemented signage since 2004 and continues to maintain the signs. Furthermore, all construction and/or digging projects on Buckroe Beach require approval from the City Engineering Department in the form of a digging permit and. The City of Hampton will provide MEC Recognition and Safety Brochures with all permits to conduct construction work in these areas. Distribution of informational brochure/flyers and MEC educational signs and posters at the beach are examples of educational controls.

This Proposed Plan (PP) summarizes information that can be found in greater detail in the supporting documents listed in the **Administrative Record File (ARF)** for this site. The ARF can be examined at locations shown in the text box on this page and in Section 6.0. The public is encouraged to review these documents to gain a more comprehensive understanding of the Buckroe Beach and other CERCLA

Table 1: **EVALUATION CRITERIA FOR CERCLA REMEDIAL ALTERNATIVES**

Threshold Criteria:

1. Overall Protectiveness of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered Criteria (TBCs)
evaluates whether the alternative meets Federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

Balancing Criteria:

3. Long-Term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

4. Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

5. Short-Term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.

6. Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. Cost includes estimated capital and annual O&M costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30%.

Modifying Criteria:

8. State/Support Agency Acceptance considers whether the state and/or support agency agrees with USACE's analyses and recommendations, as described in the RI/FS and Proposed Plan.

9. Community Acceptance considers whether the local community agrees with USACE's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

activities that have been conducted following munitions discovery at the Site. This Proposed Plan provides an overview of the status of the Buckroe Beach and is divided into the following sections:

1.0 Background
2.0 Site Characteristics
3.0 Previous Removal Actions
4.0 Post Removal Action and Remedial Investigation Sampling
5.0 Summary of the Site Risk
6.0 No Further Removal Action Proposal
7.0 Remedial Action Objectives
8.0 Summary of Potential Remedial Alternatives
9.0 Scope and Roles
10. Detailed Evaluation of Remedial Alternatives
11.0 Community Participation

Conduct Remedial Investigation and Feasibility (RI/FS) and Prepare RI/FS Report ↓
Prepare and Distribute Proposed Plan ↓
Public Meeting ↓
Public Comments and Finalizing PP
↓
Decision Document

Table 2: Buckroe Beach FUDS DD Process

Table 2 summarizes the process flow and public participation steps in achieving a final Decision Document (DD).

SECTION 1. SITE BACKGROUND

In July and August 1990, the City of Hampton, Virginia, conducted a beach replenishment project at Buckroe Beach, placing approximately 280,000 cubic yards of sand over a 3,660 linear foot section of the beach. The sand material was dredged from the bottom of Chesapeake Bay approximately 2 miles offshore to a depth of 8 feet from the borrow area. There was no screening for munitions debris (**MD**) at the borrow area location as the available historical records were checked and it appeared the borrow area was outside the expected firing area of nearby Fort Monroe. Following completion of the 1990 beach replenishment MEC were reported on the beach and removed by the local Explosive Ordnance Disposal (**EOD**) unit. There were also several removal actions between 1990 and 1994 managed by the USACE.

In 1996, the City of Hampton conducted another beach replenishment project placing approximately 56,500 cubic yards of sand over a 1900 linear foot section of the beach. This northern portion of the beach was losing sand due to erosion and storm events. During the 1996 replenishment effort, the sand was

dredged from a depth of 12 feet and screened with a rebar grate at the discharge point to prevent MEC items larger than 76 millimeters from being placed on the beach. Unfortunately the grate failed during the replenishment effort and had to be repaired. At least one item, which was recovered, was known to have been dredged onto the beach. Consequently, some MEC may have been deposited during the 1996 effort. In November 1990, USACE, determined that Buckroe Beach was eligible under Defense Environmental Response Program- FUDS (**DERP-FUDS**) based on the military origin of the MEC. USACE was charged to determine if further action was warranted.

In 2001, the City of Hampton, Fire Department Haz-Mat Captain reported the MEC incidents at Buckroe Beach to the USEPA and in June 2002 met with USEPA and toured the beach. The USEPA quickly contacted USACE about the MEC. Of the various MEC items recovered at Buckroe Beach since 1997, two (2) were reported to be Marine Marker MK25 flares used by the U.S. Navy. The flares were likely washed up from naval training exercises found all along the local coast line and determined to not be associated with the beach replenishment activities. Indications are that most of the MEC items discovered since 1997, including the more recent items conducted since 2000, were inadvertently dug up by individuals using metal detectors, usually below low tide in shallow water.

SECTION 2: SITE CHARACTERISTICS

Buckroe Beach is located in Hampton, Virginia on the western shore of the Chesapeake Bay, north of Fort Monroe. Buckroe Beach is oriented northeast to southwest and is approximately 3,670 feet long by 300 feet wide, at low tide. It consists of approximately 13 acres of gently sloping beachfront and 4 acres of tidal area. A four-foot high concrete seawall bounds the beach to the west. Eight jetties and a pier, oriented perpendicular to the seawall, extend into the Chesapeake Bay from the beach. The beach varies in width from approximately 60 feet to 260 feet at mean low water (MLW). Buckroe Beach is owned by the City of Hampton and serves as a recreation area for the general public.

SECTION 3: PREVIOUS REMOVAL ACTIONS

After the 1990 beach replenishment project was completed, MEC was reported on the beach, the local EOD unit was notified, and approximately 55 MEC items were removed, consisting mainly of 76mm projectiles. Between 1990 and 1994, USACE Huntsville conducted an initial removal action of MEC on the beach, and subsequent yearly sweeps of the beach. The removal effort by Huntsville detected and removed MEC items to a depth of 24 inches, covering the dry beach, the intertidal zone between the mean high and low tide water, and channel-ward to knee deep water at low tide.

The Corps of Engineers, Baltimore District (CENAB) conducted a Time Critical Removal Action (TCRA) at Buckroe Beach 2003. The project consisted of performing a Digital Geophysical Mapping (DGM) survey to locate subsurface anomalies, followed by excavating the items and disposal of MEC/MD items recovered. The TCRA was performed along a 3,700 foot section of the Buckroe Beach where the 1990 beach replenishment was performed (see Figures 2).

A total of 579 anomalies identified by the DGM were excavated. Of these 579 excavations, eight 75mm and 76mm MD items were identified, removed and disposed of (Figure 3). Six of the items had functioned as designed and two of the items were sand-filled training rounds. The term functioned as designed indicates that a munitions had been fuzed, fired and successfully completed its desired effect with its contents depleted or consumed. Once an item has functioned as designed, and certified to be free of energetic material, it is then categorized as MD.

SECTION 4: POST REMOVAL ACTION AND REMEDIAL INVESTIGATION SAMPLING

Following TCRA in 2003, Remedial Investigation was initiated by USACE. The purpose of this investigation was to determine if residual munitions constituents (MC) such as explosives and metals remained in the soil underlying known former MEC locations; as well as the nature and extent of semi-volatile organic compounds (**SVOCs**), explosives, and metals in the MEC disposal areas and three former MEC locations. A total of fifteen (15) primary soil samples (from sandy beach area) were collected during this sampling event (Figure 4 and Table 3). Eight (8) subsurface samples and three (3) surface samples were collected along the beach. Four (4) surface soil samples were collected, two (2) from each disposal area. Additionally, three background samples were collected off-site and analyzed for SVOCs in order to properly evaluate the samples collected at Buckroe Beach. The presence or absence of compounds was used to evaluate if MEC (SVOCs, explosives, or metals) leached into the underlying soil as a result of the MEC and MEC removal. No SVOCs and no explosive compounds were detected in any samples.. Based on the results of this sampling event, no SVOCs or explosives had leached into the underlying soil as a result of the MEC and MEC removal operations that occurred at Buckroe Beach. The analytical results indicated that metals were present at the beach; however, aluminum, antimony, barium, beryllium, chromium, cobalt, copper, cyanide, lead, manganese, nickel, silver, vanadium and zinc were at concentrations well below the screening criteria. Arsenic was present in all samples at concentrations above the Residential risk based concentration level from EPA Region 3. However, the concentrations were well within natural levels of arsenic found in soil, which range from 0.1 to 73 ppm, with a mean of 5 ppm (ATSDR, 2000; Shacklette and Boerngen, 1984). The purpose of the RI sampling event was to determine the

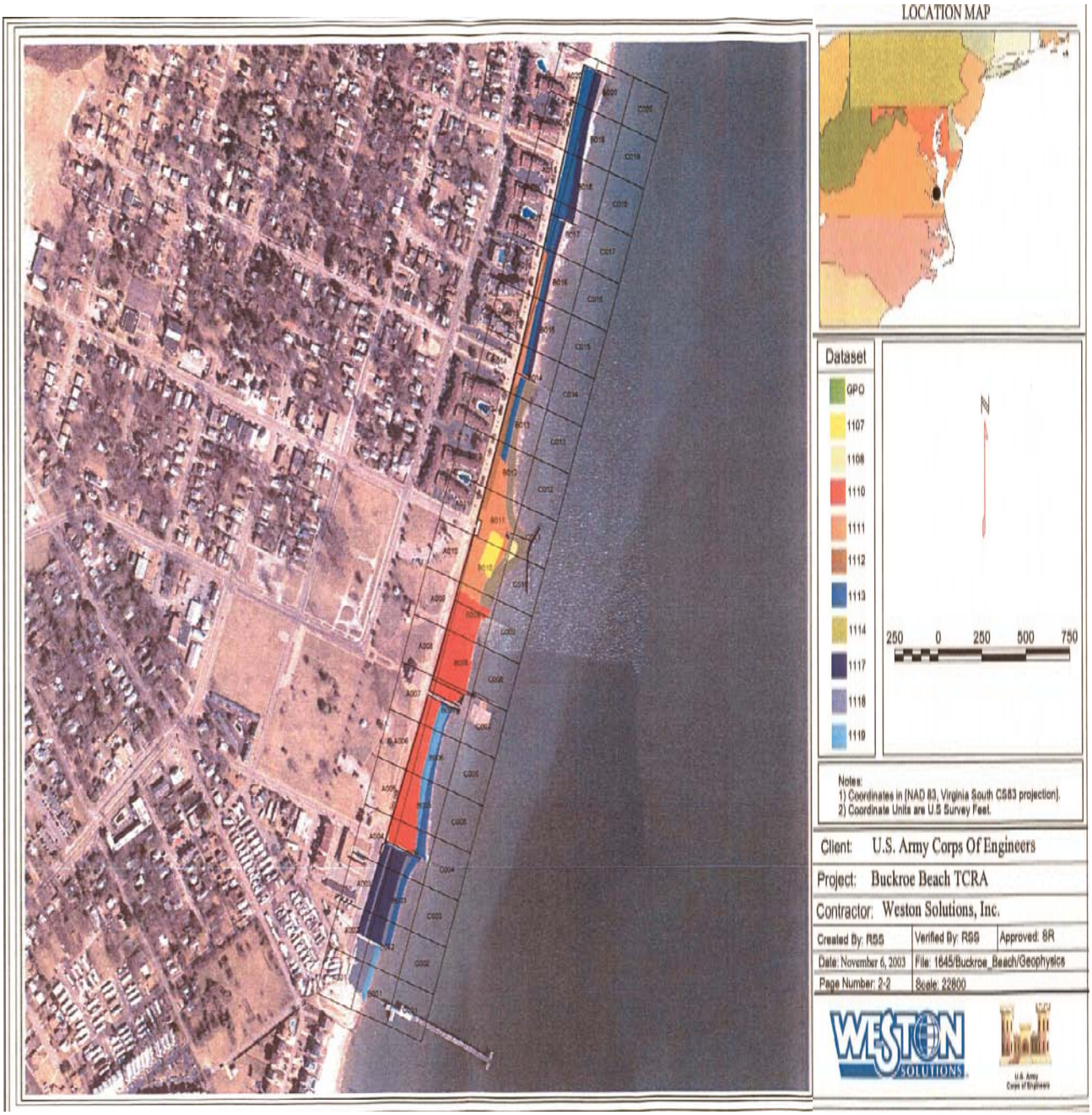

Figure 2- Geophysical Survey Site Layout Map

Figure 3- Locations of Recovered MEC

Sample Location	Actual Sample Depth (inches bgs1)	Description	Anomaly	Depth to MEC2 (inches bgs)	
1	24-30	Subsurface	Ordnance related scrap, projectile, 75 mm, MK1 shrapnel round, empty	24	Dec 2003
2	12-18	Subsurface	Ordnance related scrap, projectile, 75 mm, MK1 shrapnel round, empty	12	Dec 2003
3	24-30	Subsurface	Ordnance related scrap, projectile, 75 mm, MK1 shrapnel round, empty	24	Dec 2003
4	24-28	Subsurface	OE, projectile, 76mm, projectile, practice, M42B2 round	24	Dec 2003
5	10-16	Subsurface	Ordnance related scrap, projectile, 75 mm, MK1 shrapnel round, empty	10	Dec 2003
6	0-6	Surface	Ordnance related scrap, projectile, 75 mm, MK1 shrapnel round, empty	12	Dec 2003
7	18-24	Subsurface	Ordnance related scrap, projectile, 75 mm, MK1 shrapnel round, functioned as designed	18	Dec 2003
8	0-6	Surface	75 mm, 40 mm	Unknown	Spring 2003
9	18-24	Subsurface	75 mm	Unknown	Spring 2003
10	18-24	Subsurface	MEC type unknown	Unknown	1998-2002
11	0-14	-	South Disposal Area	Disposal Depth +2[3]	-
12	0-14	-	North Disposal Area	Disposal Depth +2	-
13	0-6	Surface	OE, projectile, 76mm, projectile, practice, M42B2 round	18	Dec 2003

Table 3- Sample Depth

1 bgs - below ground surface
2 The depth at which MEC was originally discovered.
3 14-inch depth equals the depth at which the MEC was placed prior to detonation plus 2 inches. The disposal areas were used during the December 2003 removal operation

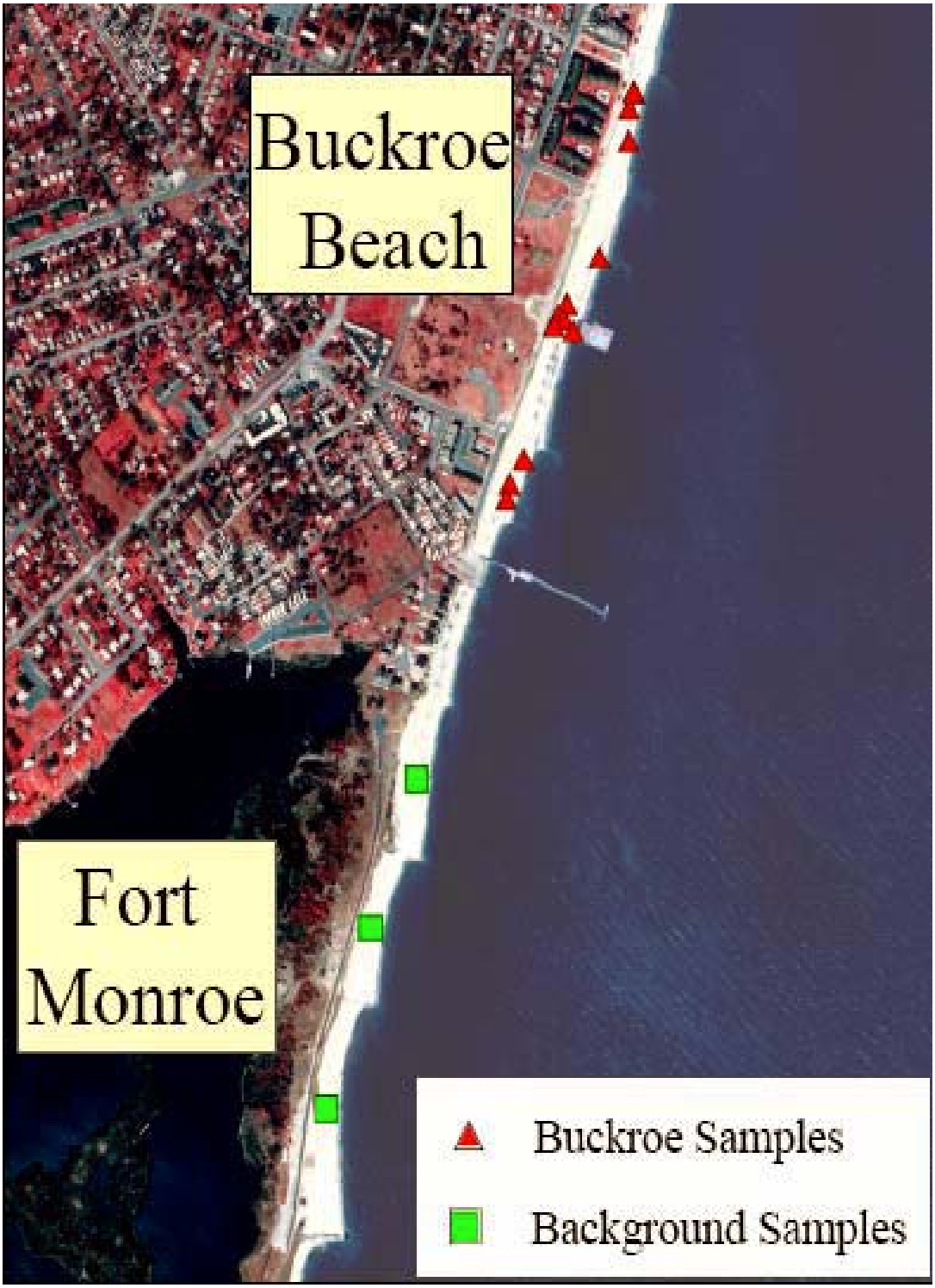

Figure 4- Primary & Background Sample Locations

nature and extent of SVOCs, explosives, and metals in soil at Buckroe Beach in order to determine if residual contamination existed as a result of MEC or MEC-related removal activities. Results from this sampling event indicated that no SVOC or explosive compounds relating to MEC or MEC-related activities were present at Buckroe Beach. Trace metals were present at concentrations either below screening criteria or within the range of accepted natural background concentrations.

SECTION 5: SUMMARY OF SITE RISKS

5.1- Risk Evaluation for Munitions Constituents (MC)- Following a TCRA conducted in 2003-2004, a screening-level risk assessment was completed in the RI. The results of sampling indicate that all MCs either were not detected during this sampling event or their concentrations were well below ecological or human health screening level risk assessment criteria. Based on the screening-level risk assessment completed in the remedial investigation, MC -- including metals and explosive compounds -- were not detected at concentrations that pose an unacceptable risk to human health or the environment. Therefore, explosive safety risk is the only MEC-related risk at the site.

5.2- Explosive Safety Risk- Explosive safety risk is the probability for a MEC item to detonate and potentially cause harm as a result of human activities. An explosive safety risk exists if a person can come into contact with a MEC item and act upon it to cause detonation. The potential for explosive safety risk depends on the presence of three critical elements: a source (presence of MEC), a receptor (person), and interaction between the source and receptor (such as picking up the item or disturbing the item during construction). There is no explosive safety risk if any one element is missing.

The **exposure pathway** for a MEC item to a receptor is primarily through direct contact as a result of some human activity. Agricultural or construction activities involving subsurface intrusion are examples of human activities that will increase the likelihood for direct contact with buried MEC. A MEC item will tend to remain in place unless disturbed by human or natural forces, such as erosion or frost heave. Movement of the MEC item by natural forces may increase the probability for direct human contact, but not necessarily result in a direct contact or exposure.

A qualitative risk evaluation was conducted using the **USACE Munitions Hazard Assessment (UMHA)** draft guidance document (USACE 2005) to assess explosive safety risks to the public at the Buckroe Beach site. The potential explosive safety risk posed by MEC was characterized qualitatively by evaluating the following three primary risk factors and associated secondary risk factors (in parentheses):

1. Presence of a MEC source (type, sensitivity, density, and depth distribution)

2. Site characteristics (site accessibility and stability)

3. Human factors (population and site activity)

By performing a qualitative assessment of these three risk factors, an overall assessment of the explosive safety risk posed by munitions is evaluated. The results of the risk evaluation were used to assign an overall qualitative explosive safety risk (no risk, low, moderate, or high risk) for Buckroe Beach. Overall, a finding of no safety risk was found due to a combination of each of the primary hazard factors that are presented above. Even though there is a high potential pathway, the past removal actions in combination with the likelihood that any possible remaining munitions items are not sensitive combine to give a finding of low overall safety hazard.

SECTION 6: NO FURTHER REMEDIAL ACTION PROPOSAL

Based upon the completion of a removal action conducted at Buckroe Beach in 2003-2004 and subsequent soil and sediment testing, previously described in RI report, the USACE proposes that LUCs be implemented to manage any remaining risks at Buckroe Beach. By implementing LUCs, use of the beach will be "unrestricted," based upon the demonstrated effectiveness of the removal actions undertaken at Buckroe Beach. However, the city ordinance will impose limited restrictions on construction activities. The City of Hampton will provide MEC Recognition and Safety Brochures with all permits to conduct construction work in these areas. In 2008 it was agreed to by USACE, EPA Region III, and VA DEQ to open the beach up to metal-detecting treasure hunters. The treasure hunters were required to watch an MEC Safety and Recognition Video at the Buckroe Beach Ranger Station, sign a document agreeing to follow all guidelines put forth in the safety video, and given a unique badge to be worn while conducting metal detecting activities at Buckroe Beach. Since inception of the metal detector program in August of 2008, no MEC or parts of MEC have been found at Buckroe Beach or reported by treasure hunters, park staff, or the general public.

These LUCs will be subjected to any applicable state and local planning/zoning laws, regulations and ordinances. Subsequent to implementation of the Preferred Remedy of LUCs, no further actions are anticipated. However, in accordance with FUDS Program Policy, "…the property may be reactivated if future conditions or new information suggests this is necessary." (U. S. Army Corps of Engineers, Engineering Regulation 200-3-1, dated May 10, 2004).

This *Proposed Plan* will be made available for public review at the document repositories for the site, at (needs to be identified).

7.0 REMEDIAL ACTION OBJECTIVES

The Buckroe Beach is used by the public for outdoor recreational activities, including fishing and swimming. The City of Hampton Master Plan 2010 describes the site as a recreational

(public facility) area reflecting the long – term use of the site as parks and public beach. There is no stated intent by the Hampton City to change the land use. The goal of the Buckroe Beach proposed remedial action is to reduce explosives safety risk to ensure protection of human health, public safety, and the environment. The **remedial action objective (RAO)** for the Buckroe Beach is to: 1) Minimize or eliminate the explosive safety risk to the public and site personnel, and to 2) Ensure that future beach replenishments will incorporate munitions safety measures or MEC screening. The 2005 project used screens on the dredge intake and beach discharge areas to preclude placing any MEC with the sand. The screening process proved to be very effective and no MEC was located on the beach relating to the 2005 project. USACE's current judgment is that the LUCs identified and discussed in this PP will protect human health or welfare and the environment.

SECTION 8: SUMMARY OF POTENTIAL REMEDIAL ALTERNATIVES

Since all known munitions were removed during TCRA in 2003 and subsequent Remedial Investigation in 2004 indicated no unacceptable risk from MC and MEC at the site therefore only the No Action and LUC Alternatives were evaluated in the Focused Feasibility Study (FFS) for Buckroe Beach. USACE, State and local government agree that LUC is the appropriate remedy for Buckroe Beach while local government has all the tools and capability to provide oversight with funding less than $5000 per year.

Results from RI indicate that no semivolatile or explosive compounds of concern relating to MEC or MEC-related activities are present at Buckroe Beach. Trace metals are present at concentrations either below screening criteria or within the range of accepted natural background concentrations. Based on TCRA performed on 2003 and RI in 2004, project delivery team found no justification to evaluate additional alternative which require further excavation or intrusive activity at the beach.

1. No Further Action – Required to be evaluated by the **NCP**.

2. Land Use Controls

   a) Legal Mechanism
   b) Engineering Control
   c) Educational Control

Alternative 1 – No Further Action is provided, as required under CERCLA and the NCP, as a baseline for comparison to the other proposed alternatives. Alternative 1 is for the government to take no further action in regards to locating, removing, and disposing of any potential MEC present at the site. In addition, no public awareness or education training would be initiated with regard to the potential risk of MEC. The No Further Action alternative assumes continued land use of the Buckroe Beach in its present state.

Alternative 2

a) Administrative and legal Mechanism: Administrative mechanisms include construction permitting, adopting local land use plans and ordinances, and deed notices. Some of these restrictive measures are already in place by local government and impose very little financial burden on the implementing agency (City of Hampton). Restrictions against excavation, construction or well drilling without a permit are also examples of legal. Additional measures that prohibit certain activities which are incompatible with future land use in Buckroe Beach are included in the City of Hampton 2010 Comprehensive Master Plan. Future provisions may stipulate that no construction activities be conducted at the beach or in close proximity to the beach area or on submerged lands near the beach or other marine structures without the completion of a permit. The permit could be issued by the City of Hampton. Permit programs have the effect of land use controls when the City of Hampton, desiring to prohibit certain activities, relies on the program to limit the identified activities.

The City of Hampton, (and/or state government) has authority to enforce the provisions of these restrictions, and provide/promote a site-wide MEC safety educational program. The City of Hampton will be responsible for ensuring that the construction restrictions are adhered to prior to and during any construction activities that may be necessary on the property. There is no cost to USACE associated with this aspect of LUC.

b) Engineering Control: Controls are designed to limit public access and/or exposure to residual contamination that remains on site to an acceptable level. The recommended engineering control for Buckroe Beach is signage. The associated cost for installing new signs and maintenance is around $1500 per year.

c) Educational Control: Educational programs are an essential component of LUCs and are intended to inform the public of 1) the types of hazards that might remain at the site, 2) identification of hazards and safety precautions, and 3) how to inform. Presently, there is no educational program available that includes ordnance safety procedures for local residents or visitors. An educational program should be incorporated into the present educational system to help educate and thus protect the public from possible ordnance hazards. Specific topics to be addressed in the educational program will include the following:

Community education and outreach activities including, but not limited to:

- Distribution of informational brochures/fact sheets.
- Distribution of visual and audio educational and training media.
- Performance of classroom education and training as needed.
- Posting of MEC educational information on the Park website.

The annual cost associated with educational control should not exceed $5000.. Under CERCLA Section 121(c), a 5-year review of a remedial

action is required whenever any hazardous substances, pollutants, or contaminants are left at the site when the site conditions do not allow for Unrestricted Use and Unlimited Exposure (UU/UE). USACE is required to conduct the 5-year review at Buckroe Beach. During 5-year review period, USACE, the City and State will discuss and evaluate the effectiveness of educational control to ensure that human health and environment are still being protected by remedy. All aspects of educational control should be implemented by the City of Hampton and State of Virginia.

Successful implementation of LUCs is contingent on the cooperation and active participation of the existing powers and authorities of the property owners, as well as other government agencies to protect the public from MEC risks. The remedial design will specify steps and controls to be put in place that will ensure the LUCs are maintained, thus ensuring long-term effectiveness and permanence

There are additional recommendation proposed in FFS and summarized here in PP which warrant further discussion with local government (City of Hampton) as the sole responsible party for implemnting the LUC for Buckroe Beach.

- It is recommended that a munitions safety training session would accompany any permit application with the city of Hampton for construction related work on Buckroe Beach
- City of Hampton conduct periodic visual inspection of Buckroe Beach following storm events
- City of Hampton conduct an annual survey of the beach area to ensure a minimum thickness of sand on the beach
- USACE will provide munitions safety training to the City planning and zoning division personnel upon request
- USACE will provide the City of Hampton with site specific munitions safety flyers for presentation, distribution or mailing to residential properties
- USACE requests that any munitions finding to be reported to USACE-Baltimore District for further evaluation. The USACE Point of Contact must be provided on munitions safety training flyers
- It is recommended that all future beach replenishments activities incorporate additional safety procedures that will detect MEC/MC prior to beach replenishment. Virginia Department of Conservation and Recreation (VDCR) with the help of Virginia Institute of Marine Science (VIMS) will be instrumental in identifying sources of beach quality sand (or borrow sites) in the Chesapeake Bay and off the coast of Virginia Beaches

SECTION 9: SCOPE AND ROLE

Past beach replenishment activities have resulted in the potential for MEC contamination at the Buckroe Beach. The role of the LUC selected for the Buckroe Beach is to minimize the risk associated with MEC to human health and the environment at the site for the current and intended future land use of public access for outdoor recreational activities which is planned for this site. Evidence assembled to date would indicate that the MEC recovered on Buckroe Beach is consistent with those items which could be located within and adjacent to the Ft. Monroe target range fans.

SECFTION 10: DETAILED EVALUATION OF REMEDIAL ALTERNATIVES

The alternatives presented in FFS meet the RAOs of eliminating or minimizing the exposure route hazards posed by possible munitions buried underneath the sands or transported to shoreline during storm events at Buckroe Beach.

10-1- Overall Protectiveness of Human Health and the Environment- Although a TCRA addressed the surfaced munitions at Buckroe Beach in 2004, there is an unacceptable risk that buried ordnance may still be present at depth below the instrument detection capability. Therefore, Alternative 1 is not protective because no further action would be taken to prevent human exposure to MEC. Alternative 2 is more protective than Alternative 1 because the LUCs would reduce unacceptable exposure.

10-2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered Criteria (TBCs) – There are no regulations or criteria associated with Alternative 1, and Alternatives 2 would be implemented and performed to comply with all ARARs and applicable TBCs.

10-3-Long-Term Effectiveness and Permanence – Alternative 1 is not effective or permanent. Alternative 2 is more effective and permanent than Alternative 1, assuming the cooperation and active participation of the existing powers and authorities of government agencies. The LUCs recommended as Alternative 2 have been designed to provide effectiveness in the long term.

10-4 Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants Through Treatment – Neither alternatives 1 nor 2 will reduce the TMV of MEC through treatment at Buckroe Beach. However alternative 2 will minimize the chance of injury by implementation of a MEC safety training (please see educational control) from items that potentially move to the surface due to erosion or migration during storm events.

10-5 Short-Term Effectiveness Because there are no USACE construction activities associated with either alternative, Alternatives 1 and 2 would not present significant additional risk to the community, workers or beach goers. Alternative 2 (LUCs) will provide a greater amount of

protection/effectiveness in the short-term than the No Further Action alternative.

10-6 Implementability – No further action alternative would be easily implemented because it requires no further action. The LUCs recommended as Alternative 2 could also be easily implemented because they pose no technical difficulties and the materials and services needed are available. The power and resources to implement LUCs rest with the local government and may impose very little financial burden on the implementing agency.

10-7-Cost – The total cost to perform each alternative for 5 consecutive years for Buckroe Beach is as follows:

Alternative 1 = $0
Alternative 2 = $40,000

Under CERCLA Section 121(c), a 5-year review of a remedial action is required whenever any hazardous substances, pollutants, or contaminants are left at the site at levels that do not allow for UU/UE. USACE is required to conduct the 5-year review at Buckroe Beach. During 5-year review period, USACE, the City and State will discuss and evaluate the effectiveness of LUC and monitoring program to ensure that human health and environment are still being protected by remedy. All aspects of LUCs should be implemented and funded by the City of Hampton and State of Virginia.

10-8 State Acceptance The State Acceptance and Community Acceptance factors will be evaluated in the Decision Document, after the public comment period has ended.

11 PREFERRED REMEDIAL ALTERNATIVE

The preferred remedial alternative for Buckroe Beach is Alternative 2 (LUCs). This preferred alternative was selected over the no further action because it is expected to meet the threshold criteria and provide the best balance of tradeoffs relative to the balancing and modifying criteria.

This alternative will provide the highest level of protection to human health and the environment, and is the most effective and permanent remedy by implementing LUCs to increase public awareness to reduce risk associated with MEC.

SECTION 12: COMMUNITY PARTICIPATION

The USACE strongly encourages the public to review and comment on this Proposed Plan. The information regarding the cleanup of the Buckroe Beach and following Remedial Investigation and Feasibility study is available to the public through the USACE-Norfolk District, the Administrative Record File for the site, and Public Civic Association at Hampton City, Virginia. If any significant new information or public comments are received during the public comment period, the Proposed Plan for LUC may be modified to acknowledge new information.

A minimum 30-day public comment period will begin on Month xxx, 2013 and extend to Month xxx, 2013. Notice

of the public comment period will be printed in local newspapers. In addition, the public comment period will include a **Public Meeting** during which the USACE and Virginia Department of Environmental Quality (VDEQ) will provide an overview of the site and investigation findings, answer questions, and accept public comments on the Proposed Plan.

Comments on the Proposed Plan will be summarized and responses provided in the Responsiveness Summary Section of a Decision Document (DD). To submit written comments or obtain further information, please contact the following representative:

U. S. Army Corps of Engineers,
Attn: George Follett
Environmental & Munitions Design Center, Baltimore District
P.O. Box 1715
Baltimore, Maryland 21201
(410) 962-6743

REFERENCES

1) American Seacoast Defenses, Second Edition, CDSG Press, 2004.

2) CTT Range and UXO-DMM-MC Sites, Fort Monroe, VA, USACE, 2003.

3) Chesapeake Bay Shoreline, Hampton, Virginia Hurricane and Storm Damage Reduction Study Feasibility Report, USACE, 2001.

4) United States Corps of Engineers, EP 1110-1-24, Establishment and Maintaining Institutional Controls for Ordnance and Explosives (OE) Projects, 2000.

5) United States Corps of Engineers, Final Remedial Investigation/Feasibility Study Report for Buckroe Beach, September 2009

GLOSSARY OF TERMS AND ACRONYM LIST

Administrative Record File (ARF) - A comprehensive set of all documents relied upon to select an alternative for a remedial action.

Applicable or Relevant and Appropriate Requirements (ARARs)- The Federal and State environmental laws, administrative regulations, and contaminant limits/standards that a selected remedy must meet unless waived by the lead agency. These requirements may vary among sites and alternatives.

Background concentration- The concentration of a substance in an environmental media (air, water, or soil) that occurs naturally or is not the result of human activities.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund statute)- A Federal law that addresses the funding for and cleanup of abandoned or uncontrolled waste sites concerns response to hazardous substances. This law also establishes criteria for the creation of decision documents such as the Remedial Investigation, Feasibility Study, Proposed Plan, and Record of Decision (ROD).

Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS)- Federal program that addresses Department of

Defense-related hazards posed at former defense sites.

Decision Document (DD)- A legal public document that describes the cleanup action or other remedy selected for a site, the basis for the choice of that remedy, public comments and responses to comments . The DD is based on information and technical analysis generated during the RI/FS and the public comment process.

Department of Defense (**DoD)**- A Federal department that includes the military services.

Digital Geophysical Mapping (DGM)-

Explosive Ordnance Division (EOD) - A military unit tasked with bomb disposal (i.e., the process by which hazardous devices are rendered safe). Generally, ordnance includes all military supplies such as weapons, ammunition, combat vehicles, and maintenance tools and equipment.

Feasibility Study (FS): A document that serves as the mechanism for the development, screening, and detailed evaluation of alternative remedial actions. **Focused Feasibility Study** (**FFS)**: an evaluation of remedial alternatives for a limited number of media or exposure pathways that address hazards posed by a site.

Human Health Risk Assessment (**HHRA)**- An evaluation of the risk posed to humans from exposure to contaminants.

Land Use Controls (LUCs)- Physical, legal, or administrative mechanisms that restrict the use of, or limit access to, real property, to prevent or reduce risks to human health and the environment (Army, 2005).

Munitions Debris (MD)- Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization or disposal (Army, 2005).

Munitions and Explosives of Concern (MEC)- This term distinguishes specific categories of military munitions that may pose unique explosive safety risks, including:

UXO,

DMM, or

Munitions constituents (e.g., trinitrotoluene [TNT], Royal Demolition Explosive [RDX]) present in high enough concentrations to pose an explosive hazard

National Oil and Hazardous Substance Pollution Contingency Plan (NCP)- Revised in 1990, the NCP provides the regulatory framework for responses under CERCLA.

No Further Action (NFA)- The lead agency may determine that no further action is required when a previous response(s) has eliminated the need for further remedial response.

Organic Compounds (OC)- Carbon-based compounds, such as solvents, oils, and pesticides. Most are not readily dissolved in water. Some organic compounds can cause cancer.

Proposed Plan (PP)- In one of the first steps in the remedy selection process, the lead agency identifies the alternative that best meets the requirements in

CERCLA 300.430(f)(1) and presents that alternative to the public in a proposed plan. The purpose of the proposed plan is to supplement the RI/FS and provide the public with a reasonable opportunity to comment on the preferred alternative for remedial action, as well as alternative plans under consideration, and to participate in the selection of remedial action at a site.

Remedial Action Objective (RAO)- Objectives established for remedial actions to guide the development of alternatives and focus the comparison of acceptable remedial action alternatives, if warranted. RAOs also assist in clarifying the goal of minimizing risk and achieving an acceptable level of protection for human health and the environment.

Remedial Investigation (RI)- A study of a site that provides information supporting the evaluation for the need for a remedy and/or selection of a remedy for a site where hazardous substances have been disposed of. The RI identifies the nature and extent of contamination at the facility.

Time Critical Removal Action (TCRA)- A TCRA is a response to a release or threat of release that poses such a risk to public health (serious injury or death), or the environment, that clean up or stabilization actions must be initiated within 6 months.

To Be Considered Criteria (TBCs)- Criteria used to evaluate remedial alternatives when there are no ARARs, or when ARARs alone may not adequately protect human health and the environment.

Semivolatile organic compounds (SVOCs)– a class of organic chemicals.

United States Army Corps of Engineers (**USACE)** - A Federal agency whose authority includes response to releases or threatened releases of hazardous substances at formerly used defense sites.

USACE Munitions Hazard Assessment (UMHA)- A qualitative risk assessment for MEC sites that uses direct analysis of site conditions and human issues that create MEC risk.

Volatile organic compounds (VOCs)– a class of organic chemicals.