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SITE INSPECTION FOR SKEET RANGE AND PISTOL RANGE NAS CORPUS CHRISTI TX
9/1/2009
TETRA TECH, NUS

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-04-D-0055

Rev. 1
09/04/09

Site Inspection Report
for
Skeet Range and Pistol Range

Naval Auxiliary Landing Field Cabaniss
Corpus Christi, Texas

Contract Task Order 0023

September 2009

NAVFAC
Naval Facilities Engineering Command
NAVFAC SOUTHEAST

NAS Jacksonville
Jacksonville, Florida 32212-0030

TETRA TECH NUS, Inc.

Rev. 1
09/04/09

SITE INSPECTION REPORT
FOR
SKEET RANGE AND PISTOL RANGE

NAVAL AUXILIARY LANDING FIELD CABANISS
CORPUS CHRISTI, TEXAS

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Naval Facilities Engineering Command
Southeast
NAS Jacksonville
Jacksonville, Florida 32212-0030

Submitted by:
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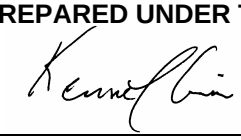
CONTRACT NUMBER N62467-04-D-0055
CONTRACT TASK ORDER 0023

SEPTEMBER 2009

PREPARED UNDER THE SUPERVISION OF:



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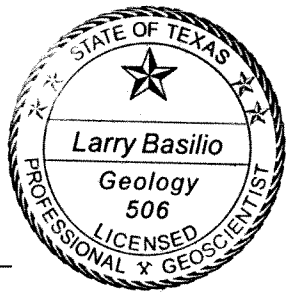
CERTIFICATION PAGE
LICENSED TEXAS PROFESSIONAL GEOLOGIST
CERTIFICATION

By affixing my seal to this report, I certify that the data and interpretations represented in the *Site Inspection Report, Skeet Range and Pistol Range, Naval Auxiliary Landing Field Cabaniss, Corpus Christi, Texas* are true and accurate to the best of my knowledge. I further certify that I am licensed to practice geology in the State of Texas and that it is within my professional expertise to verify the correctness of this information.



Larry Basilio
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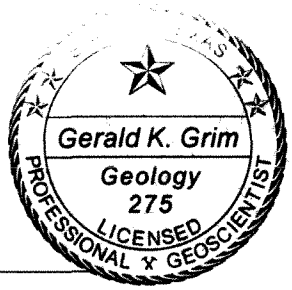
Date



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ABBREVIATIONS AND ACRONYMS

%	Percent
AICUZ	Air Installation Compatible Use Zone
bgs	below ground surface
°C	Degrees Centigrade
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
c-PCL	Critical Protective Concentration Level
CLEAN	Comprehensive Long-term Environmental Action Navy
COC	Chemical of Concern
CSM	Conceptual Site Model
CTO	Contract Task Order
DoD	Department of Defense
DPT	Direct-push Technology
EB	Equipment Blank
ESS	Explosive Safety Submission
e.g.	for example
°F	Degrees Fahrenheit
FM	Farm-to-Market
GEL	General Engineering Laboratories, Inc.
GPS	Global Positioning System
GSA	General Services Administration
IAS	Initial Assessment Study
ID	Inner Diameter
IDW	Investigation-Derived Waste
i.e.	That is
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
mg/kg	Milligram per Kilogram
mg/L	Milligram per Liter
ml	Milliliter
mm	Millimeter
MRS	Munitions Response Sites
MRSPP	Munitions Response Sites Prioritization Protocal
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MSL	Mean Sea Level
mV	Millivolt
NAAS	Naval Auxiliary Air Station
NAD	North American Datum
NALF	Naval Auxiliary Landing Field
NAS	Naval Air Station
NASCC	Naval Air Station Corpus Christi
NAVFAC SE	Naval Facilities Engineering Command Southeast
NOSSA	Naval Ordnance Safety and Security Activity
NTU	Nephelometric Turbidity Unit
OLF	Outlying Field
ORP	Oxidation-Reduction Potential

SITE INSPECTION REPORT
Skeet Range and Pistol Range
NALF Cabaniss, Corpus Christi, Texas

ABBREVIATIONS AND ACRONYMS (Continued)

PA	Preliminary Assessment
PAH	Polyaromatic Hydrocarbons
PCL	Protective Concentration Level
PID	Photoionization Detector
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
QA	Quality Assurance
QC	Quality Control
RBEL	Risk Based Exposure Limits
S/cm	Siemen per Centimeter
SI	Site Inspection
S.U.	Standard Unit
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCEQ	Texas Commission on Environmental Quality
TCLP	Toxicity Characteristic Leaching Procedure
TRRP	Texas Risk Reduction Program
TtNUS	Tetra Tech NUS, Inc.
$^{Tot}Soil_{Comb}$	Total Soil Combined
UCL	Upper Confidence Limit
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound
WWII	World War II
XRF	X-ray Fluorescence

1.0 INTRODUCTION AND PURPOSE

Tetra Tech NUS, Inc. (TtNUS) was contracted by the Department of the Navy, Naval Facilities Engineering Command Southeast (NAVFAC SE) to perform a site inspection (SI) and associated reporting for the Skeet Range and Pistol Range located at Naval Auxiliary Landing Field (NALF) Cabaniss, Corpus Christi, Texas. Figure 1-1 shows the general location of NALF Cabaniss and the location of the Skeet Range and Pistol Range at NALF Cabaniss. This work was performed under Contract Task Order (CTO) No. 0023 under the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract No. N62467-04-D-0055.

This SI report presents the results of SI investigative, sampling, and analytical activities.

1.1 PROJECT OVERVIEW

A SI was conducted to determine the presence and approximate lateral extent of munitions constituents (MC) contamination present in surface water, surface soil and sediment at the Skeet Range and Pistol Range within NALF Cabaniss. Groundwater samples were also collected for water quality classification purposes. The SI consisted of the collection of surface soil samples, drilling of soil borings, installation of temporary groundwater monitoring wells, collection and laboratory analysis of soil samples, groundwater samples and surface water/sediment samples, land surveying of sample locations and reporting of results.

1.2 INVESTIGATION OBJECTIVES

Data collected during the SI will be used to meet the following objectives:

- Determine the presence and nature of MC contamination within soils at the Skeet Range and Pistol Range.
- Determine the presence and nature of MC contamination within surface water (Oso Creek) at the Skeet Range and Pistol Range.
- Determine the presence and nature of MC contamination within sediments (Oso Creek) at the Skeet Range and Pistol Range.
- Determine the water quality classification of shallow groundwater at the Skeet Range and Pistol Range.

- Delineate the affected property boundaries of the site-specific chemicals of concern (COCs) to Texas Risk Reduction Program (TRRP) Tier 1 Residential Protective Concentration Levels (PCLs).

- Prepare a SI Report for submittal to the Texas Commission on Environmental Quality (TCEQ).

1.3 REPORT ORGANIZATION

The purpose of this SI report is to present the results of the SI activities that TtNUS conducted at the Skeet Range and Pistol Range in April and May 2008.

This SI report contains the following sections:

1.0 – Introduction and Purpose
2.0 – Project Background and Physical Setting
3.0 – Site Inspection Activities
4.0 – Site Inspection Results
5.0 – Summary of Findings and Recommendations

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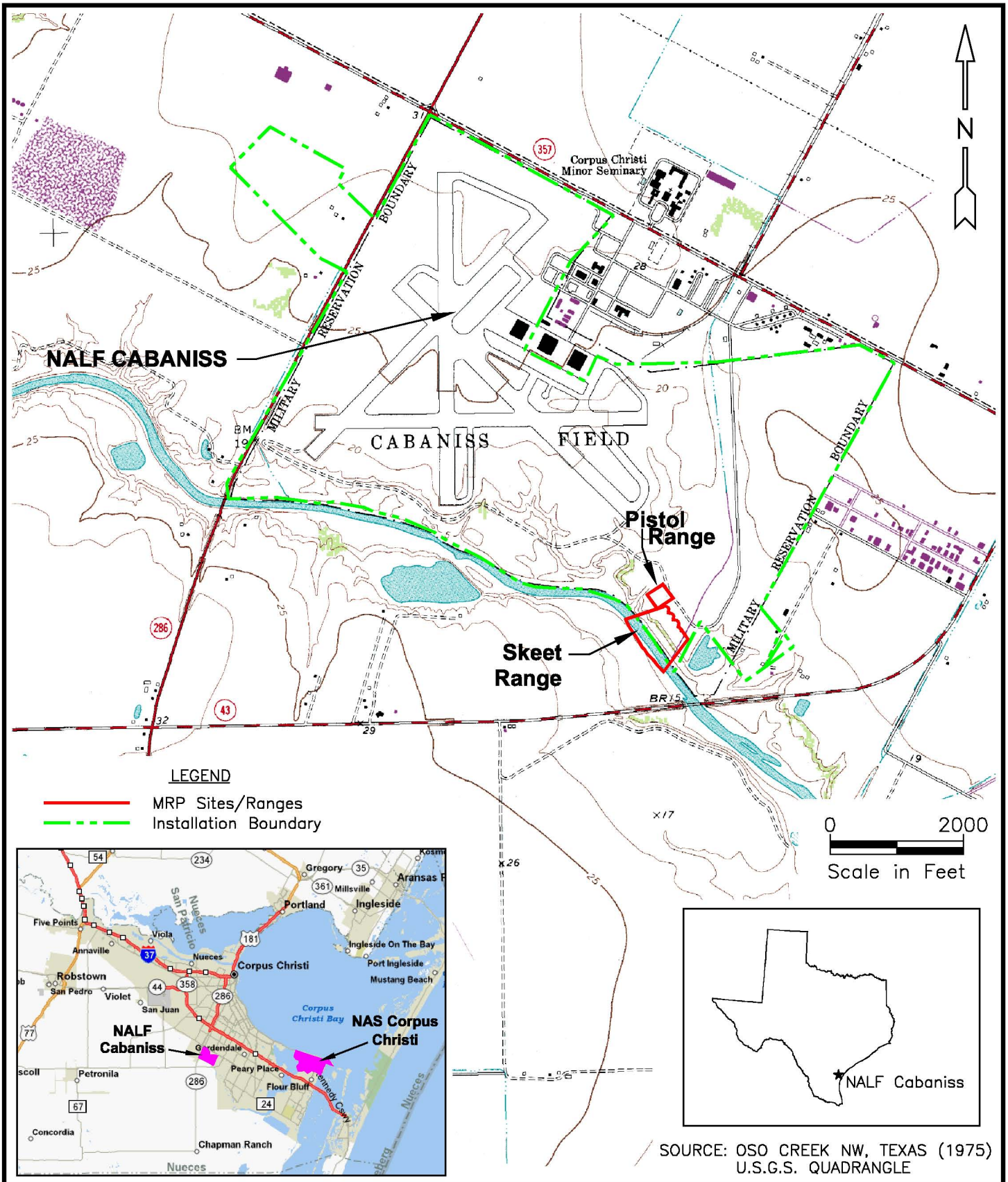

SOURCE: OSO CREEK NW, TEXAS (1975)
U.S.G.S. QUADRANGLE

DRAWN BY GS DATE 10/31/08	NAVFAC	AREA LOCATION MAP SKEET RANGE AND PISTOL RANGE NALF CABANISS, TEXAS	PROJECT NO. 112G00356
CHECKED BY LB DATE 6/29/06			CTO NO. 0023
REVISED BY DATE			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1-1 / REV. 0

2.0 PROJECT BACKGROUND AND PHYSICAL SETTING

The following sections provide a brief description of the project background and physical setting along with a summary of previous relevant investigations completed at the Skeet Range and Pistol Range at NALF Cabaniss. Figure 1-1 shows the general location of NALF Cabaniss and the location of the Skeet Range and Pistol Range at NALF Cabaniss. Figure 2-1 shows the Skeet Range and Pistol Range at NALF Cabaniss.

2.1 FACILITY LOCATION

NALF Cabaniss is located on the eastern side of Nueces County, Texas, and lies approximately eight miles west of Naval Air Station Corpus Christi (NASCC). The installation is immediately bounded on the east by Brezina Road, on the north by Ayers Street and Farm-to-Market (FM) 286, to the west by Saratoga Road, and to the south by Oso Creek. The installation encompasses a total of 923 acres and lies just outside the corporate bounds of the City of Corpus Christi. The installation boundary area includes Air Installation Compatible Use Zone (AICUZ) lands that extend northwest and southeast from the main acreage of the installation. These AICUZ lands are Navy property acquired to encompass noise zones and Accident Potential Zones in the event an accident were to occur on approach to or departing from the runways at NALF Cabaniss. NALF Cabaniss is bounded to the south by Oso Creek, a perennial water body that ultimately flows into Oso Bay. Beyond Oso Creek are agricultural and industrial properties. The area east of the installation is comprised of mixed agricultural, industrial, and residential areas. North of the current boundary are former buildings and recreational areas that were once a part of the installation. These areas were transferred to the General Services Administration (GSA) for disposal in 1958, and are now the property of the local school district. Residential zones lie beyond these buildings to the north. A former landfill is located directly west of the installation.

2.2 FACILITY DESCRIPTION AND HISTORY

NALF Cabaniss is an outlying field (OLF) with the current primary role of supporting Naval air training operations originating from NASCC. NASCC, home to the Chief of Naval Air Training, maintains and operates facilities and provides services and material to support the operations of the aviation facilities of the Naval Air Training Command and other tenant activities. The general command assignment is pilot training, primarily focusing on primary and intermediate flight maneuvering and traffic pattern operations.

NALF Cabaniss is located eight miles west of NASCC. The installation occupies 923 acres and was originally constructed with four 5,000-foot runways. Only two runways, oriented in north/south and

northwest/southeast directions are presently active and maintained. Training Air Wing FOUR, based at the main installation, performs touch-and-go landing training between the main installation, NALF Cabaniss, and NALF Waldron, three miles south of NASCC. The airfield is lighted, to allow for night flight training, and daylight training.

NALF Cabaniss is covered with tall grasses, shrubs, trees, and other low-lying vegetation. Grasses and other vegetation near the operational runways are maintained through periodic mowing in support of flight training operations.

In December 1938, the Navy recommended the Flour Bluff area south of Corpus Christi Bay as a potential site for the construction of a new aviation training station. Construction began June 30, 1940, and the installation was officially commissioned on March 12, 1941.

As an auxiliary station, Naval Auxiliary Air Station (NAAS) Cabaniss Field was outfitted with landing fields, runways, hangers, shops, barracks, a mess hall, and a recreational center. With the main installation and the six auxiliary fields, NASCC became the Navy's largest air training center during World War II (WWII). Following the conclusion of WWII, NASCC's mission was reduced to include only primary and instrument flight training. As a result, NAAS Cabaniss Field was temporarily decommissioned (1947), along with Naval Air Station (NAS) Kingsville, NAAS Rodd, and NAAS Waldron. The start of the Korean War in 1950 marked an increase in flight training at NASCC. NAS Kingsville, NAAS Cabaniss, and NAAS Chase Fields were also re-opened to support the increased training mission. In 1958, NAAS Cabaniss Field was converted from an auxiliary air station, which required personnel housing and support facilities, to an OLF, which required only the landing field property. As a result, approximately 346 acres in the northern section of the installation were determined to be excess and given over to the GSA for disposal. This portion of the property was comprised mainly of administrative and housing facilities; there was no known use of munitions within this portion of the installation. The installation was commissioned as a NALF in June 1969. NALF Cabaniss is currently in use as an OLF for primary flight training out of NASCC. Current flight training includes touch-and go, night training, and other student training operations.

2.3 PHYSICAL SETTING

The general topography of the mainland areas of Nueces County around Corpus Christi Bay can be described as a low-lying coastal area consisting of flat coastal prairies, chaparral pastures, and farmland. Elevations range between 15 and 30 feet above mean sea level (MSL). The topographic profile of NALF Cabaniss is generally flat with a mean elevation of 30 feet above MSL, with some steep downward slopes near Oso Creek.

The climate at NALF Cabaniss is a moderate to semi-tropical marine climate with hot, humid, breezy summers and mild winters. The wind direction is predominantly from the southeast during the warmer months and from the northwest and north during periods of higher pressure and cold fronts during cooler months. Average low and high temperatures are 42 degrees Fahrenheit (°F) (January) and 86°F (July), respectively. The number of clear days averages 114 days per year. Annually, there are more than 100 days of high temperatures of 90°F or higher and fewer than seven days of low temperatures at or below 32°F. Annual rainfall average is 34 inches.

The coastal plain of the Corpus Christi area is underlain by Pleistocene river, delta, and shoreline sediments deposited during the interglacial periods. NALF Cabaniss is underlain by the Beaumont Formation, characterized by barrier islands and beach deposits composed of fine grained sands. Numerous pimple mounds and poorly defined relic beach ridges characterize the land surface. Locally active sand dunes are present in undisturbed areas. The barrier island and beach deposits of the Beaumont Formation are typically less than 60 feet thick. Other stratigraphic units, in order of increasing age, include the Montgomery Formation, Lissie Formation, Willis Formation, and the Goliad Sand.

NALF Cabaniss is underlain by Victorian Association soils. The Victoria series soils are dark, clayey sand, calcareous, crumbly soils that are referred to as blackland. These soils are deep, nearly level, and have developed over clayey materials of the coastal terrace. The soils exhibit very slow internal drainage when wet and crack to depths of several feet when dry. Surface drainage from these soils flows into Oso Creek to the south of the installation.

Vegetation in the NALF Cabaniss area consists primarily of tall grasses and copses of shrubs, trees, and other low-lying vegetation. Original vegetation at the site likely consisted of mid- to tall grass in prairie grassland with minimal tree coverage. However, agricultural use and later development of the installation have left no native grasslands and natural vegetation; only disturbance-related species remain.

Freshwater and brackish water jurisdictional wetlands have been delineated at NALF Cabaniss, primarily concentrated at the southern end of the installation along Oso Creek. The wetlands at NALF Cabaniss cover a total area of 28.2 acres.

Surface water resources at NALF Cabaniss include open drainage ditches, which drain south and southeast into Oso Creek. The eastern-most drainage ditch intersects the Skeet Range and Pistol Range near the former locations of the armory and trap arcs. A drainage ditch is present west of the former ranges. An unnamed pond associated with the former Sewage Disposal Plant is present 100 feet southeast of the NALF Cabaniss property.

The average depth to groundwater at NALF Cabaniss is approximately 17 feet below ground surface (bgs). The site is underlain by low permeability clays, which cause the majority of precipitation to run-off with only a small percentage recharging the groundwater. The regional aquifer, the Gulf Coast Aquifer (six to 250 feet bgs), is predominantly sandy material overlying a clay zone with low permeability. Regional groundwater flow in the Corpus Christi area is to the northeast; local flow paths at NALF Cabaniss are unknown. Artesian aquifers located 250 to 2,800 feet bgs in the Corpus Christi area are moderately to highly saline and, therefore, have limited potential use. Therefore, potable water for the NALF Cabaniss and the City of Corpus Christi is supplied from Lake Corpus Christi, 38 miles to the northwest of the field.

2.4 SKEET RANGE AND PISTOL RANGE

The Skeet Range and Pistol Range were located in the southeastern corner of the installation, 1,230 feet southeast of Runway 31 and 400 feet north of Oso Creek. A former drainage ditch lies to the west of the former ranges, while another drainage canal currently intersects the eastern end of the former range area. The area surrounding the former range is open and covered in vegetation.

The former ranges were originally constructed in 1942 through 1943. Initially, the site contained only the skeet range, comprised of two large firing arcs for skeet shooting, three smaller firing arcs for trap shooting, and an armory. Wood-frame “high” and “low” skeet houses were positioned at the end of each skeet firing arc, which measured approximately 148 feet in length. The trap firing arcs present on the east side of the range, were smaller in size than the skeet firing arcs (approximately 82 feet in length), and had trap houses centered in the middle of each firing arc. By January 1944, an additional skeet firing arc was added on the western side of the skeet range. All firing arcs faced to the southwest toward the installation boundary and Oso Creek. WWII-era skeet and trap ranges were typically constructed with five firing positions per firing arc.

Station records and aerial photographs indicate the skeet range was expanded in 1943 through the addition of the pistol range to the west. The two ranges were connected by a road and sidewalk. The pistol range was located 200 feet west of the skeet range and was comprised of 15 firing positions facing to the southwest towards an earthen target butt positioned 50 yards from the end of the firing area. Pistol ranges were typically constructed with firing lines located 10 feet, 25 feet, and 50 feet from the target area.

The Skeet Range and Pistol Range were generally used for small arms qualification and moving target orientation training for Naval aviators, although the ranges may have also been used for recreational purposes. Ammunition used at the site likely included 12-, 16-, and 20-gage and .410 caliber shotgun munitions; other small caliber ammunition (e.g., .22 caliber, .38 caliber, .45 caliber, 9-millimeter [mm])

were likely used at the range for pistol training purposes. The armory associated with the former Skeet Range and Pistol Range is no longer present at the installation, and the date of decommissioning is not known. The former small arms magazine remains in place in an open field east of a drainage canal on property no longer owned by the installation.

A February 1984 Initial Assessment Study (IAS) for the Naval Energy and Environmental Support Activity indicated an aircraft de-arming area was located at the end of Runway 31 near the taxiway. The report indicates that the area was used to de-arm aircraft returning from training missions through the 1970s. No ordnance was disposed at this site; only munitions de-arming and transfer activities took place. This area is no longer used for de-arming operations.

In 2005, Malcolm Pirnie, Inc. conducted a Preliminary Assessment (PA) of the Skeet Range and Pistol Range at NALF Cabaniss. The PA summarized the history of munitions use at the Skeet Range and Pistol Range. The PA provided an assessment of the conditions with respect to Munitions and Explosives of Concern (MEC) and MC.

The PA concluded that based upon historical operations and visual observations, the 12.5-acre Skeet Range and Pistol Range were used for small arms qualification training of installation personnel, moving target orientation for Naval aviators, and, likely, for recreational purposes. Historical documentation (station documents and drawings) and NASCC personnel indicated that no other explosives or munitions were used at the sites and that the sites were not used for any other purpose. There is no evidence of MEC at the Skeet Range or Pistol Range. Based on historical operations at the site, it is possible for MC contamination to exist in surface soil at the Skeet Range and Pistol Range and in surface water and sediments within Oso Creek.

There are no currently operating ordnance/munitions storage facilities at NALF Cabaniss.

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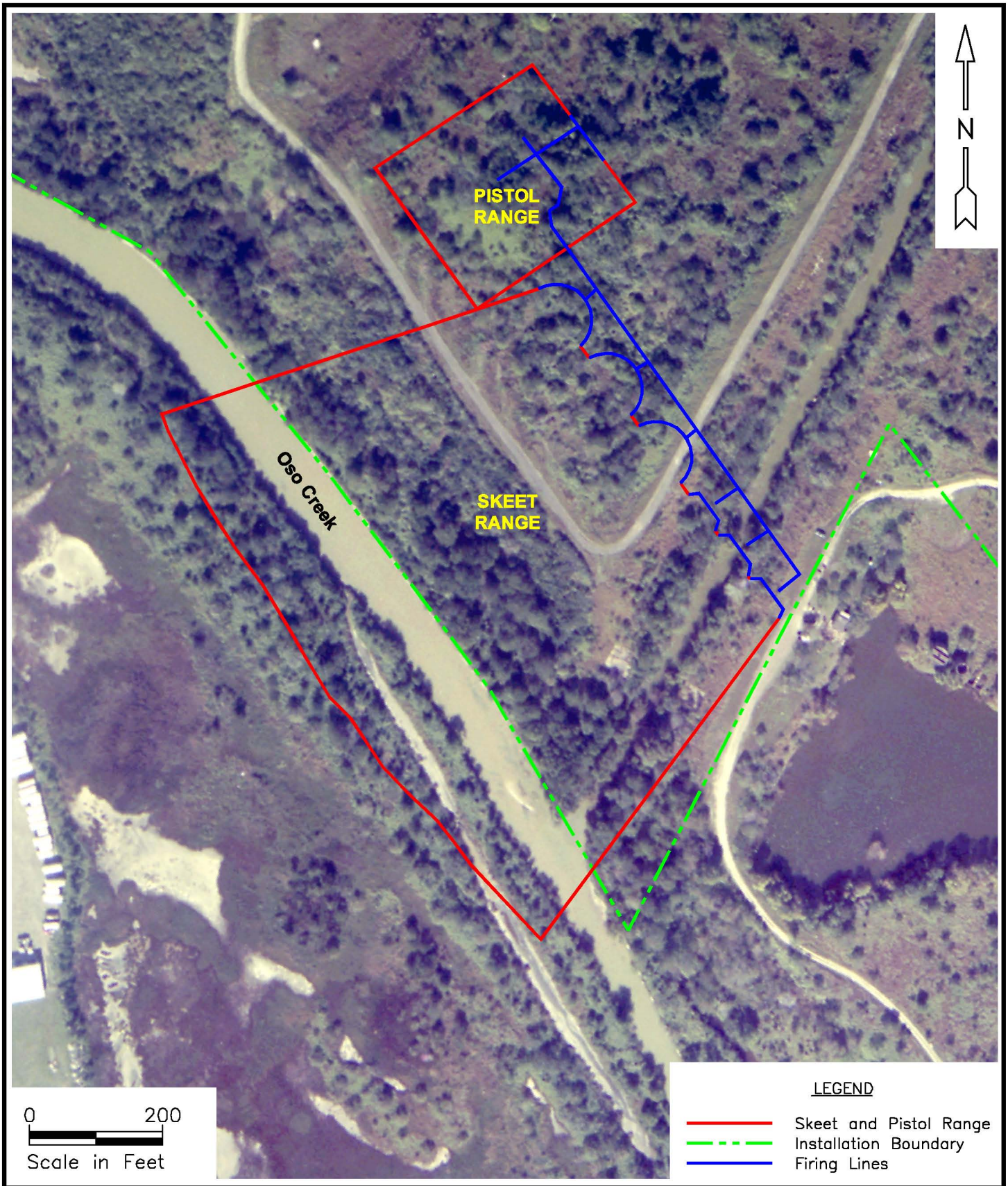

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CHECKED BY LB DATE 03/02/07			CTO NO. 0023
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3.0 SITE INSPECTION ACTIVITIES

The following subsections provide a detailed discussion of field operations that were conducted during the course of the SI at the Skeet Range and Pistol Range at NALF Cabaniss in April and May 2008. Figures 1-1 and 2-1 show the general location of NALF Cabaniss and the location of the Skeet Range and Pistol Range at NALF Cabaniss, respectively.

3.1 GENERAL DESCRIPTION AND INFORMATION

This SI was performed to determine the presence or absence of MC at the Skeet Range and Pistol Range.

Data collected was used to meet the following objectives:

- Determine the presence and nature of MC contamination within soils at the Skeet Range and Pistol Range.
- Determine the presence and nature of MC contamination within surface water (Oso Creek) at the Skeet Range and Pistol Range.
- Determine the presence and nature of MC contamination within sediments (Oso Creek) at the Skeet Range and Pistol Range.
- Determine the site specific geology and depth to shallow groundwater at the Skeet Range and Pistol Range.

Laboratory analyses of surface water, soil and sediment samples were obtained to confirm the presence or absence of MC at the Skeet Range and Pistol Range. Laboratory analysis of groundwater was used to determine groundwater quality classification at the Skeet Range and Pistol Range.

The SI consisted of the drilling of soil borings, installation of temporary groundwater monitoring wells, collection and laboratory analysis of surface and subsurface soil samples, collection and laboratory analysis of groundwater samples, collection and laboratory analysis of surface water and sediment samples, Global Positioning System (GPS) survey of sample locations and reporting of results.

3.2 SURFACE WATER SAMPLING PROGRAM

Surface water samples were collected from Oso Creek, adjacent to the Skeet Range and Pistol Range, and from an unnamed drainage channel east of the Skeet Range and Pistol Range to characterize present levels and the extent of site-related contaminants in the surface water.

Seven surface water samples were collected adjacent to the site and three surface water background samples were collected upstream of the site. Figure 3-1 depicts the locations of the surface water samples. Table 3-1 is a summary of the surface water samples collected.

Collection of surface water samples for chemical analysis was performed using clean laboratory supplied sample containers. Grab samples were collected by dipping the sample containers directly into the surface water. Samples were collected from 0 to 1-foot below the water surface. When sample containers were provided "pre-acidified," a dedicated, clean, un-preserved bottle was used for sampling and transferring the surface water to the appropriately-preserved container.

To minimize potential of cross contamination of samples, the samples were collected by progressing up the channel from downstream locations to upstream locations.

At each sample location, the pH, conductivity, specific conductance, temperature, oxidation reduction potential (ORP), dissolved oxygen, and turbidity of the water sample was measured using a multi-parameter instrument (i.e., Horiba U-22). The multi-parameter probe was lowered into the water body to a depth of 1-foot below the water surface. The surface water sample locations were recorded using a hand-held GPS unit. The physical characteristics of the sample (e.g., color, general appearance, odor, etc.) were recorded on a sample log sheet.

Surface water samples were analyzed for metals (antimony, arsenic, copper, lead, and zinc). The surface water samples to be submitted for laboratory analysis were immediately labeled and placed on ice in an insulated cooler awaiting packaging and shipping. The samples were packaged for shipment at the conclusion of each day’s sample collection activities.

Surface water samples were collected in conjunction with the collection of sediment samples as described in Section 3.3. At each location, the surface water sample was collected prior to the sediment sample.

3.3 SEDIMENT SAMPLING PROGRAM

Sediment samples were collected from Oso Creek adjacent to the Skeet Range and Pistol Range and from an unnamed drainage channel east of the Skeet Range and Pistol Range to characterize present levels and the extent of site-related contaminants in the sediment.

Thirteen sediment samples were collected adjacent to the sites and three background sediment samples were collected upstream of the sites. Figure 3-1 depicts the locations of the sediment samples. Table 3-2 is a summary of the sediment samples collected.

A telescopic dipper with a ladle was used to collect the sediment samples by scooping along the bottom of the creek in an upstream direction. The sediment with the upper one-foot of sediment was collected for laboratory analysis. A disposable pre-cleaned polypropylene ladle, 600-milliliters (ml) in capacity, was used to collect the sediment samples. A new ladle was used for each sample collected.

To prevent potential cross contamination of samples, the samples were collected by progressing up the channel from downstream locations to upstream locations. The sediment sample locations were recorded using a hand-held GPS unit. The physical characteristics of the sample (e.g., color, general appearance, odor, etc.) were recorded on a sample log sheet.

Sediment samples were analyzed for metals (antimony, arsenic, copper, lead and zinc) and polyaromatic hydrocarbons (PAHs) as shown in Table 3-2. The sediment samples to be submitted for laboratory analysis were immediately labeled and placed on ice in an insulated cooler awaiting packaging and shipping. The samples were packaged for shipment at the conclusion of each day's sample collection activities.

Sediment samples were collected in conjunction with the collection of surface water samples as described in Section 3.2. At each location, the surface water sample was collected prior to the sediment sample.

3.4 SURFACE SOIL SAMPLING PROGRAM

3.4.1 Surface Soil Sampling Strategy – Pistol Range

The SI at the Pistol Range focused on the former soil backstop berm area and firing line as these locations were expected to potentially be the most impacted. The exact length of the berm was not known but was estimated to be approximately 200 feet. The former firing line was located approximately 50 feet from the berm. The area of investigation was approximately 200 feet by 150 feet and

encompassed the berm and firing line areas. A systematic grid pattern for soil sampling was established within this area. The grid size was 25 feet by 25 feet. A total of 48 grid cells were established. Figure 3-2 depicts the sample grid. One soil sample was collected from the center of each grid cell.

X-ray Fluorescence (XRF) was used to field screen the 48 soil samples collected. Lead was the target COC for the XRF field screening. Results of the field screening were used by the Project Team to determine which samples to analyze at the fixed based laboratory. The action level for determining if additional sampling and delineation is needed was 500 milligrams per kilogram (mg/kg). This value is the TRRP total soil combined ($^{Tot}Soil_{Comb}$) PCL. As stated in the Conceptual Site Model (CSM), impacts to groundwater are unlikely due to the presence of clayey soil with low permeability and maximum penetration depths of less than 6-inches are expected for small arms ammunition.

3.4.2 Surface Soil Sample Collection – Pistol Range

Surface soil samples were collected for field XRF analysis at 48 locations at the Pistol Range. Figure 3-2 depicts the locations of the surface soil samples. Table 3-3 is a summary of the surface soil samples collected. One surface soil sample was collected at the center of each grid.

Soil samples were collected at each sample location from a depth of 0 to 6 inches and placed in a labeled individual plastic Ziplock^{tm} (or equivalent) bag. Soil samples were collected using a decontaminated stainless steel trowel or disposable plastic sampler. Care was taken to not include any foreign matter (i.e., vegetation, rocks, debris) in the soil samples collected by sifting using a No. 10 mesh (2.0-mm) sieve or by manually removing foreign matter. Each of the samples was analyzed in the field using a calibrated XRF detector. Details of the XRF screening and sampling methodology are discussed in Section 3.5. The samples in general were analyzed “as-is”. The samples may have been manipulated within the baggies to break up any larger soil fragments to produce a relatively homogenous sample. No lead shot or projectiles were visibly identified in the soil samples collected. In some of the soil samples collected, skeet fragments were identified.

The XRF reading for each sample was recorded on a field log. The surface soil samples to be submitted for laboratory analysis were placed into laboratory supplied containers, immediately labeled and placed on ice in an insulated cooler awaiting packaging and shipping. The samples were packaged for shipment at the conclusion of each day’s sample collection activities.

Soil samples were held at the analytical laboratory pending review of the field XRF data by the Project Team who then selected the samples for analysis. Six (12 percent) of the samples submitted to the analytical laboratory were selected for analysis.

Surface soil samples were analyzed for metals (antimony, arsenic, copper, lead and zinc). The Project Team also decided to analyze soil samples collected along the firing line for propellants. A composite sample of Grids 11, 17, 29, 35, and 41 was prepared by the laboratory and analyzed for propellants.

Boring logs were not prepared for surface soil samples. However, the physical characteristics of the samples (e.g., color, lithology, general appearance, odor, etc.) were recorded in the sample log sheet.

3.4.3 Surface Soil Sampling Strategy – Skeet Range

The SI at the Skeet Range focused on the shotfall area down range of the skeet and trap arcs and the range floor directly in front of the firing positions as these would be expected to be the most potentially impacted. A grid pattern for soil sampling was set up across the Skeet Range. The grid size was approximately 150 feet by 150 feet (0.5-acres). The grids extended from the firing positions to Oso Creek. Due to the geometry of the site, some grids were larger or smaller in size and irregularly shaped. Figure 3-3 depicts the sample grid. A total of 14 grids were sampled. Two grids on the eastern side of the unnamed drainage channel were slated for sampling in the Work Plan. It was later decided by the Project Team during the Triad process that based on the results of the XRF screening and analytical results the property across the drainage channel did not require sampling.

3.4.4 Surface Soil Sample Collection – Skeet Range

At the Skeet Range, up to five soil samples were collected from each of the 14 grids. The samples were, in general, collected in an "X" pattern within each grid. Figure 3-3 depicts the locations of the surface soil samples. Table 3-4 is a summary of the surface soil samples collected.

Soil samples were collected at each sub sample location from a depth of 0 to 6 inches and placed in a labeled individual plastic Ziplock^{tm} (or equivalent) bag. Soil samples were collected using a decontaminated stainless steel trowel or disposable plastic sampler. Care was taken to not include any foreign matter (i.e., vegetation, rocks, debris) in the soil samples collected by sifting using a No. 10 mesh (2.0-mm) sieve or by manually removing foreign matter. At some locations sifting was not conducted due to the nature of the soil (i.e., clayey) or because the soil was wet (due to rain events). Each of the five sub samples was analyzed in the field using XRF. Details of the XRF screening and sampling methodology are discussed in Section 3.5. The samples in general were analyzed "as-is". The samples may have been manipulated within the baggies to break up any larger soil fragments to produce a relatively homogenous sample. Skeet fragments were identified in several of the soil samples collected. Lead shot was not observed in the soil samples collected.

The XRF reading for each sub sample was recorded on a field log. Following XRF analysis of the sub samples, portions of each sub sample was composited into one sample. A XRF reading of the composited sample was recorded in the field log. The composite sample was submitted to the laboratory for analytical testing. The soil sample was placed into clean laboratory supplied sample containers. The surface soil samples to be submitted for laboratory analysis were immediately labeled and placed on ice in an insulated cooler awaiting packaging and shipping. The samples were packaged for shipment at the conclusion of each day's sample collection activities.

Surface soil samples collected for laboratory analysis at the former Skeet Range were analyzed for metals (antimony, arsenic, copper, lead, and zinc) and PAHs. According to the Work Plan, one-half of the samples were to be analyzed for PAHs. Upon reviewing the initial analytical data during the Triad process, the Project Team decided to analyze all the grids for PAHs.

Boring logs were not be prepared for surface soil samples. However, the physical characteristics of the samples (e.g., color, lithology, general appearance, odor, etc.) were recorded in the field notebook or sample log sheet.

3.4.5 MEC at Skeet Range

During brush clearing operations to allow for surface soil sampling at the Skeet Range, one MEC item was discovered. The item, a smoke cartridge, was inspected by unexploded ordnance (UXO) technicians, left in place and reported to NAS Corpus Christi and Naval Ordnance Safety and Security Activity (NOSSA) personnel. The discovery of the MEC item lead to a change in the Explosive Safety Submission (ESS) Determination for the site. UXO Avoidance was added to that site for safety of sampling crews. UXO technicians were on site during MC investigation and sampling to conduct UXO avoidance activities.

3.5 XRF SCREENING

XRF was used to field screen soil samples. This technique measures the fluorescence spectrum of x-rays emitted when metal atoms are excited by an x-ray source. The energy of emitted x-rays reveals the identity of the metals in the sample and the intensity of emitted x-rays is related to their concentrations. Rapid, multi-element analysis can be performed by XRF. The target COC was lead. An Innov-X XT400 was used to field screen the soil samples. The XRF instrument was operated in accordance with the manufacturer's instructions.

Soil samples collected were analyzed in the plastic Ziplock^{tm} (or equivalent) bags. The samples were analyzed "as-is". The samples may have been manipulated within the plastic bag by kneading to breakup

any larger soil fragments. Three XRF readings were collected from each sample to get a better overall reading from the sample. A summary of the XRF field screening results is presented in Appendix A.

Accuracy of the data was assessed through correlation coefficients (r^2) for linear regression developed to compare the field XRF results with laboratory analyzed results. The correlation curve indicated a very good relationship between the field and laboratory results. Correlation coefficients (r^2) values were 0.87 for the linear correlation model and 0.91 for the logarithmic correlation model.

3.6 SUBSURFACE SOIL SAMPLING

Direct-push Technology (DPT) drilling was conducted via a hydraulically-powered direct-push machine for lithologic characterization of soils, collection of geotechnical and groundwater samples and to determine depth to the water table in and around the Skeet Range and Pistol Range.

TtNUS obtained a Digging Permit from NASCC identifying the area where the intrusive activities occurred.

DPT soil borings were installed at two locations as shown on Figure 3-4. For ease of access, the DPT soil borings were located along the Perimeter Road. Each boring was logged by an on-site geologist as the boring was being drilled. Soil boring logs are presented in Appendix B. Borehole locations were recorded using a hand-held GPS unit.

Collection of soil samples for geotechnical analysis was performed in conjunction with the soil boring program using downhole sampling devices. Table 3-5 is a summary of the subsurface soil samples collected.

3.7 TEMPORARY MONITORING WELL INSTALLATION AND SAMPLING

Temporary monitoring wells were installed in each of the DPT soil borings drilled at the Skeet Range and Pistol Range. Temporary monitoring wells allowed for the collection of groundwater samples for laboratory analysis to aid in the determination of the classification of groundwater at the site and to determine the depth to groundwater.

The following subsections present discussions pertaining to the drilling, installation, construction, and sample collection for the temporary groundwater monitoring wells.

3.7.1 Temporary Well Drilling and Installation

Temporary groundwater monitoring wells were installed at the sites as shown on Figure 3-4. Borings in which the temporary wells were installed were advanced and documented using the procedures described in Section 3.6. Temporary wells consisted of flush-threaded 1-inch inner diameter (ID), Schedule 40 polyvinyl chloride (PVC) riser pipe and factory slotted screen. The screen slot size was 0.01 inches. The screen length was 5 feet.

Flowing sands were encountered at depth in each of the soil borings. Because of the flowing sands, the wells were not able to be placed at the total depth of the hole. The natural formation was allowed to collapse around the well screen. The temporary wells were not developed but were allowed to equilibrate overnight.

3.7.2 Groundwater Sampling

Ground water samples were unable to be collected from the temporary monitoring wells. The combination of flowing sands and fine nature of the sediments clogged the screen inlet and did not allow for sufficient water to enter the well screen for sampling purposes.

3.7.3 Backfilling and Abandonment of Borings

The temporary monitoring wells were plugged and abandoned. The abandonment of the temporary monitoring wells consisted of removing the riser pipe and screen assembly and backfilling the boring using bentonite chips.

3.8 ANALYTICAL PARAMETERS AND METHODS

The following subsections discuss analysis of soil, groundwater, surface water/sediment and Quality Assurance/Quality Control (QA/QC) samples that were collected for the project. Table 3-6 presents the analytical parameters and methods.

3.8.1 Surface Water Samples

The surface water samples were collected as described in Section 3.3. Surface water samples collected for chemical analysis were analyzed for metals (antimony, arsenic, copper, lead, zinc).

3.8.2 Sediment Samples

The sediment samples were collected as described in Section 3.4. Sediment samples collected for chemical analysis were analyzed for metals (antimony, arsenic, copper, lead, zinc) and PAH.

3.8.3 Surface Soil Samples

The soil samples were collected as described in Sections 3.5 and 3.6. Surface soil samples collected for chemical analysis at the Skeet Range were analyzed for metals (antimony, arsenic, copper, lead, zinc) and PAHs. Surface soil samples collected for chemical analysis at the Pistol Range were analyzed for metals (antimony, arsenic, copper, lead, zinc). One surface soil sample was analyzed for explosives, Target Analyte List (TAL) metals, and perchlorate.

3.8.4 Geotechnical Soil Samples

Soil samples were collected as described in Section 3.6. Soil samples collected for geotechnical analysis were analyzed for pH, total organic carbon, fraction organic content, and effective porosity.

3.8.5 IDW Samples

Soil and liquid investigation-derived waste (IDW) samples were analyzed for Toxicty Characteristic Leaching Procedure (TCLP) volatile organic compounds (VOCs), TCLP semivolatile organic compounds (SVOCs), TCLP Herbicides, TCLP Pesticides, TCLP Metals, reactivity, corrosivity, and ignitability.

3.9 FIELD QA/QC SAMPLE DESCRIPTION

The QA/QC samples were collected during the investigation sampling activities to assess the variability introduced in sampling, handling, shipping and laboratory analysis. Field QA/QC samples included equipment blanks, QC samples (field duplicates), and Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples. The types and frequency of field QA/QC samples are described in the following subsections.

3.9.1 Equipment Blanks

Equipment (rinsate) blanks are samples that are prepared in the field to assess the effectiveness of decontamination procedures applicable to soil and groundwater sampling equipment. Equipment blanks were prepared by pouring analyte-free distilled water through the decontaminated sampling equipment and collecting the rinsate in appropriate clean laboratory supplied sample containers.

Equipment blanks were collected at a rate of five percent, being defined as one equipment blank for every 20 or less samples per matrix for non-dedicated or non-disposable equipment. Two equipment blanks for soil were collected. The equipment blank was analyzed for metals and PAHs.

3.9.2 Field Duplicates

Field duplicates are samples that are divided into two portions at the time of sampling. Field duplication provides precision information regarding homogeneity, handling, shipping, storing, preparation, and analysis. Field duplicates were collected at a frequency of one per every 10 or less samples per matrix (solid or liquid). A total of six duplicate samples (three surface soil, two sediment, and one surface water) were collected. Duplicate samples were analyzed for the same parameters as the original sample as described in Section 3.8.

3.9.3 Matrix Spike and Matrix Spike Duplicate Samples

MS/MSD samples were analyzed at a rate of five percent being defined as one set per every 20 or less samples per investigation group of surface water, soil and sediment surface samples. A total of three MS/MSD samples (one surface soil, one sediment, one surface water) were collected. MS/MSD samples were analyzed for the same parameters as the original sample described in Section 3.8.

3.9.4 Temperature Blanks

Temperature blanks, supplied by the analytical laboratory, were included in each cooler containing samples that are shipped to the laboratory. Temperature blanks are used by the laboratory to verify sample preservation.

3.10 FIELD MEASUREMENTS

The following subsections present discussions pertaining to field measurements that were performed in conjunction with the SI.

Field parameters measured during the course of the SI were as follows:

- Volatile organics scanning of worker's breathing space and recovered soil samples.
- Water quality (pH, temperature, specific conductance, turbidity, dissolved oxygen, ORP) of water samples.
- XRF analysis of soil samples.

Volatile organics scanning was conducted using a Thermo Environmental Instruments Model 580S Organic Vapor meter photoionization device. The Photoionization Detector (PID) was recorded on the field logs. There were no positive PID readings above background.

Water quality parameters were measured using a Horiba U-22. XRF analysis was conducted using a Innov-X XT400.

Instruments used to collect field data were identified with a unique identification number so that the instrument calibration and maintenance history can be traced. Each instrument was calibrated prior to its delivery to the field, daily or as needed. A calibration check on the XRF unit was conducted approximately every 20 samples in accordance with the manufacturers recommendations. The measurements of the XRF were subsequently adjusted for these calibration checks.

The project field notebook or the calibration log sheet was used to document the calibration of field testing equipment.

3.11 DECONTAMINATION PROCEDURES

Proper decontamination of field equipment is an integral part of the overall QC process. Decontamination liquids were placed in 55-gallon drums and stored in a secure designated area until final disposition. The containers used were supplied by NASCC. The containers were clearly identified and labeled. In addition, the containers were labeled "PENDING ANALYSIS".

Prior to and after the completion of all sampling events, sampling equipment was decontaminated through the following steps:

- Wash in solution of tap water and Liquinox® soap or equivalent
- Tap water rinse
- Double rinse with deionized or distilled water
- Air dry, if feasible

Tap water for decontamination was obtained from a faucet connected to the city public water supply.

Field measurement equipment that directly contacted environmental media (i.e., interface probe, flow-through cell, etc.) was rinsed with distilled/deionized water after each usage.

3.12 FIELD DOCUMENTATION

Field documentation and tracking of sample custody are integral portions of the overall QA/QC process for the SI. The field documentation system serves as a record of activities conducted in the field during sample collection and data generation and provides the means to identify track and monitor each sample from the time of collection through final reporting of data.

3.12.1 Sample Identification

The sample identification scheme presented below was used to identify and label the field samples collected and field QC blanks created during the SI. The sample identification procedure was used for the sample labels and chain-of-custody documents in order to maintain consistency in the labeling process and to allow efficient handling of a large number of samples from different sources.

The sampling numbers were assigned as follows:

ss-xxxaa-bbcc-dd

- **ss** – refers to the site being investigated, where
  - SR = Skeet Range
  - PR = Pistol Range
- **xxx -** describes the type of sample, where:
  - SB = soil boring sample
  - GW = groundwater sample
  - SS = surface soil sample
  - SW = surface water sample
  - SD = sediment sample
- **aa** - refers to the sample location number
- **bb** - indicates the top depth of the sample, where applicable
- **cc** - indicates the bottom depth of the sample, where applicable

In the case where a QA/QC modifier was used (e.g., EB [see below]), the depth indicator was separately and sequentially incremented for each type of blank. The first equipment blank was labeled 001, the second 002, etc.

- **dd** - is a QA/QC modifier, when needed, where:
  - QC Quality Control sample duplicate
  - EB Equipment Blank
  - MS Matrix Spike
  - MSD Matrix Spike Duplicate

3.12.2 Field Log Books/Sample Log Sheets

The sampling coordinator for each field team maintained a field notebook and field data sheets containing pertinent information regarding the samples. The field logs are intended to provide sufficient data and observations to enable the field team and other interested parties to reconstruct events that occur during field activities. The field notebook was a bound book with consecutively numbered pages. Field documentation was completed in the field notebook or data sheets (e.g., boring log forms, sampling sheets, etc.) using indelible ink.

Boring logs and well construction diagrams were prepared for the soil borings. Boring logs were not prepared for surface soil or sediment samples. The physical characteristics of these samples (e.g., color, lithology, general appearance, odor, etc.) were recorded on a sample log sheet or field notebook. Similarly, sample log sheets were prepared for surface water and groundwater samples.

3.13 LAND SURVEYING

Land surveying was conducted to determine the horizontal location of the soil borings, temporary monitoring wells, surface soil, surface water, and sediment samples.

Land surveying was conducted by TtNUS using a Trimble GeoXH GPS to determine the horizontal (XY) location of the sample locations. Accuracy of locations is to approximately one-half meter in the horizontal axis. The points are referenced to the Texas State Plane Coordinate System North American Datum 1983 (NAD 83). Table 3-7 summarizes the horizontal location of the Pistol Range sample locations. Table 3-8 summarizes the horizontal location of the Skeet Range sample locations. Sample locations are shown of Figures 3-1 through 3-4.

3.14 SAMPLE MANAGEMENT

The following chain-of-custody procedures documented sample possession from the time of sample collection until ultimate disposal of the sample. For the purposes of these procedures, a sample was considered to be in custody if it was:

- In one's actual possession,
- In view after being in one's possession,
- Secured (i.e., locked up) so that no one could tamper with it, or
- In a secured area, available to authorized personnel only.

Strict chain-of-custody procedures were maintained throughout the duration of the investigation. These procedures included the following:

- A Chain-of-Custody record was completed in the field. The original accompanied the samples, and copies were maintained at intermediate steps.
- At the point where the responsibility for custody of the samples changed, the new custodian signed the Chain-of-Custody record and noted the date and time.

SI samples were packed in an ice-filled cooler and sent by overnight carrier to the analytical laboratory, General Engineering Laboratories, Inc. (GEL), in Charleston, South Carolina, for chemical analyses.

3.15 INVESTIGATION-DERIVED WASTE MANAGEMENT

The types of wastes generated as a result of the SI activities were soils, disposable sampling equipment, personal protective equipment (PPE), purge water and decontamination liquids. The solid and liquid IDW was collected and placed into 55-gallon drums supplied by NASCC. The waste containers were clearly identified and labeled “PENDING ANALYSIS”. The generated IDW was temporarily stored at a location designated by NASCC personnel.

One composite soil sample was collected from the drums containing solid IDW and one composite liquid sample was collected from the drums containing liquid IDW and submitted to the laboratory for chemical analysis. The solid and liquid IDW samples were analyzed for TCLP VOCs, TCLP SVOCs, TCLP Herbicides, TCLP Pesticides, TCLP metals, and reactivity, corrosivity, and ignitability. Analytical results were provided to NASCC personnel who were responsible for manifesting, transportation and disposal of the IDW.

TABLE 3-1

SURFACE WATER SAMPLE ANALYSIS SUMMARY
SKEET RANGE AND PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

Sample Location	Surface Water Sample Identification	Depth (feet)	Analyte	
			Metals (1)	Water Quality Parameters (2)
2	SR-SW02	0 - 1	x	x
4	SR-SW04	0 - 1	x	x
6	SR-SW06	0 - 1	x	x
8	SR-SW08	0 - 1	x	x
9	SR-SW09	0 - 1	x	x
11	SR-SW11	0 - 1	x	x
13	SR-SW13	0 - 1	x	x
BG1	BG-SW01	0 - 1	x	x
BG2	BG-SW02	0 - 1	x	x
BG3	BG-SW03	0 - 1	x	x

Notes:
1. Antimony, arsenic, copper, lead, and zinc.
2. Water quality parameters (pH, conductivity, temperature, turbidity, dissolved oxygen and oxidation-reduction potential) measured in field.

TABLE 3-2

SEDIMENT SAMPLE ANALYSIS SUMMARY
SKEET RANGE AND PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

Sample Location	Sediment Sample	Depth (feet)	Analyte	
			PAHs	Metals [1]
1	SR-SD01	0 - 1		x
2	SR-SD02	0 - 1		x
3	SR-SD03	0 - 1	x	x
4	SR-SD04	0 - 1		x
5	SR-SD05	0 - 1		x
6	SR-SD06	0 - 1		x
7	SR-SD07	0 - 1	x	x
8	SR-SD08	0 - 1		x
9	SR-SD09	0 - 1	x	x
10	SR-SD10	0 - 1		x
11	SR-SD11	0 - 1		x
12	SR-SD12	0 - 1		x
13	SR-SD13	0 - 1	x	x
BG1	BG-SD01	0 - 1	x	x
BG2	BG-SD02	0 - 1	x	x
BG3	BG-SD03	0 - 1	x	x

Notes:
1. Antimony, arsenic, copper, lead, and zinc.

TABLE 3-3

**SOIL SAMPLE ANALYSIS SUMMARY - PISTOL RANGE
SKEET RANGE AND PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS**

Sample Identification	Depth (feet bgs)	Metals [1]	Propellants	XRF [2]
PR-SS01	0 - 0.5			x
PR-SS02	0 - 0.5			x
PR-SS03	0 - 0.5			x
PR-SS04	0 - 0.5	x		x
PR-SS05	0 - 0.5			x
PR-SS06	0 - 0.5			x
PR-SS07	0 - 0.5			x
PR-SS08	0 - 0.5			x
PR-SS09	0 - 0.5			x
PR-SS10	0 - 0.5			x
PR-SS11	0 - 0.5			x
PR-SS12	0 - 0.5			x
PR-SS13	0 - 0.5			x
PR-SS14	0 - 0.5	x		x
PR-SS15	0 - 0.5			x
PR-SS16	0 - 0.5			x
PR-SS17	0 - 0.5			x
PR-SS18	0 - 0.5			x
PR-SS19	0 - 0.5			x
PR-SS20	0 - 0.5			x
PR-SS21	0 - 0.5			x
PR-SS22	0 - 0.5			x
PR-SS23	0 - 0.5			x
PR-SS24	0 - 0.5			x
PR-SS25	0 - 0.5			x
PR-SS26	0 - 0.5	x		x
PR-SS27	0 - 0.5	x		x
PR-SS28	0 - 0.5			x
PR-SS29	0 - 0.5			x
PR-SS30	0 - 0.5			x
PR-SS31	0 - 0.5			x
PR-SS32	0 - 0.5			x
PR-SS33	0 - 0.5			x
PR-SS34	0 - 0.5			x
PR-SS35	0 - 0.5			x
PR-SS36	0 - 0.5			x
PR-SS37	0 - 0.5			x
PR-SS38	0 - 0.5	x		x
PR-SS39	0 - 0.5			x
PR-SS40	0 - 0.5	x		x
PR-SS41	0 - 0.5			x
PR-SS42	0 - 0.5			x
PR-SS43	0 - 0.5			x
PR-SS44	0 - 0.5			x
PR-SS45	0 - 0.5			x
PR-SS46	0 - 0.5			x
PR-SS47	0 - 0.5			x
PR-SS48	0 - 0.5			x
PR-SS49 [3]	0 - 0.5		x	

Notes:

1. Antimony, arsenic, copper, lead, zinc.
2. X-ray fluorescence field screening.
3. Composite of SS11, SS17, SS29, SS35, SS41.

TABLE 3-4

SOIL SAMPLE ANALYSIS SUMMARY - SKEET RANGE
SKEET RANGE AND PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

Grid Number	Subsample Identification	Composite Sample Identification	Depth (feet bgs)	Metals [1]	PAHs	XRF [2]
1	SR-SS01a	SR-SS01	0 - 0.5	x	x	x
1	SR-SS01b		0 - 0.5			x
1	SR-SS01c		0 - 0.5			x
2	SR-SS02a	SR-SS02	0 - 0.5	x	x	x
2	SR-SS02b		0 - 0.5			x
2	SR-SS02c		0 - 0.5			x
2	SR-SS02d		0 - 0.5			x
2	SR-SS02e		0 - 0.5			x
3	SR-SS03a	SR-SS03	0 - 0.5	x	x	x
3	SR-SS03b		0 - 0.5			x
3	SR-SS03c		0 - 0.5			x
3	SR-SS03d		0 - 0.5			x
3	SR-SS03e		0 - 0.5			x
4	SR-SS04a	SR-SS04	0 - 0.5	x	x	x
4	SR-SS04b		0 - 0.5			x
4	SR-SS04c		0 - 0.5			x
4	SR-SS04d		0 - 0.5			x
4	SR-SS04e		0 - 0.5			x
5	SR-SS05a	SR-SS05	0 - 0.5	x	x	x
5	SR-SS05b		0 - 0.5			x
5	SR-SS05c		0 - 0.5			x
6	SR-SS06a	SR-SS06	0 - 0.5	x	x	x
6	SR-SS06b		0 - 0.5			x
6	SR-SS06c		0 - 0.5			x
7	SR-SS07a	SR-SS07	0 - 0.5	x	x	x
7	SR-SS07b		0 - 0.5			x
7	SR-SS07c		0 - 0.5			x
7	SR-SS07d		0 - 0.5			x
7	SR-SS07e		0 - 0.5			x
8	SR-SS08a	SR-SS08	0 - 0.5	x	x	x
8	SR-SS08b		0 - 0.5			x
8	SR-SS08c		0 - 0.5			x
8	SR-SS08d		0 - 0.5			x
8	SR-SS08e		0 - 0.5			x
9	SR-SS09a	SR-SS09	0 - 0.5	x	x	x
9	SR-SS09b		0 - 0.5			x
9	SR-SS09c		0 - 0.5			x
9	SR-SS09d		0 - 0.5			x
9	SR-SS09e		0 - 0.5			x

TABLE 3-4

SOIL SAMPLE ANALYSIS SUMMARY - SKEET RANGE
SKEET RANGE AND PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

Grid Number	Subsample Identification	Composite Sample Identification	Depth (feet bgs)	Metals [1]	PAHs	XRF [2]
10	SR-SS10a	SR-SS10	0 - 0.5	x	x	x
10	SR-SS10b		0 - 0.5			x
10	SR-SS10c		0 - 0.5			x
10	SR-SS10d		0 - 0.5			x
10	SR-SS10e		0 - 0.5			x
11	SR-SS11a	SR-SS11	0 - 0.5	x	x	x
11	SR-SS11b		0 - 0.5			x
11	SR-SS11c		0 - 0.5			x
11	SR-SS11d		0 - 0.5			x
11	SR-SS11e		0 - 0.5			x
12	SR-SS12a	SR-SS12	0 - 0.5	x	x	x
12	SR-SS12b		0 - 0.5			x
12	SR-SS12c		0 - 0.5			x
12	SR-SS12d		0 - 0.5			x
12	SR-SS12e		0 - 0.5			x
13	SR-SS12a	SR-SS13	0 - 0.5	x	x	x
13	SR-SS13b		0 - 0.5			x
13	SR-SS13c		0 - 0.5			x
13	SR-SS13d		0 - 0.5			x
13	SR-SS13e		0 - 0.5			x
14	SR-SS14a	SR-SS14	0 - 0.5	x	x	x
8	SR-SS17	SR-SS17	0 - 0.5	(3)		x

Notes:
PAHs - Polyaromatic Hydrocarbons
1. Antimony, arsenic, copper, lead, zinc.
2. X-ray fluorescence field screening.
3. Sample analyzed for TAL metals, explosives and perchlorate.

TABLE 3-5

GEOTECHNICAL SOIL SAMPLE ANALYSIS SUMMARY
SKEET RANGE AND PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

Geotechnical Sample Identification	Depth (feet)	Analyte			
		pH	Total Organic Carbon	Fraction Organic Carbon	Effective Porosity
SR-SB01	6 - 8	x	x	x	x
SR-SB02	16 - 17	x	x	x	x

TABLE 3-6

ANALYTICAL PROGRAM
SKEET RANGE AND PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

Analysis	Method [1]
SURFACE WATER	
Metals (antimony, arsenic, copper, lead, zinc)	6010B, 6020 [2]
SEDIMENT	
Polyaromatic Hydrocarbons	8270C
Metals (antimony, arsenic, copper, lead, zinc)	6010B, 6020 [2]
SURFACE SOIL	
Explosives	8330
Metals (antimony, arsenic, copper, lead, zinc)	6010B, 6020 [2]
TAL Metals	6010B, 6020, 7000A [2]
Perchlorate	6850 Modified
Polyaromatic Hydrocarbons	8270C
GEOTECHNICAL - SOIL	
pH	9045C
Fraction Organic Content	Walkley-Black
Effective Porosity	ASTM D425M
IDW - SOIL	
TCLP Volatile Organics	1311/8260B
TCLP Semivolatile Organics	1311/8270C
TCLP Pesticides	1311/8081A
TCLP Herbicides	1311/8151A
TCLP Metals	1311/6010B, 7000
Reactivity	SW-846 Chapter 7
Corrosivity	9040C
Ignitability	1020A
IDW - WATER	
TCLP Volatile Organics	1311/8260B
TCLP Semivolatile Organics	1311/8270C
TCLP Pesticides	1311/8081A
TCLP Herbicides	1311/8151A
TCLP Metals	1311/6010B, 7000
Reactivity	SW-846 Chapter 7
Corrosivity	9040C
Ignitability	1020A

Notes:

(1) All methods from EPA SW-846 except as noted.

(2) For metals the totals analysis was completed using Methods 6010/6020/7000A.

Definitions:

IDW=Investigative Derived Waste

TCLP=Toxicity Characteristic Leaching Procedure

SAMPLE LOCATION COORDINATES
PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

Location	Northing (feet)	Easting (feet)
PR-SS01	17142308	1330213
PR-SS02	17142323	1330233
PR-SS03	17142346	1330252
PR-SS04	17142354	1330273
PR-SS05	17142371	1330294
PR-SS06	17142381	1330312
PR-SS07	17142288	1330225
PR-SS08	17142302	1330246
PR-SS09	17142319	1330266
PR-SS10	17142333	1330287
PR-SS11	17142349	1330306
PR-SS12	17142362	1330327
PR-SS13	17142268	1330243
PR-SS14	17142283	1330261
PR-SS15	17142298	1330281
PR-SS16	17142313	1330303
PR-SS17	17142344	1330322
PR-SS18	17142344	1330344
PR-SS19	17142249	1330258
PR-SS20	17142262	1330254
PR-SS21	17142278	1330297
PR-SS22	17142295	1330317
PR-SS23	17142307	1330336
PR-SS24	17142322	1330358
PR-SS25	17142229	1330271
PR-SS26	17142243	1330291
PR-SS27	17142258	1330313
PR-SS28	17142271	1330331
PR-SS29	17142288	1330351
PR-SS30	17142303	1330372
PR-SS31	17142209	1330286
PR-SS32	17142223	1330306
PR-SS33	17142239	1330327
PR-SS34	17142252	1330347
PR-SS35	17142269	1330367
PR-SS36	17142283	1330387
PR-SS37	17142188	1330302
PR-SS38	17142202	1330322
PR-SS39	17142217	1330341
PR-SS40	17142234	1330362
PR-SS41	17142248	1330382
PR-SS42	17142263	1330401
PR-SS43	17142535	1330318
PR-SS44	17142183	1330340
PR-SS45	1714197	1330358
PR-SS46	17142213	1330377
PR-SS47	17142229	1330398
PR-SS48	17142244	1330417

Note: Coordinates are Texas State Plane, South Zone, North American Datum 1983.

SAMPLE LOCATION COORDINATES
SKEET RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

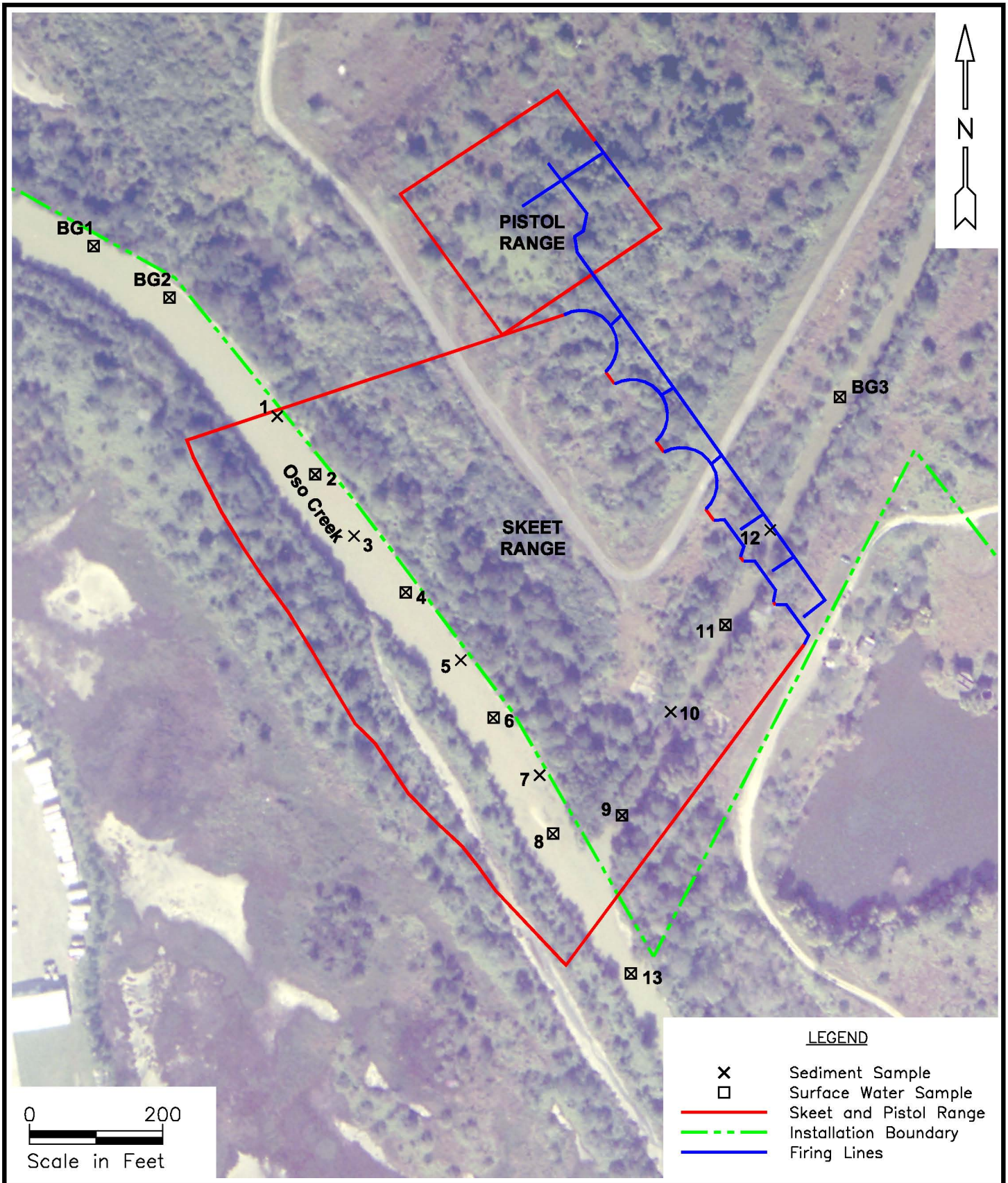
Location	Area	Northing (feet)	Easting (feet)
SR-SS01A	Grid1	17142061	1330258
SR-SS01B	Grid1	17142073	1330337
SR-SS01C	Grid1	17142090	1330420
SR-SS02A	Grid 2	17141990	1330026
SR-SS02B	Grid 2	17142010	1330148
SR-SS02C	Grid 2	17141965	1330088
SR-SS02D	Grid 2	17141929	1330026
SR-SS02E	Grid 2	17141909	1330146
SR-SS03A	Grid 3	17142009	1330207
SR-SS03B	Grid 3	17142007	1330294
SR-SS03C	Grid 3	17141965	1330249
SR-SS03D	Grid 3	17141922	1330207
SR-SS03E	Grid 3	17141921	1330292
SR-SS04A	Grid 4	17142008	1330359
SR-SS04B	Grid 4	17142009	1330443
SR-SS04C	Grid 4	17141966	1330400
SR-SS04D	Grid 4	17141924	1330354
SR-SS04E	Grid 4	17141924	1330441
SR-SS05A	Grid 5	17142032	1330189
SR-SS05B	Grid 5	17141923	1330505
SR-SS05C	Grid 5	17141913	1330583
SR-SS06A	Grid 6	17141866	1330075
SR-SS06B	Grid 6	17141858	1330150
SR-SS06C	Grid 6	17141765	1330150
SR-SS07A	Grid 7	17141857	1330207
SR-SS07B	Grid 7	17141861	1330293
SR-SS07C	Grid 7	17141816	1330252
SR-SS07D	Grid 7	17141772	1330207
SR-SS07E	Grid 7	17141771	1330293
SR-S08A	Grid 8	17141859	1330356
SR-S08B	Grid 8	17141859	1330443
SR-S08AC	Grid 8	17141815	1330399
SR-S08AD	Grid 8	17141774	1330361
SR-S08AE	Grid 8	17141772	1330442
SR-SS09A	Grid 9	17141859	1330511
SR-SS09B	Grid 9	17141857	1330520
SR-SS09C	Grid 9	17141816	1330568
SR-SS09D	Grid 9	17141773	1330510
SR-SS09E	Grid 9	17141772	1330621

SAMPLE LOCATION COORDINATES
SKEET RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

Location	Area	Northing (feet)	Easting (feet)
SR-SS10A	Grid 10	17141707	1330206
SR-SS10B	Grid 10	17141708	1330293
SR-SS10C	Grid 10	17141665	1330259
SR-SS10D	Grid 10	17141623	1330238
SR-SS10E	Grid 10	17141558	1330301
SR-SS11A	Grid 11	17141711	1330356
SR-SS11B	Grid 11	17141709	1330441
SR-SS11C	Grid 11	17141669	1330400
SR-SS11D	Grid 11	17141626	1330358
SR-SS11E	Grid 11	17141623	1330443
SR-SS12A	Grid 12	17141708	1330505
SR-SS12B	Grid 12	17141706	1330591
SR-SS12C	Grid 12	17141669	1330542
SR-SS12D	Grid 12	17141600	1330516
SR-SS12E	Grid 12	17141532	1330497
SR-SS13A	Grid 13	17141559	1330360
SR-SS13C	Grid 13	17141559	1330445
SR-SS13D	Grid 13	17141515	1330402
SR-SS13E	Grid 13	17141474	1330358
SR-SS13A	Grid 13	17141474	1330444
SR-SS14	Grid 14	17141401	1330415
SR-SS17	Grid 8 MEC	17141892	1330285
SR-BG1	upstream surface water/sediment background	17142239	1329649
SR-BG2	upstream surface water/sediment background	17142146	1329766
SR-BG3	upstream surface water/sediment background	17142103	1330837
SD01	surface water	17141995	1329928
SD02/SW02	surface water/sediment	17141886	1329977
SD03	surface water	17141808	1330056
SD04/SW04	surface water/sediment	17141732	1330112
SD05	surface water	17141644	1330189
SD06/SW06	surface water/sediment	17141540	1330240
SD07	surface water	17141444	1330319
SD08/SW08	surface water/sediment	17141344	1330349
SD09/SW09	surface water/sediment	17141365	1330456
SD10	surface water	17141525	1330531
SD11/SW11	surface water/sediment	17141661	1330606
SD12	surface water	17141807	1330684
SD13/SW13	surface water/sediment	17141119	1330467

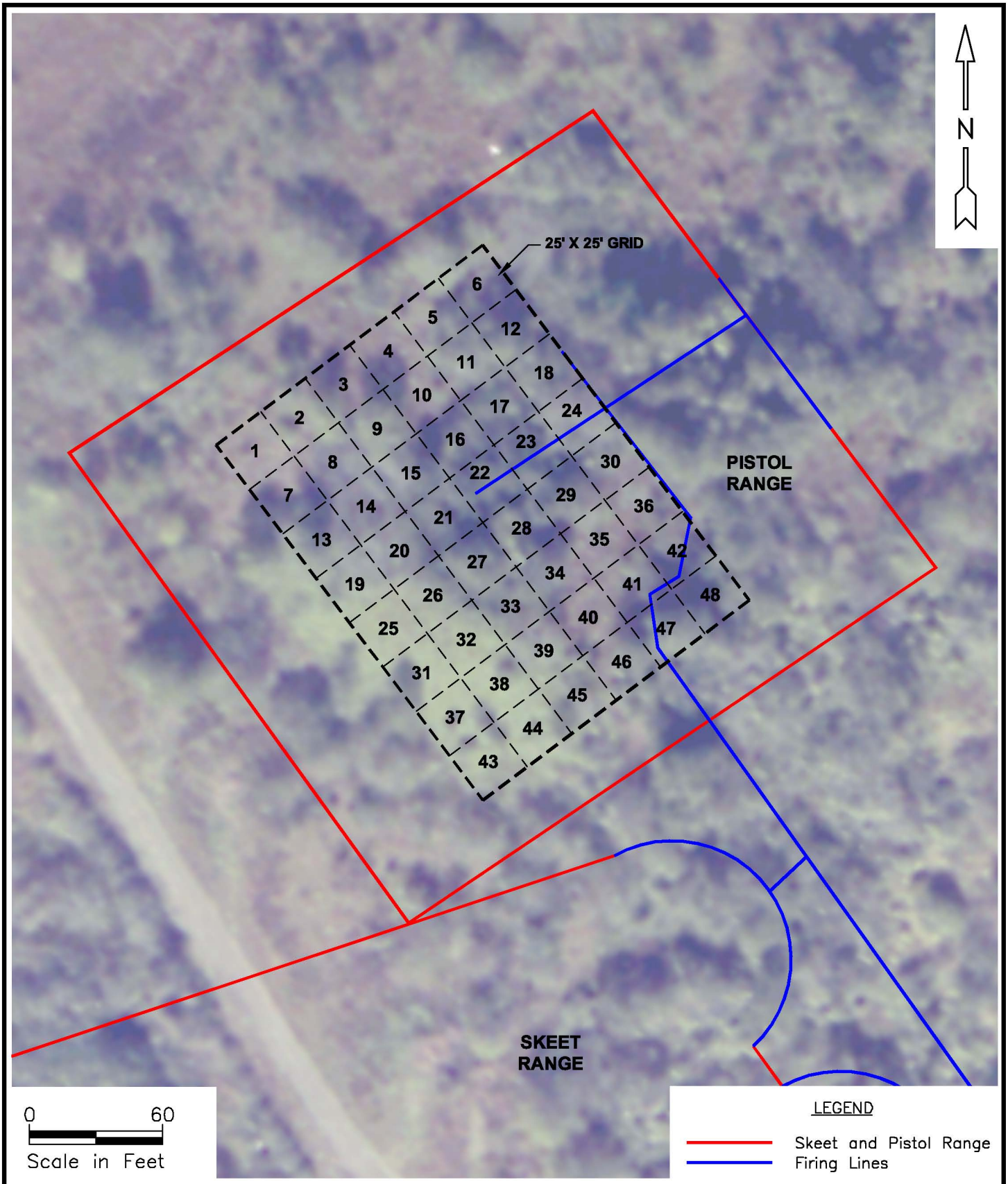
Note: Coordinates are Texas State Plane, South Zone, NAD 83

ACAD: 0356SM10.dwg 03/02/07 JFF



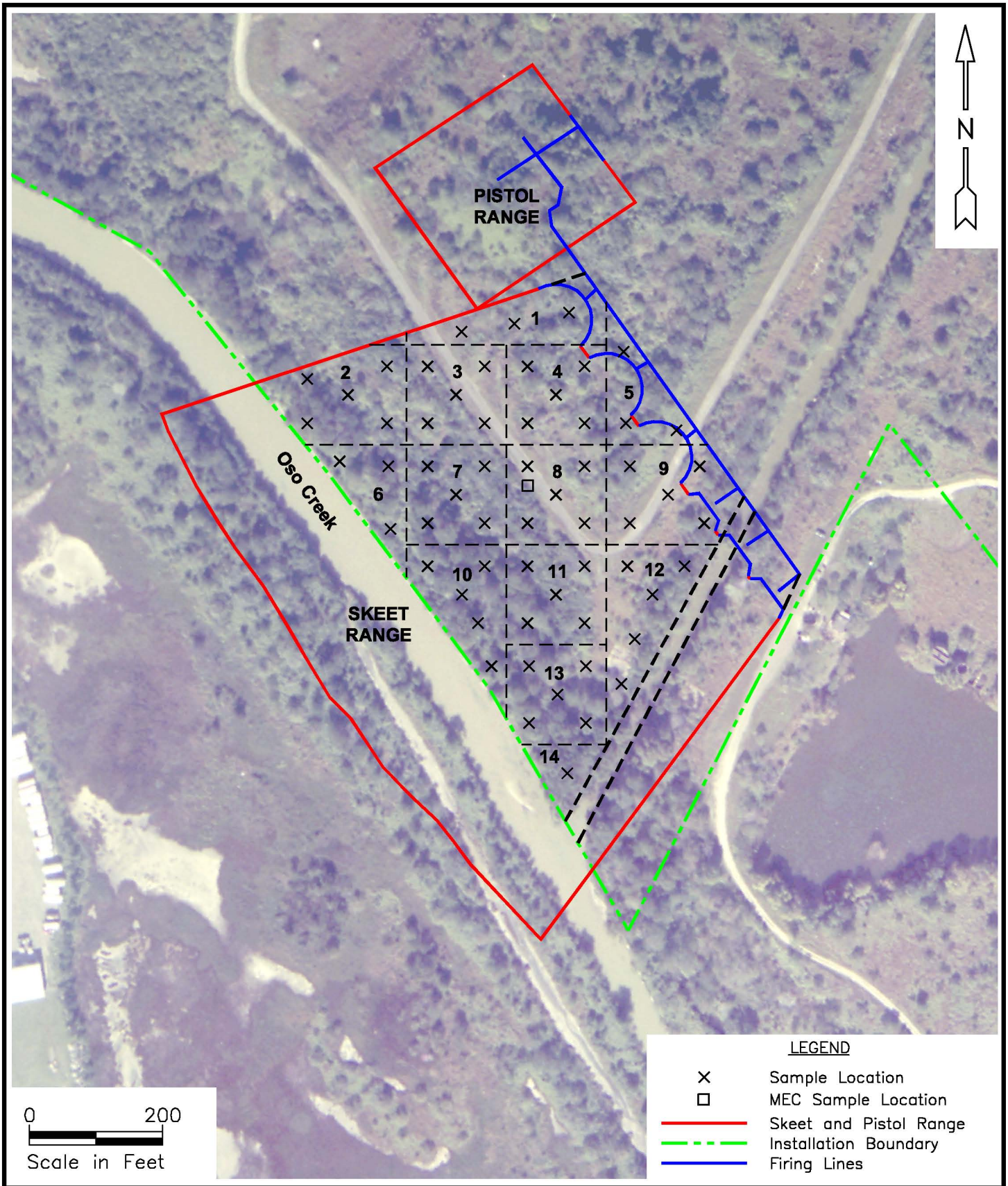
DRAWN BY GS DATE 10/31/08	NAVFAC	SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS SKEET RANGE AND PISTOL RANGE NALF CABANISS, TEXAS	PROJECT NO. 112G00356
CHECKED BY LB DATE 03/02/07			CTO NO. 0023
REVISED BY DATE			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3–1 / REV. 1

ACAD: 0356SM11.dwg 03/28/07 JFF



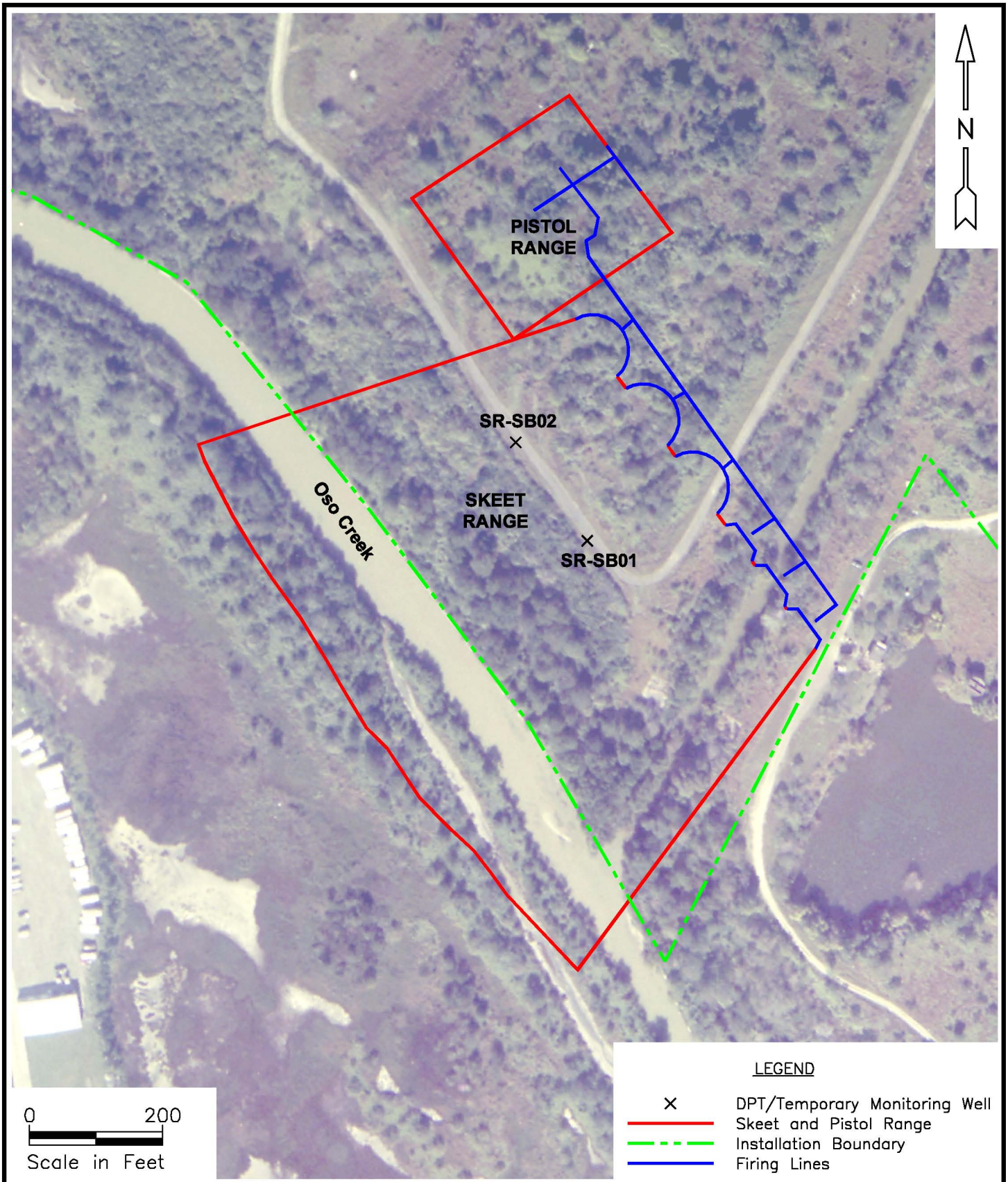
DRAWN BY GS DATE 10/31/08	NAVFAC	GRID SAMPLE PLAN – PISTOL RANGE SKEET RANGE AND PISTOL RANGE NALF CABANISS, TEXAS	PROJECT NO. 112G00356
CHECKED BY LB DATE 03/28/07			CTO NO. 0023
REVISED BY DATE			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3–2 / REV. 0

ACAD: 0356SM14.dwg 04/04/07 JFF



DRAWN BY GS DATE 10/31/08	NAVFAC	SAMPLE LOCATIONS – SKEET RANGE SKEET RANGE AND PISTOL RANGE NALF CABANISS, TEXAS	PROJECT NO. 112G00356
CHECKED BY LB DATE 03/28/07			CTO NO. 0023
REVISED BY DATE			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3–3 / REV. 1

ACAD: 0356SM13.dwg 03/28/07 JFF



DRAWN BY GS DATE 10/31/08	NAVFAC	DPT SOIL BORING AND TEMPORARY MONITORING WELL LOCATIONS SKEET RANGE AND PISTOL RANGE NALF CABANISS, TEXAS	PROJECT NO. 112G00356
CHECKED BY LB DATE 03/28/07			CTO NO. 0023
REVISED BY DATE			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3-4 / REV. 1

4.0 SITE INSPECTION RESULTS

The following subsections provide a detailed discussion of field data and analytical results that were generated during the course of the SI at the Skeet Range and Pistol Range at NALF Cabaniss. Figures 1-1 and 2-1 show the general location of NALF Cabaniss and the locations of the Skeet Range and Pistol Range at NALF Cabaniss.

The analytical data presented in this SI Report were subjected to a data validation process performed by TtNUS personnel to ensure the integrity and defensibility of the data. Samples collected for chemical analysis during the SI were analyzed by GEL of Charleston, South Carolina.

For reporting purposes, detected concentrations of analyzed soil, groundwater, surface water and sediment samples are discussed in this section. Calcium, iron, potassium, and sodium are not considered constituents of concern from a human health standpoint and are not discussed, as regulatory criteria are not available for these constituents.

4.1 SITE GEOLOGY AND HYDROGEOLOGY

The site-specific geological settings of the Skeet Range and Pistol Range were determined by the examination of soil samples from two DPT soils borings. The locations of the soils borings are shown on Figure 3-4. Boring log data presented in Appendix B provide a detailed description of the lithologies encountered.

The borings at the Skeet and Pistol Range were drilled to a depth of 18 feet bgs. In general, the geologic section consisted of an upper fine-grained unit and a lower coarse-grained unit. This lower coarse-grained unit contained the first zone of saturated material. The upper fine-grained unit consisted of a gray to tan with depth, lean clay with a varying amount of admixed silt. The silt content generally increased with depth. Caliche nodules were present in the upper portions of the section. The thickness of the unit was between 17 and 18 feet.

The lower coarse-grained unit was the first unit in which saturated sediments were encountered. The contact between the two units was generally well defined. This unit consisted of a gray to tan very fine grained silty sand. This unit exhibited characteristics of a flowing sand in that the sand entered the borehole and rose several feet within the borehole at the transition point from the upper and lower units. Because the borings were terminated with this lower unit, the true thickness of the lower coarse-grained zone was unable to be determined.

As discussed previously, the lower-coarse grained unit was the zone in which saturated materials were first encountered. Groundwater at the site appears to be under semi-confined conditions as exhibited by the flowing sands encountered and the fact that water was measured in the well at a higher level than was encountered during drilling. Depth to static groundwater was measured at approximately 15 feet and 18.5 feet bgs in the two temporary wells installed at the site. The difference in the two readings is attributable to the difference in well screen placement via the DPT drilling rig due to the flowing sands. The actual water-bearing unit was encountered between 17 and 18 feet bgs.

4.2 REGULATORY CRITERIA

4.2.1 Surface Soil Samples

Analytical results of soil samples were screened to determine if potential impacts to human health or the environment are present. Analytical results were compared to TRRP Tier 1 Residential PCLs for a 0.5-acre source area. Under the TRRP regulations, the Tier 1 PCLs are designed to be protective of human health. These PCLs represent the concentration of a COC that can remain within the source medium and not result in levels that exceed the applicable human health risk-based exposure limit at the point of exposure for that exposure pathway. The Critical PCL (c-PCL) is defined as the lowest PCL for a COC within a source medium determined from the applicable human health exposure pathways.

The applicable human health exposure pathways are dependent on the source medium being sampled. For the Skeet Range and Pistol Range, the applicable surface soil human health exposure pathway is the following:

1. Combined inhalation of volatile emissions and particulates from COCs in surface soil, dermal contact with COCs in surface soil, ingestion of COCs in surface soil ($^{Tot}Soil_{Comb}$).

For metals constituents, the c-PCL was determined to be the higher of the TRRP Tier 1 PCL or the Texas-specific background concentration for each respective metal.

Per the CSM developed in the PA, the groundwater pathway was not considered complete and therefore was not evaluated in the SI.

4.2.2 Surface Water Samples

Analytical results of surface water samples were compared to Saltwater Aquatic Life Surface Water Risk Based Exposure Limits (RBELs), Saltwater Human Health Surface Water RBELs and TRRP Tier 1 Contact Recreational Water PCLs.

4.2.3 Sediment Samples

Analytical results of sediment samples were compared to criteria presented in Table 3-3, Ecological Benchmarks for Sediments, of TCEQ guidance document RG-263, Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas, January 2006. Analytical results were also compared to TRRP Tier 1 Direct Human Contact Sediment PCLs.

4.3 SURFACE WATER SAMPLING RESULTS

Analytical results for surface water samples collected at the Skeet Range and Pistol Range are summarized in Table 4-1. Surface water sample locations are shown on Figure 3-1.

4.3.1 Metals

Two metals (copper and lead) were detected at concentrations greater than the criteria. The remaining metals were either detected at concentrations greater than the reporting limits but less than the criteria or were not detected at concentrations greater than the reporting limit.

Copper

Copper was detected in seven surface water samples exceeding the criteria at concentrations ranging from 0.0041 to 0.0081 milligrams per liter (mg/L). These concentrations exceed the Aquatic Life Saltwater Chronic RBEL of 0.0036 mg/L.

However, the detected concentrations are less than the Aquatic Life Saltwater Acute RBEL of 0.0135 mg/L and the TRRP Tier 1 Contact Recreational Water PCL of 33.1 mg/L. A human health surface water RBEL is not available.

Lead

Lead was detected in one surface water sample exceeding the criteria at a concentration of 0.0054 mg/L. This concentration exceeds the Aquatic Life Saltwater Chronic RBEL of 0.0053 mg/L. However, the detected concentration is less than the Aquatic Life Saltwater Acute RBEL of 0.133 mg/L and the human health RBEL of 0.169 mg/L. A TRRP Tier 1 Contact Recreational PCL is not available.

4.3.2 Water Quality Parameters

Various water quality parameters were measured as part of the SI using a field water quality instrument. The results for the water quality parameters are presented in Table 4-2.

4.4 SEDIMENT SAMPLING RESULTS

Analytical results for sediment samples collected at the Skeet Range and Pistol Range are summarized in Table 4-3. Sediment sample locations are shown on Figure 3-1.

4.4.1 PAHs

Eight PAHs were detected at concentrations greater than the reporting limits in sediment samples collected at the Skeet Range and Pistol Range. However, the concentrations detected are less than the respective ecological benchmarks or TRRP Tier 1 Residential PCLs.

4.4.2 Metals

Four metals were detected at concentrations greater than the reporting limits in sediment samples collected at the Skeet Range and Pistol Range. The detected concentrations of metals are less than the regulatory criteria with the exception of lead and zinc.

Lead was detected in one sediment sample exceeding the regulatory criteria at a concentration of 133 mg/kg. This concentration exceeds the ecological benchmark for sediment of 35.8 mg/kg. However, the detected concentration is less than the TRRP Tier 1 Direct Human Contact Sediment PCL of 500 mg/kg.

Zinc was detected in one sediment sample exceeding the regulatory criteria at a concentration of 143 mg/kg. This concentration exceeds the ecological benchmark for sediment of 121 mg/kg. However, the detected concentration is less than the TRRP Tier 1 Direct Human Contact Sediment PCL of 76,020 mg/kg.

4.5 SURFACE SOIL SAMPLING RESULTS – PISTOL RANGE

Analytical results for surface soil samples collected at the Pistol Range are summarized in Table 4-4. Surface soil sample locations are shown on Figure 3-2.

4.5.1 Propellants

Propellants were not detected at concentrations greater than the reporting limits in surface soil samples collected at the Pistol Range.

4.5.2 Metals

Metals were detected at concentrations greater than the reporting limits but less than the TRRP Tier 1 Residential PCL or were not detected at concentrations above the reporting limit.

4.6 SURFACE SOIL SAMPLING RESULTS – SKEET RANGE

Analytical results for surface soil samples collected at the Skeet Range are summarized in Table 4-5. Surface soil sample locations are shown on Figure 3-3.

4.6.1 PAHs

Four PAHs were detected at concentrations greater than the TRRP Tier 1 Residential PCL. The remaining PAHS were detected at concentrations greater than the reporting limits but less than the TRRP Tier 1 Residential PCL or were not detected at concentrations greater than the reporting limit.

Benzo(a)anthracene was detected in six soil samples at concentrations greater than the criteria ranging from 7.45 mg/kg to 158 mg/kg. These concentrations exceed the TRRP Tier 1 Residential PCL of 5.65 mg/kg.

Benzo(a)pyrene was detected in nine soil samples at concentrations greater than the criteria ranging from 0.615 mg/kg to 187 mg/kg. These concentrations exceed the TRRP Tier 1 Residential PCL of 0.56 mg/kg.

Benzo(b)fluoranthene was detected in eight soil samples at concentrations greater than the criteria ranging from 8.25 mg/kg to 323 mg/kg. These concentrations exceed the TRRP Tier 1 Residential PCL of 5.71 mg/kg.

Indeno(1,2,3-cd)pyrene was detected in three soil samples at concentrations greater than the criteria ranging from 7.76 mg/kg to 98.2 mg/kg. These concentrations exceed the TRRP Tier 1 Residential PCL of 5.72 mg/kg.

Figure 4-1 depicts the locations of the PAH exceedances.

4.6.2 Metals

Metals were detected at concentrations greater than the reporting limits but less than the TRRP Tier 1 Residential PCL or were not detected at concentrations greater than the reporting limit.

4.6.3 Geotechnical Parameters

Geotechnical parameters were analyzed for possible use in developing Tier 2 or 3 PCLs. The results are presented in Table 4-5.

4.7 SURFACE SOIL SAMPLING RESULTS – MEC LOCATION

Analytical results for the surface soil sample collected at the MEC location at the Skeet Range are summarized in Table 4-5. Surface soil sample locations are shown on Figure 3-3.

4.7.1 Explosives

Explosives were not detected at concentrations greater than the reporting limits in surface soil samples collected at the Pistol Range.

4.7.2 Perchlorate

Perchlorate was detected at a concentration greater than the reporting limit but less than the TRRP Tier 1 Residential PCL.

4.7.3 TAL Metals

TAL metals were detected at concentrations greater than the reporting limits but less than the TRRP Tier 1 Residential PCL or were not detected at concentrations greater than the reporting limit.

TABLE 4-1

SUMMARY OF SURFACE WATER ANALYTICAL RESULTS
SKEET RANGE AND PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

LOCATION	Human Health Surface Water RBEL [1]	Aquatic Life Surface Water RBEL [2]		TRRP Tier 1 PCL [3]	BG1	BG2	BG2	BG3	SR-SW02	SR-SW04	SR-SW06	SR-SW08	SR-SW09	SR-SW11	SR-SW13
SAMPLE ID					BG-SW01	BG-SW02	BG-SW02-D	BG-SW03	SR-SW02	SR-SW04	SR-SW06	SR-SW08	SR-SW09	SR-SW11	SR-SW13
DEPTH (ft)	Saltwater Fish Only	Saltwater Acute	Saltwater Chronic		0 -1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
PARAMETER															
INORGANICS (MG/L)															
ANTIMONY	0.640	NA	NA	0.199	0.00066 U	0.00099 U	0.00066 U	0.00083	0.00079	0.0013 U	0.001 U	0.00088 U	0.0011	0.00092	0.0012
ARSENIC	0.0014	0.149	0.078	0.0285	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
COPPER	NA	0.0135	0.0036	33.1	**0.0045**	**0.0044**	**0.0047**	0.0033	0.0031	**0.006**	**0.0059**	**0.0081**	0.0036	0.0033	**0.0041**
LEAD	0.0169	0.133	0.0053	NA	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	**0.0054**	0.0025 U	0.0025 U	0.0025 U
ZINC	26	0.0927	0.0842	201	0.019	0.018	0.02	0.012	0.017	0.023	0.019	0.043	0.019	0.013	0.021

Notes:
1. Human Health Surface Water RBEL Table, TRRP-24, May 19, 2005.
2. Aquatic Life Surface Water RBEL Table, TRRP-24, October 2005.
3. TRRP Tier 1 Direct Human Contact Recreational PCL, TRRP-24, March 31, 2006.
Bold - indicates exceedance of criteria.
mg/L - milligrams per liter
NA - criteria not available
U - not detected

TABLE 4-2

SURFACE WATER QUALITY PARAMETER RESULTS
SKEET RANGE AND PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

Sample Location	Surface Water Sample Identification	Depth (feet)	Analyte							
			Color (visual)	pH (S.U.)	Specific Conductivity (S/cm)	Temperature (°C)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Salinity (%)	Oxidation-Reduction Potential (+/-mV)
2	SW02	0 - 1	clear to cloudy	7.94	0.48	31.2	89	12.51	0.2	116
4	SW04	0 - 1	clear to cloudy	7.80	0.48	21.9	92	7.48	0.2	110
6	SW06	0 - 1	clear to cloudy	7.95	0.47	30.5	140	12.30	0.2	98
8	SW08	0 - 1	clear to cloudy	7.81	0.48	30.1	98	12.33	0.2	73
9	SW09	0 - 1	cloudy	7.60	0.48	28.3	73	9.25	0.3	117
11	SW11	0 - 1	clear to cloudy	7.79	0.50	24.5	50	1.00	0.3	113
13	SW13	0 - 1	clear to cloudy	7.58	0.48	28.4	62	9.00	0.2	118
BG1	BG-SW01	0 - 1	clear to cloudy	7.27	0.49	28.0	80	8.27	0.3	152
BG2	BG-SW02	0 - 1	clear to cloudy	6.43	0.50	28.1	56	8.75	0.3	189
BG3	BG-SW03	0 - 1	clear to cloudy	8.03	0.52	28.5	58	13.74	0.3	106

Notes:
S.U. - standard unit
S/cm - siemen per centimeter
°C - degress centigrade
NTU - nephelometric turbudity unit
mg/L - milligrams per liter
% - percent
mV - millivolts

TABLE 4-3

REVISION 1
SEPTEMBER 2009

SUMMARY OF SEDIMENT ANALYTICAL RESULTS
SKEET RANGE AND PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

LOCATION	Tier 1 Sediment PCL [1]	Ecological Benchmark for Sediment [2]	BG1	BG2	BG2	BG3	SR-SD01	SR-SD02	SR-SD03	SR-SD04	SR-SD05	SR-SD06	SR-SD07	SR-SD07	SR-SD08	SR-SD09	SR-SD10	SR-SD11	SR-SD12	SR-SD13
SAMPLE ID			BG-SD01	BG-SD02	BG-SD02-D	BG-SD03	SR-SD01	SR-SD02	SR-SD03	SR-SD04	SR-SD05	SR-SD06	SR-SD07	SR-SD07-D	SR-SD08	SR-SD09	SR-SD10	SR-SD11	SR-SD12	SR-SD13
DEPTH (ft)			0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
PAH (MGKG)																				
ACENAPHTHENE	7400	0.0067	0.0218 U	0.0225 U	0.0206 U	0.0392 UJ			0.0198 U				0.02 U	0.0185 U		0.0401 U				0.026 U
ACENAPHTHYLENE	7400	0.0059	0.0195 U	0.0202 U	0.0185 U	0.0352 UJ			0.0178 U				0.018 U	0.0166 U		0.0360 U				0.0233 U
ANTHRACENE	37000	0.0572	0.0130 U	0.0135 U	0.0123 U	0.0235 UJ			0.0118 U				0.018 U	0.0111 U		0.0240 U				0.0156 U
BENZO(A)ANTHRACENE	16	0.108	0.0195 U	0.0202 U	0.0185 U	0.0352 UJ			0.0178 U				0.018 U	0.0166 U		0.0360 U				0.0233 U
BENZO(A)PYRENE	1.6	0.15	0.0195 U	0.0202 U	0.0185 U	0.0984 J			0.0178 U				0.018 U	0.0166 U		0.0708 J				0.0284 J
BENZO(B)FLUORANTHEN	16	NA	0.023 J	0.0425 J	0.0185 U	0.25 J			0.0178 U				0.018 U	0.0166 U		0.159				0.0719 J
BENZO(G,H,I)PERYLENE	3700	NA	0.0195 U	0.0202 U	0.0185 U	0.0985 J			0.0178 U				0.018 U	0.0166 U		0.0457 J				0.0285 J
BENZO(K)FLUORANTHEN	160	NA	0.0195 U	0.0202 U	0.0185 U	0.0352 UJ			0.0178 U				0.018 U	0.0166 U		0.0360 U				0.0233 U
CHRYSENE	1600	0.166	0.0195 U	0.0202 U	0.0185 U	0.114 J			0.0178 U				0.018 U	0.0166 U		0.0894 J				0.0322 J
DIBENZO(A,H)ANTHRACE	1.6	0.033	0.0195 U	0.0202 U	0.0185 U	0.0352 UJ			0.0178 U				0.018 U	0.0166 U		0.0360 U				0.0233 U
FLUORANTHENE	4900	0.423	0.0195 U	0.0327 J	0.0185 U	0.187 J			0.0178 U				0.018 U	0.0166 U		0.135				0.0549 J
FLUORENE	4900	0.0774	0.0195 U	0.0202 U	0.0185 U	0.0352 UJ			0.0178 U				0.018 U	0.0166 U		0.0360 U				0.0233 U
INDENO(1,2,3-CD)PYRENE	16	NA	0.0195 U	0.0202 U	0.0185 U	0.0927 J			0.0178 U				0.018 U	0.0166 U		0.0579 J				0.0259 J
NAPHTHALENE	2500	0.176	0.0195 U	0.0202 U	0.0185 U	0.0352 UJ			0.0178 U				0.018 U	0.0166 U		0.0360 U				0.0233 U
PHENANTHRENE	3700	0.204	0.0195 U	0.0202 U	0.0185 U	0.0352 UJ			0.0178 U				0.018 U	0.0166 U		0.0488 J				0.0233 U
PYRENE	3700	0.195	0.0205 U	0.0329 J	0.0194 U	0.174 J			0.0186 U				0.018 U	0.0174 U		0.128				0.0513 J
INORGANICS (MG/KG)																				
ANTIMONY	83	2	0.189 UR	0.199 UR	0.179 UR	1.41 UJ	0.48 U	0.578 UJ	0.678 UR	0.676 UR	0.751 UJ	0.24 U	0.718 UR	0.65 UR	0.487 UR	1.38 UJ	1.45 UJ	0.973 UJ	1.06 UJ	0.93 UJ
ARSENIC	110	9.79	2.5	3	3.2	4.2	5.4	2.3	2.1	2.2	3.2	2.7	3.1	3	4.2	7.1	8	5.2	6.4	3.1
COPPER	21000	31.6	7.9	7.7	6.2	7.9	8.2 J	3.5	5.5 J	5.9 J	5.7	7.2 J	5.7 J	4.7	3.2 J	16	19.6	12.1	15.2	6.6
LEAD	500	35.8	11.1	10.7	10.1	12.9	13.5	7.2	9	7.6	11.8	10.7	9.9	8.7	**133**	22.1	23.9	16.8	19.6	9.6
ZINC	76000	121	49.3	50	38.1	56.9	63.1	24.1	37.8	43.9	42.6	41.4	40	34.5	13.3	111	**143**	89	103	57

Notes:
1. TRRP Tier 1 Direct Human Contact Sediment PCLs, March 31, 2006.
2. Table 3-3, Ecological Benchmarks for Sediment, RG-262, January 2006.
Bold - indicates exceedance of ecological benchmark criteria
mg/kg - milligrams per kilogram
NA - criteria not available
U - not detected
J - estimated
R - rejected, not detected

TABLE 4-4

REVISION 1
SEPTEMBER 2009

SUMMARY OF SOIL ANALYTICAL RESULTS
PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

LOCATION	**TRRP Tier 1 Residential PCL** [1]	**PR-SS04**	**PR-SS04**	**PR-SS14**	**PR-SS26**	**PR-SS27**	**PR-SS28**	**PR-SS40**	**PR-SS49**
SAMPLE ID		**PR-SS04**	**PR-SS04-D**	**PR-SS14**	**PR-SS26**	**PR-SS27**	**PR-SS38**	**PR-SS40**	**PR-SS49**
TOP DEPTH (ft)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BOTTOM DEPTH (ft)		**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
PARAMETER									
PROPELLANTS (MG/KG)									
NITROGLYCERIN	6.7								1 U
BIS(2-ETHYLHEXYL)PHTHALATE	43								0.193 U
DI-N-BUTYL PHTHALATE	5100								0.386 U
DIETHYL PHTHALATE	2700								0.386 U
DIMETHYL PHTHALATE	1300								0.386 U
DIPHENYLAMINE	1200								0.386 U
INORGANICS (MG/KG)									
ANTIMONY	15	0.11 UR	0.57 UR	0.420 U	0.18 U	0.17 U	0.23 U	0.15 U	
ARSENIC	24	3.3	3.8	2.9	3.3	3.0	3.1	3.1	
COPPER	550	13.2	13.1	14.3	13.2	19.7	11.3	13.3	
LEAD	500	22.9	20.1	187	177	121	132	52.3	
ZINC	9900	68.8 L	62.3 L	67.8 L	58.8 L	156 L	79.6 L	84.0 L	

Notes:
1. TRRP Tier 1 Residential PCL, total soil combined, April 23, 2008
Bold - indicates exceedance of PCL
mg/kg - milligrams per kilogram
NA - criteria not available
blank - indicates parameter not analyzed for
U - not detected
UR - not detected, rejected data
J - estimated
L - biased low

TABLE 4-5

REVISION 1
SEPTEMBER 2009

SUMMARY OF SOIL ANALYTICAL RESULTS
SKEET RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

LOCATION	TRRP Tier 1 Residential PCL [1]	SR-SS01	SR-SS02	SR-SS02	SR-SS03	SR-SS04	SR-SS05	SR-SS06	SR-SS07	SR-SS08	SR-SS09
SAMPLE ID		SR-SS01	SR-SS02	SR-SS02-D	SR-SS03	SR-SS04	SR-SS05	SR-SS06	SR-SS07	SR-SS08	SR-SS09
TOP DEPTH (ft)		0	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH (ft)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PARAMETER											
EXPLOSIVES (MG/KG)											
1,3,5-TRINITROBENZENE	190										
1,3-DINITROBENZENE	6.5										
2,4,6-TRINITROTOLUENE	23										
2,4-DINITROTOLUENE	6.9										
2,6-DINITROTOLUENE	6.9										
2-AMINO-4,6-DINITROTOLUENE	10										
2-NITROTOLUENE	21										
3-NITROTOLUENE	380										
4-AMINO-2,6-DINITROTOLUENE	10										
4-NITROTOLUENE	200										
HMX	350										
NITROBENZENE	66										
RDX	43										
TETRYL	59										
PAH (MG/KG)											
ACENAPHTHENE	3000	0.24 H	0.0138 U	0.0137 U	0.186 J	0.54	7.29	0.0141 U	0.0415 U	0.7 J	0.587
ACENAPHTHYLENE	3800	0.0416 U	0.0124 U	0.0123 U	0.399 U	0.16	3.99 U	0.0127 U	0.0415 U	0.0406 UJ	0.404 U
ANTHRACENE	18000	0.475 H	0.00825 UL	0.00822 UL	0.182 J	1.07 L	18.5	0.00982 L	0.0415 U	1.34 J	1.15
BENZO(A)ANTHRACENE	5.7	5.35 H	0.0124 U	0.0123 U	**7.45**	**7.86**	**158**	0.0127 U	0.0468	**29.6 J**	**9.95**
BENZO(A)PYRENE	0.56	**6.92 H**	0.0124 U	0.0123 U	**12.6**	**9.83**	**187**	0.0182 J	0.0653	**47.3 J**	**11.3**
BENZO(B)FLUORANTHENE	5.7	**12.5 H**	0.0225 J	0.0128 J	**20.5**	**20**	**323**	0.037 J	0.117	**62.4 J**	**20.1**
BENZO(G,H,I)PERYLENE	1800	3.81 J	0.0124 U	0.0123 U	8.93	2.78	113	0.0168 J	0.0479	25.8 J	6.24
BENZO(K)FLUORANTHENE	57	0.0416 UR	0.0124 U	0.0123 U	0.399 U	0.0124 U	3.99 U	0.0127 U	0.0415 U	28 J	0.404 U
CHRYSENE	560	6.04 H	0.0124 UL	0.0123 UL	8.78	8.67 L	171	0.0171 L	0.048	35.1 L	10.1
DIBENZO(A,H)ANTHRACENE	0.55	0.0416 U	0.0124 U	0.0123 U	0.399 U	0.0124 U	3.99 U	0.0127 U	0.0415 U	0.0406 UJ	0.404 U
FLUORANTHENE	2300	8.68 J	0.0149 J	0.0123 U	6	10.4	273	0.0286 J	0.0521	31.3 J	17.3
FLUORENE	2300	0.0819 H	0.0124 U	0.0123 U	0.399 U	0.194	2.51 J	0.0127 U	0.0415 U	0.281 J	0.233 J
INDENO(1,2,3-CD)PYRENE	5.7	3.54 H	0.0124 U	0.0123 U	**7.76**	4.97	**98.2**	0.0146 J	0.0316 J	**22.3 J**	5.54
NAPHTHALENE	220	0.236 H	0.0124 U	0.0123 U	0.399 U	0.477	5.98	0.0127 U	0.0415 U	0.615 J	0.582
PHENANTHRENE	1700	2.4 H	0.0124 U	0.0123 U	0.76	4.44	85.7	0.0127 U	0.0125 J	8.4 J	5.4
PYRENE	1700	7.59 J	0.0129 U	0.0129 U	6.86	12.5	239	0.0259 J	0.0471	29.6 J	14
INORGANICS (MG/KG)											
ALUMINUM	65000										
ANTIMONY	15	0.475 UR	0.475 UR	0.2 L	0.46 UR	0.483 UR	0.478 UR	0.491 UR	0.475 UR	0.32 L	0.484 UR
ARSENIC	24	3.5	5.6	4.2	3.8	4.1	4.4	7.3	6.7	7.9	4.2
BARIUM	8000										
BERYLLIUM	38										
CADMIUM	52										
CALCIUM	NA										
CHROMIUM	30000										
COBALT	21										
COPPER	550	11.6 J	11.7 J	10.2 J	11.2 J	11 J	12.1 J	12.3 J	12.5 L	10.8 J	9.4 L
IRON	NA										
LEAD	500	53.9 J	36.2 J	54.9 J	68.7 J	40.3 J	38.6 J	21.1 J	44.5	476 J	64.1
MAGNESIUM	NA										
MANGANESE	3700										
MERCURY	3.6										
NICKEL	840										
POTASSIUM	NA										
SELENIUM	310										
SILVER	96										
SODIUM	NA										
THALLIUM	6.3										
VANADIUM	290										
ZINC	99000	64.4	90.6	68.6	62.5	68.5	87.2	82.2	69.4	86.6	98.4
MISCELLANEOUS (MG/KG)											
PERCHLORATE	51										
GEOTECHNICAL											
EFFECTIVE POROSITY (%)	NA										
FRACTION ORGANIC CARBON (G/G)	NA										
PH (S.U.)	NA										
TOTAL ORGANIC CARBON (MG/KG)	NA										
TOTAL POROSITY (%)	NA										

Notes:
1. TRRP Tier 1 Residential PCL, total soil combined, April 23, 2008
Bold - indicates exceedance of PCL
mg/kg - milligrams per kilogram
NA - criteria not available
blank - indicates parameter not analyzed for
U - not detected
UR - not detected, rejected data
J - estimated
L - biased low

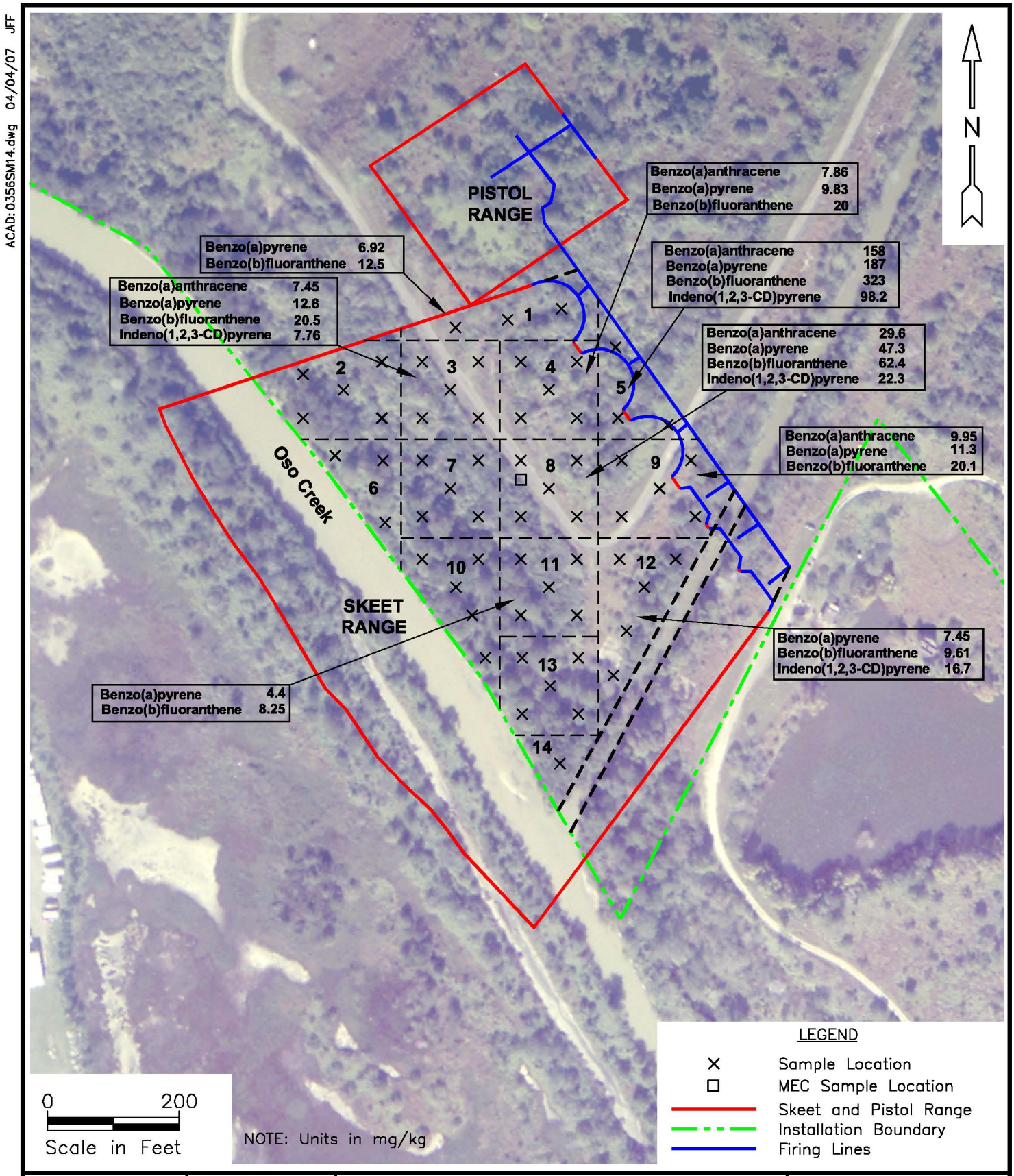
TABLE 4-5

REVISION 1
SEPTEMBER 2009

SUMMARY OF SOIL ANALYTICAL RESULTS
SKEET RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

LOCATION	TRRP Tier 1 Residential PCL [1]	SR-SS10	SR-SS11	SR-SS12	SR-SS12	SR-SS13	SR-SS14	SR-SS17	SR-SB01	SR-SB02
SAMPLE ID		SR-SS10	SR-SS11	SR-SS12	SR-SS12-D	SR-SS13	SR-SS14	SR-SS17	SR-SB01-0608	SR-SB02-1617
TOP DEPTH (ft)		0	0	0	0	0	0	0	6	16
BOTTOM DEPTH (ft)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	8	17
PARAMETER										
EXPLOSIVES (MG/KG)										
1,3,5-TRINITROBENZENE	190							0.05 U		
1,3-DINITROBENZENE	6.5							0.05 U		
2,4,6-TRINITROTOLUENE	23							0.05 U		
2,4-DINITROTOLUENE	6.9							0.05 U		
2,6-DINITROTOLUENE	6.9							0.05 U		
2-AMINO-4,6-DINITROTOLUENE	10							0.05 U		
2-NITROTOLUENE	21							0.05 U		
3-NITROTOLUENE	380							0.05 U		
4-AMINO-2,6-DINITROTOLUENE	10							0.05 U		
4-NITROTOLUENE	200							0.05 U		
HMX	350							0.05 U		
NITROBENZENE	66							0.05 U		
RDX	43							0.05 U		
TETRYL	59							0.05 U		
PAH (MG/KG)										
ACENAPHTHENE	3000	0.0141 U	0.0942 J	0.294 J	0.0212 J	0.0411 U	0.0136 U			
ACENAPHTHYLENE	3800	0.0126 U	0.161 U	0.012 U	0.0121 U	0.0411 U	0.0122 U			
ANTHRACENE	18000	0.00842 UL	0.203	0.534 L	0.0441 L	0.0127 J	0.00815 UL			
BENZO(A)ANTHRACENE	5.7	0.0126 U	2.87	**7.45 J**	0.524 J	0.178	0.0122 U			
BENZO(A)PYRENE	0.56	0.0226 J	**4.4**	**9.61 J**	**0.615 J**	0.3	0.0214 J			
BENZO(B)FLUORANTHENE	5.7	0.0452	**8.25**	**16.7 J**	1.09 J	0.541	0.0438			
BENZO(G,H,I)PERYLENE	1800	0.0211 J	2.37	4.28 J	0.38 J	0.181	0.0217 J			
BENZO(K)FLUORANTHENE	57	0.0126 U	0.161 U	0.012 U	0.0121 U	0.0411 U	0.0122 U			
CHRYSENE	560	0.0205 L	3.31	8 L	0.536 L	0.232	0.0198 L			
DIBENZO(A,H)ANTHRACENE	0.55	0.0126 U	0.161 U	0.012 U	0.0288 J	0.0411 U	0.0122 U			
FLUORANTHENE	2300	0.0349 J	3.58	9.21 J	0.667 J	0.21	0.0375 J			
FLUORENE	2300	0.0126 U	0.161 U	0.111	0.0121 U	0.0411 U	0.0122 U			
INDENO(1,2,3-CD)PYRENE	5.7	0.0176 J	2.19	4.38 J	0.353 J	0.152	0.0186 J			
NAPHTHALENE	220	0.0126 U	0.0903 J	0.284 J	0.0251 J	0.0411 U	0.0122 U			
PHENANTHRENE	1700	0.0126 U	0.893	2.16 J	0.206 J	0.052	0.0122 U			
PYRENE	1700	0.0259 J	3.97	9.51 J	0.624 J	0.222	0.0281 J			
INORGANICS (MG/KG)										
ALUMINUM	65000							10800		
ANTIMONY	15	0.504 UR	0.472 UR	0.459 UR	0.48 UR	0.487 UR	0.489 UR	0.112 UR		
ARSENIC	24	5.7	4.9	4.2	3.8	5.4	4.9	3.5		
BARIUM	8000							130		
BERYLLIUM	38							0.59		
CADMIUM	52							0.17		
CALCIUM	NA							28800		
CHROMIUM	30000							8		
COBALT	21							3.9 J		
COPPER	550	14.2 L	13 L	8.6 L	9.6 L	13.3 L	10.8 L	7.7 J		
IRON	NA							6180		
LEAD	500	17.5	97.5	19.9	18	25.4	12.8	29.6		
MAGNESIUM	NA							3220		
MANGANESE	3700							248 J		
MERCURY	3.6							0.027		
NICKEL	840							6.5		
POTASSIUM	NA							2900		
SELENIUM	310							2.2		
SILVER	96							0.21		
SODIUM	NA							116		
THALLIUM	6.3							0.562 U		
VANADIUM	290							14 J		
ZINC	99000	107	87.8	60.3	64.7	93.9	70.5	42.1		
MISCELLANEOUS (MG/KG)										
PERCHLORATE	51							0.0239		
GEOTECHNICAL										
EFFECTIVE POROSITY (%)	NA								5.75	4.47
FRACTION ORGANIC CARBON (G/G)	NA								0.00125	0.00125
PH (S.U.)	NA								7.8	8.11
TOTAL ORGANIC CARBON (MG/KG)	NA								1250	1250
TOTAL POROSITY (%)	NA								50.2	48.1

Notes:
1. TRRP Tier 1 Residential PCL, total soil combined, April 23, 2
Bold - indicates exceedance of PCL
mg/kg - milligrams per kilogram
NA - criteria not available
blank - indicates parameter not analyzed for
U - not detected
UR - not detected, rejected data
J - estimated
L - biased low



DRAWN BY GS DATE 10/31/08	NAVFAC	SURFACE SOIL SAMPLE EXCEEDANCES – SKEET RANGE SKEET RANGE AND PISTOL RANGE NALF CABANISS, TEXAS	PROJECT NO. 112G00356
CHECKED BY LB DATE 03/28/07			CTO NO. 0023
REVISED BY DATE			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 4–1 / REV. 1

5.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

The following subsections provide a discussion of the findings of the SI and recommendations.

5.1 SURFACE WATER SAMPLING FINDINGS

Two metals (copper and lead) were detected at concentrations greater than the regulatory criteria. The remaining metals were either detected at concentrations greater than the reporting limits but less than the regulatory criteria or were not detected at concentrations greater than the reporting limit.

Copper

Copper was detected in seven surface water samples exceeding the criteria at concentrations ranging from 0.0041 to 0.0081 mg/L.

These concentrations exceed the Aquatic Life Saltwater Chronic RBEL of 0.0036 mg/L. However, some of these concentrations are near the concentrations in the background samples and some of the concentrations are slightly above the background concentrations. The remaining concentration is considered an isolated occurrence since concentrations both upstream and downstream from this sample have lower concentrations.

Additionally, the detected concentrations are less than the TRRP Tier 1 Contact Recreational Water PCL of 33.1 mg/L. The human health surface water RBEL is not available.

Lead

Lead was detected in one surface water sample exceeding the criteria at a concentration of 0.0054 mg/L. This concentration exceeds the Aquatic Life Saltwater Chronic RBEL of 0.0.0053 mg/L. However, the detected concentration is less than the Aquatic Life Saltwater Acute RBEL of 0.133 mg/L and the human health RBEL of 0.169 mg/L. A TRRP Tier 1 Contact Recreational PCL is not available

The analytical result for lead appears to be a statistical outlier as all other analytical results are less than the reporting limit.

5.2 SEDIMENT SAMPLING FINDINGS

5.2.1 PAHs

Eight PAHs were detected at concentrations greater than the reporting limits in sediment samples collected adjacent to the Skeet Range and Pistol Range. However, the concentrations detected are less than the respective ecological benchmarks or TRRP Tier 1 Residential PCLs.

5.2.2 Metals

Four metals were detected at concentrations greater than the reporting limits in sediment samples collected adjacent to the Skeet Range and Pistol Range. The detected concentrations of metals are less than the regulatory criteria with the exception of lead and zinc.

Lead

Lead was detected in one sediment sample exceeding the regulatory criteria at a concentration of 133 mg/kg.

This concentration exceeds the ecological benchmark for sediment of 35.8 mg/kg. The concentration also exceeds the background sediment sample concentration. However, the detected concentration is less than the TRRP Tier 1 Direct Human Contact Sediment PCL of 500 mg/kg.

Zinc

Zinc was detected in one sediment sample exceeding the regulatory criteria at a concentration of 143 mg/kg.

This concentration exceeds the ecological benchmark for sediment of 121 mg/kg. The concentration also exceeds the background sediment sample concentration. However, the detected concentration is less than the TRRP Tier 1 Direct Human Contact Sediment PCL of 76,020 mg/kg.

A 95% UCL was calculated for zinc. The calculated 95% UCL is 73.1 mg/kg. This value is less than the ecological benchmark for sediment of 121 mg/kg.

5.3 SURFACE SOIL SAMPLING FINDINGS – PISTOL RANGE

5.3.1 Propellants

Propellants were not detected at concentrations greater than the reporting limits in surface soil samples collected at the Pistol Range.

5.3.2 Metals

Metals were detected at concentrations greater than the reporting limits but less than the TRRP Tier 1 Residential PCLs or were not detected at concentrations greater than the reporting limit.

5.4 SURFACE SOIL SAMPLING FINDINGS – SKEET RANGE

5.4.1 PAHs

Four PAHs were detected at concentrations greater than the TRRP Tier 1 Residential PCLs. The remaining PAHS were detected at concentrations greater than the reporting limits but less than the TRRP Tier 1 Residential PCLs or were not detected at concentrations greater than the reporting limit.

Benzo(a)anthracene was detected in six soil samples at concentrations, greater than the regulatory criteria, ranging from 7.45 mg/kg to 158 mg/kg. These concentrations exceed the TRRP Tier 1 Residential PCL of 5.65 mg/kg.

Benzo(a)pyrene was detected in nine soil samples at concentrations, greater than the regulatory criteria, ranging from 0.615 mg/kg to 187 mg/kg. These concentrations exceed the TRRP Tier 1 Residential PCL of 0.56 mg/kg.

Benzo(b)fluoranthene was detected in eight soil samples at concentrations, greater than the regulatory criteria, ranging from 8.25 mg/kg to 323 mg/kg. These concentrations exceed the TRRP Tier 1 Residential PCL of 5.71 mg/kg.

Indeno(1,2,3-cd)pyrene was detected in three soil samples at concentrations, greater than the regulatory criteria, ranging from 7.76 mg/kg to 98.2 mg/kg. These concentrations exceed the TRRP Tier 1 Residential PCL of 5.72 mg/kg.

5.4.2 Metals

Metals were detected at concentrations greater than the reporting limits but less than the TRRP Tier 1 Residential PCL or were not detected at concentrations greater than the reporting limit.

5.5 SURFACE SOIL SAMPLING FINDINGS – MEC LOCATION

5.5.1 Explosives

Explosives were not detected at concentrations greater than the reporting limits in the surface soil samples collected at the Skeet Range.

5.5.2 Perchlorate

Perchlorate was detected at a concentration greater than the reporting limit but less than the TRRP Tier 1 Residential PCL.

5.5.3 TAL Metals

TAL Metals were detected at concentrations greater than the reporting limits but less than the TRRP Tier 1 Residential PCLs or were not detected at concentrations greater than the reporting limit.

5.6 RECOMMENDATIONS

5.6.1 Surface Water

Metals were detected at concentrations greater than the reporting limits but less than the TRRP ecological or human health criteria or were not detected at concentrations greater than the reporting limit with the exception of lead.

Lead was detected at a concentration greater than the ecological criteria in only one of 11 surface water samples. The detected concentration is less than the human health criteria.

The single detection of lead appears to be an isolated event. Based upon the number of exceedances of the ecological criteria, the limited spatial distribution, the magnitude of the exceedance of the ecological criteria; the impact to ecological receptors appears minimal. The single exceedance does not appear to be site related; therefore, no further action for surface water is recommended.

5.6.2 Sediment

Metals were detected at concentrations greater than the reporting limits but less than the TRRP ecological or human health criteria or were not detected at concentrations greater than the reporting limit with the exception of lead.

Lead was detected at a concentration greater than the ecological criteria in only one of 18 sediment samples. The detected concentration is less than the human health criteria.

The single exceedance of lead appears to be an isolated event. Based upon the number of exceedances of the ecological criteria, the limited spatial distribution, the magnitude of the exceedance of the ecological criteria; the impact to ecological receptors appears minimal. The single exceedance does not appear to be site related; therefore, no further action for sediment is recommended.

5.6.3 Surface Soil – Pistol Range

Metals and propellants were not detected at concentrations greater than the TRRP Tier 1 Residential PCLs; therefore, no further action is recommended.

5.6.4 Surface Soil – Skeet Range

Metals were not detected at concentrations greater than the TRRP Tier 1 Residential PCL; therefore, no further action is recommended for metals.

PAHs were detected at concentrations greater than the TRRP Tier 1 Residential PCLs at eight locations at the Skeet Range. The detections of PAHS appear to be site related; therefore, it is recommended that the site proceed to the remedial investigation phase in accordance with Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA) guidelines.

5.6.5 Surface Soil – MEC Location

Explosives, perchlorate and TAL metals were not detected at concentrations greater than the TRRP Tier 1 Residential PCLs; therefore, no further action is recommended for the MEC location.

5.7 CONCEPTUAL SITE MODEL

The CSM describes the site and its environmental setting. The CSM presents information regarding:

1) MEC or MC (or both) known or suspected to be at the site; 2) current and future reasonably anticipated or proposed uses of the real property; and 3) actual, potentially complete, or incomplete exposure pathways that link them. The CSM is the basis for the risk evaluation, prioritization, and remediation cost estimate.

For MC, a complete or potentially complete exposure pathway must include the following components:

1) a source (e.g., locations where MC are expected to be found); 2) an exposure medium (e.g., surface soil); 3) an exposure route (e.g., dermal contact); and 4) receptors (e.g., Navy personnel, construction workers, recreational users, or authorized visitors). If one or more of these components are missing, the exposure pathway is not complete.

5.7.1 Skeet Range

Analytical results indicate that concentrations of MC in surface soil are greater than TRRP Tier 1 Residential PCLs. Analytical results for surface water and sediment did not indicate impacts; therefore, the exposure pathways for surface water and sediment are not complete. Figure 5-1 is an updated MC exposure pathway analysis for the Skeet Range reflecting the results of the SI.

5.7.2 Pistol Range

Analytical results indicate that concentrations of MC in soil are less that TRRP Tier 1 Residential PCLs. As a source is not present, the exposure pathways for surface water, sediments and soil are not complete. Figure 5-2 is an updated MC exposure pathway analysis for the Pistol Range reflecting the results of the SI.

5.8 MUNITION RESPONSE SITE PRIORITIZATION PROTOCOL

Munitions Response Site Prioritization Protocol (MRSPP) scoring tables have been prepared for both the Skeet Range and Pistol Range. The Department of Defense (DoD) developed the MRSPP as the methodology for prioritizing sites known or suspected to contain UXO or MC for response actions. The priority assigned is based on the overall conditions at each site, taking into consideration various factors relating to the potential environmental and safety hazards. The MRSPP scoring tables are located in Appendix C.

A Munitions Response Site (MRS) priority rating of 6 was calculated for the Skeet Range.

A MRS priority rating of 6 was calculated for the Pistol Range.

APPENDIX A

FIELD XRF RESULTS AND CORRELATION CURVES

SUMMARY OF XRF FIELD RESULTS

PISTOL RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

Subsample Identification	Depth (feet bgs)	XRF Lead Values (mg/kg)			Maximum Composite XRF Lead Value (mg/kg)	Average Composite XRF Lead Value (mg/kg)	Laboratory Lead Analytical Result (mg/kg)
PR-SS01	0 - 0.5	47	33	43	47	41	
PR-SS02	0 - 0.5	25	25	26	26	25	
PR-SS03	0 - 0.5	27	21	20	27	23	
PR-SS04	0 - 0.5	30	33	21	33	28	22.9
PR-SS05	0 - 0.5	21	24	16	24	20	
PR-SS06	0 - 0.5	17	23	19	23	20	
PR-SS07	0 - 0.5	50	68	68	68	62	
PR-SS08	0 - 0.5	64	50	56	64	57	
PR-SS09	0 - 0.5	26	45	48	48	40	
PR-SS10	0 - 0.5	22	25	18	25	22	
PR-SS11	0 - 0.5	15	23	26	26	21	
PR-SS12	0 - 0.5	26	18	28	28	24	
PR-SS13	0 - 0.5	44	40	40	44	41	
PR-SS14	0 - 0.5	169	181	138	181	163	187
PR-SS15	0 - 0.5	37	31	26	37	31	
PR-SS16	0 - 0.5	24	26	23	26	24	
PR-SS17	0 - 0.5	29	33	26	33	29	
PR-SS18	0 - 0.5	25	37	39	39	34	
PR-SS19	0 - 0.5	61	57	59	61	59	
PR-SS20	0 - 0.5	32	25	29	32	29	
PR-SS21	0 - 0.5	65	61	64	65	63	
PR-SS22	0 - 0.5	27	32	37	37	32	
PR-SS23	0 - 0.5	36	27	30	36	31	
PR-SS24	0 - 0.5	28	28	31	31	29	
PR-SS25	0 - 0.5	28	26	24	28	26	
PR-SS26	0 - 0.5	163	201	660	660	341	177
PR-SS27	0 - 0.5	111	98	108	111	106	121
PR-SS28	0 - 0.5	40	35	38	40	38	
PR-SS29	0 - 0.5	62	62	63	63	62	
PR-SS30	0 - 0.5	18	25	14	25	19	
PR-SS31	0 - 0.5	21	16	19	21	19	
PR-SS32	0 - 0.5	45	38	40	45	41	
PR-SS33	0 - 0.5	80	75	70	80	75	
PR-SS34	0 - 0.5	35	31	32	35	33	
PR-SS35	0 - 0.5	34	51	52	52	46	
PR-SS36	0 - 0.5	63	62	61	63	62	
PR-SS37	0 - 0.5	74	84	66	84	75	
PR-SS38	0 - 0.5	128	104	93	128	108	132
PR-SS39	0 - 0.5	19	21	18	21	19	
PR-SS40	0 - 0.5	89	63	45	89	66	52.3
PR-SS41	0 - 0.5	30	37	36	37	34	
PR-SS42	0 - 0.5	30	32	30	32	31	
PR-SS43	0 - 0.5	66	47	47	66	53	
PR-SS44	0 - 0.5	60	61	57	61	59	
PR-SS45	0 - 0.5	40	60	49	60	50	
PR-SS46	0 - 0.5	41	47	57	57	48	
PR-SS47	0 - 0.5	29	25	35	35	30	
PR-SS48	0 - 0.5	29	33	31	33	31	

SUMMARY OF XRF FIELD RESULTS

SKEET RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

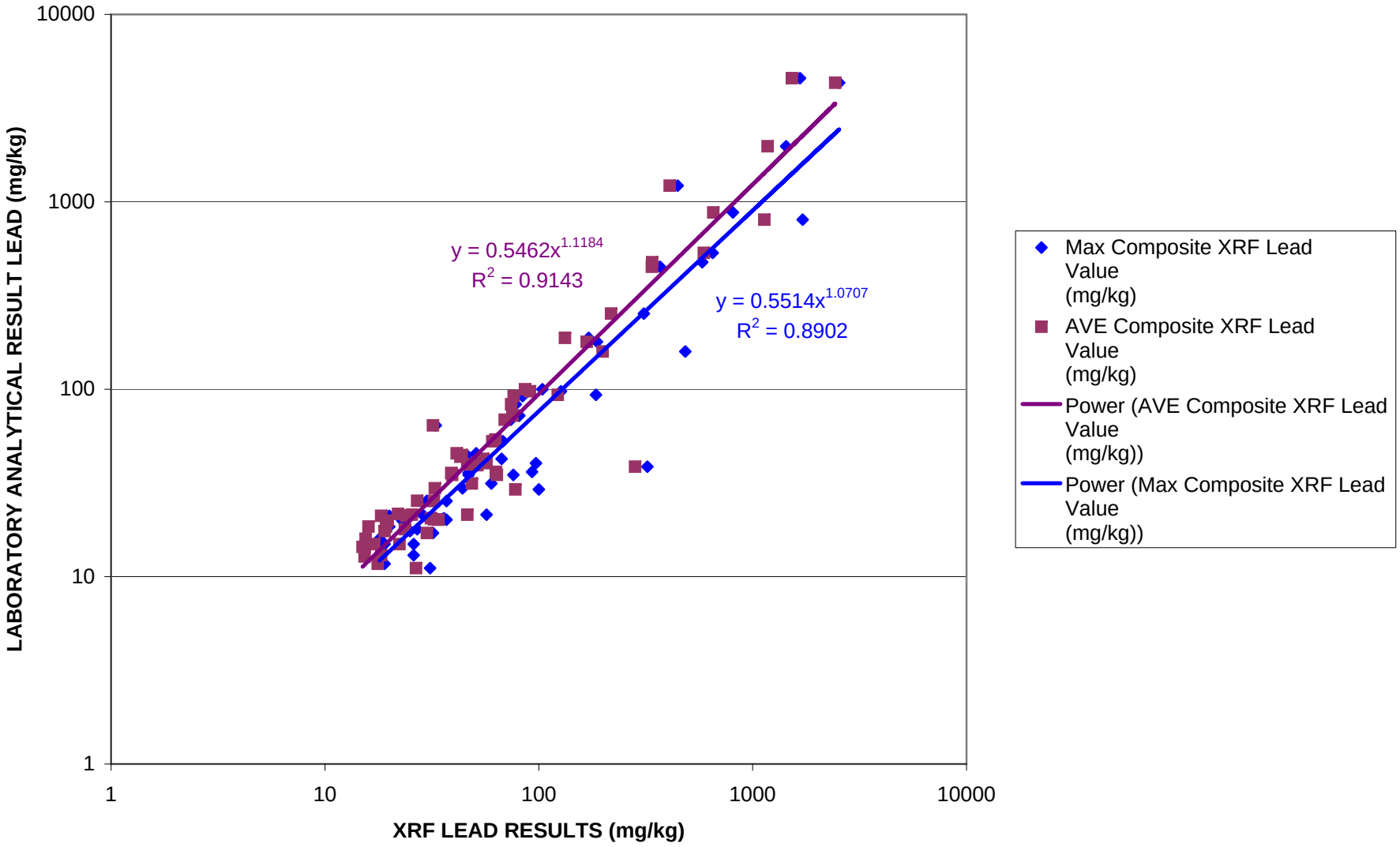
Grid Sample Location	Depth (feet bgs)	Composite Sample Identification	Subsample Identification	XRF Lead Values (mg/kg)			Composite XRF Lead Values (mg/kg)			Maximum Composite XRF Lead Value (mg/kg)	Average Composite XRF Lead Value (mg/kg)	Laboratory Lead Analytical Result (mg/kg)
1	0 - 0.5	SR-SS01	SR-SS01a	55	56	74	65	65	58	65	63	53.9
			SR-SS01b	68	53	66						
			SR-SS01c	62	62	63						
2	0 - 0.5	SR-SS02	SR-SS02a	20	37	25	93	62	34	93	63	36.2
			SR-SS02b	111	89	359						
			SR-SS02c	17	33	40						
			SR-SS02d	23	20	25						
			SR-SS02e	34	69	40						
3	0 - 0.5	SR-SS03	SR-SS03a	238	199	137	73	74	61	74	69	54.9
			SR-SS03b	33	46	40						
			SR-SS03c	57	38	139						
			SR-SS03d	78	88	63						
			SR-SS03e	73	74	61						
4	0 - 0.5	SR-SS04	SR-SS04a	29	33	35	39	35	97	97	57	40.3
			SR-SS04b	127	180	147						
			SR-SS04c	35	42	42						
			SR-SS04d	46	35	51						
			SR-SS04e	98	92	96						
5	0 - 0.5	SR-SS05	SR-SS05a	74	85	78	239	322	285	322	282	38.6
			SR-SS05b	583	903	1095						
			SR-SS05c	62	64	76						
6	0 - 0.5	SR-SS06	SR-SS06a	26	23	13	17	18	20	20	18	21.1
			SR-SS06b	21	26	24						
			SR-SS06c	22	27	27						
7	0 - 0.5	SR-SS07	SR-SS07a	39	40	36	43	46	42	46	44	44.5
			SR-SS07b	36	42	42						
			SR-SS07c	90	45	56						
			SR-SS07d	20	23	19						
			SR-SS07e	44	69	50						
8	0 - 0.5	SR-SS08	SR-SS08a	53	68	84	232	204	581	581	339	476
			SR-SS08b	88	74	68						
			SR-SS08c	68	97	124						
			SR-SS08d	406	157	119						
			SR-SS08e	116	123	144						
9	0 - 0.5	SR-SS09	SR-SS09a	82	141	131	31	32	33	33	32	64.1
			SR-SS09b	<13	<13	15						
			SR-SS09c	25	22	19						
			SR-SS09d	<11	<11	14						
			SR-SS09e	38	25	29						
10	0 - 0.5	SR-SS10	SR-SS10a	16	27	<13	17	15	25	25	19	17.5
			SR-SS10b	33	30	18						
			SR-SS10c	30	15	23						
			SR-SS10d	22	20	23						
			SR-SS10e	28	18	26						
11	0 - 0.5	SR-SS11	SR-SS11a	33	41	50	56	127	90	127	91	97.5
			SR-SS11b	69	102	89						
			SR-SS11c	70	110	126						
			SR-SS11d	26	20	21						
			SR-SS11e	196	256	249						
12	0 - 0.5	SR-SS12	SR-SS12a	35	19	31	23	17	19	23	20	19.9
			SR-SS12b	21	15	24						
			SR-SS12c	18	23	22						
			SR-SS12d	37	31	26						
			SR-SS12e	20	26	29						

SUMMARY OF XRF FIELD RESULTS

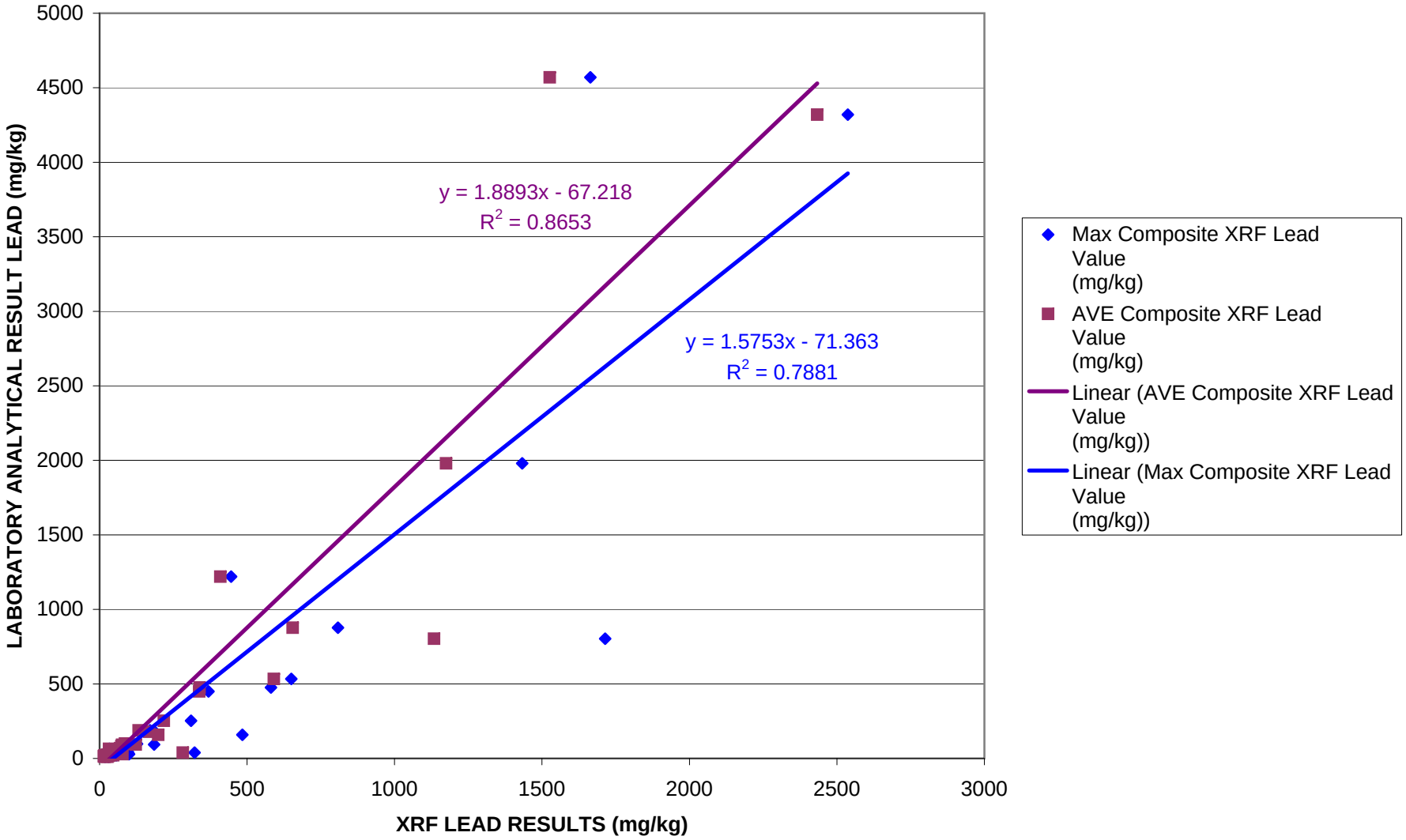
SKEET RANGE
NALF CABANISS, CORPUS CHRISTI, TEXAS

Grid Sample Location	Depth (feet bgs)	Composite Sample Identification	Subsample Identification	XRF Lead Values (mg/kg)			Composite XRF Lead Values (mg/kg)			Maximum Composite XRF Lead Value (mg/kg)	Average Composite XRF Lead Value (mg/kg)	Laboratory Lead Analytical Result (mg/kg)
13	0 - 0.5	SR-SS13	SR-SS13a	23	27	21	25	26	30	30	27	25.4
			SR-SS13b	17	32	47						
			SR-SS13c	31	28	32						
			SR-SS13d	23	19	16						
			SR-SS13e	14	26	19						
14	0 - 0.5	SR-SS14	SR-SS14a	16	18	12	16	18	12	16	15	12.8
8	0 - 0.5	SR-SS17	SR-SS17-1	20	30	22	44	33	21	44	33	29.6
			SR-SS17-2	57	56	54						
			SR-SS17-3	46	45	34						
			SR-SS17-4	19	33	23						
			SR-SS17-5	29	32	23						
			SR-SS17-6	33	35	31						
			SR-SS17-7	34	34	27						

CORRELATION CURVE (EXPONENTIAL) NALF CABANISS



CORRELATION CURVE (LINEAR) NALF CABANISS



APPENDIX B

SOIL BORING LOGS

Tetra Tech NUS, Inc.
Houston, Texas

BOREHOLE No.: SR-SB01

NORTHING: **17141808.8**

EASTING: **1330379.4** GROUND ELEVATION: **NA**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	**NALF Cabaniss CTO 23**	DRILLING CO.:	**ESN**
SITE LOCATION:	**Skeet Range**	DRILLER:	**Dennis Crowl**
JOB NO.:	**112G00356**	RIG TYPE:	**Strataprobe**
LOGGED BY:	**Larry Basilio**	METHOD OF DRILLING:	**DPT**
PROJECT MANAGER:	**Ken Grim**	SAMPLING METHODS:	**Split Spoon**
DATE DRILLED:	**5/8/08**	TOTAL DEPTH:	**21 feet BGS**

NOTES: Coordinates = Texas State Plane Coordinate System, Texas South Zone (4205), NAD 83

▽ Initial Water Level ▼ Static Water Level

DEPTH (FEET)	SOIL SYMBOL	USCS: SOIL DESCRIPTION	SAMPLE NUMBER/ INTERVAL	RECOVER/ ADVANCE (inches)	PID (ppm)	WELL DETAIL	WELL DESCRIPTION
0		CL: CLAY - gray, hard, silty, dry to damp, some charcoal fragments present, trace skeet fragments		16/24	0		
					0		1" PVC riser
		CL: CLAY - gray, silty, very slightly plastic, damp, shell fragments		22/24	0		
					0		
-5		CL: CLAY - gray brown, very stiff, silty, damp to moist in parts, shell fragments		16/24	0		
		CL: CLAY - tan, silty, slightly plastic, very stiff to hard, damp, caliche at top, iron staining towards base	SR-SB01 -0608		0		
				24/24	0		
					0		
-10				24/24	0		
		CL: CLAY - tan, mottled, very stiff to hard, slightly plastic, silty, iron staining, damp			0		
				24/24	0		
		CL: CLAY - gray tan, mottled, very stiff, silty to very silty in parts, damp			0		
				24/24	0		
-15					0		
				36/36	0		0.010" slot 1" diameter PVC screen, no sand filter pack
		SM: SAND - tan, very fine grained, very silty, loose, damp to wet at 19 ft bgs			0		
▽				24/24	0		
					0		Flowing sands encountered, unable to set well on bottom
-20		CL: CLAY - brown, hard, silty, moist		24/24	0		
		SM: SAND - gray, fine grained, silty, wet					
		Total Depth = 21 feet below ground surface					

STATE OF TEXAS
Larry Basilio
Geology
506
LICENSED PROFESSIONAL GEOSCIENTIST

Tetra Tech NUS, Inc.
Houston, Texas

BOREHOLE No.: SR-SB02

NORTHING: **17141995.5**
EASTING: **1330240.9** GROUND ELEVATION: **NA**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	**NALF Cabaniss CTO 23**	DRILLING CO.:	**ESN**
SITE LOCATION:	**Skeet Range**	DRILLER:	**Dennis Crowl**
JOB NO.:	**112G00356**	RIG TYPE:	**Strataprobe**
LOGGED BY:	**Larry Basilio**	METHOD OF DRILLING:	**DPT**
PROJECT MANAGER:	**Ken Grim**	SAMPLING METHODS:	**Split Spoon**
DATE DRILLED:	**5/8/08**	TOTAL DEPTH:	**21 feet BGS**

NOTES: Coordinates = Texas State Plane Coordinate System, Texas South Zone (4205), NAD 83

▽ Initial Water Level ▼ Static Water Level

DEPTH (FEET)	SOIL SYMBOL	USCS: SOIL DESCRIPTION	SAMPLE NUMBER/ INTERVAL	RECOVER/ ADVANCE (inches)	PID (ppm)	WELL DETAIL	WELL DESCRIPTION
0		CL: CLAY - gray, hard, very slightly plastic, dry to damp, trace weathered caliche at base		13/24	0		
					0		1" PVC riser
				24/24	0		
					0		
-5		CL: CLAY - gray to light gray, hard to very stiff with depth, slightly plastic, damp		24/24	0		
					0		
					0		
				36/36	0		
					0		
-10		CL: CLAY - gray, very stiff, silty, slightly to moderately plastic with depth, damp			0		
					0		
				36/36	0		
		CL: CLAY - gray, mottled orange, very stiff, moderately plastic, silty, damp			0		0.010" slot 1" diameter PVC screen, no sand filter pack
				36/36	0		
-15 ▽		CL: CLAY - brownish gray, very stiff, slightly plastic, silty, damp	SR-SB02 -1617		0		When sampler pulled from hole at 21 ft, 7 ft of flowing sand entered hole. Re-enter hole with sampler to clean out. Sand flowed again to 19 ft. Set well at 19 ft.
				24/36	0		
		SM: SAND - gray, very fine grained, silty, clayey in parts, wet			0		
		CL: CLAY - tan and brown, very stiff, slightly plastic, silty, damp			0		
-20				36/36	0		
		Total Depth = 21 feet below ground surface					

STATE OF TEXAS
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APPENDIX C

MRSPP SCORING SHEETS

SKEET RANGE

Table 1

EHE Module: Munitions Type Data Element Table

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

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

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

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

Small arms, primarily 12-, 16-, and 20-gage and .410 caliber shotgun and pistols (e.g., .22, .38, .45 caliber, 9-mm). Small arms ammunition were known to be used at the range. According to Environmental personnel and available documentation, no other munitions were used at the site. This data supported by Table 5.1-1 in the Final Preliminary Assessment dated April 2005.

Table 2

EHE Module: Source of Hazard Data Element Table

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

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

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

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

Station documents indicate an armory was present. Small arms were likely stored at this site for use at the range. According to Environmental personnel and available documentation, no other munitions were used at the site. This information is supported by p. 2-6 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 3

EHE Module: Location of Munitions Data Element Table

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the scores that correspond with **all** the locations where munitions are known or suspected to be present at the MRS.

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

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

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

Environmental personnel and observations made during the site walk indicated the ranges were demolished and that no live munitions remain at the site. If small arms remain they are likely buried or covered by vegetation. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-8 in the Final Site Recommendations, Site Prioritization and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 4

EHE Module: Ease of Access Data Element Table

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

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

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

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

Fencing exists around the entire installation but the Skeet Range is not separately fenced. However the site is not constantly monitored and the installation fence is broken and down near the site. The only physical barriers preventing access to the site includes Oso Creek to the south and dense vegetation in the area of the site. A patrol road surrounds the installation perimeter and is occasionally patrolled each day but the Skeet Range is not patrolled on a routine basis. The range lies within the flightline control zone. Any visitors to the site require an escort from Air Operations. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-9 in the Final Site Recommendations, Site Prioritization and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 5

EHE Module: Status of Property Data Element Table

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

Classification	Description	Score
Non-DoD control	♦ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies. ♦ The MRS is at a location that is owned by DoD, but that DoD has leased to another entity and for which DoD does not control access 24 hours per day.	5
Scheduled for transfer from DoD control	♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied.	3
DoD control	♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year.	(0)
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**0**

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

Fencing exists around the entire installation but the Skeet Range is not separately fenced. However the site is not constantly monitored and the installation fence is broken and down near the site. The only physical barriers preventing access to the site includes Oso Creek to the south and dense vegetation in the area of the site. A patrol road surrounds the installation perimeter and is occasionally patrolled each day but the Skeet Range is not patrolled on a routine basis. The range lies within the flightline control zone. Any visitors to the site require an escort from Air Operations. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-9 in the Final Site Recommendations, Site Prioritization and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 6

EHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are three classifications of the population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the score.

Note: Use the U.S. Census Bureau tract data available to capture the **highest** population density within a two-mile radius of the perimeter of the MRS.

Classification	Description	Score
> 500 persons per square mile	♦ There are more than 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	5
100-500 persons per square mile	♦ There are 100 to 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	(3)
< 100 persons per square mile	♦ There are fewer than 100 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	1
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**3**

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

Population density: According to 2000 U.S. Census, the population of Nueces County was 313,645 in 2000, with a population density of 375 resident per square mile. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-11 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 7

EHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are six classifications of the number of inhabited structures near the MRS. The number of inhabited buildings relates to the potential population near the MRS. Determine the number of inhabited structures within two miles of the MRS's boundary and circle the score that corresponds with the number of inhabited structures.

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

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

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

Inhabited structures/activities: Numerous homes and industrial buildings are located within a 2-mile radius of the Skeet Range. This information is supported by p. 2-12 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 8

EHE Module: Types of Activities/Structures Data Element Table

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

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

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

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

Inhabited structures/activities: Numerous homes and industrial buildings are located within a 2-mile radius of the Skeet Range. This information is supported by p. 2-13 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 9

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

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

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

Classification	Description	Score
Ecological and cultural resources present	♦ There are both ecological and cultural resources present on the MRS.	5
Ecological present	♦ There are ecological resources present on the MRS.	(3)
Cultural resources present	♦ There are cultural resources present on the MRS.	3
No ecological or cultural resources present	♦ There are no ecological resources or cultural resources present on the MRS.	0
TYPES OF ACTIVITIES/STRUCTURES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**3**

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

Ecological/cultural resources: Wetlands have been delineated at NALF Cabaniss, along Oso Creek and 650 feet west of the Skeet Range. No federal or state endangered species but a few State threatened species may be present. No cultural resources identified. This information is supported by Table 5.1-1 in the Final Preliminary Assessment dated April 2005.

Table 10
Determining the EHE Module Rating

DIRECTIONS:

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

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

	Source	Score	Value
Explosive Hazard Factor Data Elements			
Munitions Type	Table 1	2	4
Source of Hazard	Table 2	2	
Accessibility Factor Data Elements			
Location of Munitions	Table 3	1	9
Ease of Access	Table 4	8	
Status of Property	Table 5	0	
Receptor Factor Data Elements			
Population Density	Table 6	3	16
Population Near Hazard	Table 7	5	
Types of Activities/Structures	Table 8	5	
Ecological and/or Cultural Resources	Table 9	3	
EHE MODULE TOTAL			**29**

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

Table 11

CHE Module: CWM Configuration Data Element Table

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

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

Classification	Description	Score
CWM, that are either UXO, or explosively configured damaged DMM	The CWM known or suspected of being present at the MRS are: ♦ CWM that are UXO (i.e., CWM/UXO) ♦ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged.	30
CWM mixed with UXO	♦ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO.	25
CWM, explosive configuration that are undamaged DMM	♦ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: ♦ Nonexplosively configured CWM/DMM either damaged or undamaged ♦ Bulk CWM (e.g., ton container).	15
CAIS K941 and CAIS K942	♦ The CWM/DMM known or suspected of being present at the MRS are CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M2/E11.	12
CAIS (chemical agent identification sets)	♦ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10
Evidence of no CWM	♦ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	(0)
CWM CONFIGURATION	**DIRECTIONS:** Record **<u>the single highest score</u>** from above in the box to the right (maximum score = 30).	**0**

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

No historical evidence (interviews with Environmental Division personnel, aerial photographs, station maps, and an archive search, or physical evidence (visual survey) was found indicating CWM was present at the Skeet Range. This information is supported by p. 5-9 of the Final Preliminary Assessment dated April 2005.

Table 12

CHE Module: Sources of CWM Data Element Table

DIRECTIONS: Below are 11 sources of CWM hazards and their descriptions. Review these classifications and circle the scores that correspond with **all** the sources of CWM hazards known or suspected to be present at the MRS.

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

Classification	Description	Score
Live-fire involving CWM	♦ The MRS is a former military range that supported live-fire of explosively configured CWM and the CWM/UXO are known or suspected of being present on the surface or in the subsurface. ♦ The MRS is a former military range that supported live-fire with conventional munitions, and CWM/DMM are on the surface or in the subsurface commingled with conventional munitions that are UXO.	10
Damaged CWM/DMM surface or subsurface	♦ There are damaged CWM/DMM on the surface or in the subsurface at the MRS.	10
Undamaged CWM/DMM surface	♦ There are undamaged CWM/DMM on the surface at the MRS.	10
CAIS/DMM surface	♦ There are CAIS/DMM on the surface.	10
Undamaged CWM/DMM, subsurface	♦ There are undamaged CWM/DMM in the subsurface at the MRS.	5
CAIS/DMM subsurface	♦ There are CAIS/DMM in the subsurface at the MRS.	5
Former CA or CWM Production Facilities	♦ The MRS is a facility that formerly engaged in production of CA or CWM, and CWM/DMM is suspected of being present on the surface or in the subsurface.	3
Former Research, Development, Testing, and Evaluation (RDT&E) facility using CWM	♦ The MRS is at a facility that formerly was involved in non-livefire RDT&E activities (including static testing) involving CWM, and there are CWM/DMM suspected of being present on the surface or in the subsurface.	3
Former Training Facility using CWM or CAIS	♦ The MRS is a location that formerly was involved in training activities involving CWM and/or CAIS (e.g., training in recognition of CWM, decontamination training) and CWM/DMM or CAIS/DMM are suspected of being present on the surface or in the subsurface.	2
Former Storage or Transfer points of CWM	♦ The MRS is a former storage facility or transfer point (e.g., intermodal transfer) for CWM.	1
Evidence of no CWM	♦ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	(0)
SOURCES OF CWM	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	**0**

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

No historical evidence (interviews with Environmental Division personnel, aerial photographs, station maps, and an archive search, or physical evidence (visual survey) was found indicating CWM was present at the Skeet Range. This information is supported by p. 5-9 of the Final Preliminary Assessment dated April 2005.

Table 13

CHE Module: Location of CWM Data Element Table

DIRECTIONS: Below are seven classifications of CWM locations and their descriptions. Review these locations and circle the scores that correspond with **all** the locations where CWM are known or suspected of being found at the MRS.

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

Classification	Description	Score
Confirmed surface	♦ Physical evidence indicates that there are CWM on the surface of the MRS. ♦ Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report, that an incident or accident that involved CWM, regardless of configuration, occurred) indicates there are CWM on the surface of the MRS.	25
Confirmed subsurface, active	♦ Physical evidence indicates the presence of CWM in the subsurface of the MRS and the geological conditions at the MRS are likely to cause CWM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose CWM. ♦ Historical evidence indicates that CWM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause CWM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose CWM.	20
Confirmed subsurface, stable	♦ Physical evidence indicates the presence of CWM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause CWM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause CWM to be exposed. ♦ Historical evidence indicates that CWM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause CWM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause CWM to be exposed.	15
Suspected (physical evidence)	♦ There is physical evidence, other than the documented presence of CWM, indicating that CWM may be present at the MRS.	10
Suspected (historical evidence)	♦ There is historical evidence indicating that CWM may be present at the MRS.	5
Subsurface, physical constraint	♦ There is physical or historical evidence indicating that CWM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the CWM.	2
Evidence of no CWM	♦ Following investigation of the MRS, there is physical evidence that there is no CWM present or there is historical evidence indicating that no CWM are present.	(0)
LOCATION OF CWM	**DIRECTIONS:** Record **<u>the single highest score</u>** from above in the box to the right (maximum score = 25).	**0**

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

No historical evidence (interviews with Environmental Division personnel, aerial photographs, station maps, and an archive search, or physical evidence (visual survey) was found indicating CWM was present at the Skeet Range. This information is supported by p. 5-9 of the Final Preliminary Assessment dated April 2005.

Table 14

CHE Module: Ease of Access Data Element Table

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

Note: The terms *barrier* are defined in Appendix C of the Primer.

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

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

Fencing exists around the entire installation but the Skeet Range is not separately fenced. However the site is not constantly monitored and the installation fence is broken and down near the site. The only physical barriers preventing access to the site includes Oso Creek to the south and dense vegetation in the area of the site. A patrol road surrounds the installation perimeter and is occasionally patrolled each day but the Skeet Range is not patrolled on a routine basis. The range lies within the flightline control zone. Any visitors to the site require an escort from Air Operations. This information is supported by Table 5.1-1in the Final Preliminary Assessment and p. 2-9 in the Final Site Recommendations, Site Prioritization and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 15

CHE Module: Status of Property Data Element Table

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

Classification	Description	Score
Non-DoD control	♦ The MRS is at a location that is no longet owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal or local governments; and land or water bodies managed by other federal agencies. ♦ The MRS is at a location that is owned by DoD, but that DoD has leased to another entity and for which DoD does not control access 24 hours per day.	5
Scheduled for transfer from DoD control	♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied.	3
DoD control	♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD controls access to the MRS 24 hours per day, every day of the calendar year.	(0)
STATUS OF PROPERTY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**0**

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

Fencing exists around the entire installation but the Skeet Range is not separately fenced. However the site is not constantly monitored and the installation fence is broken and down near the site. The only physical barriers preventing access to the site includes Oso Creek to the south and dense vegetation in the area of the site. A patrol road surrounds the installation perimeter and is occasionally patrolled each day but the Skeet Range is not patrolled on a routine basis. The range lies within the flightline control zone. Any visitors to the site require an escort from Air Operations. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-9 in the Final Site Recommendations, Site Prioritization and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 16

CHE Module: Population Density Data Element Table

DIRECTIONS: Below are three classifications for population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the most appropriate score.

Note: Use the U.S. Census Bureau tract data available to capture the **highest** population density within a two-mile radius of the perimeter of the MRS.

Classification	Description	Score
> 500 persons per square mile	♦ There are more than 500 persons per square mile in the U.S Census Bureau tract in which the MRS is located.	5
100-500 persons per square mile	♦ There are 100 to 500 persons per square mile in the U.S Census Bureau tract in which the MRS is located.	(3)
> 100 persons per square mile	♦ There are less than 100 persons per square mile in the U.S Census Bureau tract in which the MRS is located.	1
POPULATION DENSITY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**3**

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

Population density: According to 2000 U.S. Census, the population of Nueces County was 313,645 in 2000, with a population density of 375 resident per square mile. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-11 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 17

CHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are seven classifications of CWM locations and their descriptions. Review these locations and circle the scores that correspond with **all** the locations where CWM are known or suspected of being found at the MRS.

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

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

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

Inhabited structures/activities: Numerous homes and industrial buildings are located within a 2-mile radius of the Skeet Range. This information is supported by p. 2-12 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 18

CHE Module: Types of Activities/Structures Data Element Table

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

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

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

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

Inhabited structures/activities: Numerous homes and industrial buildings are located within a 2-mile radius of the Skeet Range. This information is supported by p. 2-12 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 19

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

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

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

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

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

Ecological/cultural resources: Wetlands have been delineated at NALF Cabaniss, along Oso Creek and650 feet west of the Skeet Range. No federal or state endangered species but a few State threatened species may be present. No cultural resources identified. This information is supported by Table 5.1-1 in the Final Preliminary Assessment dated April 2005.

Table 20
Determining the CHE Module Rating

DIRECTIONS:

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

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

	Source	Score	Value
Explosive Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Source of CWM	Table 12	0	
Accessibility Factor Data Elements			
Location of CWM	Table 13	0	8
Ease of Access	Table 14	8	
Status of Property	Table 15	0	
Receptor Factor Data Elements			
Population Density	Table 16	3	16
Population Near Hazard	Table 17	5	
Types of Activities/Structures	Table 18	5	
Ecological and/or Cultural Resources	Table 19	3	
CHE MODULE TOTAL			**24**

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

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

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

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (high)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
S > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

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

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

Receptor Factor

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

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

No Known or Suspected Groundwater MC Hazard ☒

Table 22

HHE Module: Surface Water – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

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

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
ANTIMONY	1.2	30	0.040
COPPER	8.1	9	0.970
LEAD	54	2.5	21.600
ZINC	43	120	0.358
CHF Scale	**CHF Value**	**Sum The Ratios**	22.968
CHF > 100	**H (high)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
S > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		**M**

Migratory Pathway Factor

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

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

Receptor Factor

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

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

No Known or Suspected Surface Water MC Hazard ☐

Table 23

HHE Module: Sediment – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

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

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
BENZO(A)PYRENE	98.4 J	6.200	15.871
BENZO(B)FLUORANTHENE	250 J	62.000	4.032
BENZO(G,H,I)PERYLENE	98.5 J	**NO VALUE**	--
CHRYSENE	89.4 J	6200.000	0.014
FLUORANTHENE	135	2300.000	0.059
CHF Scale	**CHF Value**	**Sum The Ratios**	723.906
CHF > 100	**H (high)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
S > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		**H**

Migratory Pathway Factor

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

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

Receptor Factor

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

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

No Known or Suspected Sediment MC Hazard ☐

Table 24

HHE Module: Surface Water – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

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

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
ANTIMONY	1.2	15.000	0.080
COPPER	8.1	1500.000	0.005
LEAD	54	15.000	3.600
ZINC	43	11000.000	0.004
CHF Scale	**CHF Value**	**Sum The Ratios**	3.689
CHF > 100	**H (high)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
S > CHF	**L (Low)**		

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	**L**

Migratory Pathway Factor

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

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

Receptor Factor

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

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

No Known or Suspected Surface Water MC Hazard ☐

Table 25

HHE Module: Sediment – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

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

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
BENZO(A)PYRENE	98.4 J	0.150	656.000
BENZO(B)FLUORANTHENE	250 J	**NO VALUE**	--
BENZO(G,H,I)PERYLENE	98.5 J	0.170	579.412
CHRYSENE	89.4 J	0.166	593.912
FLUORANTHENE	135	0.423	319.149
CHF Scale	**CHF Value**	**Sum The Ratios**	14446.787
CHF > 100	**H (high)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
S > CHF	**L (Low)**		

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	**H**

Migratory Pathway Factor

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

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

Receptor Factor

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

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

No Known or Suspected Sediment MC Hazard ☐

Table 26

HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

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

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
ACENAPHTHENE	7290	3700.000	1.970
ANTHRACENE	18500	22000.000	0.841
BENZO(A)ANTHRACENE	158000	62.000	2548.387
BENZO(A)PYRENE	187000	6.200	30161.290
BENZO(B)FLUORANTHENE	323000	62.000	5209.677
CHF Scale	**CHF Value**	**Sum The Ratios**	42353.746
CHF > 100	**H (high)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
S > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		**H**

Migratory Pathway Factor

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

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

Receptor Factor

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

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

No Known or Suspected Surface Soil MC Hazard ☐

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table (for Table 23)

<u>**Contaminant Hazard Factor (CHF)**</u>

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

Note: Do not add ratios from different media.

Media	Contaminant	Maximum Concentration	Comparison Value	Ratio
Sediment	INDENO(1,2,3-CD)PYRENE	92.7 J	62.000	1.495
Sediment	PHENANTHRENE	48.8 J	**NO VALUE**	--
Sediment	PYRENE	174.0 J	2300.000	0.076
Sediment	ARSENIC	8000.0	22.000	363.636
Sediment	COPPER	19.6	3100.000	0.006
Sediment	LEAD	133000.0	400.000	332.500
Sediment	ZINC	143000.0	23000.000	6.217

Table 27 (continued)

HHE Module: Supplemental Contaminant Hazard Factor Table (for Table 25)

<u>Contaminant Hazard Factor (CHF)</u>

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

Note: Do not add ratios from different media.

Media	Contaminant	Maximum Concentration	Comparison Value	Ratio
Sediment	INDENO(1,2,3-CD)PYRENE	92.7 J	0.017	5452.941
Sediment	PHENANTHRENE	48.8 J	0.204	239.216
Sediment	PYRENE	174.0 J	0.195	892.308
Sediment	ARSENIC	8000.0	9.800	816.327
Sediment	COPPER	19.6	31.600	0.620
Sediment	LEAD	133000.0	35.800	3715.084
Sediment	ZINC	143000.0	121.000	1181.818

Table 27 (continued)

HHE Module: Supplemental Contaminant Hazard Factor Table (for Table 26)

Contaminant Hazard Factor (CHF)

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

Note: Do not add ratios from different media.

Media	Contaminant	Maximum Concentration	Comparison Value	Ratio
Surface Soil	BENZO(G,H,I)PERYLENE	113000	**NO VALUE**	--
Surface Soil	BENZO(K)FLUORANTHENE	28000 J	620.000	45.161
Surface Soil	CHRYSENE	171000	6200.000	27.581
Surface Soil	FLUORANTHENE	273000	2300.000	118.696
Surface Soil	FLUORENE	2510 J	2700.000	0.930
Surface Soil	INDENO(1,2,3-CD)PYRENE	98200	**NO VALUE**	--
Surface Soil	NAPHTHALENE	5980	56.000	106.788
Surface Soil	PHENANTHRENE	85700	**NO VALUE**	--
Surface Soil	PYRENE	239000	2300.000	103.913
Surface Soil	ALUMINUM	10800000	76000.000	142.105
Surface Soil	AERSENIC	7900	22.000	359.090
Surface Soil	BARIUM	130000	16000.000	8.125
Surface Soil	BERYLLIUM	590	150.000	3.933
Surface Soil	CADMIUM	170	39.000	4.359
Surface Soil	CALCIUM	28800000	**NO VALUE**	--
Surface Soil	CHROMIUM	8000	1600.000	5.000
Surface Soil	COBALT	3900 J	1400.000	2.786
Surface Soil	COPPER	14200 L	3100.000	4.581
Surface Soil	IRON	6180000	23000.000	268.696
Surface Soil	LEAD	476000 J	400.000	1190.000
Surface Soil	MAGNESIUM	3220000	**NO VALUE**	--
Surface Soil	MANGANESE	248000 J	3300.000	75.152
Surface Soil	MERCURY	27	23.000	1.174
Surface Soil	NICKEL	6500	1600.000	4.063
Surface Soil	POTASSIUM	2900000	**NO VALUE**	--
Surface Soil	SELENIUM	2200	390.000	5.641
Surface Soil	SILVER	210	390.000	0.538
Surface Soil	SODIUM	116000	**NO VALUE**	--
Surface Soil	VANADIUM	562	78.000	7.205
Surface Soil	ZINC	14000 J	23000.000	0.609
Surface Soil	PERCHLORATE	107000	55.000	1945.455

Table 28

Determining the CHE Module Rating

DIRECTIONS:

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

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A-G)
Groundwater (Table 21)	N/A	N/A	N/A	--	--
Surface Water/Human Endpoint (Table 22)	M	L	M	MML	E
Sediment/Human Endpoint (Table 23)	H	L	L	HLL	E
Surface Water/Ecological Endpoint (Table 24)	L	L	M	MLL	F
Sediment/Ecological Endpoint (Table 25)	H	L	L	HLL	E
Surface Soil (Table 26)	H	L	L	HLL	E
			HHE MODULE RATING		**E**

DIRECTIONS (cont.):

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

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

HHE Ratings (for reference only)

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

Table 29
MRS Priority

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

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

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

Table A
MRS Background Information

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

Munitions Response Site Name: Skeet Range

Component:

Installation/Property Name: Naval Auxiliary Landing Field Cabaniss

Location (City, County, State): Corpus Christi, Nueces, Texas

Site Name/Project Name (Project No.): UXO 000001 – Skeet Range

Date Information Entered/Updated: 31 October 2008

Point of Contact (Name/Phone): Helen Lockard / (904) 542-6858

Project Phase (check only one):

☐ PA	☒ SI	☐ RI	☐ FS	☐ RD
☐ RA-C	☐ RIP	☐ RA-O	☐ RC	☐ LTM

Media Evaluated (check all that apply):

☐ Groundwater	☒ Sediment (human receptor)
☒ Surface Soil	☒ Surface Water (ecological receptor)
☒ Sediment (ecological receptor)	☒ Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type:

The former Skeet Range is a 12.5-acre area (includes an adjacent former Pistol Range) located in the southeast corner of NALF Cabaniss. The Skeet Range was composed of 3 tarp firing arcs with trap houses center in the middle of each arc. The Range was constructed in 1942 and was demolished between 1958 and 1964. The range was used for weaponry training And qualification, moving target training, and likely for recreation. The area is covered in dense vegetation and has no military use. Future use is not expected to change. No records were found describing maintenance, closure, or remediation activities performed at the site.

Description of Pathways for Human and Ecological Receptors: Pathways of exposure would be surface soil, sediment, and water in Oso Creek. Groundwater exposure pathways are considered to be incomplete for ingestion or absorption.

Description of Receptors (Human and Ecological): Human receptors: Navy personnel patrolling the area and Public Works personnel, contractors, trespassers, and visitors including civilians fishing and swimming in Oso Creek.
Ecological Receptors: Common fauna/flora predominantly grassland species, large mammals such as deer, small mammals such as rabbits, reptiles/amphibians, bird species, and fish in nearby surface waters are present at the site.

PISTOL RANGE

Table 1

EHE Module: Munitions Type Data Element Table

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

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

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

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

Small arms, primarily 12-, 16-, and 20-gage and .410 caliber shotgun and pistols (e.g., .22, .38, .45 caliber, 9-mm). Small arms ammunition were known to be used at the range. According to Environmental personnel and available documentation, no other munitions were used at the site. This data supported by Table 5.1-1 in the Final Preliminary Assessment dated April 2005.

Table 2

EHE Module: Source of Hazard Data Element Table

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

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

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

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

Station documents indicate an armory was present. Small arms were likely stored at this site for use at the range. According to Environmental personnel and available documentation, no other munitions were used at the site. This information is supported by p. 2-6 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 3

EHE Module: Location of Munitions Data Element Table

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the scores that correspond with **all** the locations where munitions are known or suspected to be present at the MRS.

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

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

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

Environmental personnel and observations made during the site walk indicated the ranges were demolished and that no live munitions remain at the site. If small arms remain they are likely buried or covered by vegetation. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-8 in the Final Site Recommendations, Site Prioritization and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 4

EHE Module: Ease of Access Data Element Table

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

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

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

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

Fencing exists around the entire installation but the Pistol Range is not separately fenced. However the site is not constantly monitored and the installation fence is broken and down near the site. The only physical barriers preventing access to the site includes Oso Creek to the south and dense vegetation in the area of the site. A patrol road surrounds the installation perimeter and is occasionally patrolled each day but the Pistol Range is not patrolled on a routine basis. The range lies within the flightline control zone. Any visitors to the site require an escort from Air Operations. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-9 in the Final Site Recommendations, Site Prioritization and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 5

EHE Module: Status of Property Data Element Table

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

Classification	Description	Score
Non-DoD control	♦ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies. ♦ The MRS is at a location that is owned by DoD, but that DoD has leased to another entity and for which DoD does not control access 24 hours per day.	5
Scheduled for transfer from DoD control	♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied.	3
DoD control	♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year.	(0)
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**0**

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

Fencing exists around the entire installation but the Pistol Range is not separately fenced. However the site is not constantly monitored and the installation fence is broken and down near the site. The only physical barriers preventing access to the site includes Oso Creek to the south and dense vegetation in the area of the site. A patrol road surrounds the installation perimeter and is occasionally patrolled each day but the Pistol Range is not patrolled on a routine basis. The range lies within the flightline control zone. Any visitors to the site require an escort from Air Operations. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-9 in the Final SiteRecommendations, Site Prioritization and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 6

EHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are three classifications of the population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the score.

Note: Use the U.S. Census Bureau tract data available to capture the **highest** population density within a two-mile radius of the perimeter of the MRS.

Classification	Description	Score
> 500 persons per square mile	♦ There are more than 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	5
100-500 persons per square mile	♦ There are 100 to 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	(3)
< 100 persons per square mile	♦ There are fewer than 100 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	1
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**3**

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

Population density: According to 2000 U.S. Census, the population of Nueces County was 313,645 in 2000, with a population density of 375 resident per square mile. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-11 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 7

EHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are six classifications of the number of inhabited structures near the MRS. The number of inhabited buildings relates to the potential population near the MRS. Determine the number of inhabited structures within two miles of the MRS's boundary and circle the score that corresponds with the number of inhabited structures.

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

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

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

Inhabited structures/activities: Numerous homes and industrial buildings are located within a 2-mile radius of the Pistol Range. This information is supported by p. 2-12 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 8

EHE Module: Types of Activities/Structures Data Element Table

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

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

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

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

Inhabited structures/activities: Numerous homes and industrial buildings are located within a 2-mile radius of the Pistol Range. This information is supported by p. 2-13 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 9

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

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

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

Classification	Description	Score
Ecological and cultural resources present	♦ There are both ecological and cultural resources present on the MRS.	5
Ecological present	♦ There are ecological resources present on the MRS.	(3)
Cultural resources present	♦ There are cultural resources present on the MRS.	3
No ecological or cultural resources present	♦ There are no ecological resources or cultural resources present on the MRS.	0
TYPES OF ACTIVITIES/STRUCTURES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**3**

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

Ecological/cultural resources: Wetlands have been delineated at NALF Cabaniss, along Oso Creek and650 feet west of the Pistol Range. No federal or state endangered species but a few State threatened species may be present. No cultural resources identified. This information is supported by Table 5.1-1 in the Final Preliminary Assessment dated April 2005.

Table 10
Determining the EHE Module Rating

DIRECTIONS:

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

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

	Source	Score	Value
Explosive Hazard Factor Data Elements			
Munitions Type	Table 1	2	4
Source of Hazard	Table 2	2	
Accessibility Factor Data Elements			
Location of Munitions	Table 3	1	9
Ease of Access	Table 4	8	
Status of Property	Table 5	0	
Receptor Factor Data Elements			
Population Density	Table 6	3	16
Population Near Hazard	Table 7	5	
Types of Activities/Structures	Table 8	5	
Ecological and/or Cultural Resources	Table 9	3	
EHE MODULE TOTAL			**29**

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

Table 11

CHE Module: CWM Configuration Data Element Table

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

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

Classification	Description	Score
CWM, that are either UXO, or explosively configured damaged DMM	The CWM known or suspected of being present at the MRS are: ♦ CWM that are UXO (i.e., CWM/UXO) ♦ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged.	30
CWM mixed with UXO	♦ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO.	25
CWM, explosive configuration that are undamaged DMM	♦ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: ♦ Nonexplosively configured CWM/DMM either damaged or undamaged ♦ Bulk CWM (e.g., ton container).	15
CAIS K941 and CAIS K942	♦ The CWM/DMM known or suspected of being present at the MRS are CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M2/E11.	12
CAIS (chemical agent identification sets)	♦ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10
Evidence of no CWM	♦ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	(0)
CWM CONFIGURATION	**DIRECTIONS:** Record **<u>the single highest score</u>** from above in the box to the right (maximum score = 30).	**0**

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

No historical evidence (interviews with Environmental Division personnel, aerial photographs, station maps, and an archive search, or physical evidence (visual survey) was found indicating CWM was present at the Pistol Range. This information is supported by p. 5-9 of the Final Preliminary Assessment dated April 2005.

Table 12

CHE Module: Sources of CWM Data Element Table

DIRECTIONS: Below are 11 sources of CWM hazards and their descriptions. Review these classifications and circle the scores that correspond with **all** the sources of CWM hazards known or suspected to be present at the MRS.

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

Classification	Description	Score
Live-fire involving CWM	♦ The MRS is a former military range that supported live-fire of explosively configured CWM and the CWM/UXO are known or suspected of being present on the surface or in the subsurface. ♦ The MRS is a former military range that supported live-fire with conventional munitions, and CWM/DMM are on the surface or in the subsurface commingled with conventional munitions that are UXO.	10
Damaged CWM/DMM surface or subsurface	♦ There are damaged CWM/DMM on the surface or in the subsurface at the MRS.	10
Undamaged CWM/DMM surface	♦ There are undamaged CWM/DMM on the surface at the MRS.	10
CAIS/DMM surface	♦ There are CAIS/DMM on the surface.	10
Undamaged CWM/DMM, subsurface	♦ There are undamaged CWM/DMM in the subsurface at the MRS.	5
CAIS/DMM subsurface	♦ There are CAIS/DMM in the subsurface at the MRS.	5
Former CA or CWM Production Facilities	♦ The MRS is a facility that formerly engaged in production of CA or CWM, and CWM/DMM is suspected of being present on the surface or in the subsurface.	3
Former Research, Development, Testing, and Evaluation (RDT&E) facility using CWM	♦ The MRS is at a facility that formerly was involved in non-livefire RDT&E activities (including static testing) involving CWM, and there are CWM/DMM suspected of being present on the surface or in the subsurface.	3
Former Training Facility using CWM or CAIS	♦ The MRS is a location that formerly was involved in training activities involving CWM and/or CAIS (e.g., training in recognition of CWM, decontamination training) and CWM/DMM or CAIS/DMM are suspected of being present on the surface or in the subsurface.	2
Former Storage or Transfer points of CWM	♦ The MRS is a former storage facility or transfer point (e.g., intermodal transfer) for CWM.	1
Evidence of no CWM	♦ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	(0)
SOURCES OF CWM	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	**0**

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

No historical evidence (interviews with Environmental Division personnel, aerial photographs, station maps, and an archive search, or physical evidence (visual survey) was found indicating CWM was present at the Pistol Range. This information is supported by p. 5-9 of the Final Preliminary Assessment dated April 2005.

Table 13

CHE Module: Location of CWM Data Element Table

DIRECTIONS: Below are seven classifications of CWM locations and their descriptions. Review these locations and circle the scores that correspond with **all** the locations where CWM are known or suspected of being found at the MRS.

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

Classification	Description	Score
Confirmed surface	♦ Physical evidence indicates that there are CWM on the surface of the MRS. ♦ Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report, that an incident or accident that involved CWM, regardless of configuration, occurred) indicates there are CWM on the surface of the MRS.	25
Confirmed subsurface, active	♦ Physical evidence indicates the presence of CWM in the subsurface of the MRS and the geological conditions at the MRS are likely to cause CWM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose CWM. ♦ Historical evidence indicates that CWM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause CWM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose CWM.	20
Confirmed subsurface, stable	♦ Physical evidence indicates the presence of CWM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause CWM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause CWM to be exposed. ♦ Historical evidence indicates that CWM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause CWM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause CWM to be exposed.	15
Suspected (physical evidence)	♦ There is physical evidence, other than the documented presence of CWM, indicating that CWM may be present at the MRS.	10
Suspected (historical evidence)	♦ There is historical evidence indicating that CWM may be present at the MRS.	5
Subsurface, physical constraint	♦ There is physical or historical evidence indicating that CWM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the CWM.	2
Evidence of no CWM	♦ Following investigation of the MRS, there is physical evidence that there is no CWM present or there is historical evidence indicating that no CWM are present.	(0)
LOCATION OF CWM	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).	**0**

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

No historical evidence (interviews with Environmental Division personnel, aerial photographs, station maps, and an archive search, or physical evidence (visual survey) was found indicating CWM was present at the Pistol Range. This information is supported by p. 5-9 of the Final Preliminary Assessment dated April 2005.

Table 14

CHE Module: Ease of Access Data Element Table

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

Note: The terms *barrier* are defined in Appendix C of the Primer.

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

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

Fencing exists around the entire installation but the Pistol Range is not separately fenced. However the site is not constantly monitored and the installation fence is broken and down near the site. The only physical barriers preventing access to the site includes Oso Creek to the south and dense vegetation in the area of the site. A patrol road surrounds the installation perimeter and is occasionally patrolled each day but the Pistol Range is not patrolled on a routine basis. The range lies within the flightline control zone. Any visitors to the site require an escort from Air Operations. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-9 in the Final Site Recommendations, Site Prioritization and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 15

CHE Module: Status of Property Data Element Table

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

Classification	Description	Score
Non-DoD control	♦ The MRS is at a location that is no longet owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal or local governments; and land or water bodies managed by other federal agencies. ♦ The MRS is at a location that is owned by DoD, but that DoD has leased to another entity and for which DoD does not control access 24 hours per day.	5
Scheduled for transfer from DoD control	♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied.	3
DoD control	♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD controls access to the MRS 24 hours per day, every day of the calendar year.	(0)
STATUS OF PROPERTY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**0**

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

Fencing exists around the entire installation but the Pistol Range is not separately fenced. However the site is not constantly monitored and the installation fence is broken and down near the site. The only physical barriers preventing access to the site includes Oso Creek to the south and dense vegetation in the area of the site. A patrol road surrounds the installation perimeter and is occasionally patrolled each day but the Pistol Range is not patrolled on a routine basis. The range lies within the flightline control zone. Any visitors to the site require an escort from Air Operations. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-9 in the Final Site Recommendations, Site Prioritization and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 16

CHE Module: Population Density Data Element Table

DIRECTIONS: Below are three classifications for population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the most appropriate score.

Note: Use the U.S. Census Bureau tract data available to capture the **highest** population density within a two-mile radius of the perimeter of the MRS.

Classification	Description	Score
> 500 persons per square mile	♦ There are more than 500 persons per square mile in the U.S Census Bureau tract in which the MRS is located.	5
100-500 persons per square mile	♦ There are 100 to 500 persons per square mile in the U.S Census Bureau tract in which the MRS is located.	(3)
> 100 persons per square mile	♦ There are less than 100 persons per square mile in the U.S Census Bureau tract in which the MRS is located.	1
POPULATION DENSITY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	**3**

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

Population density: According to 2000 U.S. Census, the population of Nueces County was 313,645 in 2000, with a population density of 375 resident per square mile. This information is supported by Table 5.1-1 in the Final Preliminary Assessment and p. 2-11 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 17

CHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are seven classifications of CWM locations and their descriptions. Review these locations and circle the scores that correspond with **all** the locations where CWM are known or suspected of being found at the MRS.

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

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

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

Inhabited structures/activities: Numerous homes and industrial buildings are located within a 2-mile radius of the Pistol Range. This information is supported by p. 2-12 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 18

CHE Module: Types of Activities/Structures Data Element Table

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

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

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

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

Inhabited structures/activities: Numerous homes and industrial buildings are located within a 2-mile radius of the Pistol Range. This information is supported by p. 2-12 in the Final Site Recommendations, Site Prioritization, and Cost Analysis, NALF Cabaniss, Texas dated April 2005.

Table 19

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

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

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

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

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

Ecological/cultural resources: Wetlands have been delineated at NALF Cabaniss, along Oso Creek and650 feet west of the Pistol Range. No federal or state endangered species but a few State threatened species may be present. No cultural resources identified. This information is supported by Table 5.1-1 in the Final Preliminary Assessment dated April 2005.

Table 20
Determining the CHE Module Rating

DIRECTIONS:

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

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

	Source	Score	Value
Explosive Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Source of CWM	Table 12	0	
Accessibility Factor Data Elements			
Location of CWM	Table 13	0	8
Ease of Access	Table 14	8	
Status of Property	Table 15	0	
Receptor Factor Data Elements			
Population Density	Table 16	3	16
Population Near Hazard	Table 17	5	
Types of Activities/Structures	Table 18	5	
Ecological and/or Cultural Resources	Table 19	3	
CHE MODULE TOTAL			**24**

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

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

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

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	**CHF Value**	**Sum The Ratios**	
CHF > 100	**H (high)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
S > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

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

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

Receptor Factor

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

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

No Known or Suspected Groundwater MC Hazard ☒

Table 22

HHE Module: Surface Water – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

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

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
ANTIMONY	1.2	30	0.040
COPPER	8.1	9	0.970
LEAD	54	2.5	21.600
ZINC	43	120	0.358
CHF Scale	**CHF Value**	**Sum The Ratios**	22.968
CHF > 100	**H (high)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
S > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		**M**

Migratory Pathway Factor

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

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

Receptor Factor

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

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

No Known or Suspected Surface Water MC Hazard ☐

Table 23

HHE Module: Sediment – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

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

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
BENZO(A)PYRENE	98.4 J	6.200	15.871
BENZO(B)FLUORANTHENE	250 J	62.000	4.032
BENZO(G,H,I)PERYLENE	98.5 J	**NO VALUE**	--
CHRYSENE	89.4 J	6200.000	0.014
FLUORANTHENE	135	2300.000	0.059
CHF Scale	**CHF Value**	**Sum The Ratios**	723.906
CHF > 100	**H (high)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
S > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		**H**

Migratory Pathway Factor

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

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

Receptor Factor

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

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

No Known or Suspected Sediment MC Hazard ☐

Table 24

HHE Module: Surface Water – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

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

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
ANTIMONY	1.2	15.000	0.080
COPPER	8.1	1500.000	0.005
LEAD	54	15.000	3.600
ZINC	43	11000.000	0.004
CHF Scale	**CHF Value**	**Sum The Ratios**	3.689
CHF > 100	**H (high)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
S > CHF	**L (Low)**		

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	**L**

Migratory Pathway Factor

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

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

Receptor Factor

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

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

No Known or Suspected Surface Water MC Hazard ☐

Table 25

HHE Module: Sediment – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

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

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
BENZO(A)PYRENE	98.4 J	0.150	656.000
BENZO(B)FLUORANTHENE	250 J	**NO VALUE**	--
BENZO(G,H,I)PERYLENE	98.5 J	0.170	579.412
CHRYSENE	89.4 J	0.166	593.912
FLUORANTHENE	135	0.423	319.149
CHF Scale	**CHF Value**	**Sum The Ratios**	14446.787
CHF > 100	**H (high)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
S > CHF	**L (Low)**		

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	**H**

Migratory Pathway Factor

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

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

Receptor Factor

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

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

No Known or Suspected Sediment MC Hazard ☐

Table 26

HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

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

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
ANTIMONY	3800	31.000	122.581
COPPER	19700	3100.000	6.355
LEAD	17700	400.000	44.25
ZINC	156000 L	23000.000	6.78
CHF Scale	**CHF Value**	**Sum The Ratios**	179.966
CHF > 100	**H (high)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
S > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		**H**

Migratory Pathway Factor

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

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

Receptor Factor

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

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

No Known or Suspected Surface Soil MC Hazard ☐

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table (for Table 23)

Contaminant Hazard Factor (CHF)

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

Note: Do not add ratios from different media.

Media	Contaminant	Maximum Concentration	Comparison Value	Ratio
Sediment	INDENO(1,2,3-CD)PYRENE	92.7 J	62.000	1.495
Sediment	PHENANTHRENE	48.8 J	**NO VALUE**	--
Sediment	PYRENE	174.0 J	2300.000	0.076
Sediment	ARSENIC	8000.0	22.000	363.636
Sediment	COPPER	19.6	3100.000	0.006
Sediment	LEAD	133000.0	400.000	332.500
Sediment	ZINC	143000.0	23000.000	6.217

Table 27 (continued)

HHE Module: Supplemental Contaminant Hazard Factor Table (for Table 25)

Contaminant Hazard Factor (CHF)

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

Note: Do not add ratios from different media.

Media	Contaminant	Maximum Concentration	Comparison Value	Ratio
Sediment	INDENO(1,2,3-CD)PYRENE	92.7 J	0.017	5452.941
Sediment	PHENANTHRENE	48.8 J	0.204	239.216
Sediment	PYRENE	174.0 J	0.195	892.308
Sediment	ARSENIC	8000.0	9.800	816.327
Sediment	COPPER	19.6	31.600	0.620
Sediment	LEAD	133000.0	35.800	3715.084
Sediment	ZINC	143000.0	121.000	1181.818

Table 28

Determining the CHE Module Rating

DIRECTIONS:

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

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A-G)
Groundwater (Table 21)	N/A	N/A	N/A	--	--
Surface Water/Human Endpoint (Table 22)	M	L	M	MML	E
Sediment/Human Endpoint (Table 23)	H	L	L	HLL	E
Surface Water/Ecological Endpoint (Table 24)	L	L	M	MLL	F
Sediment/Ecological Endpoint (Table 25)	H	L	L	HLL	E
Surface Soil (Table 26)	H	L	L	HLL	E
			HHE MODULE RATING		**E**

DIRECTIONS (cont.):

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

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

HHE Ratings (for reference only)

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

Table 29
MRS Priority

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

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

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

Table A
MRS Background Information

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

Munitions Response Site Name: Pistol Range

Component:

Installation/Property Name: Naval Auxiliary Landing Field Cabaniss

Location (City, County, State): Corpus Christi, Nueces, Texas

Site Name/Project Name (Project No.): UXO 000001 – Pistol Range

Date Information Entered/Updated: 31 October 2008

Point of Contact (Name/Phone): Helen Lockard / (904) 542-6858

Project Phase (check only one):

☐ PA	☒ SI	☐ RI	☐ FS	☐ RD
☐ RA-C	☐ RIP	☐ RA-O	☐ RC	☐ LTM

Media Evaluated (check all that apply):

☐ Groundwater	☒ Sediment (human receptor)
☒ Surface Soil	☒ Surface Water (ecological receptor)
☒ Sediment (ecological receptor)	☒ Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type:

The former Pistol Range is a 12.5-acre area (includes an adjacent former Skeet Range) located in the southeast corner of NALF Cabaniss. The Pistol Range was composed of 15 firing positions and an earthen target butt. The Range was constructed in 1942 and was demolished between 1958 and 1964. The range was used for weaponry training and qualification, moving target training, and likely for recreation. The area is covered in dense vegetation and has no military use. Future use is not expected to change. No records were found describing maintenance, closure, or remediation activities

Description of Pathways for Human and Ecological Receptors: Pathways of exposure would be surface soil, sediment, and water in Oso Creek. Groundwater exposure pathways are considered to be incomplete for ingestion or absorption.

Description of Receptors (Human and Ecological): Human receptors: Navy personnel patrolling the area and Public Works personnel, contractors, trespassers, and visitors including civilians fishing and swimming in Oso Creek.
Ecological Receptors: Common fauna/flora predominantly grassland species, large mammals such as deer, small mammals such as rabbits, reptiles/amphibians, bird species, and fish in nearby surface waters are present at the site.