FTBL-1.A.1
e²M. US Army CTT Range/Site Inventory, Fort Bliss, Texas.
January 2003. pg. ES-1 – ES-2.

FINAL
U.S. ARMY CLOSED, TRANSFERRING, and TRANSFERRED
RANGE/SITE INVENTORY
for
FORT BLISS, TEXAS

21 January 2003

Prepared for

U.S. Army Environmental Center
and
U.S. Army Corps of Engineers,
Omaha District

Prepared by

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EXECUTIVE SUMMARY

Purpose of the Closed, Transferring, and Transferred (CTT) Inventory

To meet immediate short-term and long-term needs, the U.S. Army is conducting its range inventory in three phases. Phase 1 involved a data call issued to each U.S. Army Major Command (MACOM) requesting general information about ranges on their installations. This phase, referred to as the Advance Range Survey (ARS), allowed the Army to meet its immediate needs; however, a more detailed inventory was necessary to meet the short-term and long-term inventory needs of the Army. The Army divided the detailed follow-on inventory into two parts, Phase 2, an active and inactive (A/I) inventory and Phase 3, a closed, transferring, and transferred (CTT) inventory, Base Realignment and Closure (BRAC) site inventory, and a Formerly Used Defense Sites (FUDS) inventory. This report addresses only the CTT inventory portion of Phase 3.

A Phase 2 inventory was performed for Fort Bliss to gather information on the A/I ranges that exist at the facility. Fort Bliss is an active Army installation, and all A/I range areas will remain in Department of Defense (DoD) ownership.

This CTT inventory began as an inventory of U.S. Army CTT military ranges. However, as a result of the congressional requirements outlined in the Defense Authorization Act of 2002 (Public Law 107-107) and resultant changes to the Defense Environmental Restoration Program (DERP), the CTT inventory has become a comprehensive inventory of both CTT military ranges and other CTT sites with unexploded ordnance, discarded military munitions, and/or munitions constituents (UXO-DMM-MC). All Army installations previously or currently owned, leased, or possessed by the Department of Defense (DoD), except those classified as A/I ranges, are included in the CTT inventory. The U.S. Army Environmental Center (AEC) is the Program Manager for the Army's CTT inventory.

This CTT inventory specifically focuses on non-A/I areas within the installation, and areas associated with the installation that may have been used in the past for ordnance-related testing or training, except where such properties are eligible as FUDS or BRAC sites. Both FUDS and BRAC properties are being inventoried under separate Phase 3 inventory efforts. None of the areas inventoried in this report is listed as a FUDS.

Specific requirements of the CTT inventory for Fort Bliss included:

1. Mapping the CTT military ranges and UXO-DMM-MC sites;
2. Collecting and preparing data to be uploaded into the Army Range Inventory Database (ARID);
3. Conducting an assessment of explosives safety risk using the Risk Assessment Code (RAC) methodology for each CTT military range or site with UXO and/or DMM (UXO-DMM) identified in the inventory; and

4. Determining which sites in the inventory qualify for the Military Munitions Response Program (MMRP).

The data collection portion of this CTT Inventory was conducted in March 2002 and involved a site visit to the installation. While at the installation, the CTT inventory team reviewed historical records and interviewed installation personnel concerning potential CTT military ranges and UXO-DMM-MC sites. This report summarizes the CTT inventory conducted at Fort Bliss and presents the inventory findings.

Purpose of the Range Inventory Report

The purpose of this report is to present the results of the CTT inventory for Fort Bliss located in western Texas and southern New Mexico. The report includes an individual CTT map for the installation, a copy of the data tables that will be submitted electronically to AEC for uploading into ARID, completed RAC worksheets for all CTT military ranges and sites that potentially contain UXO-DMM, DERP eligibility determination, and identification of which ranges and sites qualify for the MMRP. Although an exhaustive archive search was not performed for this inventory, historical research was performed to identify sites subject to this inventory, including locations, periods of use, the types of ordnance used, and other specific information regarding the site. The majority of these data were obtained by reviewing installation records and interviewing personnel at or involved with Fort Bliss. Although the data presented in this report are believed to be accurate, they have not been verified by inspection or field sampling. Therefore, it is possible that additional CTT military ranges and UXO-DMM-MC sites may be discovered at Fort Bliss in the future.

Summary of Results

Fort Bliss [Federal Facility Identification (FFID): TX213720101] is a 1.12-million acre facility located in Western Texas and southern New Mexico. The Headquarters and main cantonment areas are in El Paso County, Texas. Maneuver Area No. 1 is located in Hudspeth County, Texas, and the remainder of the transferred properties in Texas are also in El Paso, County. The range lands in New Mexico are split between Dona Ana County on the western side and Otero County on the eastern portion. In 1849, the U.S. Army began to use the property and the post was officially established as Fort Bliss in 1854. Today, Fort Bliss is the second largest Army post, second only to White Sands Missile Range, which is adjacent to Fort Bliss.

Fort Bliss has provided the U.S. Army a military training facility, including explosive ordnance training, since its establishment. Troop and equipment training, air defense, air-to-ground training, and ground maneuver training are supported by Fort Bliss. The land is rich with ecological diversity and protected historical and cultural resources.

The U.S. Army's Air Defense and Artillery Center and Fort Bliss (USAADACENFB) is an U.S. Army Training and Doctrine Command (TRADOC) installation. Fort Bliss is

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CTT Range and Site Summaries

Below are summaries for the individual CTT military ranges and UXO-DMM-MC sites inventoried at Fort Bliss. Each summary typically includes a brief history of the area, total acreage, relative location, types of ordnance used or discarded, periods of use, information on any UXO responses conducted, and current usage. The military ranges and UXO-DMM-MC sites reported to ARID and included in the CTT inventory summary details table are adjusted so that areas are not counted more than once in the inventory. Some summaries are more detailed than others based on the level of data available during the data collection period of this CTT inventory.

This CTT inventory identified five CTT military ranges and no UXO-DMM-MC sites at Fort Bliss.

Castner Range (FTBL-073) – full ACRES 7000+AC

Castner Range is located within the city limits of El Paso, Texas, between U.S. Highway 54 and the Franklin Mountains State Park, approximately 15 miles south of the New Mexico border. Acquisition of Castner Range began in 1926, and initially it was approximately 3,500 acres in size. By 1939, additional land was acquired bringing the total size of the range up to 8,328 acres. Castner Range was heavily used for small arms, artillery firing, and impact areas from 1926 through 1966, at which time all ordnance use at Castner Range was discontinued. Range operations were then transferred to the Meyer Range Complex. In 1972, the Department of the Army declared Castner Range surplus to its needs. Several parcels of Castner Range have since been transferred to non-DoD entities, as described below.

Many isolated clearance operations have been conducted on Castner Range over the years, and the 1,244 acres that have been transferred have been thoroughly cleared. However, the remaining 7,084 acres of Castner Range are still unsuitable for transfer. This site contains large caliber high explosives, mortars, pyrotechnics, illumination flares, grenades, and small arms. Additionally, a large area used for open burning (OB)/open detonation (OD) has been found to contain HMX, RDX, and Resource Conservation and Recovery Act metals. This OB/OD area will not be remediated independent of any effort to remediate the Castner Range for UXO or ordnance and explosives (OE). Several cost estimates have been developed to determine clearance and remediation costs of the property, with some as high as $23 million. Given the proximity of residential areas, the highway that runs through it and the Franklin Mountain State Park that borders Castner Range, this area poses a very high hazard to people in the area. Since 1955, there have been numerous deaths and disfigurements caused by UXO and OE encounters on Castner Range.

Castner Range is currently undeveloped and is patrolled by personnel from the Fort Bliss Range Control Office. Trespassing by the general public is a common and potentially dangerous problem.

No fieldwork - presence of MEC determined
- need samples

Castner Range – XD (DSERTS FTBL-078)
As described above, several parcels of Castner Range totaling 1338.9 acres have been transferred to non-DoD entities, including the State of Texas, private developers, and the City of El Paso. This transferred parcel is collectively referred to as "Castner Range Recreation Area."

Castner Range – XD consists of 1338.9 acres and was used for small arms, artillery firing, and impact areas from 1926 through 1966, at which time all ordnance use at Castner Range was discontinued. Ordnance types found in the transferred portions of Castner Range include large and medium caliber high explosives, mortars, and pyrotechnics.

In 1964, the State of Texas acquired 216 acres of Castner Range to construct Trans Mountain Road. Throughout construction several truckloads of UXO and shrapnel were removed from the developed highway easement. An additional 249-acre plot was transferred to the state for construction of Patriot Freeway. In 1974, approximately 1,244 acres were surface cleared to make the land suitable for transfer. Four small ordnance items were located and destroyed during this clearing effort. The 1,244-acre plot was transferred and currently has multiple uses. Part of the land was sold and is now a residential area known as Castner Heights. Another 580 acres were donated as follows: 227 acres is park land operated by the City of El Paso; 144 acres were used to develop the El Paso Community College for their Transmountain Campus; 112 acres were transferred to El Paso Integrated School District (EPISD) for schools; 39 acres to Region XIX; and 58 acres to the University of Texas, El Paso (UTEP). Fort Bliss developed a recreational area for soldiers and their families on 58 acres that is no longer used.

The transferred portion of Castner Range was cleared for UXO by the USACE Huntsville District, and environmental soil samples were collected that revealed nothing above the Texas Natural Resources Conservation Commission residential soil screening levels. Therefore, this land was declared "Response Complete" as no further action was warranted. The FUDS database does not include this site.

Dona Ana Range – McNew Surplus 174C

In December 1911, Fort Bliss acquired for military purposes approximately 40,250 acres in Dona Ana County, New Mexico, along Highway 54, the main route between El Paso, Texas and Alamogordo, New Mexico. Several additional land acquisitions over the next 10 years brought the total acreage of land owned by Fort Bliss in New Mexico up to 46,010 acres. In 1921, this land was established as the Fort Bliss Target Range or the Dona Ana Range, originally to be used for small arms and artillery firing ranges. In 1940, an adjacent tract of nearly 422,000 acres was leased. This newly leased land along with the Dona Ana Range was named the Fort Bliss Antiaircraft Artillery (AAA) Range.

The Fort Bliss AAA Range continued to change shape and purpose for several years. In November 1945, 19,122.67 acres were declared surplus. This parcel

eventually increased to approximately 52,410.7 acres and was referred to as the McNew Surplus Area. A 90mm gun position and two impact areas were located within the surplus property. In 1946, explosive ordnance disposal (EOD) teams conducted a 4-week long cleanup of this area. OE found during the cleanup include 90mm shells fused with mechanical time fuses, one 120mm shell, three parachute flare bombs, and four white phosphorus igniters.

Although the ground cover in much of the area was dense brush and growth, the USACE, Huntsville District deemed this range free and clear of UXO and safe for future use. The remaining land of Dona Ana Range is classified as A/I. Much of the land is undeveloped, although some of the land is used for agricultural and residential purposes. The FUDS database does not include this site.

Maneuver Areas No. 1 and No. 2

Maneuver Areas No. 1 and No. 2 is a transferred range that occupies approximately 73,528.6 acres in the southeastern portion of the Fort Bliss range area, adjacent to the city of El Paso, Texas. In 1939, 54,953 acres, known as the Expansion of Facilities Area, was acquired for field exercises. In 1942, Fort Bliss leased an 118,667-acre plot adjacent to the Expansion of Facilities Area for tactical training known as the Maneuver Area. Troops from Fort Bliss and Biggs Field utilized these Maneuver Areas during World War II. Between 1946 and 1947, the entire Maneuver Area was declared surplus, only to be re-acquired and expanded a few years later.

In 1949, the 54,953-acre Expansion of Facilities Area was renamed as Maneuver Area No. 1, and the newly leased 125,151-acre parcel was named Maneuver Area No. 2. During the 1970s, the municipal airport and expansions to Biggs Field reduced Maneuver Area No. 1 by roughly 10,000 acres. At about the same time, 65,920 acres of Maneuver Area No. 2 were purchased outright and the last lease along Carlsbad Highway was not renewed. Several clearance operations on the Maneuver Areas have been conducted. While the entire area has not been cleared, 1,280 acres were searched and cleared of duds in 1946, and several "hot spots" were cleared in 1992 and 1993. Although the areas were never intended for use of live ordnance, several pieces of UXO and OE have been discovered on the Maneuver Areas. Even though the RAC score sheet (Section G) for Maneuver Areas No. 1 and No. 2 indicates a "serious explosive safety risk" (RAC 2), documentation indicates that the incidence of UXO and OE discovery have been few in number, and given the development that has occurred without UXO incidents, the transferred land should be viewed as low hazard. A RAC score of 2 is determined based not on the quantity of UXO or OE found on the site, but the hazard potential of any UXO or OE discovered. The score is further based on proximity to occupied buildings and other exposure factors.

This transferred range is currently partially used as commercial property and part of the airport for the city of El Paso. The remainder of the transferred land is undeveloped, while the retained land of Maneuver Areas No. 1 and No. 2 is classified as A/I. The FUDS database does not include this site.

Winfree's Nose

Winfree's Nose is a small parcel approximately 1,898.4 acres in size located south of Biggs Field at the southern end of Fort Bliss. Limited documentation is available on this site. This portion of land was declared surplus in January 1947. It is assumed that this range was used as a training and maneuver area between 1921 and 1947. Much of the supporting documentation addresses Maneuver Areas No. 1 and No. 2 together with Winfree's Nose; therefore, the history of this range is expected to have been similar until this land was declared surplus in 1947. None of the munitions types found on Maneuver Areas No. 1 and No. 2 that are categorized as aerial rockets, practice bombs, or aerial guided missiles were noted on the Winfree's Nose site. However, evidence of practice hand grenades and small arms have been documented at this site.

Winfree's Nose is currently used for commercial property and residential areas. The FUDS database does not include this site.

CTT Range and Site Details Table

The CTT Range and Site Details Table, Table D-2, provides detailed information on the CTT military ranges and UXO-DMM-MC sites included in the inventory.

Table D-2: CTT Range and Site Details Table

Installation and Range/Site Name	Classification	Total Area (Acres)	Munitions Type(s)	Munitions Constituents	RAC Score[a]	Historic Use
Fort Bliss Castner Range	Closed	7,084.0	Hand Grenades (Live); Large Caliber (37mm and Larger), HE; Medium Caliber (20mm, 25mm, 30mm), HE; Mortars (WP, Incendiary, Illumination, Smoke); Pyrotechnics; Small Arms	Yes	1	Small Arms, Artillery, Mortar
Fort Bliss Castner Range – XD	Transferred	1,338.9	Hand Grenades (Live); Large Caliber (37mm and Larger), HE; Medium Caliber (20mm, 25mm, 30mm), HE; Mortars (WP, Incendiary, Illumination, Smoke); Pyrotechnics; Small Arms	No	2	Buffer Area, Multiple/ Combined Use

FTBL-2.A.1
Fort Bliss. FY2006 Fort Bliss Texas Installation Action Plan. March 2005. pg. 8-10.

FY2006

FORT BLISS
Texas
INSTALLATION ACTION PLAN

Printed March 2005

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Installation Information

INSTALLATION LOCALE: Fort Bliss is located on approximately 1.2 million acres of land in far west Texas and southern New Mexico. Fort Bliss encompasses portions of two states and three counties (Doña Ana and Otero counties in New Mexico and El Paso County in Texas). The main cantonment area is situated adjacent to the city of El Paso, and just north of the city of Juarez, Chihuahua, Mexico. These sister cities have a combined population of over two million people.

INSTALLATION MISSION: The USAADACEN mission is to be prepared for combat operations with trained and ready soldiers and units, which can be deployed rapidly to areas of crises. This includes not only all active forces assigned to Fort Bliss, but also reserve component forces, which will activate and mobilize during an emergency. Key elements include:

(1) Train soldiers and units;
(2) Serve as a power projection platform;
(3) Serve as the Air Defense Artillery (ADA) proponent;
(4) Serve as a test bed and training installation for joint and combined warfare, employing state of the art technologies;
(5) Become a model installation supporting a variety of missions;
(6) Provide the best possible quality of life for the greater Fort Bliss Community;
(7) Develop interservice, intergovernmental and civic partnerships.

The Garrison's mission is to support the Air Defense Artillery Center and School and the other tenant units on Fort Bliss.

COMMAND ORGANIZATION: **Installation Management Activity** - Southwest Regional Office
Army Chief of Staff for Installation Management Environmental - Army Environmental Center

REGULATOR PARTICIPATION:
Federal: Environmental Protection Agency (EPA) Region VI
State: Texas Commission on Environmental Quality (TCEQ), and New Mexico Environment Department (NMED)

NPL STATUS:
- Non-NPL, no known hazardous waste off-post contamination
- Resource Conservation and Recovery Act (RCRA) Part B Permit for Hazardous Waste Storage, Jan 91
- Defense - State Memorandums of Agreement (DSMOA) between the Army and the states of Texas and New Mexico (NMED GWQB only)
- TNRCC Agreed Order for Closure of Fire Fighting Training Area (FTBL-018/SWMU 32), Nov 87
- Notices of Violation for Leaking USTs, 1989-1993
- TNRCC Order Assessing Administrative Penalties (13 Dec 93) for failure to conduct quarterly sampling of monitoring wells (corrective action taken - Site closed)
- TNRCC Agreed Order for Closure of Bureau of Prisons (BOP) Ponds (FTBL-050/SWMU 75), Aug 93
- Final Subpart X RCRA Permit (HSWA) for New Mexico requiring 9 SWMUs to undergo RIs (July 95).
- Notice of Violation for unauthorized discharge at Trans-Mountain Buried Drum Site (FTBL-070), June 95.

- New Mexico has received primacy from EPA Region VI, for enforcement of all EPA federal environmental laws and regulations in New Mexico.
- NMED added FTBL-045, 032 to subpart X permit, December 1997.
- HSWA Permit with State of Texas, renewed 19 March 2002
- NMED Notice of Violation, 1 May 2003, "Failure to Submit a Corrective Measures Study" (NOV rejected by Fort Bliss and returned to NMED 19 May 2003)

Agreement with TNRCC. The renewed Texas State Resource Conservation and Recovery Act (RCRA) permit HW-50296, was reissued March 2003 and required RCRA Facility Investigation (RI) for 2 IRP sites, FTBL-030, Former Castner Firing Range, SWMU # 64 and FTBL-073, no SWMU number, OB/OD Pit A-1.

RAB/TRC/TAPP STATUS:

The Fort Bliss RAB was established on 06 October 1997. RAB meets quarterly and consistently achieves a quorum with total meeting attendance (RAB, Bliss and Public) averaging about 36 attendees. The RAB has achieved full membership and true representation to the ethnic and geographic diversity of this area. In November 2003 the RAB elected Mr. Doug Moor of Alamogordo, NM as Civilian Co-Chair. The Fort Bliss RAB is pleased that it retains its title as the Best RAB in the Army. It also received favorable remarks on the FY 2004 AEC RAB Survey.

PROGRAM SUMMARIES:

DERP

IRP

Contaminants of Concern: POL, solvents, PCB, heavy metals
Media of Concern: soil
Estimated date for RIP/RC: 2005
Funding to Date: (FY00-FY06) $21,667,940.00
CTC: $ 406,000.00

MMRP

Contaminants of Concern: RMX, HMX, UXO
Media of Concern: soil
Estimated date for RIP/RC: 2015+
Funding to Date: $2,000,000
CTC: $42,025,000

Cleanup Program Summary

HISTORIC ACTIVITY: The U.S. Army Air Defense Artillery Center (USAADACEN), an active training organization, is under the U.S. Army Training and Doctrine Command (TRADOC) with a primary mission of air defense. It is the only troop training installation in the continental U.S. capable of supporting long-range missile firings. USAADACENFB also supports joint U.S. and Allied training, major U.S. Army Forces Command (FORSCOM) units and the U.S. Air Force at Biggs Army Air Field. Biggs has also hosted the NASA shuttle program. Also located at Fort Bliss are the U.S. Army Sergeants Major Academy, William Beaumont Army Medical Center, the German Air Force Training Command and Air Defense School, and several Department of Defense (DOD) liaison officers. Under the recent reorganization of the US Army, the Fort Bliss installation, under the Garrison Commander, now reports to a new major command (Installation Management Agency, Southwest Regional Office) located at Fort Sam Houston, Texas. This will not affect the day-to-day operations of the DERP work at Fort Bliss.

In 1846, during the war with Mexico, Colonel Alexander W. Doniphan and the 1st Missouri Mounted Volunteers became the first U.S. Army troops to enter the El Paso Area. On November 7, 1848, the War Department directed the establishment of a post in El Paso. The post was occupied in September 1849 when six companies of the 3rd Infantry arrived in the area.

The initial mission of the military post was to protect railways, stage routes and settlers. On March 8, 1854, the Post was renamed "Fort Bliss" in honor of Lieutenant Colonel William Wallace Smith Bliss. In March 1890, the citizens of El Paso raised the money to purchase a permanent site for the post, which had occupied six sites in the area, on La Noria Mesa, east of the city. Troops began to occupy the current site in 1893.

Fort Bliss began its greatest growth period following the turn of the century when the Army responded to a raid across the border by Pancho Villa. Border patrol and defense became a major concern. William Beaumont Army Medical Center and Biggs Army Air Field were added after World War II.

The Cavalry ruled the post until World War II. In 1940, the Army's new anti-aircraft artillery arrived and re-established the mission of Fort Bliss as the largest overland, air defense missile range and training center throughout the free world. In 1966, the United States Air Force closed Biggs Air Force Base and turned the base over to Fort Bliss.

PRESENT ACTIVITY: The Environmental Protection Agency (EPA), Region VI, Texas Commission on Environmental Quality (TCEQ) formerly TNRCC and New Mexico Environment Department (NMED) have purview over Fort Bliss in environmental compliance matters. The installation does not have any sites listed on the National Priorities List (NPL) but has three agreed orders with the state of Texas, issued on November 17, 1987, February 23, 1989, and August 31, 1993. Of the original 9 SWMUs listed in the Texas permit, all have been remediated and closed by agreement with TCEQ (formally TNRCC). The renewed Texas State Resource Conservation and Recovery Act (RCRA) permit HW-50296, was issued March 2003 and required RCRA Facility Investigation (RI) for 2 IRP sites, FTBL-030, Former Castner Firing Range, SWMU # 64 and FTBL-073, no SWMU number, OB/OD Area A-1.

FTBL-2.A.2
Fort Bliss. FY2006 Fort Bliss Texas Installation Action Plan. March 2005. pg. 34-36.

FTBL-030 (PAGE 1 OF 2)
EXCESS (DISPOSE OF) CASTNER RANGE (SWMU 64)
FTBLS-004-R-01
CLOSED CASTNER FIRING RANGE

SITE DESCRIPTION

FTBL No. 030, located in northwest El Paso on the foothills of the Franklin Mountains, is a 7,080-acre closed firing range used for live-fire operations from 1928-1966. During its operation, a variety of ordnance was fired into the range, including Stokes mortar shells, 8-inch coastal artillery shells, and various calibers of field and air defense artillery (ADA). No documentation of Castner Range impact areas exists prior to 1953, however, unexploded ordnance (UXO) found at various locations include: .22 caliber, .30 caliber, and .45 caliber; 3.5-inch rockets; rifle and hand grenades; 4.2-inch mortars; 81 mm mortars; 3-inch, 105, 90, 75, 40, and 37 mm projectiles. Contamination is apparently limited to UXO, white phosphorous, military munitions constituents and possibly smoke rounds.

Castner Range is bounded on the west by the Franklin Mountains State Park, the largest urban park in Texas, and by residential and commercial development on the remaining sides. The Range consists of rugged mountains and canyons to the west and rounded foothills and gently sloping desert floor to the east. It is heavily vegetated and the vast majority on the land remains untouched, as even during the active use of the range, most all activity was confined to the firing points and roads. The range supports a large and varied population of native southwest wildlife living undisturbed, protected by restrictions the Army has placed on the property.

Castner Range is bisected by a four-lane highway (TX 54) and Trans Mountain Road, which is an important route for traffic flowing between east and west El Paso. There is a short section of fence (+/- 3 miles) on the north and limited portion of the west side of the property. However, there are no fences along the rest of the perimeter of the Range. Fort Bliss has an ongoing program to alert the public against trespassing on military lands and of the dangers of ordnance present on the Range. The post has erected sixty-seven large warning signs, in English and Spanish, plus one hundred and two smaller signs, which have a large visual display in addition to bilingual warnings. One hundred and ten large boulders have been emplaced to block the entrances to old roads into the range from the public right-of-ways that now surround the range on several sides. However, Castner is a popular hiking area with the public and containment of trespassing requires continued efforts on the part of the post Range Riders and MPs.

STATUS

RRSE: Medium

CONTAMINANTS: UXO, RDX, HMX, Metals

MEDIA OF CONCERN: Soil. Groundwater

PHASES	Start	End
PA	200203	200305
RI	201310	201509
RD	201510	201609
RA(C)	201610	201709
LTM	201710	204709

RC: 201709

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EXCESS (DISPOSE OF) CASTNER RANGE (SWMU 64)
FTBLS-004-R-01
CLOSED CASTNER FIRING RANGE

Use of the range stopped and the property was declared excess in 1972 and is subject to clearance of UXO by the Army prior to property transfer in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). In the 1950-60 era, four deaths were attributed to UXO found off the range. The fire department reported that during 1994 wild fires on the range, they observed numerous explosions, indicating that UXO were detonating spontaneously. Naturally this hindered their efforts to extinguish the blaze.
Special congressional appropriations of $1.15 M in FY 94, $1M in FY95, $1M FY97 (non-DERA) were awarded for a preliminary assessment screening (PAS), archives search, and surface removal/interim remedial action (IRA) for limited sections of the range. A characterization report detailing cleanup alternatives and estimated costs was completed in May 1998. Interim measures (such as a boundary fence) to restrict access are estimated at $200K capital cost and up to $15K per year to maintain.
The estimate for a complete surface-only cleanup of UXO is $22M. In the 1999 fall AEDB-R data call, FTBL-030 was classified as response complete. This step was taken because under pre-September 2001 DOD regulations, unexploded ordnance (UXO) was considered a safety hazard, not an environmental hazard. In the spring of 2001, the Huntsville COE informed the Fort Bliss IRP manager that ~$40,000 of prior year investigation money was still available and had to be used prior to Sept 2001. The Post used this money to bring in five commercial UXO removal contractors who gave hard dollar proposals to clean up to 1,000 acres of Castner Range. This was done so that if funding became available, Fort Bliss IRP would be ready with valid proposals to take advantage of the funding. On September 28, 2001, the Department of Defense published a new Management Guidance for the Defense Environmental Restoration Program, which made major revisions to the DERP program. One of those is the establishment of detailed requirements (titled the Military Munitions Response Program) for response actions to address military munitions (i.e., unexploded ordnance and waste military munitions) and the chemical residues of munitions at locations that are not operational ranges When funding became available in the summer of 2002, Fort Bliss was the only active Army installation that was prepared to accept $2 million in UXO removal funding provided under the new MMRP in FY02. .
Castner Firing Range is now an "open" project under the new Military Munitions Response Program (MMRP). The first major UXO removal ended in March 2004 and cleared 1,164 acres (174 subsurface and 990 surface) were cleared. 358 live ordnance items were found and removed or destroyed in place. 2.9 tons of UXO scrap and 15 tons of trash were also removed. An additional 45 acres were subsurfaced cleared for the new Border Patrol Sector Headquarters, leaving 5,875 acres left to clear.

CLEANUP STRATEGY

Additional clearance of UXO as funding becomes available under the MMRP (FTBLS-004-R-01). Fort Bliss will continue to request (FY 2006) $25,000,000 in UXO surface removal funds even though it appears that MMRP funding won't be available until 20013.

FTBL-073 (PAGE 1 OF 2)
CASTNER OB/OD AREA A-1 (FORMERLY PIT A-1)

SITE DESCRIPTION

FTBL-073 was a suspected second OB/OD area located near the northwest corner of the former Castner Range. The exact dates of use are not known, but probably coincided with the use of the range. The site was investigated in 1997 by the Fort Worth ACE and reinvestigated by Malcolm Pirnie in 1999. Contaminants detected were lead and 2, 4-dinitrotoluene (DNT). The site includes several earthen depressions, a bulldozed cut, and fragmentary surface debris. The general location of the areas is in a small valley with a dry streambed running through the bottom. The material from past range activities is spread over an approximately 4-acre study area along the valley floor. The site is more remote and therefore more isolated from the public than Pit B-1, FTBL-072.

STATUS

RRSE: Low

CONTAMINANTS: DNT, Lead, Pesticides

MEDIA OF CONCERN: Soil

PHASES	Start	End
PA	199602	199603
SI	199701	199708
RI	199710	200307
RA(C)	200303	200409
LTM	200409	200709

RC: 200409

The RI/FS field work was completed to delineate the nature and extent of the contamination in Area A-1 in the fall of 2002 and the only COCs above the Tier 2 TERP screening levels were constituents of DDT. The APAR was sent to TCEQ in Jan 2003. In June 2003, TCEQ replied with six questions seeking additional information about the possible presence on ammonium perchlorate in chunks of solid rocket fuel present on the site.

The Fort Bliss response was that:

1. Perchlorate was not a tested COC during the investigation (no completed exposure pathway).

2. Downstream testing demonstrated that other equally soluble contaminants found at the site were not migrating downstream.

3. There was no groundwater at the site or anywhere in the vicinity.

4. There are no established Federal/State guidelines requiring perchlorate testing.

5. Further remedial action, if any, would be initiated when all of Closed Castner Range was cleared of UXO.

6. OB/OD Area A-1 was a very remote site and would continue to stay within the original boundaries of the Closed Castner Range for the foreseeable future.

In Jan 2004, an additional soil boring was taken to 43ft bgs and no groundwater was discovered. In June 2004 Fort Bliss tested lightweight chunks of manmade material that were lying about the site because previous IAP descriptions of this site had speculated that they could possible be pieces of "solid rocket

CASTNER OB/OD AREA A-1 (FORMERLY PIT A-1)

fuel". The test titled "Exsrpy" proved definitively that the material did not contain explosive material. When the soil boring results of no groundwater plus no explosive material remaining at the site given to TCEQ, the agency said they would reconsider the requirement for testing the site soils for perchlorate. A tentative verbal decision from TCEQ was passed to Fort Bliss in late March indicating the site would be closed as is but the final closure decision could be reviewed if the future land use turns to residential.

CLEANUP STRATEGY

Site is expected to be closed by TCEQ in 2005

FTBL-2.B.1
Fort Bliss. FY2005 Fort Bliss Texas Installation Action Plan. April 2004. pg. 55-57.

Fort Bliss
Installation Action Plan
FY05 as of April 2004

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FTBL-070
TRANSMOUNTAIN BURIED DRUM SITE

SITE DESCRIPTION

FTBL-70 is located in the closed Castner Firing Range complex approximately 2,000-feet north of Trans-Mountain Road (TX Highway 375). The site sits on an alluvial fan adjacent to the east side of the Franklin Mountains. In addition, the release site is approximately 3,000 feet from the Wilderness Park Museum and Border Patrol Museum. The site is located on the groundwater recharge area for El Paso's sole source aquifer, the Hueco Bolson. After a site inspection, the Texas Natural Resource Conservation Commission (TNRCC) issued a Notice of Violation on June 30, 1995 for the release of a tar-like material from drums, some partially exposed at the surface.

STATUS

RRSE RATING:

High

CONTAMINANTS OF CONCERN:

POL

MEDIA OF CONCERN:

Soil

COMPLETED IRP PHASE:

PA/SI, RI/FS, RD, RA

CURRENT IRP PHASE:

RC - 2001

The site covers approximately 5 acres and contained concrete slabs, asphalt pavement, piles of concrete and metal debris, piles of asphalt pavement material, and buried asphaltic tar material. The central feature of this site and the focus of interim restoration was a central pit approximately 230 x 10 x 12 ft wide at the top that contained asphaltic tar material. Additionally, there was a surface flow of asphalt (originating from the pit). Phase I Interim Clean Up activities conducted geophysical surveys (side-looking radar, magnetometer, and electric conductivity surveys) plus backhoe trenching at the site to confirm the trench location. Borings conducted across the site encountered granite bedrock at an average depth of 21 feet below ground surface. As an IRA in the summer of 1999, the installation installed site fencing on the north and portions of the west range boundary.

A larger than expected FY 01 IRP budget for the post allowed Fort Bliss to perform a complete removal action at this site.

(Note: the concrete slabs erected by the US Army Corps of Engineers will be left as historical evidence of the usage of the site.)

The Affected Property Assessment Report (APAR) was submitted to TNRCC in September 2001 and the Response Action Completion Report (RACR) in November 2001. A closure letter was received from TCEQ on Dec 31, 2002.

FTBL-071
MEDICAL/CAVALRY DUMP

SITE DESCRIPTION

FTBL-071 is a 96-acre dump located adjacent to and east of Sanitary Landfill Road, about one-half mile north of its intersection with Fred Wilson Drive. Apparently the area was used as a burning dump in the 1930s through the 1950s, primarily for medical waste and horse cavalry material. The potential wastes at this dump include biological/ infectious waste, solvents/organic compounds, radiological wastes, UXO, asbestos-containing material, PCBs and heavy metals. Archeological material is also present. The site was investigated to a limited extent when a rail deployment facility was considered for the site. Based on the preliminary sampling results and the evidence of age of material determined by the Fort Bliss DOE archeological team, TNRCC concluded that no further action was required at the site.

STATUS

RRSE RATING:

High

CONTAMINANTS OF CONCERN:

Biological, Radiological, Solvents, VOCs, UXO, Asbestos, PCBs, Metals

MEDIA OF CONCERN:

Soil, Groundwater

COMPLETED IRP PHASE:

PA/SI

CURRENT IRP PHASE:

RC - 1996

FTBL-072
CASTNER OB/OD PIT B-1

SITE DESCRIPTION

FTBL-072 is a former open burning/open detonation (OB/OD) pit located at the northernmost boundary of the former Castner Range. The exact dates of use are not known but would match the use of Castner Range, 1926 to 1967. This pit was used as a "Burn Kettle" or "Burn Pit" exclusively for the destruction of small arms ammunition. The center of the site, which sits on the side of an arroyo that runs east out of the Franklin Mountains, was a small concrete pit, 5 x 10 ft with 2 ft. high walls open on one side. The site is located in the groundwater recharge area for the Hueco Bolson, which is used by Fort Bliss, El Paso and Juarez, Mexico. City Water Supply Well #52 is 1,000 feet east of the site and a residential area is 2,000 feet to the north and east. The site is covered with the grasses and small shrubs typical for the area. The vegetation shows no sign of distress. The run-off from rain in the area is to the arroyo immediately north of this site. The north boundary fence for Castner Range protects the site but trespassing by the public is a possibility.

STATUS

RRSE RATING:

High

CONTAMINANTS OF CONCERN:

Lead

MEDIA OF CONCERN:

Soil, Groundwater

COMPLETED IRP PHASE:

PA/SI, RI/FS, RD, RA

CURRENT IRP PHASE:

RC - 2001

A RI/FS for this site was conducted in the spring of 2000 and soil samples were taken at surface, near surface and down to 2 feet below the ground level. Lead concentrations were discovered in the near surface soil. One detection of lead in the near surface soils downhill from the site was 12,100 mg/kg. Soils below and above that location were much less. From the sampling grid it appeared that lead contamination from "blow out" at the pit was distributed in the near soil, +/- 6 to 12 inches, in a cloverleaf pattern around the pit. This pattern is typical of the open burning of small arms ammunition, which would rupture the casing and expel the lead cartridge away from the pit.

A larger than expected FY 01 IRP budget for the post allowed Fort Bliss to perform a complete removal action at this site.

The Affected Property Assessment Report (APAR) was submitted to TNRCC in May 2001 and the Response Action Completion Report (RACR) in November 2001. A closure letter was received from TCEQ on Jan 10, 2003.

FTBL-3.A.1
Tech Law. US Army CTT Range/Site Inventory, Dona Ana Range Camp, New Mexico. November 2002. pg. D-2.

FINAL
U.S. ARMY CLOSED, TRANSFERRING and TRANSFERRED RANGE/SITE INVENTORY
for
DONA ANA RANGE CAMP, NM

November 2002

Prepared for

U.S. Army Environmental Center
and
U.S. Army Corps of Engineers,
Sacramento District

Prepared by

TechLaw, Inc.
560 Golden Ridge Road, Suite 130
Golden, CO 80401-9532

FORT BLISS DONA ANA RANGE—This is a closed range, still owned by the U.S. Army, comprising 17 acres in the northern portion of the southern half of the installation property, and is part of an area that is currently used for vehicle and equipment maintenance. This area was part of a much larger area used by Fort Bliss, Texas, for training and testing at various times throughout the 20th century. From 1911-1940, it was part of the Fort Bliss "Dona Ana Target Range" where small arms and artillery were fired. From 1964 to 1975, it was again used as part of ranges where small arms and rockets were used in training. The area was reported to be cleared of munitions in May 1946. However, surveys conducted during and after the area's subsequent use as a range noted that there is a "high possibility of surface and subsurface dud contamination" in the area covering Dona Ana Range Camp. Please refer to Map 2 for perspective on Dona Ana Range Camp's location within the greater area covered by Fort Bliss. No response actions are known to have taken place in the area of this range since 1946.

CTT Range and Site Details Table

The CTT Range and Site Details Table (Table D-2) provides detailed information on the CTT areas included in the inventory.

Table D-2: CTT Range and Site Details Table

INSTALLATION AND RANGE / SITE NAME	CLASSIFICATION	TOTAL AREA (ACRES)	MUNITIONS TYPE(S)	MUNITION CONSTITUENTS	RAC SCORE*	HISTORIC USE
DONA ANA RANGE CAMP						
FORT BLISS DONA ANA RANGE	CLOSED	17	GROUND ROCKETS, RIFLE GRENADES, LIVE LARGE CALIBER (37MM AND LARGER), HE SMALL ARMS	UNKNOWN	2	SMALL ARMS ARTILLERY OTHER

* The RAC score is a prioritization and sequencing tool used to rank the explosives safety risk at a site; 1 is the highest explosives safety risk, 5 is the lowest explosives safety risk. The RAC score is discussed further in section G. The RAC Score is only developed for range, UXO and DMM sites, not MC sites.

The area data reported in the ARID is adjusted to account for CTT range and site overlaps with A/I range areas inventoried in Phase 2 to ensure that no area is reported more than once. By definition, if a portion of the CTT range/site is considered an A/I range and is reported in Phase 2, the range/site portion is not reported again in the Phase 3 acreage (where applicable).

CTT Range and Site Ownership, Use and Access Control Summary Table

The Range and Site Ownership Table (Table D-3) provides a summary of the owner, current use and access restrictions associated with each CTT site in the inventory.

FTBL-4.A.1
US ACE St. Louis District. Archives Search Report, Fort Bliss, Castner Range, El Paso, Texas, El Paso County. August 1994. pg. 5-1.

US Army Corps
of Engineers
HUNTSVILLE DIVISION

Defense Environmental Restoration Program
Ordnance and Explosive Waste

ARCHIVES SEARCH REPORT

FORT BLISS
CASTNER RANGE

El Paso, Texas
El Paso County

AUGUST 1994

Prepared by
US ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT

ORDNANCE AND EXPLOSIVE WASTE
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APPENDICES

5.0 Real Estate

5.1 DOD Ownership

Castner Range was originally established in 1926 for small arms firing courses and artillery firing and impact areas. It was comprised of approximately 3500 acres. A Deed of Cession was obtained from the state of Texas on 19 October 1928. An additional 4800 acres were acquired by purchase in 1939. Property boundaries are shown on Plate 1. The final total acreage of the Range was 8328 acres.

5.2 Current Ownership

In 1971 the Army declared 1247 acres as excess and the General Services Administration disposed of them to the city of El Paso. The Army is currently seeking to dispose of the remaining acreage.

The previously excessed portion of Castner has been developed for commercial, residential, and public purposes.

FTBL-4.A.2
US ACE St. Louis District. Archives Search Report, Fort Bliss, Castner Range, El Paso, Texas, El Paso County. August 1994. pg. 6-1 – 6-7.

6.0 OEW/CWM Site Activities

6.1 Historical Summary of OEW/CWM Activities

6.1.1 Pre-World War II Activities

Castner Range originally consisted of Sections 34, 35, and 36 of Block 81, Township 1 and Sections 2, 3, and the eastern half of 4, Block 81, Township 2, acquired in 1926. Originally, four rifle ranges were constructed in section 2 in south central area of the range. In 1939 additional sections were purchased bringing the total property to almost thirteen sections (2, 3, 4, 5 in township 2 and 34, 35, 36, 37, 33, 32, 31, 25, and 26 in township 1). With the additional land, more ranges were added. Plate 1 shows the progression of the Castner Range boundaries. Documents indicate that the range area was probably used for firepower demonstrations even before World War II.

Regular range operations were not the only use of ammunition at Castner Range. One Chemical Corps report from the VIII Corps Chemical Officer detailed an experiment in retrograde operations where units on Fort Bliss conducted a retrograde movement through the Franklin Mountains at MacKilligan's Canyon using new smoke munitions to cover movements (Barrett 1929). This indicates that there may have been use agreements for training operations in an area adjacent to Castner Range that were independent of range operations and may not have been restricted to what is currently government owned property.

6.1.2 World War II Era Ranges

6.1.2.1 Ranges and Firing Points

Range maps from 1943 identify sixteen ranges as detailed on Plate 2. Although most of the ranges were small arms ranges, Range 9 was a 37mm subcaliber range and Range 15 was a mortar range. Ranges 12 and 13 were moving target and field firing courses with no weapons types specified. In addition to the ranges listed below, the 1943 documents also identified 3 apparent field artillery firing points. These firing points are also shown on Plate 2.

Range 1	Rifle
Range 2	.30 caliber machine gun
Range 3	Rifle
Range 4	Rifle
Range 5	Rifle
Range 6	.30 and .50 caliber machine gun
Range 7	Pistol
Range 8	.30 caliber machine gun
Range 9	37 mm sub-caliber
Range 10	.22 caliber landscape
Range 11	Rifle - .30 caliber
Range 12	Gravity course moving target

Range 13	Field firing course
Range 14	Submachine gun / shotgun
Range 15	Mortar
Range 28	.22 caliber aerial target

Documents and maps from the World War II era do not mention any grenade courses, neither hand nor rifle, at the Castner Range. The grenade courses during this period of use were shown either on the base proper or at the Winifree's Nose Range, southeast of Fort Bliss in El Paso. After World War II a significant number of grenade ranges were established on Castner.

A report on excess for Castner Range, dated 11 May 1971, from the Commander of Fort Bliss states that the western mountainous portions of the range had been used during the 1930's and 1940's for large artillery impact areas.

6.1.2.2 Other Ordnance-related Uses

Another potential source of OEW on Castner Range resulted from experiments conducted as part of Project Sphinx. This project was conducted during World War II and was focused upon developing methods of attacking Japanese Cave-Type fortifications. At Fort Bliss experiments were conducted using air defense artillery (40mm and 90mm HE rounds) in a direct fire mode to attack and attempt to close cave openings (Volkenburgh 1945). This document does not identify Castner Range as the location of the tests but the Franklin Mountains would provide terrain conducive to this test.

6.1.3 Post-World War II Ranges

Range locations used after World War II are shown on Plate 3.

6.1.3.1 Ranges from 1947 through the 1950's

Army Military Service maps updated in 1947 and 1948 show the firing ranges located in the southeast area of the Castner Range in addition to a firing range and a demolition area in the northeast portion.

Range firing fans from 1953 show the firing points located along the eastern edge of the range using the Franklin Mountains as a backdrop.

A 1955 report indicated that 27 ranges existed at Castner Range. These ranges again were predominately small arms ranges. However, Range 16 was listed as a 3.5-inch rocket range, Range 20 was a live hand grenade range, and Range 26 was a demolition range (Speed 1955). The identified ranges are listed below. Many of the ranges are shown as being renovated in 1954. Most of the small arms firing courses were in the same locations as the previous ones.

Range 1	Known Distance (KD) 100 and 200 yards
Range 2	KD 100, 200, and 300 yards
Ranges 3 & 4	Transition Table VII
Range 5	KD 100, 200, and 300 yards
Range 6	KD 100, 200, and 300 yards (unsatisfactory condition)
Range 7	KD 100, 200, and 300 yards
Range 8	1000-inch and landscape (unsatisfactory condition)
Range 9	Pistol 15, 25, and 50 yards
Range 10 & 11	1000-inch and landscape
Range 12	Infiltration
Range 13	Individual day training (barbwire entanglements)
Ranges 14A & 14B	500-inch machine gun
Range 14 C	Attack course
Range 15	1000-inch and landscape (unsatisfactory condition)
Range 16	3.5-inch rocket launcher
Range 17	Transition Table VII (225 yards instead of 500 yards)
Range 17A	Transition Table VIII
Range 18	Hand grenade-dummy practice
Range 19	Rifle grenade-practice
Range 20	Hand grenade-live
Ranges 23-25	Close combat (unsatisfactory-ranges washed out in 1954 flood)
Range 26	Demolition (Consisted of a number of pits for blowing demolitions)

A subsequent, undated document which rescinded the 17 March 1955 range training memorandum lists the same ranges but with different numbers (Alford ca.1955). Significant additional information on the ranges is shown below.

Range 14	3.5-inch practice rocket only course, target is stationary tank
Range 18	Dummy and live rifle grenade course, 20 firing points, impact area
Range 19	Live grenade course, 10 throwing revetments

6.1.3.3 Ranges during the 1960's

Documents from 1961 indicate that a series of firing ranges were located along the eastern edge of the Castner Range. This complex was identified as Trainfire I and included 8 live firing courses and 10 target detection courses. The ranges were generally located in the same areas as previous ones. Rifle and other small arms firing were the only operations specified for these ranges. Target detection courses do not involve any live munitions firing.

Later a close combat range (Vietnam Village) was constructed in the same area as the demolition range in the northern area of Castner. The Vietnam Village occupied about 20 acres and is shown on Plate 5.

All organized weapons firing was discontinued on the Castner Range during 1966. Operations were transferred to the newly-constructed Meyer Range complex.

6.1.4 Other Activities at Castner Range

6.1.4.1 General Operations

Fort Bliss was originally a combat garrison and as such had artillery units assigned. Later it became the Air Defense School and was heavily involved in training personnel in the use of various air defense weapons. It can be anticipated that any type of field artillery in use prior to the start of World War II and any type of air defense artillery may have been used, demonstrated, or disposed of on Castner Range.

Another source of OEW were firing demonstrations reported to have been conducted on Castner Range. In this type of demonstration selected weapons would mass fire on a location to demonstrate to an audience the destructive fire power of the weapons being used. In addition to live ammunition of various calibers, these demonstrations also probably used white phosphorous and smoke munitions.

6.1.4.2 Special Operations

Historical documents indicate that special explosive operations were also carried out on the Castner Range.

One special operation, reported in the 8 August 1958 Fort Bliss News, involved blasting and quarrying along some of the rock faces of the Franklin Mountains in the Castner Range. Small diameter holes, drilled into the rock, were filled with explosives to split the rock formation. The operations were carried out as part of the explosives training to provide materials for the rock crusher units operated by the 273rd Engineer Detachment.

Another operation was a June 1976 cratering exercise in which shaped charges were placed in holes advanced into the soil materials and then detonated to create excavations. Both M2A3 (15-pound) and M3A4 (40-pound) shaped charges were exploded. Some of the M2A3 charges were detonated near the highway and Museum. The other explosions appear to have been set off in the demolition area. The M2A3 charges created holes about 4½ feet deep and 7 inches in diameter. The M3A4 left a hole approximately 6½ feet deep and 10 inches in diameter. Windows were knocked out in the nearby Butterfield Apartments (Raper 1976).

6.1.5 Range Incidents

6.1.5.1 Incident Reported on 14 August 1963

During a routine inspection of the Castner Range in 1963, Mr. Richard Dement (Safety Inspector) encountered a Boy Scout leader and 5 Scouts travelling to the hillsides around the recently constructed water control dam. The Scout leader indicated that they had provisions stored in a cave near the dam and intended to camp there. Mr. Dement stated that the site to which the group was heading was in an old artillery impact area. In order to get to the dam the group had crossed through the danger area for the current firing ranges. Mr. Dement

had received previous notice that firing operations had to sometimes be halted because civilians were wandering in that part of the range. Mr. Dement found an open entrance point into the range about 1.5 miles west on Hondo Pass Road from Dyer Street (Dement 1963).

6.1.5.2 Incidents Reported on in January 1971

The Armed Services Explosives Safety Board reported in 1971 on several UXO incidents which had occurred on the Castner Range over the years. During the construction of the Trans Mountain Road in 1967 through 6 sections of the land, numerous HE duds were found. Additionally, HE items have been found throughout the range. Explosive items picked up by civilians have resulted in several fatalities off the base. In 1955, a 75mm detonation killed 3 children and injured 10 others; in 1962 a 2.36-inch rocket detonated killing one child and 4 others lost one or both legs (Cameron 1971).

6.1.5.3 Incident Reported on 26 June 1989

An article in the 26 June 1989 El Paso Times stated that the EOD unit from Fort Bliss had recovered in 1988 a 3.5-inch rocket from a local resident, who had found it out on the Castner Range. At that time the range had been closed for over 20 years.

6.1.6 Ordnance and Explosive Waste Recovered on Castner Range

6.1.6.1 Report from October 1971

Personnel from Fort Bliss completed a surface investigation of two areas of Castner Range in September 1971. The first area was approximately 100 acres in Section 35 (Block 81-TSP1) and the second was 100 acres in Section 4 (Block 81-TSP2). Forty OEW items, listed below, were found during the sweep.

75mm shrapnel rounds 3"	7 each	potentially lethal
40mm HE round 1 1/2"	1 each	potentially lethal
37mm HE rounds	2 each	potentially lethal
37mm AP projectiles	22 each	burn hazard from tracer element
various round components	8 each	inert

All rounds were removed from the area and destroyed (Fort Bliss 1971). Photographs of ordnance items found during the investigation are included in Appendix D-2.

6.1.6.2 Report from 18 June 1974

During the period of 8 April 1974 to 7 May 1974 Fort Bliss personnel conducted a surface sweep of 1230 acres of Castner Range. This land was that part of the range east of the North-South Freeway. One hundred and four individuals systematically walked the entire area. The only munitions found during the sweep were 1-white phosphorous 4.2-inch mortar

round and 4-HE items (Williams 1974). A statement of clearance was issued for this tract indicating that this land had been given a careful surface/visual search and has been cleared of all explosives reasonably possible to detect (Anderson 1974).

6.1.6.3 Report from January 1975

The Engineer Studies Group of the Department of the Army, Chief of Engineers Office prepared a report in January 1975 concerning the ordnance and explosive waste contamination of the Castner Range. Their analysis divided the range into 6 areas (A-F) based on previous use and potential for contamination. A copy of the final report is included in Appendix C-2. Areas A and B had been surface swept by Fort Bliss personnel in 1974 and only minimal OEW had been found. These two areas were being turned over to GSA for disposal to the city of El Paso. The remaining four areas were thought to be heavily to very heavily contaminated with ordnance items. Area C was located immediately in front of the primary firing line in the southeast area of the range. Area D, in the northeast section of the range, was reportedly used as an impact area for heavy artillery in the 1930's and 1940's. Area E, in the southwest portion of the range, was part of the original land acquisition and purportedly the impact area for most of the large caliber ordnance. Area F, in the northwest quadrant, was reported to have been for the impact of only the larger caliber ordnance. Maps of the these areas are included with the report in Appendix C-2.

6.1.6.3 Report from 1976

In a Memorandum for Record it was reported that the following munitions had been found on the Castner Range. No specific locations were given (Guarnero 1976).

Date	Ammunition Found
8 April - 7 May 1974	4.2-inch mortar round 40-mm rounds (4)
28 May 1976	3.5-inch rocket
9 June 1975	.50 caliber round

6.1.6.4 Report from 1979 and Trans Mountain Highway Information

The Army conducted an ordnance surface sweep of the Trans Mountain Road right-of-way and a portion of the North-South Highway right-of-way on the Castner Range during December 1979. The following items were removed from the area:

M52 series fuzes	6 each
Pop flares	1 each
37mm shot rounds	14 each

75mm illumination rounds (nose ejection)	12 each
75mm HE rounds 3"	5 each
7.62mm blank	3 each
7.62mm ball	2 each
57mm HE	1 each
40mm "Duster" 1½"	1 each
Powder train time fuzes	3 each
Stokes mortar (filler unknown)	1 each

The officer in charge of the operations recommended that the area swept still be limited to surface-use only because of the large number of items found in the relatively small area searched (Magee 1979).

Correspondence from the Armed Services Explosives Safety Board, dated 25 January 1971, indicated that numerous HE duds had been found during the construction of the Trans Mountain Highway in 1967. Later correspondence from an area Congressman ,concerning this same area, stated that not one instance of encountering unexploded ordnance was experienced.

6.1.6.5 Report from 1980

An inspection of Castner Range was made in January 1980 by a survey team from the Naval Explosive Ordnance Disposal Facility. As part of their site report they recapped the previous ordnance sweeps done on the range. They reported that five items identified as explosive ordnance were found on the 1200 acres of Castner Range east of the North-South Highway. They also reported that the sweep of December 1979 was conducted 200 meters on either side of the Trans Mountain Road and a long a two-mile section of the North-South Freeway (Rice 1980). Other documents indicated that the two-mile section was south of the Trans Mountain Highway.

6.1.6.6 Report from 1981

The Army conducted an ordnance surface sweep of a 30-foot wide power line easement running perpindicular from the North-South Highway to the Museum on the Trans Mountain Highway. Only a few rounds of small arms ammunition were found. The EOD supervisor recommended that the area still be restricted to surface use only (Rodgers 1981).

6.1.6.7 Area Surface Swept by City of El Paso

Besides the areas that have been investigated for ordnance contamination by the Army, there is also a 17 acre tract in Section 31, Block 81, Township 1 that had been surfaced swept by the City of El Paso for construction of a museum building along the Trans Mountain Highway. The city's work had been verified by the Army.

FTBL-4.A.3
US ACE St. Louis District. Archives Search Report, Fort Bliss, Castner Range, El Paso, Texas, El Paso County. August 1994. pg. 7-1 – 7-3.

7.0 Evaluation of Contamination

7.1 Conventional Ordnance Use

7.1.1 Range Activities

Plates 5 and 6 of this report detail all known ordnance firing locations and impact areas at the Castner Range. Available historical documents confirm that munitions from small arms to 105mm have been fired there. No archival records were found which confirmed the firing of 8-inch artillery rounds which has been cited in several general histories. Although this information may have come from previous interviews with personnel who were familiar with the range operations.

Castner Range was also reportedly used for firing demonstrations. These operations generally involve mass firing of conventional weapons in addition to white phosphorous and smoke munitions.

7.1.1.1 Pre-World War II Use

Information on range activities before World War II was limited. It does appear that during that period Castner was the primary ordnance range for Fort Bliss. Documents indicate that 4 rifle ranges were located near the southern boundary of the range. Aerial photographs from 1936 show the location of these rifle ranges, as included in Appendix D-1, and also show several graded areas that may have been artillery firing points. The 82nd Field Artillery unit was stationed at Fort Bliss.

7.1.1.2 World War II Era Use

During World War II a number of small arms firing ranges were developed in the southeast section of the Castner Range. Generally all of these ranges, except one, fired towards the west. The one exception was a .30 and .45 caliber course that was located in the southeast quadrant of the intersection of the present North-South Highway and the eastern extension of the Trans Mountain Highway. During World War II Fort Bliss was established as one of the main anti-aircraft artillery training centers. In addition to the small arms courses there were also apparently at least 4 and possibly 7 artillery firing points. These firing points were all located in the eastern portion of the range and fired to the west or southwest. Some of these range locations were shown on maps and drawings, while others were interpreted from air photos. Interspersed among the small arms courses were also a mortar range, a 37mm sub-caliber range, a field firing course, and a moving target course. Ordnance used on the field firing and moving target courses was not specified; however, the rail lines for the moving target courses fall with the firing fans for at least one of the artillery firing points. Live grenades were also used on the Castner Range during this period.

Experiments were probably conducted on the Castner Range using 40mm and 90mm ammunition to test the effectiveness of direct fire in closing cave-type fortifications. One range incident from the 1960's involved civilians entering the Castner Range in order to camp in the caves near the Fusselman Dam. Several of the artillery firing points identified in the northeastern portion of the range were directed towards the area around the dam.

7.1.1.3 Post World War II Use

Army Military Service maps from 1947 and 1948 identify several ranges and a demolition area still evident at that time. The demolition area was located in the extreme north area of the range. Range firing fans from 1953 reportedly for 3.5-inch rockets and grenades show firing points located in the eastern portion of the range and impact areas extending all the way to the western boundary.

By 1955, 27 ranges were reported to be on the Castner Range. Although most of these were small arms, there were also a 3.5-inch rocket, a live hand grenade, and a demolition range. Although the exact location of the grenade range was not specified it was described as a course containing 10 throwing revetments. The demolition range was reported to consist of a number of pits for blowing demolitions.

Besides the normal use of explosives in ordnance firing, the Castner Range was also used, at least in 1958, as a training area for rock quarrying operations. Some of the rock faces of the Franklin Mountains were blasted with explosives packed into small diameter drilled holes to produce fragmented rock. The fragmented rock was crushed by one of the post's engineer units for use in construction activities.

In the 1961 plans for the Trainfire I range facilities, only 8 live-fire small arms courses are shown for the Castner Range, in addition to 10 target detection ranges. Target detection ranges were not supposed to use live ammunition. During the 1960's a close combat range (Vietnam Village) was constructed on 20 acres near the site of the former demolition range. Vietnam Village ranges encountered at other installations often involved operations which used live hand grenades, bulk explosives, and explosive booby-traps.

All organized firing was discontinued on the Castner Range during 1966.

The range was used at least one more time after that for a 1976 cratering exercise, in which 15 and 40 pound shaped charges were used to create ground excavations. These exercises were carried out in the area of the museum and the demolition range. Windows were knocked out in a nearby apartment complex.

7.1.2 Summary of Known Contamination

7.1.2.1 Organized Ordnance Investigations

In addition to the random discovery of munitions by the local citizenry, the first of which was reported in 1955 and the last in 1988, several organized searches of Castner Range have been undertaken by the military. The locations of these searches are outlined on Figure 7-1. The first of these was in 1971 when 200 acres in land Sections 35 and Sections 4 were surface swept by personnel from Fort Bliss. The exact locations of the acres searched were not identified. During this investigation 40 OEW items were discovered, 30 of which were considered lethal or hazardous. The items were all destroyed (a listing of these items is shown in Section 6.1.6.1 of this report).

The next large-scale search in 1974 involved 1230 acres of land in the southeast section of the range, east of the North-South Highway. This area was the site of the small arms firing ranges, starting in World War II, and target detection ranges. Operations records indicate that a thorough search of the area conducted, but that no small arms ammunition was discovered. Five OEW items that were found included a 4.2-inch mortar round and (4) 40mm rounds. These items were removed and destroyed.

Documents indicate that other isolated pieces of ammunition were discovered on the range. In 1975 a .50 caliber round and in 1976 a 3.5-inch rocket were found. The locations of these finds was not reported.

The Army conducted a third large-scale sweep 200 meters on either side of the Trans Mountain Highway and along the North-South Highway south from the Trans Mountain to range boundary in December 1979. Forty-nine hazardous OEW items were discovered during the search (a listing of these items is contained in Section 6.1.6.4 of this report).

The final documented search was conducted in 1981 when the Army swept a 30-foot wide easement from the North-South Highway to the museum site. Only a few small arms rounds were found.

7.1.2.2 Site Visit June 1994 by Various Personnel

In preparation for this archives search report and subsequent clean-up the Castner Range was visited in June 1994 by personnel from Fort Bliss and the Corps of Engineers (Huntsville Division and St. Louis District). During the course of that site visit, several items of ordnance were observed by the site team. These items included a complete 2.36-inch rocket, the head of a 2.36-inch rocket, smoke or white phosphorous grenade canisters, and fragments from apparent 105mm rounds. The locations of these finds are noted on Plates 5 and 6.

FTBL-4.A.4
US ACE St. Louis District. Archives Search Report, Fort Bliss, Castner Range, El Paso, Texas, El Paso County. August 1994. pg. 8-1.

8.0 Conclusions and Recommendations

8.1 Conclusions

8.1.1 Conventional Munitions

Plates 5 and 6 of this report summarize all known or interpreted areas where conventional ordnance may have been fired, impacted, or disposed of. Ordnance thought to have been used on this range vary from .22 caliber up to possibly 8-inch rounds. Munitions reportedly fired or used on Castner Range are summarized in the following list.

.22 caliber	81mm mortar
.30 caliber	4.2-inch mortar
.50 caliber	Stokes mortar (filler unknown)
7.62mm	8-inch
37mm	White phosphorous rounds
40mm HE and "Duster"	M52 series fuzes
57mm HE	Pop flares
75mm HE, illumination, and shrapnel	Powder train time fuzes
90mm HE	Smoke munitions
105mm	Grenades (hand and rifle)
3-inch	M2A3 (15-pound shaped charge)
2.36-inch rocket	M3A4 (40-pound shaped charge)
3.5-inch rocket	Bulk explosives

The same range areas have been used during various periods for different types of ammunition. Previous range clearances have revealed 7.62mm rounds being found in the same areas as 75mm ones.

Although none of the documents and maps reviewed ever indicated an area for the use 2.36-inch rockets, several of these rockets have been found on Castner. Operations near the end of World War II in conjunction with Operation Sphinx involved the use of ordnance in ways not normally anticipated. Direct firing of 40mm and 90mm anti-aircraft artillery rounds into caves on the mountains was undertaken to determine the effectiveness of such use.

No 3.5-inch rockets and grenades were reportedly used on the range during World War II, however, after that time period almost the entire Castner area west of the North-South Highway was shown as a potential impact area for these munitions.

FTBL-4.A.5
US ACE St. Louis District. Archives Search Report, Fort Bliss, Castner Range, El Paso, Texas, El Paso County. August 1994. Appendix C-2 pg. B-2-14.

UXO PENETRATION AND SOIL OVERLAY DATA

Ordnance Type	Maximum UXO Penetration (in feet) Sand[a/]	Clay	Soil Overlay Thickness To Prevent Venting (in feet)[b/]
37-mm	2.5	5.0	2.6
40-mm	2.5	5.5	1.8
75-mm	4.5	9.5	4.8
81-mm Mortar	3.0	7.0	5.7
90-mm	7.0	13.0	4.5
105-mm	5.5	11.5	6.9
3-inch	6.0	12.0	3.5
3.5-inch	5.5	10.5	4.3
4.2-inch Mortar	4.0	8.5	6.9
8-inch[c/]	12.0	24.0	11.6

a/ Predominant soil type from literature research; on-site investigation would be required to verify soil type in impact area zones being decontaminated.

b/ Thickness is based on assumption that UXO is at a depth just below the ground surface and that the fill has a density of 100 pounds per cubic foot.

c/ Estimate of critical ordnance that results in maximum penetration of UXO.

Figure B-2-5

FTBL-4.A.6
US ACE St. Louis District. Archives Search Report, Fort Bliss, Castner Range, El Paso, Texas, El Paso County. August 1994. pg. 4-1.

4.0 Physical Characteristics of the Site

4.1 Geology/Physiography

Fort Bliss is located in the Sacramento section of the Basin and Range province. This section is characterized by cuesta-form and plateau like topography. Faulting is prevalent here, but not the strong tilting that characterizes other Basin and Range province sections. There exists several prominent bolsons in the Sacramento section. Between the Delaware Mountains in Texas and the Guadalupe Mountains in New Mexico exists the prominent basin known as Salt Basin. The north-south trending mountain ranges of the region run east of the site. The mountains consist of a series of tilted blocks bounded on the west by bold scarps and having on their east sides more gentle slopes. Initially the Guadalupe and Delaware Mountains formed a great tectonic arch which had its steepest dip on the west side. This structure was subsequently broken by numerous faults on the west. Here, along what is called the Border fault zone, strata have been dropped down 2000 to 4000 feet into the Salt Basin (Thornbury, 1965).

4.2 Soils

The majority of the Fort Bliss site is characterized by steep or very steep slopes, sometimes even vertical escarpments. There is not much soil to speak of here, only wide areas of exposed, stratified igneous rock, mostly granite, andesite, syenite, and rhyolite. On the lower, less sloping areas, there can be a 25 cm thick layer of dark reddish brown, mildly alkaline, stony, clayey soil on top of the igneous bedrock. In these highly sloping areas the hazard of soil erosion is severe if the surface is unprotected by grass.

In other areas of the site, the surface layer of soil is a pinkish gray or pale brown, gravelly and sandy, or calcareous gravelly silty clay, ranging from 15 to 30 cm thick. The subsurface layer is white or whitish, strongly cemented to indurate caliche in areas and in others it is composed of alluvial deposits of pale brown very gravelly, sandy soil several feet thick (Jaco, 1971).

4.3 Hydrology

4.3.1 Surface Water

The site is located on the east hillside of the Franklin Mountains with steep canyon streams. The streams flow in east and southeast directions into the Rio Grande Valley below.

4.4 Weather

The climate of the study area is characterized by an abundance of sunshine throughout all of the year, high daytime and comfortable night summer temperatures, very low humidity, scanty rainfall and a relatively mild winter season. The climatic data collected at El Paso,

FTBL-5.A.1
Parsons Engineering Science, Inc. OE Characterization and Cost Analysis Report for Fort Bliss: Castner Range. May 1998. pg. 2-8.

OE CHARACTERIZATION AND COST ANALYSIS REPORT for Fort Bliss: Castner Range

U.S. Army Engineering and Support Center Huntsville

Revision: Final

May 1998

Prepared by

Parsons Engineering Science, Inc.

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2.1.5.2 Also in the 1960s, a close combat range (Vietnam Village) was constructed on 20 acres near the site of the former demolition range. Documentation of the types of ordnance and operations conducted at the Vietnam Village at Castner Range are not available, however, Vietnam Village ranges encountered at other installations often involved operations which used live hand grenades, bulk explosives, and explosive booby-traps (Archive Search Report, 1994).

2.1.5.3 In 1966 all organized weapons firing was discontinued at Castner Range. Live fire operations were transferred to the newly constructed Meyer Range complex. The range was used at least once more after 1966 for a cratering exercise conducted in 1976. During the cratering exercise, 15 and 40 pound shaped charges were used to create ground excavations. These exercises were conducted in the area of the museum and the demolition range. Figure 2.1-4 presents a map depicting locations of known range activities in the 1960's.

2.1.6 Site Location

Castner Range is located north of the city of El Paso, Texas in El Paso County (see Figure 1.0-1). Castner Range is bordered by the Franklin Mountains State Park to the northwest, west and southwest; by Highway 54 to the east; and by a residential and business district to the southeast and a predominantly undeveloped area to the northeast. Development is beginning to occur in the area immediately Northeast of Castner Range. Castner Range is bisected by the Trans Mountain Highway which traverses the north-south trending Franklin Mountains Range from east to west and also provides access to the Franklin Mountains State Park.

2.1.7 Operational Status

Live fire operations were suspended at Castner Range in 1966. In 1971, the Army declared 1,247 acres as excess. Of the 1,247 acres, various parcels were transferred by the GSA to the City of El Paso, the University of Texas at El Paso (UTEP), the EPCC, and the EPISD. Portions of this land was also sold to developers and 58 acres were retained by Fort Bliss for use as a recreational area. The remaining 7,081 acre portion of Castner Range, under control of the DoD, has been declared as excess and the Army is now seeking to dispose of the remaining acreage. The range, although posted with signs identifying the area as hazardous, is frequently visited by civilians for recreational purposes. Improvements made to the remaining portion of the range include the multi-lane Trans Mountain Highway, a natural history museum, a border patrol museum, major stormwater impoundments, the Texas Department of Transportation Facility, and part of the new North-South Highway.

2.1.8 Meteorology

The climate of the study area is characterized by an abundance of sunshine throughout all of the year, high daytime and comfortable night summer temperatures, very low humidity, scanty rainfall and a relatively mild winter season (ASR, 1994). The climatic

FTBL-5.A.2
Parsons Engineering Science, Inc. OE Characterization and Cost Analysis Report for Fort Bliss: Castner Range. May 1998. pg. 1-6.

Mountains State Park are contingent upon what the Army wishes to convey. The issue of unexploded ordnance must be addressed (see Section 1.2) before any portion of Castner Range can be transferred to the State of Texas for use as a state park.

1.0.7 In 1976, the Wilderness Park Museum was constructed within Castner Range by the City of El Paso. The museum contains exhibits on the history and natural setting of the Chihauhaun Desert ecosystem. A museum dedicated to the history of the US Border Patrol was constructed adjacent to the Wilderness Park Museum. The fact that museums have been constructed in Castner Range and are currently open for public use, promotes the park future land use alternative.

1.0.8 This document provides an OE Characterization Report and Cost Analysis based upon:

- Determination of the nature and extent of OE contamination at the site through a review of previous site investigations;
- Analysis of the risk posed by the remaining OE hazards present at the site;
- Identification and development of OE removal alternatives including clearance costs;
- Screening of OE removal alternatives; and
- A comparative analysis of the remaining OE removal alternatives.

1.0.9 The results of these tasks and recommendations for the follow-on OE removal are included in this report.

1.1 PURPOSE

The purpose of this project is to evaluate the results of past OE investigations at the Castner Range to determine the feasibility, cost, and risk to the public from potential OE removal alternatives. The objective of this project is to implement the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) non-time critical removal action process to recommend a feasible and cost effective OE removal alternative that meets acceptable levels of protection to human health with respect to the intended future land use.

1.2 REGULATORY ANALYSIS AND ASSESSMENT OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

1.2.1 The Castner Range OE Characterization project has been performed by the US Army Corps of Engineers (USACE) under the Defense Environmental Restoration Program (DERP), 10 USC 2701-2707, and under Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Under these regulations, the Secretary of Defense is authorized to conduct response actions at sites that were contaminated while under the jurisdiction of the Department of Defense (DoD) or its predecessor agencies. Because this project falls under CERCLA, a general

FTBL-5.A.3
Parsons Engineering Science, Inc. OE Characterization and Cost Analysis Report for Fort Bliss: Castner Range. May 1998.
pg. 2-15 – 2-16.

2.1.12.2.2 The work force of El Paso County, based on the number of establishments, is broken down into the following: manufacturing, 21.5 percent; non-manufacturing, 72.7 percent; agriculture, 0.3 percent; and other non-agriculture, 5.5 percent.

2.1.12.2.3 Housing in El Paso is composed of both single and multi-family homes. There are approximately 168,625 housing units with a median value of $58,500.

2.1.13 Ecosystems

Castner Range has remained largely in its natural state since 1966 when live fire exercises ceased. Few biological studies have been conducted on the range since the land has remained inactive to Fort Bliss activities. Castner Range now supports a diverse Chihuahuan ecosystem.

2.1.13.1 Vegetation

2.1.13.1.1 Castner Range lies in the Chihuahuan ecosystem. The elevation varies from approximately 3,900 feet above mean sea level to approximately 7,100 feet above mean sea level. The variation in elevation results in a considerable variance in the available precipitation. Differences in available precipitation are expressed biologically as a variety of vegetational communities. The boundaries of these communities are not always distinct, and the elevational, topographic, hydrologic, and soil factors create a "patchwork quilt of vegetation."

2.1.13.1.2 The primary vegetation communities include:

- Agave-Lechuguilla community
- Alluvial fan-creosote bush community
- Draw-yucca grassland community

2.1.13.1.3 The mountainous areas are characterized by the Agave-Lechuguilla community. Lechuguilla forms dense clonal clumps on colluvial slopes, ridges, and benches of hills and mountains. This community also extends down slope onto erosional piedmont surfaces dropping out at the juncture where deposition prevails over erosion on the lower toeslopes of alluvial plains. The predominant species occurring in the Agave-Lechuguilla community are acacia (Acacia var.), lechuguilla (Bouteloua), sotol (Dasylirion wheeleri), Ocotillo (Fouquieria splendens), and catclaw mimosa (Mimosa quadrivalvis var.). The soils in these communities are rocky and shallow.

2.1.13.1.4 The alluvial fan-creosote bush community occurs on the alluvial fans of the Franklin Mountains. The vegetation is characterized by the presence of creosote bush (Larrea tridentata), whitehorn (Acacia constricta), Tarbush (Flourensia cernua), Spanish Sword yucca (Yucca torreyi), broom snake weed (Xanthrocephalum microcephalum), and Agave (Lechugilla). Grasses are absent to rare, and if present, basal coverage is quite low (less than 0.5 percent). The soil in the alluvial fan-creosote bush community is generally quite thin from 1 to 30 centimeters in depth. Arroyos and drainage areas are moister than other areas and support different vegetation types

including Desert Willow (Chilopsis linearis), Apache Plume (Fallugia) and little leaf sumac (paradoxa).

2.1.13.1.5 The draw-yucca grassland community occurs in the gentle sloping areas adjacent to highway 54. The soils in these areas are generally deeper (ranging to 50 centimeters) and have relatively greater silt and clay content than soils in the alluvial fan-creosote bush community. Grass and shrub species diversity and coverage is high. Gramma grasses are the dominant species (Bouteloua spp.) with 3-awns (Aristida spp.) and dropseeds (Sporobolus) being common. Yucca elata is common, as are all-thorn (Koeberlina spinosa), chollo (Cylindropuntia spp.), Mormon tea (Ephedra trifurca), and Apache plume (Fallugia paradoxa).

2.1.13.2 Wildlife

Castner Range provides habitat for a diverse association of wildlife. The major mammal species are listed on Table 2.1-6. Many Bird species reside in Castner Range or migrate through the area in moving between winter and summer grounds. Table 2.1-7 presents a listing of the bird species that are frequently observed during at least part of the year. There are also numerous reptile species that inhabit Castner Range. Table 2.1-8 provides a list of the reptile and amphibian species that have been observed, or are thought to be present at Castner Range.

Table 2.1-6
Major Common Mammals
Inhabiting Castner Range

Common Name	Scientific Name
Mule Deer	Odocoileus hemionus
Barbary Sheep (introduced)	Capra ibex
Mountain Lion	Felis concolor
Coyote	Canis latrans
Bobcat	Lynx rufus
Grey Fox	Urocyon cinereoargenteus
Kit Fox	Vulpes macrotis
Badger	Taxidea taxus
Skunk	Mephitis mephitis
Cottontail Rabbit	Sylvilagus floridanus
Black-tailed Jackrabbit	Lepus californicus
Ring Tail	Bassariscus astutus

Source: Archives Search Report, Fort Bliss, Castner Range (U.S. Army Corps of Engineers, St. Louis District, 1994).

FTBL-5.A.4
Parsons Engineering Science, Inc. OE Characterization and Cost Analysis Report for Fort Bliss: Castner Range. May 1998.
pg. 2-55.

defense sites. The methodology has been applied to over 30 OE sites throughout the United States.

2.3.2 There are two future land use scenarios being considered for Castner Range. Scenario 1 involves deeding the entire site to the State of Texas as an annex to the Franklin Mountains State Park. Under scenario 2, the eastern flat area of Castner Range would be retained by Fort Bliss for commercial/residential development, and the western mountainous areas of Castner Range would be deeded to the State of Texas for an annex to the Franklin Mountains State Park. The OECert analysis was performed on eleven separate zones at Castner Range based on the zones established in the 1995 study by CMS (Figure 2.2-3). For the evaluation of scenario 2, the eleven zones are grouped into two regions based on geography and potential land use. Region 1 consists of the eastern portions of zones 2, 5 and 7 plus all of zone 11. This region includes the relatively flat eastern areas of Castner Range, where commercial/residential development is a potentially viable future land use. Region 2 includes the western areas within the Franklin Mountains where the only future land use being considered is an extension of the Franklin Mountains State Park (CMS zones 1, 3, 4, 6, 8, 9, 10, and the western portion of zone 2, 5, and 7). The locations of the two regions are shown in Figure 2.3-1. Region 1 is approximately 1,932 acres. This region of Castner Range was also considered in 1971 to be feasible for commercial/residential development by the Ad Hoc Committee (Section 2.2.5). Region 2 is approximately 5,149 acres. Because Scenario 1 involves using all of the land at Castner Range in the same manner (conversion to a park), the summary below for Scenario 1 presents the results for the entire range based on the 11 CMS identified zones (Figure 2.2-3). For Scenario 2 the results for each region are presented.

2.3.3 The detailed OECert analysis is presented in Appendix A.

2.3.4 OECert Summary

2.3.4.1 The OECert methodology is designed to prioritize the removal efforts for a set of OE-contaminated sites and to determine a quantitative risk of public and individual exposure to OE at each site. An exposure, as defined by OECert methodology, is based on the proximity of an individual to UXO. This proximity can also be described as the "shadow" of the individual as it crosses over a UXO item. For an exposure to occur, the individual does not have to specifically touch or know the item is present (QuantiTech, Inc., 1998). The OECert model addresses both surface and subsurface exposures. The activities for a site determine the type and amount of surface coverage and subsurface intrusion by the participant. For example, hiking is an activity that has no intrusion component, whereas child play is an activity that includes both surface and subsurface intrusion components. The prioritization is based on a cost-effectiveness measure, defined as the maximum risk reduction achieved for each dollar spent on the removal effort. The public exposures to OE used in OECert result from individuals performing specific activities (both recreational and occupational) within OE contaminated areas. The expected number of surface OE exposures per participant in an area is dependent on the OE density, the proportion of OE on the surface, and the activity participant's exposure area (the area traversed by an individual while performing an

FTBL-5.A.5
Parsons Engineering Science, Inc. OE Characterization and Cost Analysis Report for Fort Bliss: Castner Range. May 1998.
pg. 4-7.

WARNING ● DANGER
FORMER
ARTILLERY FIRING RANGE
NO TRESPASSING

Unexploded projectiles or missiles are dangerous. The handling or removal of such ammunition and any other items by unauthorized personnel is prohibited. Violators will be prosecuted under penalities provided by law. Do not remove plants or rocks.

4.2.2.3.4.2 **Fencing**. As with signage, fencing is typically one element of a plan that uses the concept of respect for property rights. Trespass laws are the key element of enforcement and cooperation between landholders, law enforcement, and the general public. These laws are encouraged by other elements of the plan. The link between not trespassing and explosive safety must be made. Fences provide a physical barrier to inadvertent entry. Therefore, it may be easier to enforce trespass strictures. Fencing is only effective with the cooperation of local officials and the community with funding and technical support from the federal government. The federal government owns all of the property at Castner Range. There are no fences at the perimeter or within Castner Range.

4.2.2.3.4.3 **Land Use Restrictions and Regulatory Control**. There are no zoning or land use restrictions within Castner Range. There is little opportunity to limit access through the regulatory control process. Behavior modification can be facilitated through land use controls. Planning boards and zoning commissions have the authority based on state or local law to restrict uses of property in the public interest. Eliminating ordnance contaminated property from unrestricted development may be prudent and beneficial. However, within the majority of Castner Range there are no zoning or land-use restrictions.

4.2.2.3.5 **Notice**. Appropriate notice can exert a strong influence on one's behavior. When notice of ordnance contamination is given, it can affect the expectations of potential users. Appropriate uses can be sought, and the land may still be used for economic gain. However, the contamination must be considered in the design and use of any site improvements or activities. Notices can be placed on a property in at least three ways: deed notification/restriction, notification during any property transfers, and notification during any permitting process. The property within Castner Range has never been sold and is still owned entirely by the federal government. Any future reuse of the land would be subject to the GSA excess land process. The exception to this process may be the potential leasing of portions of the land for development. In either instance, future use of the land may be restricted through the three notice methods.

4.2.2.3.5.1 **Deed Notifications/Restrictions**. Notifications of ordnance contamination and restrictions of use could be placed on the deeds of any properties that

FTBL-6.A.1
Baca, Ron. Site Photos taken at Castner Range MRS. 2001.

Photograph of Castner Range taken in 2001.

FTBL-7.A.1
IT/OHM. Final Interim Control Measures Work Plan Tran Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas. January 2001. pg. 1-1.

FINAL

INTERIM CONTROL MEASURES WORK PLAN
TRANS MOUNTAIN BURIED DRUM SITE (FTBL-070)
CASTNER RANGE
FORT BLISS, TEXAS

Prepared for

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January 2001

TERC No. DACA56-94-D-0020, TO No. 0062
IT/OHM Project No. 783981

FINAL
INTERIM CONTROL MEASURES WORK PLAN
TRANS MOUNTAIN BURIED DRUM SITE (FTBL-070)
CASTNER RANGE
FORT BLISS, TEXAS

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INTERIM CONTROL MEASURES WORK PLAN
TRANS MOUNTAIN BURIED DRUM SITE (FTBL-070)
CASTNER RANGE
FORT BLISS, TEXAS

1.0 INTRODUCTION

IT Corporation/OHM Remediation Services (IT/OHM) has been contracted by the United States Army Corps of Engineers (USACE), Tulsa District, for the implementation of interim control measures at the Trans Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas. The USACE scope of work is included as **Appendix A**. The work is to be performed under the Total Environmental Restoration Contract (TERC) Number DACA56-94-0020, Task Order No. 0062. This **Interim Control Measures Work Plan (ICMWP)** describes the work activities to be implemented to control the tar-like material and asphalt to protect human health and the environment, and also includes site delineation activities to estimate the quantity of tar-like material for final remedial activities. The interim control measures will include removal of surface tar-like and metal materials.

1.1 Site Location/History

The Trans Mountain Buried Drum Site, designated FTBL-070, covers approximately 6 acres of the approximately 7,040-acre, inactive Castner Range at Fort Bliss, Texas. FTBL-070 is an Environmental Restoration, Army (ER,A)-funded Hazardous, Toxic and Radioactive Waste (HTRW) site. The general vicinity of Castner Range is shown in **Figure 1-1**. The site is situated on an alluvial fan adjacent to the east side of the Franklin Mountains. The site is located approximately 2,000 feet from a four-lane highway and approximately 3,000 feet from the Wilderness Park Museum and Border Patrol Museum. **Figure 1-2** shows the location of the site. Access is poorly controlled and the site is subject to trespassing by the public despite warning signs and Fort Bliss enforcement efforts.

The history of the site is not well known. The Castner Range served as a small arms firing course and artillery firing and impact area from 1926 to 1966. Preliminary information derived from the ordnance and explosives (OE) cleanup of Castner Range indicates the Army may have operated a rock crusher at this location. The site is covered with concrete slabs, asphalt pavement, piles of concrete and metal debris, piles of asphalt pavement material, drums containing tar-like material, and buried 55-gallon drums. Tar-like material exists in the central portion of the site along with buried drums.

1.2 Work Plan Organization

The **ICMWP** is organized into the following sections:

- **Section 2.0** discusses previous investigations and findings
- **Section 3.0** describes the interim control measures and site delineation activities by task
- **Section 4.0** presents the project organization
- **Section 5.0** provides the proposed project schedule
- **Section 6.0** lists the references

FTBL-7.B.1
IT/OHM. Final Response Action Completion Report Trans Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas. November 2002. pg. ES-1.

FINAL

RESPONSE ACTION COMPLETION REPORT
TRANS MOUNTAIN BURIED DRUM SITE (FTBL-070)
CASTNER RANGE
FORT BLISS, TEXAS

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TERC No. DACA56-94-D-0020, TO No. 0062
IT/OHM Project No. 783981

November 2002

DRAFT

RESPONSE ACTION COMPLETION REPORT
TRANS MOUNTAIN BURIED DRUM SITE (FTBL-070)
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RESPONSE ACTION COMPLETION REPORT
TRANS MOUNTAIN BURIED DRUM SITE (FTBL-070)
CASTNER RANGE
FORT BLISS, TEXAS

EXECUTIVE SUMMARY

This report documents the completion of a remedial action at the Trans Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas. IT Corporation/OHM Remediation Services (IT/OHM) performed the work for the United States Army Corps of Engineers (USACE), Tulsa District, under the Total Environmental Restoration Contract (TERC) Number DACA56-94-0020, Task Order No. 0062. The project was performed in accordance with the ***Final Remedial Action Plan, Trans Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas*** (IT/OHM, 2001a).

The site is located within the boundaries of the Castner Range of Fort Bliss. Organized firing of small arms and artillery was performed at the Castner Range from 1926 to 1966. The Trans Mountain Buried Drum Site occupies approximately 6 acres of the 7,040-acre Castner Range. The history of the Trans Mountain Buried Drum Site is not well known, although information indicates that the U.S. Army may have operated a bituminous concrete patching operation at the site. Geophysical and subsurface investigations performed at the site from 1997 to 2001 identified tar flows on the surface of the site and buried occurrences of tar and metal debris, including 55-gallon drums. As part of an Interim Control Measures conducted in January 2001 by IT/OHM, tar and associated metal debris were removed from the ground surface and Tier 2 protective concentration levels (PCLs) were established for the chemicals of concern (COCs) identified at the site according to Texas Natural Resource Conservation Commission (TNRCC, 1999). The COCs and respective PCLs were established according to TNRCC guidelines and include semivolatile organic compounds (SVOCs) and organophosphorous pesticides. Based on the results of previous investigations, a Remedial Action Plan (RAP) was prepared by IT/OHM and approved by the TNRCC (IT/OHM, 2001a).

In June/July 2001, IT/OHM performed a remedial action according to the RAP for the purpose of obtaining site closure. The remedial action consisted of removing approximately 984 cubic yards of asphalt/construction debris from the surface, removing three shallow utility pipes, and removing tar, metal debris, and associated soil from the subsurface. The subsurface occurrences of tar and metal debris were excavated from three locations to a maximum depth of approximately 11 feet below ground surface (bgs) over a total surface area of approximately 12,000 square feet. Following removal, 11 composite soil samples were collected from the limits of the excavations and analyzed for the target COCs to confirm the removal of soils with COC concentrations exceeding the established PCLs. Visual observations and analytical results for the soil samples indicated that materials with COC concentrations exceeding the established PCLs were sufficiently removed from the subsurface. The materials removed from the surface and subsurface were disposed of as non-hazardous waste at Camino Real Landfill in Sunland Park, New Mexico. The site was restored by backfilling the excavations with surrounding soil and grading the affected areas in order to create a natural arroyo that conformed to the natural topography.

No further work regarding additional remedial action is recommended.

FTBL-7.B.2
IT/OHM. Final Response Action Completion Report Trans Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas. November 2002. pg. 2-1 – 2-2.

2.0 PROJECT BACKGROUND

The project background includes a summary of previous investigations performed to evaluate the nature and extent of contamination at the site, implementation of interim control measures, and development of cleanup criteria.

2.1 Previous Investigations

In 1994, an ordnance removal contractor discovered a large surface flow of tar material and 55-gallon drums at the site. Based on this discovery, site investigations were conducted by Golder Associates and IT/OHM. Following the initial investigations, IT/OHM implemented interim control measures and performed additional site delineation activities. The investigations are summarized below.

2.1.1 Golder Site Investigation

From late November 1997 to February 1998, Golder Associates conducted a site investigation to evaluate if surface or subsurface contamination was associated with the tar flow and drums. The investigation included an archival study, geophysical survey, soil gas survey, backhoe trenching, drilling, and soil sampling. The procedures and results of the investigation are presented in the ***Final Site Investigation, Trans Mountain/Castner Range, Buried Drum Site, Fort Bliss, Texas*** (Golder Associates, 1998). Findings of the investigation are summarized as follows:

- The geophysical survey and backhoe trenching identified several subsurface anomalies containing tar and metal debris, dominated by a large trench approximately 30 to 40 feet wide and 250 feet long.

- Twenty soil-gas samples were collected from 3.5 to 10 feet below ground surface (bgs) at various locations within and surrounding the anomalies, for analysis of volatile organic compounds (VOCs). No VOCs were detected.

- Numerous surface and subsurface soil samples were collected from trenches and soil borings to 30 feet bgs. The soil samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), metals, pesticides, polychlorinated biphenyls (PCBs), and total recoverable petroleum hydrocarbons (TRPH). Analytical results indicated that a few VOCs and SVOCs were detected; however, their occurrences were attributed to laboratory contamination. Arsenic, chromium, and lead were the only metals detected. Low TRPH concentrations were detected in a few samples. No pesticides or PCBs were detected in any of the samples.

- The report concluded that no immediate or high degree of risk to human health and the environment appeared to be present. Additional geophysical work and soil sampling were recommended prior to removal activities.

2.1.2 IT/OHM Investigations

In 1999, IT/OHM collected samples of the tar material and asphalt construction debris for waste disposal characterization in accordance with the ***Final Sampling and Analysis Plan for Restoration of the Trans Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas*** (IT/OHM, 1999). The samples were analyzed by the toxicity characteristic leaching procedure (TCLP) for VOCs, SVOCs, pesticides, ignitability, and metals. Analytical results indicated that the materials were non-hazardous.

In 1999, IT/OHM subcontracted J. K. Wagner and Company to perform an archival study to determine historical operations at the site. The study concluded that the 815th Engineer Battalion conducted asphalt operations from January 1960 through 1963 at the Trans Mountain Buried Drum Site (Wagner, 1999). In addition, the study showed that other burial areas may be to the northwest (1 area), southeast (3 areas), and the southwest (1 area) of the identified surface tar flow.

2.1.3 Unexploded Ordnance Surveys at the Castner Range

Unexploded ordnance (UXO) surveys were performed at the Trans Mountain Buried Drum Site and the Open Burn/Open Detonation (OB/OD) Pit B-1 Site at the Castner Range on three occasions, between August 1999 and July 2001. In August 1999, the northern and northwestern boundaries of Castner Range were surface swept and cleared concurrent with boundary fence installation to provide control of unauthorized access to the range from the north. The Trans Mountain Buried Drum Site was surface swept and cleared in January and June/July 2001, prior to performing the interim control measures and remedial activities described in **Sections 2.1.4** and **3.0**, respectively. The site map with geophysical interpretations shows locations of geophysical anomalies relative to permanent site features. The area of the sweep is defined in the ***Final Surface Geophysical Survey Report*** (IT, 2001). In June 2001, the OB/OD pit B-1 was cleared to one-foot depth. The access road between the OB/OD pit B-1 and the staging area located 250 feet east of the pit was cleared to a depth of approximately 2 feet. The UXO surveys are summarized below.

Work Area	UXO Results
10 foot wide, 8,290 foot long fence line cleared along the northern Castner Range boundary (starting at southwest corner of housing development).	No ordnance encountered
10 foot wide, 4,875 foot long fence line cleared south from the northwestern boundary beginning at the northwest corner of the Castner Range.	No ordnance encountered
Trans Mountain Buried Drum Site 4.78 acre work site and support area cleared.	No ordnance encountered
60 foot deep by approximately 250 foot long arroyo cleared south of the Trans Mountain Buried Drum Site.	One 105 millimeter projectile
Access road cleared from Trans Mountain Highway to the Trans Mountain Buried Drum Site.	Two 2.36 Rocket Motors
OB/OD Pit B-1 Site cleared, including the access pathway from the northeast corner of the Castner Range and the soil staging area.	No ordnance encountered

2.1.4 Interim Control Measures

In January 2001, IT/OHM performed interim control measures in accordance with the ***Final Interim Control Measures Work Plan, Trans Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas*** (IT/OHM, 2001b). Procedures and results of the interim control measures are presented in Section 3.0 of the ***Final Remedial Action Plan, Trans Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas*** (IT/OHM, 2001a). The interim control measures are summarized as follows:

- Tar, asphalt, and metal debris, as shown in **Figure 2-1**, were removed from the ground surface. Based on the 1999 waste characterization results, the materials were disposed of as non-hazardous waste at a permitted landfill.

FTBL-7.B.3
IT/OHM. Final Response Action Completion Report Trans Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas. November 2002. pg. 3-1.

3.0 REMEDIAL ACTION ACTIVITIES

To achieve regulatory cleanup goals in support of site closure, remedial action activities were performed in June and July 2001. The scope of work to remediate the site is summarized as follows:

- Clear UXO from the work area and access road, as described in **Section 2.1.3**.
- Develop temporary egress/ingress for the site consistent with efforts to control trespassers and maintain the aesthetics of the area.
- Excavate at the locations of the geophysical anomalies to remove tar/asphalt materials, metal drums, and buried piping. Remove surface asphalt construction debris from the site.
- Collect soil samples at selected locations and analyze the samples for COCs to confirm removal of materials with chemical concentrations exceeding Tier 2 PCLs.
- Dispose of generated wastes removed from the surface and subsurface of the site. Perform site restoration to prevent erosion of impacted areas.
- Prepare this completion report to describe and document the remedial action.

Procedures and results of the remedial action are described below under the following tasks. Work was conducted in accordance with the ***Final Remedial Action Plan, Trans Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas*** (IT/OHM, 2001a). Deviations from the plan were submitted for USACE approval on scope of work clarification forms. The approved scope of work clarifications are contained in **Appendix A**. Photographs of the remedial activities are presented in **Appendix B**.

3.1 Task 1 – Mobilization and Site Set-Up

In June 2001, IT/OHM mobilized work crews and equipment to the site. Support and exclusion zones were established. An office trailer/storage building was set up in the support zone. Equipment and personnel decontamination areas were constructed adjacent to the support zone. Access to the site was through an existing gated entrance on the north side of Trans Mountain Road, immediately east of the entrance to the Border Patrol Museum. The remediation work area layout is shown on **Figure 3-1**. The following equipment was mobilized to the Trans Mountain Buried Drum Site:

- 3 pickups
- 1 backhoe
- 1 loader
- 1 track excavator
- 2 water trucks
- 1 bulldozer
- 1 vibratory roller/compactor
- office trailer
- rolloff trucks subcontracted from Rhino Environmental Services, Inc., to transport non-hazardous tar/soil and asphalt construction debris
- miscellaneous tools and supplies

FTBL-7.B.4
IT/OHM. Final Response Action Completion Report Trans Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas. November 2002. pg. 3-6.

No connections were observed at either end of the pipes. No visible evidence of contamination was noted in the soils surrounding the pipes.

3.2.3 Asphalt Construction Debris Removal

IT/OHM removed approximately 984 cubic yards of asphalt construction debris from the slope of the arroyo immediately south of the site (**Figure 3-2**). The debris was removed using an excavator positioned on the top edge of the slope. A water mist was applied from a water truck during removal of the asphalt construction debris to control dust emissions. The debris was transferred directly into lined dump trucks positioned near the area and transported to a landfill for disposal. Disposal of the asphalt construction debris is discussed in **Section 3.4**.

3.3 Task 3 – Confirmation Soil Sample Collection and Analysis

Following the excavation and removal of tar and metal drums at anomalies A-1, A-2, and A-3, soil samples were collected. A total of ten composite soil samples were collected from the bottom of the excavations to confirm the removal of soil with COC concentrations above PCLs. Soil samples were collected and handled according to the procedures described in the Chemical Data Acquisition Plan, Appendix I of the RAP (IT/OHM, 2001a). Each composite sample consisted of five sample points; a center point and four corners. One quality control (QC) sample was also taken.

The composite soil samples were analyzed for SVOCs by U.S. Environmental Protection Agency (USEPA) SW-846 Method 8270C and organochlorine pesticides by USEPA SW-846 Method 8081A (USEPA, 1996). The laboratory analytical data reports for the composite confirmation soil samples are presented in **Appendix C** and the results are summarized in **Table 3-1**. The composite soil sample locations are shown in plan view and cross-sectional view in **Figures 3-2** and **3-3**, respectively.

Upon receipt, the analytical results were evaluated and compared to the established PCLs. A matrix interference problem was encountered in sample FTCL070-A2CS08, resulting in SVOC detection limits above PCLs. In response, an additional 0.5 feet of soil was excavated from the grid area where composite sample FTCL070-A2CS08 had been collected. Following excavation, an additional composite sample (same identification number) was collected from the grid area. The sample was analyzed for SVOCs by USEPA SW-846, Method 8270C. No SVOCs were detected in the sample. Final evaluation of the analytical results indicated that soil remaining in the subsurface did not contain COC concentrations above Tier 1 PCLs, demonstrating that the remedial action fulfilled clean closure requirements.

The project chemist evaluated the soil sample analytical data for precision, accuracy, completeness, representativeness, and comparability. The evaluation concluded that the analytical data are acceptable. The Data Evaluation Report is presented in **Appendix C** with the laboratory analytical data reports. In addition, the data were validated by the USACE.

3.4 Task 4 – Waste Management

Characterization, transportation, and disposal of the waste streams generated during the project are described in this section. The waste streams included soil mixed with tar and metal drums, metal piping, and asphalt construction debris. **Table 3-2** provides a waste stream characterization and disposal summary.

FTBL-7.C.1
IT/OHM. Final Addendum #1 Remedial Action Plan OB/OD Pit B-1 Site (FTBL-072), Castner Range, Fort Bliss, Texas. May 2001. pg. 2-1.

FINAL
ADDENDUM #1
REMEDIAL ACTION PLAN
OB/OD PIT B-1 SITE (FTBL-072)
CASTNER RANGE, FORT BLISS, TEXAS

to the *FINAL*
REMEDIAL ACTION PLAN
TRANS MOUNTAIN BURIED DRUM SITE (FTBL-070)
CASTNER RANGE, FORT BLISS, TEXAS

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TABLE OF CONTENTS
(Continued)

ATTACHMENT

2.0 PREVIOUS INVESTIGATIONS/STUDIES AND FINDINGS

2.1 Summarization of Data

Sampling was performed at the OB/OD Pit B-1 Site in December of 1996 by the Fort Worth District, USACE to collect chemical data for a Department of Defense Relative Risk Site Evaluation. Four surface soil samples were collected from outside the pit. The Texas Natural Resource Conservation Commission's (TNRCC) Risk Reduction Rules were used as the regulatory framework at the time, and the property was evaluated under Risk Reduction Standard 2 (RRS2). The results indicated that no volatile organic compounds (VOCs) were detected. Lead was detected at concentrations up to 17,426 milligrams per kilogram (mg/kg), which exceeds the medium specific concentrations (MSCs) for groundwater protection, and inhalation and ingestion. The MSCs are possible regulatory clean-up levels presented in the Risk Reduction Rules (30 Texas Administrative Code, Chapter 335, Subchapter S). Barium, cadmium, and chromium, were detected above calculated Fort Bliss background levels and RRS2 MSCs. The explosives (2,4-dinitrotoluene and 2,6-dinitrotoluene) were also detected above Tier 1 soil and groundwater protective concentration levels (PCLs).

Malcolm Pirnie, Inc. performed sampling at the OB/OD Pit B-1 Site in November 1999 to determine the nature and extent of constituents present. Metals, semivolatile compounds and explosives were detected above RRS2 MSCs. Lead was detected at concentrations up to 12,100 mg/kg as documented in the ***Interim Report Environmental Site Assessment for Fort Bliss OB/OD Pit B-1*** (Malcolm Pirnie, 2000).

Figure 2-1 shows the sampling locations and constituents of concern at the OB/OD Pit B-1 Site. A summary of analytical results are shown in **Table 2-1**.

2.2 Regulatory

Between the time of the first investigation in 1996 and the 1999 investigation, TNRCC developed the Texas Risk Reduction Program (TRRP) to replace the Risk Reduction Rules. In 2000, a decision was made to close the site under the new TNRCC TRRP. Malcolm Pirnie prepared an APAR (Malcolm Pirnie, 2001). The analytical results from the 1999 investigation were compared to TRRP PCLs. Soil samples contained concentrations of lead, 2,4-dinitrotoluene, and 2,6-dinitrotoluene that had exceeded the Tier 1 soil and groundwater protective PCLs. No Tier 2 PCLs were calculated. Tier 3 PCLs were calculated for these constituents. The Tier 3 model used for the calculations has been approved by the TNRCC's document, ***Risk-Based Corrective Action for Leaking Petroleum Storage Tank Sites*** (TNRCC, 1994), which has been used for other Fort Bliss sites. The APAR determined the constituents of concern (COCs) that had exceeded the Tier 3 PCLs to be lead, 2,4-dinitrotoluene, and 2,6-dinitrotoluene.

2.3 Remedial Action Plan

The APAR determined an area where the COCs exceeded the Tier 3 PCLs. This is the area that will be initially excavated for this remedial action. Post-excavation sampling will be conducted to confirm the soils containing COCs above the PCLs have been removed. Excavation will continue until post-excavation confirmation sampling indicates soils with COCs above the PCLs have been removed.

FTBL-8.A.1
Ramirez, Christina. El Paso Times. Military training device causes bomb scare. 27 June 1999.

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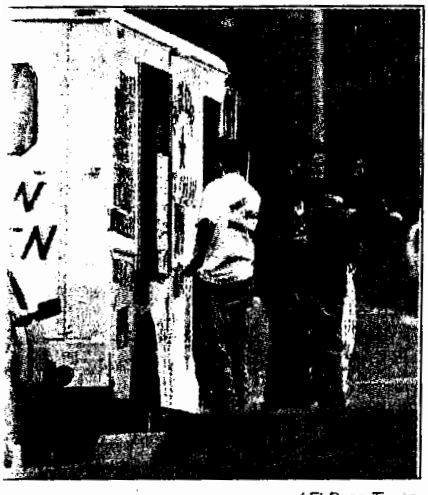
into providing a service for an additional fee.

"You can't be a human being and not be concerned. It touches every one of us because one day we will all be there, whether in McGill or a private cemetery," said Rosie Zarate, outreach coordinator for Keep El Paso Beautiful.

The cemetery is maintained by the county road and bridge department, volunteers and probationers.

Dorcas Wilkinson lives two blocks from the cemetery and helps to keep it clean.

Wilkinson said when the county chose the land, it was far away from the city limits. The cemetery used to be full of trash and weeds, some as high as four feet. Now the dusty field is clean and quiet.



/ El Paso Times

left, Juan Ramirez and Anthony Hino-
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mornings between 6 and 10, or in the evenings between 5 and 7.

"It's about picking the right time and the right amount," Corbin-Tardif said. "Less more often is better than more at once."

She suggested gardeners water three times a week for 10 to 15 minutes in the morning and then again in the evening.

Corbin-Tardif also warned gardeners not to water plant foliage because the increased heat will burn the leaves.

Paso needs to annex land to the northwest to protect its interests in the water in the area and to be able to ensure proper development and growth. City planners and lawyers are studying the proposal as part of an overall expansion plan for El Paso, a plan that also includes parts of the East Side.

If the two towns did annex land in their extraterritorial jurisdiction, or ETJ, it wouldn't affect what El Paso can do with the proposed northwest annexation area, said Rudy Valdez, city planner.

"Because we're a home-ruled city, they can't expand their ETJ or overlap it onto ours without our permission," Valdez said.

Cities in Texas have

Sylvia Bohlson, an office manager and 20-year resident of Green Acres.

Vinton could annex Johnson's 55-acre community because it is within Vinton's extraterritorial jurisdiction, the half-mile beyond Vinton's village limits, Monrreal said.

"And that's not the only area requesting us to annex," he said. "The owners of a 65-acre farm north of Vinton Road have approached us, too, and we're getting requests from almost all the people that are on the west side of Bosque Road."

The extraterritorial jurisdiction areas of Vinton and Anthony are excluded from the area El Paso is considering

Please see **Annexation** 6B

Military training device causes bomb scare

By Christina Ramírez
El Paso Times

An off-duty officer with the El Paso Police Department was enjoying a bike ride with his son early Saturday when he discovered what appeared to be a military explosive near U.S. Highway 54.

As a result, police closed the highway from Sun Valley to Kenworthy for almost four hours as the bomb squad investigated what was first described as an older-style rocket-propelled grenade.

However, it turned out to be something much less dangerous.

Fort Bliss spokesman Capt. Andrew Mutter said the 741st Explosive Ordnance Device Unit from Fort Bliss determined the object was a practice training device from the 1940s.

"It was a bazooka round with no explosives, basically a big chunk of metal that was used for practice," Mutter said. "The (detachment) took it back with them, which is routine."

Mutter said the bazooka was used until the 1950s and was then replaced by the Light Antitank Weapon, or LAW.

Mutter said the area where the device was found is full of explosives.

Sgt. Albert Madrid, commander of the police Northeast Regional Command's patrol day shift, said the closing was a precaution because the device had to be treated as any other possible explosive.

Roger St. Cyr, 79, a 29-year resident of Northeast El Paso, lives four blocks from the U.S. 54 and Kenworthy exit. He said traffic was so heavy near his home during the incident that he could hardly get out of his driveway.

"I was curious to see what was going on," St. Cyr said. "Now that I know it was for everyone's own good, I don't really mind."

Madrid said the device appeared to have washed down from the mountain, probably during the recent rains. It was intact but had noticeable rust damage, which led Madrid to feel think it might be inactive.

"We called the Fort Bliss EOD (Explosive Ordnance Detachment) Unit to come identify it and help us determine if it was live," Madrid said. The unit helped the bomb squad take X-rays of the device and then examine the pictures.

El Paso Times June 27 1999

FTBL-9.A.1
Perez, Daniel. El Paso Times. New threat menaces Castner – roving cattle. 25 February 1999.

Meeting tonight at the El Paso Community College Transmountain Campus, 9570 Gateway North.

The meeting will be from 5:30 to 7 p.m. and is open to the public.

– Erin Flores-Ritter

► Policeman hit; driver charged: Officer Eduardo Tarin, 26, of the Northeast Regional Command, was released from Providence Memorial Hospital Wednesday morning after the police cruiser he was driving was hit by an alleged drunken driver.

Tarin and his partner, Officer Mark Fernández, were driving south in the center lane at 9400 Dyer, police said. Joseph Thomas Jr., 58, of the 4800 block of Maureen allegedly made a left turn into the officers' path at 12:50 a.m. Wednesday, police reported.

Tarin was treated for a severely sprained ankle. Fernández was not injured. Thomas, who suffered facial injuries, was charged with intoxicated assault.

– Christina Ramirez

Today in history

FEB. 25

1953: Fire destroys most of the community of Clint.

1957: Buddy Holly and the Crickets travel to Clovis, N.M., to record "That'll Be the Day." Holly was killed in an airplane crash in January 1959.

The El Paso Times publishes this daily look back to celebrate the millennium.
Librarian: Judy Soles McMillie, 546-6179.

100 years ago today

El Paso Times

Feb. 25, 1899

Suspect ruled insane

Three doctors ruled that Miguel Avillos was insane and could not be held responsible for the 1895 slaying of his brother-in-law, A.J. Wells. It was expected that Avillos would be sent to an asylum.

El Paso Times

3-truck accident backs up I-10

By Christina Pino-Marina
El Paso Times

A wreck on Interstate 10 involving three trucks Wednesday resulted in minor injuries to a driver and a 20-minute shutdown of westbound traffic lanes, police said.

The accident occurred at 11:10 a.m. where Interstate 10 crosses over Cotton Street, and was caused by a yellow truck that had stalled in the middle lane of the freeway, said police Officer T.J. Gaytan. The truck was part of a transport company called Transportes Rio Grande.

Another truck, a blue tractor without a trailer, swerved to avoid crashing into the stalled truck, sideswiping a full-sized tractor-trailer in the left-hand lane, Gaytan said.

"Luckily, no one was seriously injured," said Gaytan, who made the initial police report. "It sure caused one heck of a backup, though."

Westbound traffic lanes were completely closed for about 20 minutes, Gaytan said, and three of the five lanes remained closed for an hour and a half. Seven police cars and three police motorcycles went to the scene.

No charges were filed against any of the drivers, said Traffic Commander Lt. Roy Davis. He said a lack of independent witnesses and physical evidence, such as gauges or skid marks, were factors in the decision not to charge drivers.

Police said the driver of the stalled truck, 33-year-old Felipe Barrera, suffered no injuries. The second driver, 47-year-old Luis Mauricio, had minor injuries from broken glass and was sent to Thomason Hospital. The driver of the tractor-trailer, 45-year-old Michael Weiss, was not injured.

Trucks are involved a sizable portion of accidents across the United States each year. Statistics from a 1977 National Highway Traffic Safety Administration report show that 4,777, or 11 percent of all reported motor vehicle accidents, involved heavy trucks.

Transportation and business officials in El Paso are considering a proposed Northeast Parkway, a connection of Loop 375 near Railroad Drive to the Anthony Gap in New Mexico. The connection could divert traffic, especially heavy trucks, from Interstate 10.

Freeway drivers are encouraged to stay alert, Gaytan said. I
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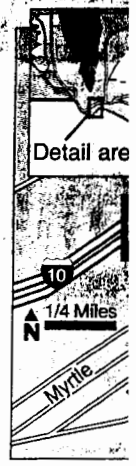


New threat menaces Castner — roving cattle

By Daniel Perez
El Paso Times

When most people think of danger at Castner Range, they think of unexploded ordnance. This year, the danger includes cow pies.

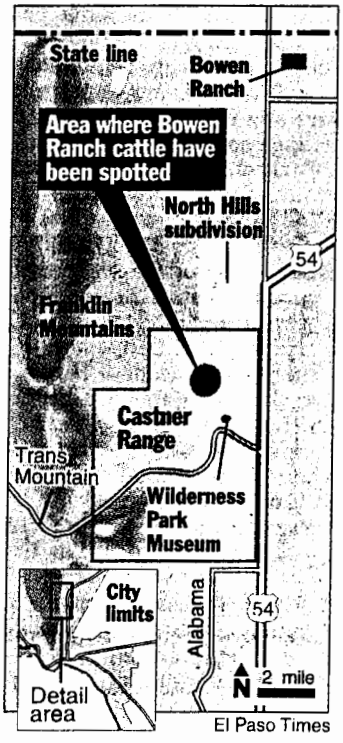
Cows from Bowen Ranch have been leaving the ranchland and venturing past the North Hills neighborhood, through the range and onto land belonging to the city's Wilderness Park Museum, creating their own trails of destruction and droppings.

"They've torn up a Mexican elder (tree), eaten the cacti and left their calling cards," said a frustrated Marc Thompson, provisional museum director. "Visitors come here to walk the trails and see the rabbits and coyotes, not animal droppings."

The museum is on a small part of Castner Range, and people don't always stick to its safe paths through the desert. The military used Castner Range for small arms, explosives and field artillery starting in 1926. Several people have died in the area from unexploded ordnance, but no serious injuries have been recorded since the 1970s.

The military tries to remind the public every spring that the range's pristine beauty disguises the potential dangers. Also, a recent post environmental impact

Please see **Cattle** 4B



El Paso Times

PARKS: 2 PR

Northeast look

By Daniel Perez
El Paso Times

Ronnie Carreon navigated the native vegetation and debris that cluttered a vacant lot in Northeast El Paso as if he were a basketball player splitting a defense on a drive to the basket.

Carreon, who loves to shoot hoops, will have that opportunity on that site in about a year.

The planned $1.9 million Nolan Richardson Community Center near the northeast corner of Maxwell and Gateway North could break ground this summer and should be completed in about 10 months. The city's Parks and Recreation Department will submit plans for bid late next month.

"I've always wanted more stuff to do around here," Carreon said on his way to a convenience store. He lives about two blocks away and usually cuts through the lot, which is covered with poppies, brush and trash. "It looks ugly the way it is."

The center isn't the department's only major project in the Northeast. It also plans to start an extensive renovation of Rae Gilmore

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endangering a child.

She remained in jail Wednesday under $18,000 bond. Police said she was on probation on a charge of injury to a child.

According to the police account, Rivera rammed her 1995 Chevro- rested.

Rivera had a 2-year-old child unsecured in the front seat of her vehicle when she was arrested, police said.

The Paiz family reportedly didn't know Rivera.

practice required by law to serve as a county court-at-law judge. A court agreed. Scolaro ... a meeting Friday.

As a magistrate, S... resume hearing arr...

Police search for origin of bomb

Associated Press

LAS CRUCES – Investigators Wednesday were sifting through papers that were left with a powerful pipe bomb found at a motel.

The bomb was discovered Tuesday afternoon in a plastic bag in a garbage can outside the motel, police Sgt. Joel Cano said.

The bomb, found by the motel manager, forced the evacuation of the motel, which has about 40 rooms, Cano said.

The Doña Ana County Sheriff's Department bomb squad was called in to neutralize the bomb with a water cannon, he said.

There were no injuries or property damage, Cano said.

Besides the papers, the bag contained enough components – including blasting caps and fuse – to make five more pipe bombs, he said.

"Hopefully, those other papers might yield information as to who rented the room – maybe a receipt or a credit card slip," Cano said.

The blasting caps and other bomb components were being analyzed by bomb technicians, he said.

Cattle

Continued from 1B

statement reported that trespassing by people, vehicles and livestock was destroying the range's natural and cultural resources.

Some visitors destroy native vegetation by taking off-road vehicles onto the range. Others just steal the cacti.

Sixty-seven bilingual signs along the range perimeters were put up almost 10 years ago to warn people about the dangers of the range and discourage them from entering the more than 7,000 acres that remain contaminated from 40 years of being a firing range.

But the military excuses the cows for not reading the signs.

Officials at the museum, 4301 Trans Mountain, have documented the damage since December 1997 and said they have tried to get the other parties involved – El Paso Public Service Board, Fort Bliss and the Bowen Ranch – to solve the problem.

Thompson pushed the cow issue Feb. 9 at the Fort Bliss Restoration Advisory Board meeting at the museum. Post representatives told the PSB's land manager that they'd try to settle the issue with ranch owner Jimmy Bowen.

Bowen did not return several telephone calls for comment.

The problem began after houses began to be built in the North Hills area, said Jean Offutt, post spokeswoman. The fences Bowen erected were torn down by vandals. The openings allowed the cows to leave the ranch.

"We're still trying to resolve it," she said.

The PSB, which leases several thousand acres to Bowen, said that part of the lease agreement calls for land improvement such as fences.

"I don't know about the integrity of the ones on the (property's) south side and their ability to secure the cattle," said Ed Archuleta, general manager of El Paso Water Utilities. "I've told our people to look into it. I don't think it's a serious problem, but something needs to be done."

On Castner Range, the military has identified 11 main entry points into the range and are studying alternatives to block them to lessen the amount of plant poaching, illegal dumping and erosion. Ideas include placement of large boulders or concrete barriers at the favored openings.

Northeast resident Mike Uzeta was at one of the most-used entrance points to the range off Trans Mountain Road Friday morning to make his usual 20-minute run along a worn dirt trail.

"I've run here for years," he said beneath one of the no-trespass signs. "No one bothers you. You stay on the roads and watch the cattle and deer."

He said many people choose to ignore the signs and will be safe as long as they follow the trails.

Texas

Committee delays school testing bill

AUSTIN – After hearing concerns from fellow lawmakers, Senate Education Committee Chairman Teel Bivins delayed action Wednesday on a bill that would require public school students to take more state tests to be promoted to the next grade level.

"I want to give us a chance to ... see if there are any other changes or amendments we may want to make in committee," said Bivins, R-Amarillo, who expects another look at the measure next week.

The testing bill is SB103.

Family planning helps predators, activists say

AUSTIN – Waving condom-filled bags stamped with red symbols against sexual predators, anti-abortion activists on Wednesday accused family-planning groups of encouraging minors to have sex.

The activists urged legislators to stop the flow of state money to groups such as Planned Parenthood. "Planned Parenthood supports the right of children to engage in sexual activity, and our schizophrenic laws allow such groups to serve as accomplices to child sexual assault by providing minors with contraceptive devices and drugs," Anne ... spokeswoman for the ... ly Research Center, to... activists on the Capito...

Margot Clarke, spo... for Planned Paren... Austin, defended the d... of safe-sex packets. "It ... understand how it triv... if it has explicit infor... the danger of HIV an... people to practice ... Clarke said.

In other news:

▶AUSTIN – A $96 ... emergency spending bil... ranging from boll weev... tion to child protectiv... has been approved by ... Senate. The bill, which ... 0 Wednesday and go... House, includes more ... million from the state ge... enue fund. Most of the ... spending is from matchi... funds for child protectiv... The bill is SB472.

▶AUSTIN – Retired ... could return to the ... without losing retiremen... under a bill introduce... Texas House. Sponsorin... anne White Delisi, R-Ter... she hoped the bill wo... school districts cope with ... shortage of teachers. H... HB1702.

Times wi...

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Court reinstates dr...

By Barry Massey
Associated Press

SANTA FE – New Mexico's highest court on Wednesday reinstated the convictions of Gordon House for the deaths of four people in a 1992 collision that became a tragic symbol of the problem of drunken driving.

The unanimous ruling by the state Supreme Court overturned a decision of the Court of Appeals that had tossed out House's convictions of vehicular homicide and other charges.

It has been more than ... since House drove the wr... on Interstate 40 nea... querque and crashed hea... a car in which Melanie ... and her three young d... were riding.

He was convicted in La... in 1995 after two trials ... ended in deadlock. The La... jury convicted him of fou... of vehicular homicide, on... of causing great bodily ha... one count of reckless drivi...

FTBL-9.B.1
Perez, Daniel. El Paso Times. Officials devise new ways to keep out trespassers. 24 May 1999.

Auditorium on the UTEP campus Sunday, as 60 high-school sophomores chanted that word and other positive phrases at a leadership seminar.

The course is called the Hugh O'Brien Leadership Seminar, which is conducted all over the United States and in some foreign countries.

The UTEP seminar was for sophomores who live in the West Texas area. Only one student per high school is chosen to attend the three-day leadership course. The students are chosen for their outstanding qualities, such as academics, leadership and community service.

"It gave me more self-confidence and leadership qualities," Aguilar said.

She said she was expecting the conference to be boring, but it was anything but unadventerous.

"I met a lot of people, a lot from El Paso who I hope to keep in touch with," Aguilar said.

However, the weekend was much more than a social scene. It was a chance for the students to learn how to become better leaders.

Mayor Carlos Ramirez and city Rep. Luis Sariñana were two of the featured guest speakers Sunday.

El Paso Times 24 May 1999

School, which is about 50 miles south of Midland, said the conference was a great chance to learn and share ideas.

"It's fun to know all the people here care," Flanigan said. He was impressed by the other students because "no one wants to fight you because you feel different."

The Crane student, who is involved in everything from football to acting, said he plans to attend either the University of Texas at Austin or Texas Tech.

Alva Alvarez, a senior from Pecos, returned to this year's seminar as a spirit leader. Alvarez will attend Harvard

ence. I had been to so many other leadership conferences, but none make you feel as welcomed and loved as this one," Alvarez said.

Ivan Rivera, an Ysleta High School junior, also returned as a spirit leader.

"When I came back from the national conference, I knew I wanted to come back," Rivera said.

Rivera was chosen to attend the national Hugh O'Brien conference in Washington last year.

He, along with all the other students, said they had an incredible time at this year's conference.

The athletes will carry the Special Olympics' torch from El Paso to San Antonio.

In San Antonio, they'll meet other law-enforcement officers who will pick up the torch and run to Houston, where this year's Summer Special Olympics Games will kick-off on Friday.

The trek from El Paso to San Antonio is the longest part of the statewide relay and will take the runners nearly four days.

The runners split up the monstrous distance by running three-miles a piece. The officers travel in a caravan of motor homes, driven by Good Sam Club members.

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FORT BLISS: CASTNER RANGE

Officials devise new ways to keep out trespassers

By Daniel Perez
El Paso Times

Trespassers onto Castner Range have been a problem as long as Fort Bliss officials can remember. People continue to use the former military bombing range to jog, hike, and enjoy nature despite the danger of unexploded ordnance.

The Fort Bliss Restoration Advisory Board voted May 18 to create new perimeter signs and to put boulders to block about a dozen key vehicle entry points to the range to prevent some trespassing.

About 30 people attended the group's quarterly meeting at the El Paso Community College Transmountain Campus Conference Center.

Post officials are concerned that people drawn by the area's beauty could find unexploded ordnance – field artillery, explosives and small arms – that was fired into the area for 40 years starting in 1926.

"Nothing will stop people who want to go in," Northeast resident Luis Aguilera said. He goes up to the Cottonwood Springs portion of the range about twice a year to enjoy nature. "It'll be next to impossible."

He agrees that vehicles tear up the terrain. He has seen as much during his climbs when he has seen deer, tarantulas, turtles and a mountain lion as well as running streams and waterfalls after heavy rains.

"To really close that area

El Paso Times

would be terrible," he said. "You almost have a spiritual experience there."

Army officials are especially interested in keeping vehicles and motorcycles off the range because they do the most damage to vegetation. The post has documented 11 key entry points into the range from the corner of Magnetic and Hondo

Please see **Trespassers** 3B

Fence should help keep cattle

By Daniel Perez
El Paso Times

The cattle problem that has troubled Wilderness Park Museum and area highways for several years could be history after Fort Bliss erects a new fence later this year.

The post has appropriated $49,000 for property and unexploded ordnance surveys, and the erection of a wood-and-wire fence along the northern property line southwest of the North Hills subdivision.

Col. Ben Hobson, post garrison commander, announced the plan during last week's Fort Bliss Restoration Advisory Board meeting at El Paso Community College Transmountain Campus. About 30 people, mostly from nature organizations, attended the meeting.

Cattle are among the many trespassers on Castner Range, 7,000 acres that had been used by the Army to fire small arms, explosives and field artillery for 40 years starting in 1926. Some unexploded ordnance remains on the land.

"It should solve the livestock problem," he said of the approximately three miles of fence. "It's the prudent thing to do."

Several people have died in the area from unexploded ordnance, but no serious injuries had been reported since the 1970s.

March Thompson, Wilderness Park Museum director, was pleased with the news. He has documented instances of area cattle that has trampled museum vegetation and left animal droppings.

"I think it's the perfect solution," he said. The museum, 4301 Trans Mountain, was built on a small portion of the range that had been cleaned of ordnance and given to the city. "It's better than building a fence around the museum."

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asset to our campaign process, United Way, and move our campaign toward its goal in 1999."

Canutillo nominated for top school board

The Canutillo Independent School District Board of Trustees has been nominated as a finalist for School Board of the Year for Region 19.

"CISD's nomination has been recorded with the service center, which will name a Region 19

about an El Paso archeological site and ancient wetlands met the standards of excellence to win the recognition given outstanding non-network and cable TV documentaries.

The documentary was produced by Jackson Polk, executive producer of Capstone Productions Inc., an El Paso-based company. Host of the program was David Carmichael of UTEP's anthropology department.

Times staff reports

CONTINUED FROM 1B

Trespassers

Continued from **1B**

Pass, north along Gateway South and around the North Hills subdivision.

But boulders may not be the best answer to the problem. It was brought up at the meeting that such boulder barriers could put the military in legal jeopardy.

El Paso County Sheriff's Lt. Jack Waite, who didn't attend the meeting, said that an accident occurring at a boulder barrier could open the Army up to a civil suit. The success of the suit would depend on a jury.

"I'd suggest they talk to (their lawyers) first," he said.

Although he understands the interest in making the area safer, he lamented that hard-core trespassers would just find another way to bypass the barrier.

Fort Bliss officials said they would take the matter to the post's Judge Advocate General office.

Kelly Blough, range restoration program manager, said he did not have a cost estimate for the boulder project. He said it could be completed by the end of the year.

The advisory board also approved new signs that would be more concisely worded that would be posted in addition to the 67 bilingual signs that already surround the range perimeter. The new signs would include the $100 fine for trespassing. The plan also includes fixing the damaged 10-year-old signs.

The post is working with the JAG corps to set up a prosecution procedure through a municipal magistrate. If that fails, the post is ready to seek permission to prosecute trespassers from the magistrate, Col. Ben Hobson, Fort Bliss garrison commander, said.

The Department of Defense's Range Development & Enforcement Section reported that it caught about 400 trespassers in the last 12 months. Most were from the Northeast area.

"That's only a fraction of what's out there," George L. Bankston, section chief, said. He added that while most hikers want to enjoy nature, those who use vehicles often have more sinister intentions.

Some go to kill wildlife, do drug transactions or other "promiscuous offenses," he said. Some range riders, deputized sentries who comb the area, have even been attacked while on patrol.

There are no immediate plans to open any part of the contaminated range to civilians. Although the post's Directorate of Environment has received $3.15 million to clean the roughly 7,000 acres that remain contaminated, it will take from $15 million to $35 million to do a complete surface and/or sub-surface sweep.

About 1,200 acres in the range were declared safe and were transferred to the city in 1971. Today that land is home to the El Paso Community College Transmountain Campus, Cohen Stadium, the Trans Mountain commercial area and several hundred homes.

Back in the one-party Democratic days, there were huge battles between liberals and conservatives. But partisanship as such had little impact in the Senate until the Republicans

Border station bill approved, but not until it is altered

By Gary Scharrer
Austin Bureau

AUSTIN – The Texas House approved watered-down legislation Sunday that will result in one-stop border inspection stations, which supporters consider necessary to help ease long waiting lines on the international bridges.

A plan already approved in the state Senate mandates the Texas Department of Transportation to build one-stop inspection stations in El Paso, Brownsville and Laredo.

But the House version says only that the department "may" build "one or more inspection stations at or near a border crossing from Mexico."

The Senate won't agree with the House changes because the state transportation agency needs a strong push to build those one-stop inspection stations that California and New Mexico already have up and running, state Sen. Eliot Shapleigh, D-El Paso, said after the House amended his bill.

Border lawmakers want inspection stations moved miles away from the bridge to locations where more than a dozen state and federal agencies could better coordinate their various inspections.

Moving the inspections will free up bridge traffic to move easier and quicker.

"If you can move everything off the bridge, you can avoid some of these lines that are sometimes five miles, seven miles long," said Rep. Rene Oliveira, D-Brownsville, House sponsor of the legislation.

Reducing cong said, means prod San Antonio, D and other Texa much faster.

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Transportation have resisted stronger languag he said, to "give ty and some tim it."

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El Paso Times 24 May 1990

FTBL-10.A.1
Ramirez, Christina and Christina Pino-Marina. El Paso Times.
Students, teachers mourn lost hiker. 23 February 2000.
pg. 1-A–2-A.

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El Paso Times

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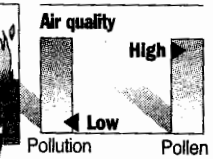


Students, teachers mourn lost hiker

By Christina Ramirez and Christina Pino-Marina
El Paso Times

Anthony Lee's closest friends were absent Tuesday at Gadsden High School, where students and teachers observed a moment of silence for the 16-year-old freshman who died Monday while hiking in the Franklin Mountains.

"They took it pretty hard," said Derrick Brown, principal of the 2,300-student school, where Lee often showed up to class wearing hiking boots and camouflage pants. Brown said counselors would be at the school today to help students cope with the loss of their classmate.

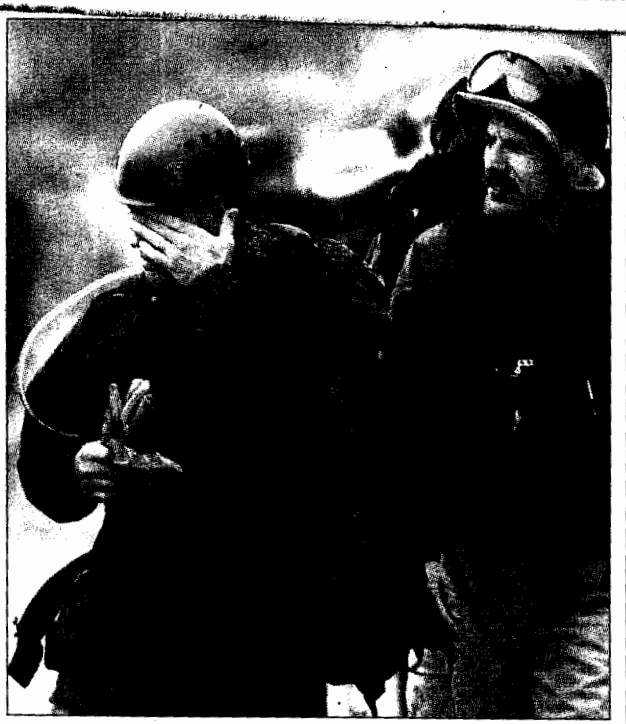
"He was a likable guy," said Tom Wildman, Lee's algebra teacher. "He was fun-loving — a good kid. And he liked to do things that were physical and outdoorsy."

Lee's body was recovered Tuesday from the rugged terrain of Castner Range in the Franklin Mountains, where he apparently fell while hiking with a friend. The friend, whom police did not identify, reported Lee missing at about 5 p.m. Monday.

Six hours later, Lee was found by El Paso Police Department Sgt. Ron Martin and other members of the Combined Search and Rescue Team.

"I'm tired, thirsty and disappointed that he wasn't found alive," Martin said at

Please see **Hiker** 2A



Clarence O'Hagen, right, and an unidentified search-and-rescue team member stayed in the Franklin Mountains overnight with the body of 16-year-old Anthony Lee after spending most of Monday night searching for him. They came down out of the mountains early Tuesday.

More 2- to 4-yeai taking psych dru

By Lindsey Tanner
Associated Press

CHICAGO — When he was a toddler, Heath Barker was nicknamed "the red tornado" for his auburn hair and his penchant for tearing things up and jumping off the furniture. When he was just 4, he was found to have attention deficit disorder, and Ritalin was prescribed.

A study of more than 200,000 preschool-age children shows this was no isolated case.

The number of 2- to 4-year-olds on psychiatric drugs including Ritalin and anti-depressants like Prozac soared 50 percent between 1991 and 1995, researchers reported in today's Journal of the American Medical Association.

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Barker, 39, of
Ariz., said, "It'
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Hiker

Continued from **1A**

about 3 p.m. Tuesday, shortly after a Border Patrol helicopter brought Lee's body down from the mountain. "I would have liked to find him alive."

Lee's parents, Eva and Michael Lee of Chaparral, N.M., took one last look at their son at the command post on Trans Mountain Road before he was transported to Beaumont Army Medical Center, where he was pronounced dead. They declined to comment.

About 46 search-and-rescue team members participated in the operation. El Paso firefighters, Emergency Medical Services personnel and police were joined by teams from the U.S. Border Patrol and the Doña Ana and El Paso counties' sheriff's departments.

Lee was found at about 11 p.m. Monday on a rocky slope above a 300-foot cliff. Three members of the search team spent the night at the site in 40-degree temperatures and 30-mph winds. They were relieved at 6:30 a.m. Tuesday by team members who assisted in the removal of the body.

One rescuer, whose name was not released, was hobbling around the command post nursing a leg injury he received during the search through steep slopes, jagged rocks and prickly Spanish dagger.

"This terrain is not stable," said Don Janes, commander of the search team. "It's not secure, and it's nothing to be climbing on."

Todd Hougen, a member of the search team, said the rocky and unstable terrain caused problems for rescuers and would not be a good place for less experienced people to hike. Lee and his companion were believed to be hiking in an area with no trails.

"When people make the mistake of getting off trails, they risk slipping and falling," said Hougen, an avid climber and mountain biker. "It's amazing that this doesn't happen more often because a lot of people get off the marked trails."

Castner Range, a former military firing range controlled by Fort Bliss, holds other dangers. Signs mark the area as off-limits to hikers, but the notices are often ignored.

Jean Offutt, spokeswoman for Fort Bliss, said it was not known why Lee was hiking in the area, which still has some unexploded ordnance, such as ammunition and grenades, from years past.

"If someone finds or steps on one, it can still go off," said Sgt. Maj. Curtis Rodocker of the military police. He said the area is patrolled by range riders and military police who try to keep people off the restricted area. First-time violators are given a letter warning them of the violation; second-time violators receive more severe penalties.

Military police from Fort Bliss, which controls Castner Range, took command of the event early Tuesday morning.

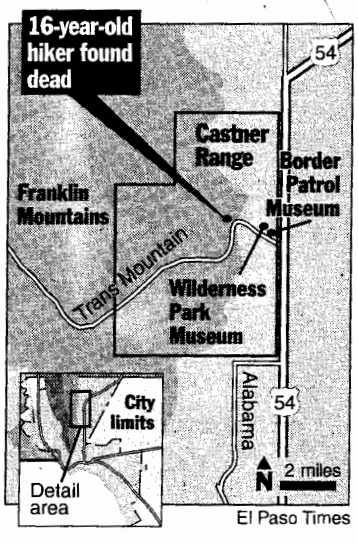
Wildman said that Lee would sometimes wear hiking boots and camouflage to class and that he would talk with a close friend about excursions in the mountains.

But Wildman said he heard about the mountain rescue efforts Tuesday night and never thought about the possibility that Lee was the reason for the search.

"I just can't believe this," Wildman said. "He was full of life. Whether you're close or not, when this happens, it affects these young people."

Rudy Gutierrez / El Paso Times

Police escorted family members of 16-year-old Anthony Lee to an ambulance Tuesday after Lee's body was recovered from the Franklin Mountains.



Bradley continues to question Gore record

By Julie Deardorff
Chicago Tribune

GARDEN CITY, N.Y. — Touting his own record on issues such as health care, abortion and gun control as "clear, consistent and reliable," Democratic presidential candidate Bill Bradley continued swiping Tuesday at the consistency of his main rival, Vice President Al Gore.

"What do we really know about Al Gore?" Bradley asked during a speech at Adelphi University on Long Island.

Minutes later, Bradley returned to what is likely to be a dominant theme in his campaign during the next several weeks: "What does Al Gore really believe?"

In a speech on the importance of conviction, Bradley succinctly outlined his own stances on gun control, abortion rights, campaign finance reform and national health care. The former New Jersey senator's refrain, which he previewed during Monday night's feisty Democratic debate with Gore at the Apollo Theater in Harlem, was that his own beliefs have never wavered through nearly two decades in public office.

"I have never cast a vote the National Rifle Association agreed with, and I didn't need Columbine (High School) to tell me we need common sense gun control," Bradley said, alluding to Gore's record. "I've always been pro-choice. Either you know what you believe or you don't.

"It's what I believe, what I've always fought for and what I'll do as president," Bradley added.

Gore, who said on Monday that Bradley was trying to build himself up by tearing others down, did not schedule any public events on Tuesday and returned to Washington, D.C.

FTBL-11.A.1
Pino-Marina, Christina. El Paso Times. Stranded hiker, 19, rescued. 20 March 2000. pg. 1-A.

MONDAY
MARCH 20, 2000

40 CENTS / 50 CENTS

El Paso Time

About the area

▶ **Castner Range** was used as a firing range from World War II to 1966. Explosive ammunition — shells and grenades — have been found in the area.

▶ **Red and white signs** in English and Spanish warn against trespassing on the Fort Bliss property.

Stranded hiker, 19, rescued

By Christina Pino-Marina
El Paso Times

A frightened, dehydrated hiker was rescued Sunday from a formidable mountain face in Northeast El Paso — the same area where another young hiker died nearly a month ago, police said.

Cesar Ivan Estrada, a 19-year-old Mexican national, was found at noon by six rescuers who were taken by helicopter to the rust-colored peak near Trans Mountain Road just west of Patriot Freeway.

Trans Mountain Road was closed at 1 p.m. during the rescue because ambulances lined the roadway. The lanes were reopened by 5 p.m., police said.

Estrada had gone hiking with his family Sunday morning in the Castner Range -- a former artillery range that is still part of Fort Bliss, Police Sgt. Ray Menchaca said. Estrada split up with his family to try to climb the mountain but became dehydrated and weak during his climb, Menchaca said.

"He got to a point where he couldn't move," he said.

The six rescuers — part of the Combined Operation Search and Rescue team — found Estrada, strapped him into a harness and, by 3:30 p.m., rappelled him down about 700 feet to safety, Menchaca said. Estrada was in stable condition and was taken to Beaumont Army Medical Center.

Sixteen-year-old Anthony Lee of Chaparral died after falling from the same mountain Feb 21.

"People are not considering the tragedies we've had and the dangers of these mountains," Menchaca said. "These are not mountains that are meant for individuals to take lightly."

Fort Bliss spokeswoman Donita Kelley said the area

White Sands wasted thousands in p

Army officials dispute findings, refus

By Daniel Perez
El Paso Times

An audit of telecommunications at White Sands Missile Range found hundreds of thousands of taxpayers' dollars being wasted, according to the El Paso company that performed the audit.

White Sands officials disputed the audit, however, and have refused to pay for it. The company's owners said they are now preparing to sue the Army. They allege that the Army is trying to cover up "embarrassing" revelations.

The audit, performed by El Paso-based Accu-Rate Inc. in 1998, reported that White Sands routinely paid for a variety of calls to sexually oriented and psychic hotline numbers, and for numerous collect calls. There were also calls, for which the audit found no authorized purpose, to other

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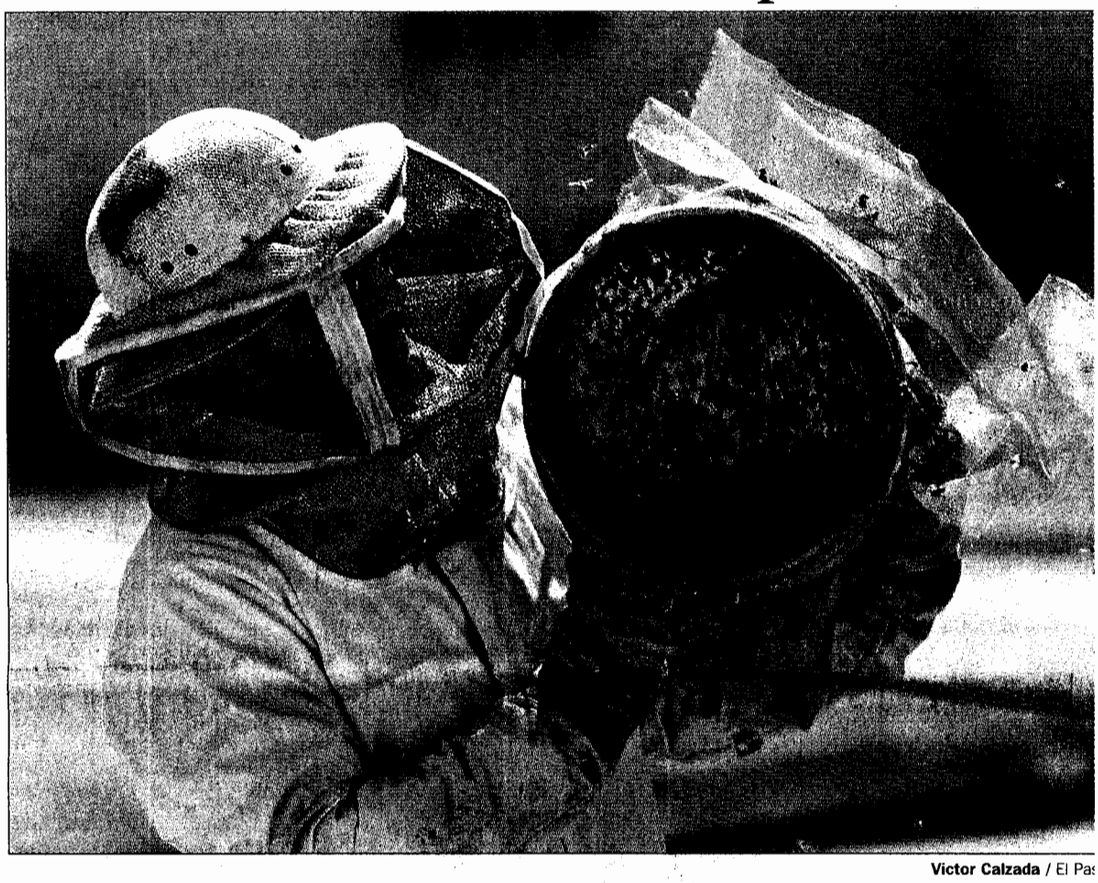
Warm weather draws pests out



Victor Calzada / El Pas

Beekeeper Bill Bartlett examined a swarm of about 2,000 bees he collected this week on Mississippi Street in West El Paso. He and other beekeepers say bees are swarmir lier than usual this spring because of the warm weat

Bees swarm into city early this yea

By Cindy Ramírez-Cadena
El Paso Times

El Paso's recent warm weather has brought out more than spring fever: Bees, scorpions, outdoor roaches and ants are creeping into homes and yards earlier than in years past.

"The warm weather came early this year, so (bees) come out early, too," said Melvin Cunningham, who calls himself a "free-lance" beekeeper and is often

fences. That's more than double the calls he typically handles after colder winters.

Camacho said the El Paso County Agricultural Extension Office quickly gathered

really for about two n
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"Because of the mil
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Torres said El P
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Bee safety

▶ **If you see a swarm** of bees, don't get close to inspect it. Leave the bees alone, and don't attempt to swat or spray them away.

▶ **If the swarm chases you,** run into an enclosed shelter and call for help.

▶ **Diving underwater** may not help because the bees may wait and attack when you come up.

▶ **Patch cracks** on walls, seal holes around pipes and fix damaged screens and doors.

▶ **Information:** U.S. Department of Agriculture, 534-6652, or the El Paso County Agricultural Extension Office, 859-7725.

chaca said. Estrada split up with his family to try to climb the mountain but became dehydrated and weak during his climb, Menchaca said.

"He got to a point where he couldn't move," he said.

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Sixteen-year-old Anthony Lee of Chaparral died after falling from the same mountain Feb 21.

"People are not considering the tragedies we've had and the dangers of these mountains," Menchaca said. "These are not mountains that are meant for individuals to take lightly."

Fort Bliss spokeswoman Donita Kelley said the area where the hiker was rescued is off-limits to civilians.

"This is not a safe area," she said. "There is unexploded ordnance out there."

Kelley said the family will be cited for unlawful entry, which can include penalties of fines or jail time.

Inside

Victor Calzada / El

Beekeeper Bill Bartlett examined a swarm of about 2,000 bees he collected this week on Mississippi Street in West El Paso. He and other beekeepers say bees are swarr lier than usual this spring because of the warm we

Bees swarm into city early this ye

By Cindy Ramírez-Cadena
El Paso Times

El Paso's recent warm weather has brought out more than spring fever: Bees, scorpions, outdoor roaches and ants are creeping into homes and yards earlier than in years past.

"The warm weather came early this year, so (bees) come out early, too," said Melvin Cunningham, who calls himself a "free-lance" beekeeper and is often called upon to get rid of swarming bees. "There will be a lot more of them in the next couple of weeks."

During the past two weeks, Cunningham has handled eight calls on bee swarms everywhere from inside water meters to hollow trees to chain link fences. That's more than double the calls he typically handles after colder winters.

Friday, Ofelia Camacho's grandchildren came across a swarm of bees in her back yard in Socorro as they helped with spring cleaning.

"We started cleaning the yard, and my grandchildren heard the buzzing," she said. "We all ran inside and called for help."

Camacho said the El Paso County Agricultural Extension Office quickly gathered the European honeybees: "We just feel safer now that the buzzing has stopped."

The mild winter and warm spring have attracted an increasing number of pests, experts said. And they predict bugs will be out in high numbers all summer.

"We've been seeing bees really for about two now, but they're co more as it gets war warmer," said Alfre Jr. of Alpha Ome Control in Central

"Because of the n ter, we've also seen scorpions, and we're ing to see more roaches, ants and re mites," he said.

Torres said El should stay away fr most of which will leave in a few days. trees and lawns sh well-maintained t drawing bugs, he sa

Serious infestatio require hiring prof pest-control compa pecially if the bugs ering close to or toward a door or Torres said.

Bee safety

- **If you see a swarm** of bees, don't get close to inspect it. Leave the bees alone, and don't attempt to swat or spray them away.
- **If the swarm chases you,** run into an enclosed shelter and call for help.
- **Diving underwater** may not help because the bees may wait and attack when you come up.
- **Patch cracks** on walls, seal holes around pipes and fix damaged screens and doors.
- **Information:** U.S. Department of Agriculture, 534-6652, or the El Paso County Agricultural Extension Office, 859-7725.

Lack of winter snow means NM fire risk

By Sharon Simonson
New Mexico reporter

The dearth of snow that depressed skiing in Southern New Mexico and sent Ruidoso retailers into a tailspin now threatens the region's forests and communities with water shortages and fire hazards.

Campfire and smoking restrictions will probably go about their personal safety," Lincoln National Forest Supervisor Jose Martinez said. "Based on what I'm hearing, it is going to be a dry season in the Lincoln."

Already, wildfires have scorched more than 190,000 acres across the state, according to the Southwest Coordination Center, a multi-agency fire-management operation in Albu-

Wildfires in New Mexico

Year	Acres burned
1999	52,054
1997	13,928
1995	91,135
1993	372,756

* As of March 17
Source: Southwest Coordination Center

El Paso Times

the Mountain Gods and the

Site hop

By Anick Jesdanu
Associated Press

NEW YORK — I fort to get more Hi online, a Spanish-Web site is handi more than 2 millio puter disks offering ternet access cust for bilingual use.

"Hispanics are coming online," sai Trujillo, chief execu Quepasa.com, whi mail CD-ROMs to U panic household

FTBL-12.A.1
Restoration Advisory Board. Castner Range Fence Power Point Presentation. 11 January 2000.

Fort Bliss Restoration Advisory Board
Public Meeting January 11, 2000
El Paso Community College-Transmountain Campus

RAB Members Present	Others Present	Others Present
David Dodge	John Green	Elza Cushing
Robert Lenhart	Inga Groff	Tom Hoskings
Charles Galt	Joe Groff	Janice Robinson
Col. Ben Hobson	Lois Balin	Terry Robinson
Russell Smith	John Barron	Kyle Reardon
Dorline Wonciar	Ken Purcell	Lee Carroll
	Jeff Kaake	Maro Thompson
RAB Not Present	Robin Smith	Jeannine Collins
Jim Bates	Brigitte Burchfield	Stanley Stack
V.W. Howard, Jr.	John Knopp	John Sproul
Michael Nivison	Daniel Perez	Marguerite Davis
Marianne Thaeler	Rosemary Staley	Bobbi Sorrell
		Pamela Kogler

No. of Attendees: 30 (all registered)

1. **Call to Order and Old Business**
   a. The meeting was called to order at approximately 7:02 p.m. Introductions were made.

   b. Minutes for the August 10, 1999, meeting at the Otero County Courthouse in Alamogordo were approved with no necessary changes.

   c. D. Dodge informed the RAB that Ms. Thaeler had asked him a question regarding the status of the Board's recommendation that the CG inform the public through press releases of the dangers at Castner Range.
      - D. Dodge responded that a press release was issued, however, the information was never published. Unfortunately, Fort Bliss has no control over what the newspaper chooses to print.
      - A letter to the editor by Dennis Cavin printed in the August 20, 1999, El Paso Times addressed the dangers on Castner Range, explaining that the Range should not be opened to the public until the dangers of UXOs are eliminated.
      - Col. Hobson stated he runs announcements in the news media every spring during "poppy season" to make persons aware of dangers.

   d. R. Smith stated the Bylaw Committee has not yet convened. The Committee will discuss the issue of whether D. Dodge should remain a Board member due to his new position as Manager of the Fort Bliss DERA program. The issue was tabled until the next meeting.

2. **New Business**
   a. Col. Hobson stated the Ft. Bliss RAB was selected as the best Restoration Advisory Board in the Training and Doctrine Command (TRADOC) as part of the Department of Defense Annual Environmental Awards contest. The Fort Bliss nomination package has been forwarded to the Department of the Army to compete at that level.

b. In addition, the Fort Bliss RAB has been picked as one of three success stories for 1999 included by the Army Environmental Command, Aberdeen Proving Grounds, in their annual report to Congress on the state of the US Army's environmental stewardship. Copies will go to Representative Reyes and Representative Skeen.

c. D. Dodge discussed the new fence constructed at the request of the RAB on the north and west boundaries of Castner Range.
   - Work on the 3-mile fence began Aug. 18, 1999, and was completed Oct. 1, 1999.
   - The Contractor had on-site UXO support during the entire operation.
   - No UXOs were encountered during the construction of the fence.
   - Great effort was made to minimize the impact to natural terrain.
     - Small ATVs were used for the transportation of personnel and material.
     - On steep terrain, small batches of concrete were mixed by hand.
   - The final fence extends along the entire northern boundary of Castner from the edge of the North Hills Subdivision housing area to the NW corner of the range.
   - It turns south until the terrain slopes exceed 45%.
   - Features of the 4 foot high fence include:
     - Four (4) double leaf gates where existing roads intersect the range boundaries.
     - One single leaf gate to facilitate movement of livestock, if necessary.
     - Bottom wire of the 3-strand fence is smooth to allow movement of small wildlife. The top two strands are barbed.
   - Prior to beginning work, the route was inspected. No historic resources, threatened or endangered species, or habitat of concern was considered to be affected by the fence.
   - There were two archaeological sites where special attention was given:
     1. A pre-historic Native American site containing multiple bedrock mortars.
        - The section of fence crossing this site is removable w/wooden upright posts that "sit" on the bedrock.
        - This method does not penetrate the bedrock and allows the entire span of fencing to be removed during historical cultural work. This allows the site to be viewed in its entirety without the fence being a physical or visual barrier.
     2. A "lithic" scatter site at the NW corner of the Range where the fence was to turn south and run along the west boundary.
        - This area was avoided by rerouting the fence around the site.
   - Ten large "standard English/Spanish DOD "legal" warning signs were erected along fence line of Castner Range.
   - Small reflective silver and orange markers were installed on the top wire along the entire route of the fence to enhance the visibility on the barbed wire.

d. D. Dodge discussed the status of Castner Range signs.
   - Thirty-six new "legal" signs replaced any "shot up", faded, or damaged signs.
   - Every sign at a right-of-way will then be readable and "like new" condition.
   - D. Dodge proposed installing 200 new simple warning signs (per RAB recommendations) to be placed in between the "legal" signs. It was designed to be simple/not complicated and have good visual impact (as illustrated on next page). The sign was open for discussion and the following recommendations were made.
     - Use the international explosive symbol, and
     - Include the name of the issuing authority.
     - 3-4 signs to go to Wilderness Museum.

- In order to speed up the process for the new signage, D. Wonciar's motion to proceed with the recommended changes carried. Copy of the sign attached.
- Lee Carroll recommended checking with the Range Rule Committee for any signage requirements before new DOD Rules are enacted in August.

e. D. Dodge discussed the status of the Boulder project.
   - The purpose of the project is to prevent motorbike/vehicle access by creating a visual and physical barrier with the boulders.
   - D. Dodge proposed placing boulders at 34 locations 4 feet inside right-of-ways versus the 5-6 locations originally planned.
   - 99 boulders, one meter in diameter, will be placed 7 feet apart.
   - Project is to begin January 24, 2000.
   - C. Galt's motion to approve the project carried.

3. **Open discussion, questions, and answers:**
   - M. Davis repeated her desire for signs to state fines & penalties for trespass.
   - Col. Hobson discussed difficulty of prosecuting over 200 trespassers in 1999.
   - Mr. Kyle Reardon, Fort Bliss Staff Judge Advocate Office, stated he will follow-up to determine the penalty/prosecution for trespassing.

4. **Selection of next meeting date, location, and topics:**
   - Next meeting will be in Las Cruces on April 4th or 5th at 7 p.m. depending on meeting room availability. <Addendum: Meeting Wed., April 5th at Branigan Library>
   - Tentative topics will be status report of fencing, signage, and boulder projects; status of Bylaw Committee; and clean-up of New Mexico sites. Requests to add agenda items should go to R. Smith or D. Dodge.

5. **Meeting adjourned at 8:35 p. m.**

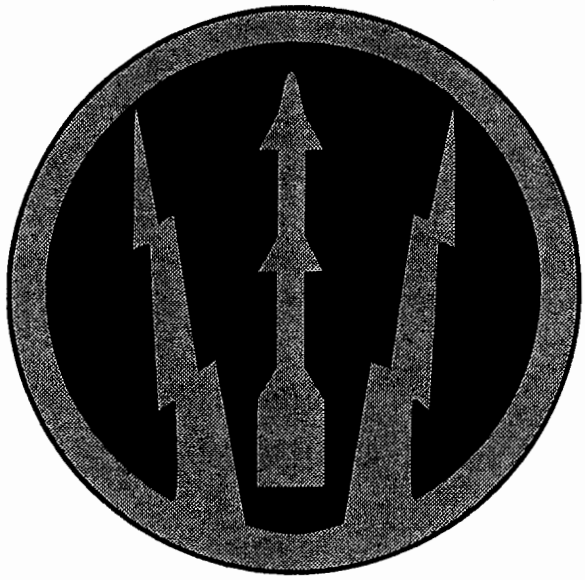
From RAB mtg.

CASTNER RANGE FENCE

New Fence on the North and West Boundary of Castner Range

CASTNER RANGE FENCE

FTBL-12.B.1
Restoration Advisory Board. Effectiveness of Land Use Controls at Castner Range Power Point Presentation. 14 November 2001.



RAB

BRIEFING BOOK

Decision Sought:

Approval of Agenda Topics for November

meeting of the

Ft. Bliss Restoration Advisory Board

Meeting Location: Alamogordo Court House

Alamogordo, New Mexico

Meeting Time: 1800 hrs. 14 November 2001

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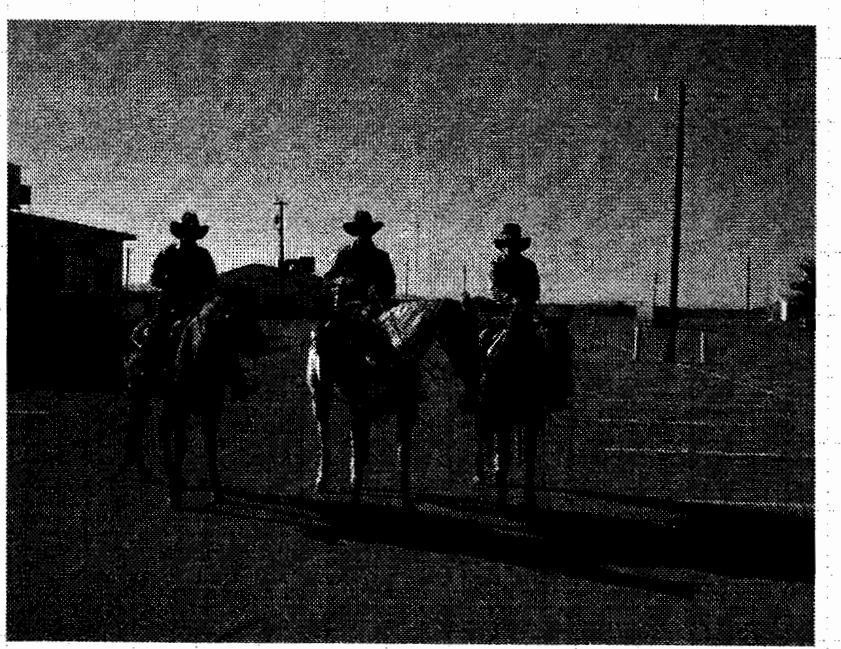
Fort Bliss RAB Briefing

"Effectiveness of Land Use Controls at Castner"

"Effectiveness of Land Use Controls at Castner"

- Range Rider Patrols (stationed at McGregor Range Camp)



"Effectiveness of Land Use Controls at Castner"

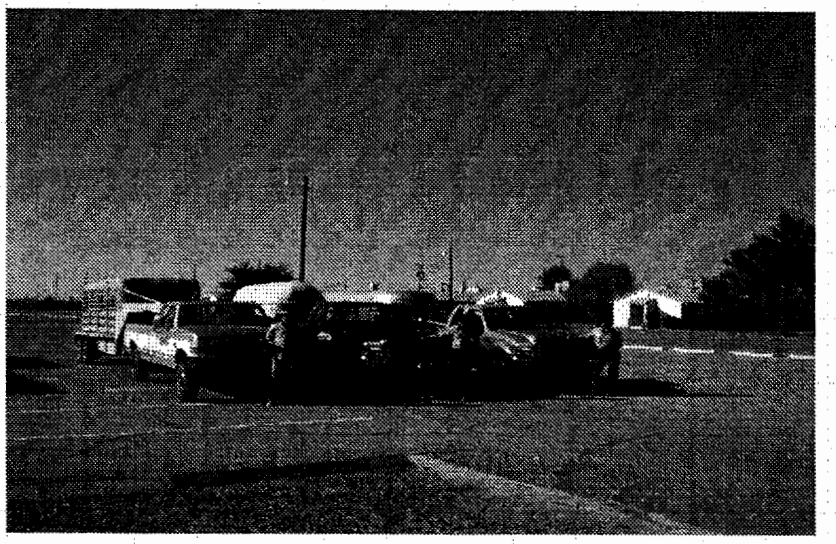
- Control of Unauthorized Entry to Closed Castner Firing Range takes two forms:
  - Active
    - Military Police Patrols
    - Range Rider Patrols
  - Passive
    - Signage
    - Fence
    - Barriers

"Effectiveness of Land Use Controls at Castner"

- Military Police Patrols
  - A four man MP team stationed at McGregor Range Camp has responsibility to check on Castner Range and all four Range Camps, Highway 54 and War Highway.
  - Needless to say, they don't get down too often to Castner.
- In addition,

"Effectiveness of Land Use Controls at Castner"

- The Range Riders are responsible also to monitor trespassing on Castner and the other 845,000 acres of training area and impact areas in New Mexico.



FTBL-13.A.1
IT Corporation. Final Work Plan Soil Investigation Proposed INS Site, Castner Range, El Paso Texas. February 2003. Appendix A pg. 1-1.

Final
Work Plan

Soil Investigation
Proposed INS Site
Castner Range, El Paso, Texas

Contract No. DACA47-99-D-0009
Delivery Order No. 0010

PREPARED FOR:
U.S. Army Corps of Engineers
Albuquerque, New Mexico

PREPARED BY:
IT Corporation
5301 Central Avenue NE, Suite 700
Albuquerque, New Mexico 87108

Approved by: _____ Date: 2/7/03
IT QC Manager

Approved by: _____ Date: 2/7/03
IT Delivery Order Manager

Approved by: _____ Date: 2/7/03
IT Project Manager

February 2003

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A	Sampling and Analysis Plan
	I. Field Sampling Plan (FSP)
	Attachment A1 Field Operating Procedures
	II. Quality Assurance Project Plan (QAPP)
	Attachment A2 Table of Measurement Quality Objectives
B	Site Safety and Health Plan
	Attachment B1 Job Safety Analysis
	Attachment B2 Material Safety Data Sheets
	Attachment B3 Lead Awareness Training
C	OE/UXO Avoidance Plan
	Attachment C1 OE/UXO Team Leader Resume
	Attachment C2 U.S. Army Corps of Engineers EP 385-1-95A, "Basic Safety Concepts and Considerations for Ordnance and Explosive Operations" (June 2001)

APPENDIX A
SAMPLING AND ANALYSIS PLAN

Final
Sampling and Analysis Plan

Soil Investigation
Proposed INS Site
Castner Range, El Paso, Texas

Contract No. DACA47-99-D-0009
Delivery Order No. 010

PREPARED FOR:
U.S. Army Corps of Engineers
Albuquerque, New Mexico

PREPARED BY:
IT Corporation
5301 Central Avenue NE, Suite 700
Albuquerque, New Mexico 87108

February 2003

I. Field Sampling Plan

1.0 Project Background
2.0 Project Organization and Responsibilities
3.0 Project Scope and Objectives
4.0 Nonmeasurement Data Acquisition
5.0 Field Activities by Area of Concern
6.0 Field Operations Documentation
7.0 Sample Packaging and Shipping Requirements
8.0 Investigation-Derived Waste
9.0 Nonconformance/Corrective Actions
10.0 References

Attachment

A1 Field Operating Procedures

II. Quality Assurance Project Plan

1.0 Project Laboratory Organization and Responsibilities
2.0 Data Assessment Organization and Responsibilities
3.0 Data Quality Objectives
4.0 Sample Receipt, Handling, Custody, and Holding Time Requirements
5.0 Analytical Procedures
6.0 Data Reduction/Calculation of Data Quality Indicators
7.0 Laboratory Operations Documentation
8.0 Data Assessment Procedures
9.0 References

Attachment

A2 Table of Measurement Quality Objectives

I. FIELD SAMPLING PLAN (FSP)

Final
Field Sampling Plan

Soil Investigation
Proposed INS Site
Castner Range, El Paso, Texas

Contract No. DACA47-99-D-0009
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PREPARED FOR:
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Attachment	Title
A1	Field Operating Procedures

1.0 Project Background

1.1 Site History and Contaminants

The proposed Immigration and Naturalization Service (INS) site is located at the extreme southeast corner of Castner Range at Fort Bliss in El Paso, Texas. Castner Range is situated in the far northern and eastern quadrant of the urban El Paso, Texas, area (Figure 1-1). The proposed INS site is comprised of 40 to 45 acres of land at the intersection of U.S. Highway 54 and Hondo Pass Drive between a Texas Department of Transportation compound and the flood control structure known as Northgate Dam (Figure 1-2). The history of the proposed INS site is included as part of the description of the larger Castner Range.

Castner Range, a former military firing range administered by the U.S. Department of Defense and Fort Bliss, is comprised of 7,080 acres of mostly mountainous terrain that includes the eastern slopes and alluvial fans of the Franklin Mountains. Castner Range was a military firing range from 1926 to 1966. The range has not been used for military training since 1966. In 1971, the U.S. Army declared Castner Range an excess and surplus property. The presence of ordnance and explosives (OE) and unexploded ordnance (UXO) hazards on the range, as well as the expense of clearing the property of OE/UXO hazards, has precluded disposal and development. The majority of Castner Range, including the proposed INS site, remains undeveloped land. The U.S. Army at Fort Bliss controls access to the range.

Past uses of Castner Range and the proposed INS site indicate the possibility for chemicals of concern (COC) associated with OE/UXO. Potential chemical contaminants of concern include metals from projectiles and explosives hardware and casings, and nitroaromatic and nitramine residues from explosives. OE scrap and debris have been identified on Castner Range and in soil at the proposed INS site.

1.2 Summary of Existing Site Data

Soil sampling and analysis data for metals and explosive residue contaminants do not exist for the proposed INS site. To date, no soil samples have been collected and analyzed to characterize the site.

Portions of the proposed INS site were included in an OE/UXO survey conducted as part of a Corrective Measures Study (CMS) at Castner Range in 1996 and 1997 (Parsons Engineering

FTBL-14.A.1

Carlson, Kurt R. 41st Ordnance Detachment Explosive Ordnance Disposal FORSCOM Field Operating Activity, Fort Bliss, Texas. Letter to Mr. Bywater Albuquerque District, Corps of Engineers. Subject: Northgate Dam Site, Castner Range, Ft. Bliss, TX, Range Clearance. 8 January 1986.

41ST ORDNANCE DETACHMENT
EXPLOSIVE ORDNANCE DISPOSAL
FORSCOM FIELD OPERATING ACTIVITY (DCSOPS)
FORT BLISS, TEXAS 79916-6803

8 January 1986

SUBJECT: Northgate Dam Site, Castner Range, Ft. Bliss, TX, Range Clearance

Albuquerque District, Corps of Engineers
ATTN: Mr. Bywater
P.O. BOX 1580
517 Gold Ave, S.W.
Albuquerque, N.M. 87103

1. On 7 January 1986 a surface sweep was conducted in the areas specified in the attached correspondence dated 29 August 1985. Surface sweep procedures recommended by the FORSCOM Letter of Instruction (Subject: Range Clearance Operations) dated 6 October 1978 were utilized.

2. There were no dangerous/explosive items found during the sweep. The only items found were various metal fragments from 90mm and 37mm HE rounds and 10 each 7.62mm ball rounds.

3. Five Explosive Ordnance Disposal Technicians and One Explosive Ordnance Disposal Officer conducted the sweep:

a. CPT Kurt R. Carlson
b. MSG Edward W. Soleau
c. SSG Marilyn E. Starkey
d. SSG Durred G. Francher
e. SP4 Kiman Kang
f. SP4 William E. Sutherland

4. The area covered by the sweep was 7.459 acres and it took 1 hour and 15 minutes to complete.

Kurt R Carlson

KURT R. CARLSON
CPT, OD
Commanding

3 Encl
1-Statement of Clearance
2-Ltr. dated 29 Aug 85
3-Decontamination Plan w/area map

Copies Furnished:

Commander, 546th Ord Det (EODCC)
Director of Facilities Engineering

Statement of Clearance

All lands within the right-of-way Northgate Dam Site, Castner Range as specified in the attached letter dated 29 August 1985 and the enclosed Decontamination Plan, located in the Northeast area of El Paso, Texas have been given a careful surface search and have been cleared of all dangerous and/or explosive materials reasonably possible to detect. It is recommended that tracts (designated), and as shown on the enclosed real estate map, be restricted to surface use except for excavation as specified in the Decontamination Plan.

Approved:

Kurt R. Carlson
CPT, OD
Commander, 41st Ord Det (EOD)

FTBL-15.A.1
EHSI, Inc. After Action Report Letter, Unexploded Ordnance Site Characterization, Fort Bliss, Texas. 10 August 1994. pg. 1-3.

ENVIRONMENTAL HAZARDS SPECIALISTS
INTERNATIONAL, INC.
Route 1, Box 232
Belvidere, North Carolina 27919
Phone (919) 297-2991
FAX (919) 297-2992

cc record 8/16/94 Friday for 8/18 mtg

August 10, 1994

After Action Report Letter

Unexploded Ordnance (UXO) Site Characterization
Fort Bliss, Texas
Contract Number: DACA87-94-P-0656

INTRODUCTION:

EHSI, Inc. has completed the UXO Site Investigation at Castner Range, Fort Bliss, Texas as required in Contract Number DACA 87-94-0656. The following pages and enclosures summarize the operations conducted between July 11, 1994 and July 22, 1994.

SCOPE OF SERVICE:

Provided a UXO Work and Safety Plan (draft and final) for approval by COR.

Provided personnel and equipment to:

- Present on-site briefs for EHSI Team members, Fort Bliss Environmental and EOD personnel, Corps of Engineer and Texas EPA personnel.

- Perform Visual Surface Sweeps of Areas A, B, C, D, E, F, G, and H as required in paragraph 3.2 of SOW.

Completed and documented Quality Control checks daily on all instruments and equipment.

OBJECTIVE:

The primary objective of the task was to assess and document the extent, and location of UXO contamination and prioritize their associated hazards based on accessibility by the local populace. Approximately 6700 total acres (which are divided into 8 areas (Figure 2)), were investigated during this project. Ten percent (720 acres) were covered using either standard EOD Surface Search Procedures including grids and search lanes (327 acres) or traversed on foot and visually swept (393 acres). The remaining acreage was randomly covered on foot or on ATVs and it is felt that a minimum of 45 -50% of the total area was covered in one form or

Purpose

720ac ——— 10% covered extensive

3850ac 45-50% covered general

another.

AFTER ACTION LETTER REPORT:

This report presents the results of the completed searches and includes the following:

- Enclosure 1 - Summary of Operations providing a pre-mobilization summary, mobilization summary, daily log of all on site activities with results of daily maintenance and calibration checks and demobilization summary.

- Enclosure 2 - Listing of all sites covered with a brief narrative, acres covered, UXO/OEW encountered and its level of hazard.

- Enclosure 3 - Listing of all site coordinates obtained with Magellan GPS NA 5000DX.

- Enclosure 4 - Maps of areas covered (keyed to sites listed in Enclosure 2) and recommended areas for future clearance operations.

- Enclosure 5 - Financial breakdown of all labor hours and costs.

- Attachment 1 - Twenty color photos of sites and UXO/OEW encountered.

- Attachment 2 - Two copies of video tape.

- Attachment 3 - Defense Mapping Agency Map 3106-433, North Franklin Mountain, TX, annotated to show areas searched and recommended clearance areas.

PERSONNEL:

The following EHSI personnel performed on this task.

Mr. Charles Wharton, Sr.	Program Manager
Mr. Al Ebner	Site Supervisor
Mr. Mark Fletcher	Site Safety
Mr. Tim Bohannon	UXO Technician
Mr. Pete Redmond	UXO Technician
Mr. Charles Wharton, Jr	Maintenance Technician/Laborer

COMMENTS AND LESSONS LEARNED:

The original Scope of Work stated that "The total acreage to be investigated for this project is approximately 3000 acres .....". On arrival at the site and after conversations with Ms. Elza

Cushing, Environmental Officer, Fort Bliss, it was determined that the actual area was 6700 acres. It was also determined that the actual areas to be investigated differed from those shown on the maps provided with the SOW. These matters were clarified after discussions between Ms. Elza Cushing and Mr. Carl Blankinship, CEHND.

The use of the GPS provided the ability to return to any previously plotted site and will prove valuable in follow-on clearances.

The availability of EHSI's 4-wheel drive All Terrain Vehicles provided the ability to cover large amounts of terrain in a short period of time, including areas not in the original tasking. They also made it possible to visually check a large portion of the range, which was not thought to be highly contaminated and confirm this fact, in a relatively short period.

The temperatures were very hot during the site investigation period, personnel were directed to consume copious amounts of both water and gator aid. Work hours were adjusted to be on site at dawn and off the range by 14:00 or 15:00.

The cooperation of all Fort Bliss personnel was greatly appreciated and aided in the efficient and timely completion of the task. The support provided by Ms. Elza Cushing and Corps of Engineer personnel was at the highest level. Of particular note was the cooperation of the Fort Bliss US Army EOD Team, their quick response and positive attitude is to be commended..

RECOMMENDATIONS:

Review of the sweep reports and the type of UXO/OEW encountered indicate that two levels of clearance be completed. The areas that received impact form light cased ordnance (i.e. 2.36" and 3,5" bazooka,. small arms) require only a surface clearance and sub-surface clearance to a depth of 6 inches. Sites that served as impact areas for the heavier cased artillery rounds will require a surface and sub-surface clearance to a depth of three feet. (It should be noted that due to the weather conditions and elevations there is a possibility that the heaving effect of freezing weather could possibly force previously un-detected items to the surface.)

Clearing priorities should be set according to the hazards of the UXO in the areas as well as by accessibility by local population. It is recommended that the areas straddling the Trans Mountain Highway be cleared first and then the remaining areas.

Sincerely,

Charles E. Wharton, Sr.
President

FTBL-15.A.2
EHSI, Inc. After Action Report Letter, Unexploded Ordnance Site Characterization, Fort Bliss, Texas. 10 August 1994. pg. 13-22.

ENCLOSURE 2

SITE SURVEY RESULTS

Site A-1

This site has been used for disposal, by burning and detonation, of various types of ammunition. The majority of OEW encountered were remnants of artillery rounds and small arms ammunition. Search of the area with a locator gave no indication of large trenches however, there were four large craters that appear to have been used for numerous disposal shots.

It is recommended that this area receive a Surface and Sub-Surface Sweep to a depth of at least three feet.

UXO

- 1 ea. 40mm Artillery Projectile

OEW

- Fragments from 4.2" mortars, 40mm and 37mm projectiles
- Unidentified heavy wall and thin wall fragments
- Aluminum fragments
- Expended fuze lighters and demolition explosive containers.
- Empty small arms casings

Site A-2

There appears to have been very little activity in this area and only one fragment was located.

Recommend that a clearance be completed to a depth of two feet.

UXO

- None

OEW

- One fragment of a heavy case munitions

Site A-3

A sweep of this area turned up no UXO or OEW,

Site B-1

This site (originally called Site H) was used as a demolition area for disposal of munitions by burning or detonation and is heavily contaminated. There is evidence of at least one disposal pit and the possibility of others. As this area is within one half mile of a residential area, it should be among the first to be cleared.

It is recommend that this area receive a clearance to at least

four feet.

UXO

- 1 ea. 40mm projectile

OEW

- 5 ea. 37mm AP projectiles
- 4 ea. 90mm projectiles, inert
- 7 ea. tail sections from rifle grenades
- 1 ea. 3.5" rocket motor, empty
- 4 ea. 3.5" rocket nose cap, empty
- 3 ea. mechanical time fuzes, expended
- 3 ea. base fuzes, expended
- 57 ea. .30 cal small arms casings, empty
- 83 ea. .50 cal small arms casing, empty
- 2 ea. hand grenade spoons
- 200+ assorted .30, .50 cal bullets
- 1 ea. pressure release booby trap device, expended
- 100+ pieces of frag from large projectiles
- 100+ pieces of frag from small caliber projectiles

Site B-2

This area is the site of the old "Viet Nam Village" training compound. The area was swept and the only items found were a few empty small arms casings.

It is recommended that this area receive a clearance to a depth of two feet.

Site B-3

Site was swept and found to contain only a small amount of OEW.

It is recommended that this area receive a clearance to a depth of two feet.

UXO

- None

OEW

- 1 ea. 60mm mortar tail fin assembly
- 1 ea. point detonating fuze, expended
- Small amount of heavy case frag

Site B-4

Area was swept an a small amount of OEW and no UXO were found.

Recommend the area receive a clearance to a depth of two feet.

UXO

- None

OEW

- 3 ea. 60mm tail fin assemblies
- assorted empty blank small arms casings for 5.56mm, 30 cal, and 7.62mm
- small amount of heavy case frag

Site B-5

Area was swept an a small amount of OEW and no UXO were found.

Recommend the area receive a clearance to a depth of two feet.

UXO
- None

OEW
- 1 ea. hand grenade fuze, fired
- 1 ea. hand grenade spoon
- assorted empty small arms casings
- 5 ea. pieces of heavy frag

Site B-6

Area was swept an a small amount of OEW and no UXO were found.

Recommend the area receive a clearance to a depth of two feet.

UXO
- None

OEW
- assorted empty small arms casings

Site B-7

Area was swept an a small amount of OEW and no UXO were found.

Recommend the area receive a clearance to a depth of two feet.

UXO
- None

OEW
- assorted empty small arms casings

Sites B-8, B-9, B-10, B-11, B-12

While these sites are all within a previously marked mortar firing fan, there is no indication of mortar usage (i.e., frag, fins) and only a small amount of frag was located in Site B-10.

Recommend that this site receive a clearance to a depth of two

feet.

Site WB-1

During a random walk through of this site no UXO were encountered and the only OEW consisted of empty small arms casings.

Recommend that the area receive a clearance to a depth of two feet.

Site C-1

Area appears to have been used for small arms training.

Recommend that area receive a clearance to a depth of two feet.

UXO

- None

OEW

- 83 ea. empty 30 cal casings
- 6 ea. 50 cal bullets

Site C-2

This area appears to have been a small arms and bazooka impact area.

Recommend that the area receive a clearance to a depth of four feet.

UXO

- 2 ea. 2.36" bazooka rounds

OEW

- 5 ea. 2.26" bazooka training rounds
- 470 ea. empty 30 cal casings
- 89 ea. 50 cal bullets
- numerous grenade pins and spoons

Site C-3

Area appears to have been the main impact area for bazooka and rifle grenades.

Recommend that the area receive a clearance to a depth of four feet.

UXO

- 2 ea. 2.36" bazooka rounds

OEW

- 10 ea. 2.36" rifle grenade training rounds
- 18 ea. rifle grenade tail sections
- 1 ea. rifle grenade flare, empty
- 2 ea. flare fins
- 8 ea. hand grenade fuzes, expended
- 1 ea. piece of frag from WP grenade

Site C-4

Appears to have been an impact area for artillery and mortar firing, and contains a large amount off fragments.

Recommend the area receive a clearance to a depth of four feet.

This area is immediately adjacent to the Trans Mountain Highway and readily available to the public. The area should be one of the first cleared.

UXO

- 2 ea. 57mm high explosive projectiles
- 1 ea. 75mm high explosive projectiles

OEW

- 8 ea. 37mm AP projectiles
- 1 ea. 4.2" mortar, expended
- 18 ea. nose fuzes, expended
- 86 ea. 30 cal bullets
- 61 ea. 50 cal bullets
- medium amounts of heavy walled fragments
- medium amounts of thin walled fragments

Site C-5

Sweep of area turned up no UXO/OEW.

Recommend Surface clearance to a depth of two feet.

Site WC-1

Random walk through of this area turned up only a few empty small arms casings.

Recommend that the area receive a clearance to a depth of two feet.

Site D-1

Used as an impact area for #.5" bazooka and artillery. This area was used heavily and contains large amounts of OEW.

Recommend that the area receive a clearance to a depth of four feet.

UXO

- None

OEW

- 95 ea. PD fuzes, expended
- 20 ea. 37mm AP projectiles
- 15 ea. 40mm AP projectiles
- 50 ea. nose cones from 3.5" rockets
- 12 ea. 3.5" rocket tail fin assemblies
- 30 ea. hand grenade fuzes, fired
- 4 ea. parachute flare hand launchers, empty
- 500+ assorted small arms casing, empty
- 1000+ assorted 30 cal and 50 cal bullets
- assorted pieces of fragments from WP grenades
- 200+ pieces of heavy walled fragments
- 200+ pieces of thin walled fragments

Site D-2

Area sweep indicates light usage and turned up moderate amounts of OEW.

Recommend a clearance to a depth of two feet.

UXO

- None

OEW

- 75 ea. 50 cal bullets
- 6 ea. 30 cal bullets
- 1 ea. grenade fuze, fired
- 14 ea. 30 cal belt links
- small amount of assorted fragments from thin walled projectiles

Site D-3

Area sweeps turned up only a few empty small arms casings.

Recommend the area receive a clearance to a depth of two feet.

Site D-4

Area sweep indicated very limited use and tuned up small amounts of OEW. However, this site is in close proximity to Site C-4 and is located along the Trans Mountain Highway.

Recommend that because of these factors, as well as the finding 37mm Ap rounds, indicate that the area should receive

a clearance to a depth of four feet.

UXO

- None

OEW

- 2 ea 37mm AP projectiles
- small amount of light cased fragments

Site D-5

Area sweep turned up small amounts of empty small arms casing and a few pieces of light cased fragments.

Recommend this area receive a clearance to a depth of two.

Site WD-1

This area appears to have been the site of "pop-up" targets and sweeps turned up no UXO/OEW.

Recommend the area receive a clearance to a depth of two feet.

Site WD-2

Random walk through of area turned up only few empty small arms casings and old packing material for 3,5" rockets.

Recommend the area be cleared to a depth of two feet.

- 16 ea. 7.62mm blanks, fired
- 23 ea. 50 cal bullets
- 106 ea. 30 cal bullets
- 12 ea. pieces of small frag

Site E-1

Sweep turned up only moderate amounts of OEW.

Recommend a clearance to a depth of two feet.

UXO

- None

OEW

- 16 ea. 7.62mm blank casings, fired
- 23 ea. 50 cal bullets
- 106 ea. 30 cal bullets
- 12 ea. pieces of small frag

Site E-2

Sweep turned up only moderate amounts of OEW.

Recommend a clearance to a depth of two feet.

UXO

- None

OEW

- 2 ea. 37mm inert training projectiles
- 8 ea. 50 cal bullets
- 12 ea. 30 cal bullets
- small amount of light cased fragments
- small amount of heavy cased fragments

Site E-3

Sweep turned up only moderate amounts of OEW.

Recommend a clearance to a depth of two feet.

UXO

- None

OEW

- 9 ea. 50 cal bullets
- 13 ea. 30 cal bullets
- small amount of light cased fragments
- small amount of heavy cased fragments

Site WE-1 and WE-2

Randomly walked through of the area turned up only a small amount of OEW.

Recommend a clearance to a depth of two feet.

Site WE-3

Random walk through turned up a small amount of OEW.

Recommend a clearance to a depth of two feet.

UXO

- None

OEW

- 2 ea. 75mm projectiles, empty

- assorted fragments from 37mm and 40mm projectiles

Sites F-1, F-2, F-3, F-4, and WF-1

Sweeps and walk through of these areas turned up only a few pieces of fragments.

Recommend that they receive a clearance to a depth of two feet.

Site WF-2

This site, located in the south east part of the section, was swept from 4200' to 4800' and turned up no UXO/OEW. This area as well as the entire area west and southwest of it, are extremely rough and hard to navigate.

Recommend that due to the conditions and lack of UXO/OEW encountered, no clearance be completed.

Site G-1

These sites appear to have been used as an act area and moderate amounts of OEW, including both light and heavy cased fragments,were located.

Recommend a clearance to a depth of two feet.

UXO

- None

OEW

- 4 ea. 37mm AP projectiles
- 46 ea. 30 cal bullets
- 21 ea. 50 cal bullets
- 1 ea. rifle grenade fin
- moderate amounts of light cased fragments
- moderate amounts of heavy cased fragments
- several hand grenade spoons

Site G-2

Sweep turned up only small amount of OEW.

Recommend a clearance to a depth of two feet.

UXO

- None

OEW

- 1 ea. 37mm AP projectile

- small amount of fragments

Sites G-3, G-4, G-5, and WG-1

Sweeps and walk through of these sites turned up only small amounts of OEW.

Recommend a clearance to a depth of two feet.

Site G-6

Sweeps turned up small amounts of OEW.

Recommend clearance to a depth of two feet.

UXO

- None

OEW

- 5 ea. 37mm projectiles, empty

Site WG-2

Appears to have been one of the main impact areas for artillery, mortar and hand held weapons. Sweeps turned up a heavy concentration of OEW.

Recommend clearance to a depth of four feet.

UXO

- 1 ea. 40mm high explosive projectile
- 1 ea. 57mm high explosive projectile

OEW

- 3 ea. 37mm AP projectiles
- 6 ea. 60mm mortar tail fin assemblies
- 13 ea. 2.36" bazooka motors and fin assemblies, fired
- 4 ea. 3,5" rocket motors and fin assemblies, fired
- large amounts of 30 and 50 cal small arms casings, fired
- medium amounts of light cased frag
- medium amounts of heavy cased fragments

FTBL-16.A.1
UXB International, Inc. Final Report for Castner Range, Fort Bliss, Texas. April 1997. pg. 2-3.

FINAL REPORT

FOR

CASTNER RANGE
FORT BLISS, TEXAS

UNEXPLODED ORDNANCE (UXO) REMOVAL ACTION

DACA87-D-0002

DELIVERY ORDER 024

PREPARED FOR:

U.S. ARMY CORPS OF ENGINEERS
HUNTSVILLE, ALABAMA

PREPARED BY:

UXB INTERNATIONAL, INC.
21641 BEAUMEADE CIRCLE, SUITE 301
ASHBURN, VA 20147-6002

APRIL 1997

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2.0 UXO OPERATIONAL PLAN

2.1 METHOD OF WORK ACCOMPLISHEMENT

UXB was responsible for providing all the necessary equipment and personnel to conduct UXO investigation in accordance with the SOW provided by the U.S. Army Corps of Engineers Division, Huntsville, Alabama (CEHND). From May through October 1995, UXB conducted surface and subsurface detection and removal where the potential for encountering OEW was suspected. These included Area 1, Area A, Area B, Area C, Area D, and Area D South. A surface clearance and 10% subsurface selective sampling was conducted in Area 1 to a depth of one foot. Only surface clearances were conducted in the other areas. The search teams utilized visual and geophysical investigation techniques.

Due to the inherent risk involved in this operation, UXB personnel were limited to a 40 hour work week The Senior UXO Supervisor had the authority to adjust the working days and hours, as long as personnel did not perform UXO related tasks more than 10 hours a day, to accommodate other agencies working on site.

2.1.1 Area Layout

Figure 1 shows the former Castner Range on a regional map. Figure 2 reflects an area map including areas cleared and the UXB site trailer location at the U.S. Border Patrol Museum.

2.1.1.1 Staging Area

UXB staged the operation from the site trailer located in the U.S. Border Patrol Museum parking lot.

2.1.1.2 Work Areas

The following selected areas (569.44 acres) were cleared under this delivery order. A total of 277 UXO items (**Annex A**) and 5,555.5 pounds of OEW related scrap were located.

2.1.1.2.1 Area 1

This was a former recreation area contained 56 acres. The area consisted of flat ground with some small trees and brush. UXB conducted a 100% surface clearance and a 10% subsurface selective sampling to a depth of one foot in this area. UXO contamination (18 items) consisted only of 30 caliber ball ammunition and 13 pounds of OEW related scrap (**Annex B**).

2.1.1.2.2 Open Burn/Open Detonation (OB/OD) Area A

Area A contained 26.25 acres. UXO contamination (30 items) included 20 millimeter (mm) to 75

mm high explosive (HE) projectiles, a rifle grenade and mine fuze, and 155 pounds of OEW related scrap. This area contained four large craters which were former demolition sites. UXB conducted a 100% surface clearance action (**Annex C**).

2.1.1.2.3 OB/OD Area B

Area B contained 40 acres. UXO contamination (66 items) included 20 mm to 40 mm HE projectiles, blasting caps, small arms, grenade and projectile fuzes, and 854 pounds of OEW related scrap. UXB conducted a 100% surface clearance action (**Annex D**).

2.1.1.2.4 OB/OD Area C

Area C contained 206.25 acres. The area has rolling hills and some ravines. The western side has steep slopes rising up into the mountains. The site is rocky with gravelly soil and desert vegetation. UXO contamintion (61 items) included 2.36" rockets, a 60mm mortar, blasting caps, pyrotechnic star clusters, grenades, fuzes and 2,038 pounds of OEW related scrap. UXB conducted a 100% surface clearance action (**Annex E**).

2.1.1.2.5 OB/OD Area D

Area D containing 51 acres was referred to as the Bowl. This area, located on the north side of the Trans-Mountain Highway, is in a small valley with steep slopes rising into the mountains. The area is rocky with gravelly soil and desert vegetation. UXO contamination (30 items) included 37 mm to 105 mm HE projectiles, 3" Stokes Mortars, projectile fuzes and 419 pounds of OEW related scrap. UXB conducted a 100% surface clearance action (**Annex F**).

2.1.1.2.6 OB/OD Area D South

Area D South contained 189.94 acres. It was located on the south side of the Trans-Mountain Highway. UXO contamination (72 items) included 20 mm to 75 mm HE projectiles, 3" Stokes Mortars, small arms, fuzes and 2,076.5 pounds of OEW related scrap. UXB conducted a 100% surface clearance action (**Annex G**).

2.1.2 Site Security

Work site security was the responsibility of all personnel working on-site. All project visitors were briefed on the site conditions and excorted when entering an area where UXB employees were conducting operations. A security service provided site trailer security, where equipment was secured, during non-working hours.

Castner Range was closed to the public with signs posted around the perimeter, stating that the range was military property with inherent ordnance hazards. If the public chose to ignore these warnings and tresspass, UXB requested assistance from Fort Bliss Military Police.

FTBL-16.A.2
UXB International, Inc. Final Report for Castner Range, Fort Bliss, Texas. April 1997. pg. Annex A.

UXO RECOVERED **FT BLISS - 5000.024**

TYPE UXO	AREA 1	AREA A	AREA B	AREA C	AREA D	AREA D South	TOTAL
30 Cal Ball Ammo (in M1 Mag)	18						18
30 Cal Mags (live primers)						2	2
50 Cal Ball Ammo			2				2
20 mm Projectile HE		11	2			6	19
20 mm Projectile HE (w/o fuze)						2	2
30 mm Projectile HE			1				1
37 mm Projectile HE		2		3	2	3	10
37 mm Projectile HE (base fuze)						4	4
37 mm Projectile HE (dummy fuze)						2	2
37 mm Projectile HE (w/o fuze-residue)						1	1
37 mm Projectile HE (w/o fuze)						1	1
37 mm Projectile APHE						2	2
37 mm Projectile Practice (Demil)						2	2
40 mm Projectile HE		10	3		1	3	17
40 mm Projectile HE (w/o fuze)			1			1	2
40 mm Fuze						1	1
57 mm Projectile HE		3		1	2	2	8
57 mm Projectile HE (w/o fuze)						1	1
75 mm Projectile HE		1		1	15	3	20
75 mm Projectile HE (w/o fuze)					2	2	4
75 mm Projectile HE (partial-w/o fuze)						1	1
75 mm Projectile Sharpnel (w/o fuze)						2	2
75 mm Projectile Shot (w/o fuze)						1	1
105 mm Projectile HE (w/o fuze)					1		1
60 mm Mortar HE				1			1
3" Stokes Mortar HE					4	9	13
3" Stokes Mortar HE (w/o fuze)						3	3
3" Stokes Mortar HE (w/nose plug)						13	13
2.36" Rocket				25			25
2.36" Rocket Warhead (only)				1			1
WP Grenade (cocked striker)						1	1
Rifle Grenade				1			1
Rifle Grenade (M9A1)		1					1
Rifle Grenade Fuze			1				1
Rifle Grenade Det				1			1
Grenade Fuzes			30				30
Grenade Fuze (primer only)				1			1
Grenade Fuze Practice (Demil)						1	1
Grenade Fuze Mk 2				1			1
Grenade Simulator						1	1
M18 Smoke Grenade (green)				1			1
Star Cluster				2			2
Parachute Flare		1					1
M48 PD Fuzes			2		2		4
PD Fuze			1				1
Base Fuzes			14				14
Fuzes			5				5
M51-A5 Fuze					1	1	2
Mech Time Fuze - M502			1	1			2
Mech Time Fuze			1				1
VT Fuze			1				1
Mine Fuze		1					1
Booster HE						1	1
Blasting Cap (w/adaptor)			1				1
Electric Blasting Caps				21			21
TOTAL	**18**	**30**	**66**	**61**	**30**	**72**	**277**

FTBL-16.B.1
UXB International, Inc. Final Removal Report Ordnance and Explosive Removal Action, Castner Range, Fort Bliss, El Paso Texas. 30 October 1998. pg. 4-5.

FINAL REMOVAL REPORT
ORDNANCE AND EXPLOSIVE REMOVAL ACTION
CASTNER RANGE, FORT BLISS
EL PASO, TEXAS

PREPARED FOR:

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

Contract No.: DACA87-97-D-0006
Delivery Order No.: 0006
Project No.: 7506-700

PREPARED BY:

UXB INTERNATIONAL, INC.
ASHBURN, VIRGINIA

October 30, 1998

The views, opinions, and/or findings contained in the report are those of the author(s) and should not be construed as an official Department of Army position, policy, or decision, unless so designated by other documentation.

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1 INTRODUCTION

The U.S. Army Engineering and Support Center, Huntsville (CEHNC), under Contract DACA87-97-D-0006, Delivery Order 0006, contracted UXB International, Inc. (UXB) to conduct an Ordnance and Explosive (OE) Removal Action at Castner Range, Fort Bliss, El Paso, Texas.

Fort Bliss originally established Castner Range (approximately 3,500 acres) in 1926 as a small arms and artillery firing range. It was expanded in 1939 to a total of 8,328 acres; later it was deactivated in 1966, and subsequently declared excess to the Department of Army.

Castner Range lies in El Paso County, approximately 8 miles northwest of Fort Bliss. It is located on the northern boundary of the city of El Paso, and is situated in the city's logical northward growth path (site maps in Appendix A). The range is bisected by Texas State Road 375 (Trans Mountain Highway) and is bordered on the east by the North Hills housing development.

Subsequent to its deactivation, the range was the subject of several OE investigations, surveys and clearances. The earliest of these was in 1971 prior to the transfer of 1,247 acres to the city of El Paso. The Department of Defense retained control of the remaining 7,081 acres but continues to seek divestiture. The investigation/survey/clearance activities conducted from 1971-1996 were in designated areas within the Castner Range boundary. In 1997, UXB completed a prior removal action.

This project concerns an OE removal action on approximately 122 acres within the boundaries of Castner Range. The total acreage was broken down into the following three sites: The White Sands Bus Parking Lot (approximately 7 acres), a former Hand Grenade Range (approximately 5 acres), and the canyon mouth area below Fusselman Dam (approximately 110 acres).

1.1 Reasons for the Ordnance and Explosive Removal Action

Ordnance explosive (OE) and unexploded ordnance (UXO) present a significant danger to human and animal life, property and the public's enjoyment of nearby homes and the surrounding environment. The probability of encountering a dangerous OE/UXO situation increases when these areas are accessible. Castner Range can be, and has been, accessed by the public. Several civilian deaths, injuries, and "close calls" have occurred due to encountering OE/UXO on the range.

1.2 Scope of Work (SOW)

A complete copy of the U.S. Army Corps of Engineers Contract SOW for this project is located in Appendix B.

This project was performed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act, Section 104 and the National Contingency Plan, Sections 300.120(c) and 300.400(e). No Federal, State, or local permits were required to disposal of OE/UXO material on-site.

1.3 Technical Instructions and Other Contract Directives

There were no contractual changes to the original SOW.

1.4 Previous Related Submittals and Citation of Government Authorization

Contractual work on Castner Range occurred on June 15, 1998 – August 21, 1998. During this period, UXB submitted Weekly Activity Reports to the CEHNC (Appendix C).

1.5 Project Objectives

UXB satisfactorily completed the following tasks to complete this Ordnance and Explosive Removal Action.

1.5.1 Task 2 - Community Relations

This task was completed as specified in the SOW.

1.5.2 Task 3 – Survey and Mapping

Task 3 was completed in accordance with the approved Final Work Plan and DID:OT-020 of the basic contract.

1.5.3 Task 4 – OE Removal

The OE Removal task was completed in accordance with Section C, paragraph 3.7 of the basic contract. The following are the three sites on Castner Range.

1.5.3.1 The White Sands Bus Parking Lot

This area consisted of approximately 7 acres that was surface cleared.

1.5.3.2 The Former Hand Grenade Range

This area is located in the vicinity of the Wilderness Museum along the Trans Mountain Highway. The former grenade range consisted of approximately 5 acres that was cleared to a depth of 1-foot.

1.5.3.3 Fusselman Canyon

This area is located in the vicinity of the Fusselman Dam. The clearance area consisted of approximately 110 acres that was surface cleared.

1.5.4 Task 5 – Recovery of OE-Related and Non-OE Related Scrap Material

The recovery and disposition this material was completed as specified by the basic contract.

1.5.5 Task 6 – Quality Control

Quality control was satisfactorily completed in accordance with DID:OT-005 of the basic contract.

1.5.6 Task 7 – OE Survey and Evaluation Report

This report is being prepared in accordance with DID:OT-030 of the basic contract.

FTBL-16.B.2
UXB International, Inc. Final Removal Report Ordnance and Explosive Removal Action, Castner Range, Fort Bliss, El Paso Texas. 30 October 1998. pg. 13-15.

4.2.2.3 Non-Ordnance Related Scrap

UXB recovered an estimated 673 pounds of non-ordnance related scrap. In accordance with the Final Work Plan, all non-ordnance related scrap was left on the grid where it was found.

5 FINANCIAL BREAKDOWN

The financial statement for this project is located in Appendix M.

6 PUBLIC AFFAIRS

On June 29, 1998, Mr. Jack Kurtz of the El Paso Times visited the site. He was given an operational orientation briefing. (Visitors Log, Appendix N).

7 SUMMARY

All three sites were located on Castner Range and were contaminated with UXO from past military training activities. All these sites were inspected and cleared of OE/UXO and OE scrap material.

7.1 The Bus Parking Lot

This area consisted of 7 acres (12 grids). It was surface cleared only. No live UXO or OE Scrap were encountered.

7.2 The Former Hand Grenade Range

This area consisted of 5 acres (9 grids). It was cleared to a depth of 1-foot. Six live UXO or explosives were encountered. A total of 278 pounds of OE scrap was collected.

7.3 Fusselman Canyon

This area consisted of 110 acres (119 grids). It was surface cleared only. Nine live UXO or explosives were encountered. A total of 1,273 pounds of OE scrap was collected.

8 CONCLUSIONS

This was a basic OE/UXO removal action that was conducted in terrain generally conducive to removal operations. UXB makes the following recommendations:

8.1 Additional OE/UXO

The existence of OE/UXO at depths in excess of Table 1 at the three sites for this project is unknown. However, in time, it is possible for OE/UXO material to gradually work its way through normal geological activity to the surface. Additionally, if any future soil disruption i.e.

construction, farming, etc. is anticipated, it is highly recommended to determine the continued sanitation of this removal action, or to conduct another UXO investigation.

8.2 Public Awareness

A public awareness campaign has been implemented but needs to be sustained with the El Paso County officials, city safety departments (police and fire), the media, and the general public. The presence of OE/UXO confirms the existence of these hazards, however the completion of this removal action does not mitigate the possibility of OE/UXO in those areas that have not been cleared.

FTBL-16.B.3
UXB International, Inc. Final Removal Report Ordnance and Explosive Removal Action, Castner Range, Fort Bliss, El Paso Texas. 30 October 1998. Appendix L pg. 1.

GRID SEARCH SUMMARY

Location	Grid Number	OE/UXO Nomenclature
Fusselman Canyon	1500n5800e	1 each, 37mm, Proj w/Fuze
	1500n6600e	1 each, 37mm, Proj w/Fuze
	1500n7800e	1 each, 37mm, Proj w/Fuze
	1900n6200e	1 each, 37mm, Proj w/Fuze
	2100n7200e	1 each, 37mm, Proj w/Fuze
		1 each, 75mm, Proj, HE
	2300n5800e	1 each, 75mm, Proj, HE
	3700n4149e	1 each, 37mm, Proj w/Fuze
	4300n3800e	1 each, 75mm, Proj, HE
	Site Subtotal	**9**
Hand Grenade Range	9477n9112e	1 each, Grenade w/o Fuze
	9606n9364e	5 each, Fuze, Grenade
	Site Subtotal	**6**
Bus Parking Lot	**Site Subtotal**	**0**
	Project Total	**15**

FTBL-17.A.1
CMS. Final Survey Report – Castner Range, Fort Bliss, Texas. 25 February 1998. pg. 1-2 – 1-4.

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Chapter 1: Summary of Activities

Chapter 2: Operational Approach

- Task 2: Perform community relations;
- Task 3: Perform location surveys and mapping;
- Task 4: Perform OE contamination survey;
- Task 5: Perform turn-in of recovered inert scrap and OE related scrap;
- Task 6: Perform Quality Control;
- Task 7: Prepare and submit removal report;

1.2.1 TASK 1, PERFORM A SITE VISIT AND PREPARE A SITE-SPECIFIC WORK PLAN

CMS personnel traveled to Castner Range (Fort Bliss), Texas and performed a Site Visit during the period of July 10-14, 1995. The site visit and schedule were coordinated with and approved by Mr. William Sargent, Program Manager, CEHNC. Following the visit, CMS prepared a Work Plan. This plan was prepared in accordance with 3.2.1, Data Item: A001, of the basic contract. The work plan was submitted in draft format, for review by CEHNC, Mr. William Sargent. Following CEHNC's review of the plan, CMS incorporated the requested changes and redistributed the draft work plan on August 9, 1996. This plan was accepted and approved by CEHNC on September 25, 1996 and CMS received a notice to proceed.

1.2.2 TASK 2, PERFORM COMMUNITY RELATIONS

There were no requests from either CEHNC or Fort Bliss Public Affairs Office for CMS to perform any type of community relations activities. Additionally, there were no requests made by external agencies for information pertaining to these Task Orders.

1.2.3 TASK 3, PERFORM LOCATION SURVEYS AND MAPPING

During the period October 21, 1996 through March 24, 1997 CMS surveyed the work site for the project. A surveyor was contracted to establish a control monument near the Wilderness Park museum on Trans Mountain Road. Location, grid layout, and surveying of the site was accomplished by CMS personnel using Real Time Global Positioning System (RT/GPS).

1.2.4 TASK 4, PERFORM OE CONTAMINATION SURVEY

By October 21, 1996 the work force was hired, trained and in place, and operating the equipment on hand. Surface sampling operations commenced on November 5, 1996 and were completed on March 26, 1997. Subsurface sampling operations began on March 31, 1997 and were completed on May 21, 1997. Activities were performed in accordance with the approved Work Plan; inspected by the on site CEHNC Safety Representative, and accepted as complete by the CEHNC Project Manager (Mr. William Sargent). Specific activities performed during this period included:

- Surveying and marking of grids;
- Surface sampling of 2035 grids (approximately 467 acres);
- Subsurface sampling of 172 grids;
- Detailed accounting of OE located and removed;
- Quality inspections of work completed;
- Demolition of OE.

1.2.4.1 Surface Sampling CMS selected sampling locations in accordance with instructions in paragraph 3.4.2 of the SOW and information gathered during the Site Visit. Castner Range was divided into eleven zones, CMS conducted a 100% surface sampling of 2035 100' X 100' grids dispersed throughout the zones. UXO and OE items were found in nine of the eleven zones. Table 1.1 contains a summary of OE items encountered and recovered during surface sampling operations.

Table 1-1: Listing Of Surface OE Items

Grid	Northing	Easting	Qty	Description
1-126	10713974	396969	1	40mm projectile, cartridge w/primer only
1-156	10714564	395369	1	81mm mortar, tail boom w/primer only
1-177	10714878	396076	2	40mm projectile , cartridge w/primer only
1-247	10716068	395596	1	40mm projectile, HE, MK II
1-264	10716359	395367	1	M52 fuze
1-276	10716858	393666	1	40mm projectile, HE, MK II
2-4	10712055	400755	1	Trip flare
2-48	10712707	398782	1	Grenade fuze
2-117	10713710	399037	1	Grenade fuze
2-117	10713717	399033	1	Firing device, M1 pressure release, w/base coupling
2-129	10713980	397880	1	Ground signal, hand launched (slap flare)
2-314	10716435	400400	1	Grenade, MK II training
2-158	10714235	400880	1	Trip flare
4-30	10709046	395086	1	60mm mortar, HE
5-140	10709700	399030	1	Grenade fuze
5-142	10709715	399310	1	Grenade fuze
6-80	10703622	388727	1	40mm projectile, HE, MK II
6-132	10705065	390708	1	75mm projectile, HE, MK I
7-2	10702580	397407	1	37mm projectile, HE, M63
7-8	10702322	398922	1	105mm projectile, HE
7-160	10704827	398757	1	Electric blasting cap
7-185	10705097	400662	1	40mm projectile, HE, MK II
8-27	10701786	396245	1	37mm projectile, HE, M54
8-27	10701763	396175	1	75mm projectile, shrapnel, MK II
8-57	10702463	395574	1	75mm projectile, shrapnel, MK II
8-92	10703446	394860	1	37mm projectile, HE, M54

Table 1-1: Listing Of Surface OE Items

Grid	Northing	Easting	Qty	Description
8-108	10704106	394410	1	57mm projectile, recoilless rifle, HE
8-151	10704066	393065	1	75mm projectile, HE
8-199	10702873	391606	1	37mm projectile, HE, M54
8-202	10702641	391420	1	37mm projectile, HE, M54
8-275	10701571	389060	1	37mm projectile, HE, M54
10-8	10699163	396378	1	105mm projectile, HE
10-8	10699173	396333	1	37mm projectile, HE, M63
10-29	10698964	395627	1	105mm projectile, HE
10-65	10701152	395790	1	75mm projectile, HE, MM I
10-69	10701456	395298	1	75mm projectile, HE, MK I
10-70	10701692	395043	1	75mm projectile, HE
10-72	10701889	394999	1	37mm projectile, HE, M63
11-10	10696309	399519	1	37mm projectile, HE, M54
11-131	10698944	399839	1	37mm projectile, HE, M63
11-168	10699824	397759	1	37mm projectile, HE, M63
11-171	10699808	398640	1	37mm projectile, HE, M63
11-196	10700491	397512	1	37mm projectile, HE, M63
11-207	10700519	400889	1	105mm projectile, HE, w/M48A2 fuze
11-252	10701744	396914	1	4.2" mortar, WP, burster tube only

1.2.4.2 Subsurface Sampling 172 grids were sampled throughout the eleven zones. Grids were selected to ensure both spatial and random sampling and based upon the location of surface contamination to ensure the likelihood of finding anomalies. Table 1.2 lists the one (1) OE item encountered and recovered during the subsurface sampling operation.

Table 1-2: Listing Of Subsurface OE Item

Grid	Northing	Easting	Qty	Description
4-190	10710579	395416	1	3.5" rocket, motor only

FTBL-17.A.2
CMS. Final Survey Report – Castner Range, Fort Bliss, Texas. 25 February 1998. pg. 4-1 – 4-2.

Chapter 4: GridStats/SiteStats Survey Methodology

4.0 INTRODUCTION

Subsurface sampling operations at Castner Range were performed with adherence to the recommendations in the following publications:

- The approved Work Plan with change 3 dated April 1, 1997;
- QuantiTech, Site/Grid Statistical Sampling Based Methodology (GridStats/SiteStats), dated September 30, 1995;
- Site training and real time support from QuantiTech during the subsurface operations.

4.1 GRIDSTATS/SITESTATS

The idea behind GridStats/SiteStats is "*accepting a small amount of uncertainty in characterizing the individual grids in exchange for a much greater understanding of the contamination of the overall site using sequential sampling techniques to minimize costs*".

4.1.1 GRIDSTATS

A cost error value, risk error, and a UXO value are all used in determining when to halt sampling within a grid. Grids conforming to 100 x 100 feet (ft) dimensions were used at Castner Range which were further divided into 32 equally sized sub-grids. A random number selection is generated to provide users with a sampling sequence to follow for sampling the sub-grids. When directed to a particular sub-grid, the UXO excavation team proceeds to the indicated location and sample all anomalies in that area. Once the anomaly is identified, the results are entered into the GridStats program. This anomaly-by anomaly sampling process continues until the stopping rules established by the program indicates that sampling can be discontinued.

4.1.2 SITESTATS

The SiteStats program is used during sampling efforts at a site contaminated with OE, such as that occurring during the preparation of an Engineering Evaluation/Cost Analysis (EE/CA). SiteStats provides insight into establishing the boundaries of contaminated areas and estimating the density of contamination in an area. Coordination between CMS' project management personnel and QuantiTech during the grid sampling ensured a sufficient number of grids were sampled to perform a statistically significant SiteStats assessment.

4.2 CASTNER RANGE ZONES

Castner Range 6568 acres were divided into eleven (11) homogeneous zones based on accessability by the public, terrain, vegetation, soil type, and historical use while active (the zones are internally homogenous, but there is little homogeneity between zones in terms of accessability, terrain, vegetation, soil etc.). Ten percent of the range was selected for surface sampling, this sampling area was divided into 2035 grids. Once surface sampling was completed, 172 of the grids were selected for subsurface sampling based on the following criteria:

- To ensure spatial and random grid sampling;
- Investigate areas based on visual and historical data, that likely would contain subsurface UXO;
- Assure a statistical sampling confidence for the sector characterization.

Zones II & V and X & XI were combined into two sectors for subsurface sampling operations. The rationale for combining the zones was based upon terrain features (steep inclines and a dry dam) which inhibited the application of the grid selection criteria listed above.

A QuantiTech representative provided on-site training March 25 & 26, 1997, actual subsurface sampling began on March 31st and were completed on May 21, 1997.

4.3 GRIDSTATS/SITESTATS SUMMARY

Table 4-1 summarizes the results of the subsurface sampling activities at Castner Range.

ZONE	NUMBER OF GRIDS SAMPLED	NUMBER OF ANOMALIES EXCAVATED	NUMBER OF UXO FOUND	CHARACTERIZATION CONCLUSIONS
1	17	305	0	Homogeneous
2 & 5	21	814	0	Homogeneous
3	15	35	0	Homogeneous
4	17	292	1	Homogeneous
6	17	73	0	Homogeneous
7	21	291	0	Homogeneous
8	23	314	0	Homogeneous
9	15	21	0	Homogeneous
10 & 11	26	283	0	Homogeneous

Table 4-1: Summary of Subsurface Sampling Actions

4.4 CONCLUSIONS

The SiteStats program assessed that a sufficient number of grids were sampled to conclude that each zone can be expected to have a density of UXO remaining that is consistent with the sample findings. The assessment provides a statistical confidence that the potential for any significant density of subsurface UXO remaining is very small (see appendix G, QuantiTech's SiteStats/GridStats Draft Report).

4.5 SUMMARY

The Castner Range subsurface sampling operation was performed in an efficient, cost effective manner. Employing the GridStats/SiteStats program was a significant factor in maintaining efficiency and cost effectiveness. Communications between QuantiTech and CMS along with information gained concerning the site as UXO and OE related material were discovered, the level of confidence in the characterization of the individual grids and sectors was dramatically increased.

FTBL-18.A.1
USA Environmental, Inc. Draft Final Removal Report, Ordnance and Explosives (OE) Removal Action at Castner Range, Fort Bliss, Texas. 16 April 2004. pg. 1-3.

Draft Final Removal Report

Ordnance and Explosives (OE) Removal Action

At

Castner Range, Fort Bliss, Texas
DACA87-00-D-0036
Task Order: 0014
Project No: K06TXCAST06SWF

Prepared For

U.S. Army Engineering and Support Center, Huntsville

And

US Army Engineer District, Fort Worth

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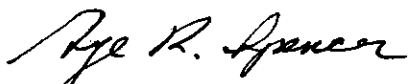

George R. Spencer
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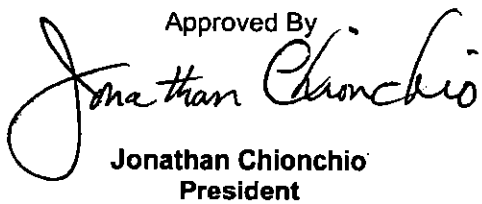

Jonathan Chionchio
President

April 16, 2004

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from previous investigations provided by USAESCH into the GIS database.

1.3.6 TASK 8: EXPLOSIVES SAFETY SUBMISSION

(See paragraph 1.3.2 above)

1.3.7 TASK 9: REMOVAL ACTION

USA mobilized to Castner Range on 15 June 2003 to begin site setup, training and OE Removal. RA operations with clearance to depth began on 1 July 2003 and continued through 20 November 2003. Based on an in-process review at Fort Bliss, USA received a letter (dated 20 November 2003) from the USAESCH Contracting Officer to cease subsurface clearance and perform only visual surface clearance with the remaining available funds. USA continued surface clearance operations, except for a two-week break during the Christmas Holidays, and completed site operations on 11 March 2004. USA personnel completed all final site closeout operations and demobilized on 17 March 2004. During the RA at Castner Range, USA subsurface cleared 167 acres to depth, excavating approximately 41,000 subsurface anomalies, and surface cleared 975 acres for a total of 1,142 acres cleared. USA located, identified, and disposed of 127 UXO items (see Appendix B), explosively vented 43 OE items, and 241 assorted small arms ammunition.

1.3.8 TASK 10: FINAL REPORT

This Final Report is prepared in accordance with the specifications outlined in paragraph 4.0 of the SOW and Data Item Description (DID) OE-030.

1.3.9 TASK 11: PUBLIC LIAISON

No public liaison was required or used during site operations. No site investigations or demolition operations impacted either residences or public traffic routes.

1.4 QUALITY CONTROL AND QUALITY ASSURANCE

USA performed Quality Control (QC) inspections throughout the RA operations. These inspections consisted of daily inspections of operational activities and formal inspections of completed work. Daily inspections included checks of maintenance and calibration procedures, and compliance with the WP. Following completion of the subsurface and surface clearance, the UXO Quality Control Specialist (UXOQCS) performed a QC inspection of the excavations and grids. Upon completion of the QC inspections the USACE Safety Specialist performed Quality Assurance (QA) inspections. All Areas and grids investigated passed QA inspection (see Appendix E) by the Government.

1.5 FINAL DISPOSITION OF AEDA/RANGE RESIDUE

During site operations, USA recovered, inspected, certified 5,575 pounds (lbs) of Ammunition, Explosives, and Dangerous Articles (AEDA) Ordnance Related Scrap (ORS) and 9,364 lbs of Range Residue (RR). All AEDA and RR were disposed of at M & M Metals (M & M), El Paso, TX. M & M provided certification that the ORS would be crushed, shredded, or smelted prior to release for resale (see Appendix B).

FTBL-18.A.2
USA Environmental, Inc. Draft Final Removal Report, Ordnance and Explosives (OE) Removal Action at Castner Range, Fort Bliss, Texas. 16 April 2004. pg. 6-1 through 6-2.

CHAPTER 6

6.0 SUMMARY

USA completed all tasks in accordance with the approved SOW and WP safely and efficiently. The SOW went through several dynamic changes as to areas for clearance, clearance methods, and priorities for clearance. USA closely coordinated with the IRP PM and USAESCH and reacted rapidly to changes.

6.1 CLEARANCE AREAS

Initially, clearance at Castner Range was to be surface clearance of 1746.7 acres in seven areas with a subsurface clearance to a depth of one foot of 258.5 acres in areas TBD. During WP preparation and coordination with Fort Bliss and the USAESCH the areas and acreage changed to five specific areas of 1,291 acres, in order of priority 1-5, and a sixth area of 481 acres TBD. During review and comments of the draft Work Plan the decision was made to change the SOW to a clearance to depth of all areas. USA changed the WP and ESS appropriately and mobilized to the site in June 2003.

6.2 CLEARANCE PRIORITIES & METHODS

Throughout the project, the USA Project Manager provided weekly status updates to include fund expenditures and projections. It soon became apparent that clearance to depth would expend all available funding and barely complete Area 1. The IRP PM and USAESCH an in-process review at Fort Bliss in November 2003 and all stakeholders attended.

6.2.1 PRIORITIES

The result of the in-process review was that subsurface clearance would cease and all future actions would be visual surface clearance with the remaining available funds. The rationale for this was that the priory was to safeguard the public from surface UXO. Even though Castner Range is posted off-limits, the area is not fenced and locals regularly enter for hiking and other activities. Immediately after the review USAESCH issued a letter from the Contracting Officer to finish current subsurface investigations already in process and then switch to surface clearance.

During surface clearance, USA continued to encounter UXO and based on the amounts and locations the IRP PM requested a change of areas and priorities. USA, with USAESCH concurrence, expanded the Area 4 boundary and did not perform any clearance in Area 5.

TABLE 6-1: UXO ENCOUNTERED

UXO Disposal	Total
105mm Projectiles	8
120 mm Projectile	1
2.36" Rockets	3
20mm Projectiles	2
37mm Projectiles	44
40mm Projectiles	11
57mm Projectiles	2
75mm Projectiles	4
76mm Projectile	1
Artillery Simulators	8
Cartridge, 75mm, w/primer	1
Demolition Block, TNT, 1/2 lb.	1
Flare, trip, M48	1
Grenade Fuzes	33
Grenade, hand, MK-II	1
Grenade, smoke, M22	1
Projectile Fuzes	3
Rifle Grenades	3
Total	**128**

6.2.2 METHODS

USA completed the subsurface clearance in Area 1 consisting of 167 acres and started surface clearance in the remaining areas. USA located/disposed of an additional 59 UXO and 34 OE items during surface clearance in Areas 2-4 and the

expanded grids in Area 4.

6.3 TOTAL AREA CLEARED

USA subsurface cleared 167 acres (181 grids) to depth, excavating approximately 41,000 subsurface anomalies, and surface cleared 975 acres (1,353 grids) for a total of 1,142 acres (1,534 grids) cleared. USA located and disposed of 128 UXO, 52 OE items, and 241 small arms ammunition. In addition, USA removed approximately 3,500 lbs of ORS and 7,790 lbs of other RR scrap.

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FTBL-18.A.3
USA Environmental, Inc. Draft Final Removal Report, Ordnance and Explosives (OE) Removal Action at Castner Range, Fort Bliss, Texas. 16 April 2004. pg. 4-2 – 4-3.

4.1.5 MAINTENANCE

Scheduled maintenance was performed in accordance with the manufactures/owners recommendation or owner's manual for equipment requiring regular upkeep. This equipment included:

- Vehicles;
- Powered Equipment;
- Personal Protective Equipment (PPE);
- Communications Equipment;
- Navigational Equipment;
- Handheld Magnetometers;
- Emergency Equipment.

4.2 QUALITY CONTROL

4.2.1 HANDHELD MAGNETIC LOCATOR (SCHONSTEDT GA-52CX)

A QC survey was performed using a handheld locator of the same technology used for the original survey covering a minimum of ten (10) percent of each grid after field operations completed. Excavations of any un-dug anomalies discovered during the QC survey were thoroughly investigated and the results recorded. In addition, a QC check of selected investigated anomalies was performed to determine that the excavation removed the anomaly and there were no remaining items of concern.

4.2.2 FAILURE CRITERIA

The failure criterion was if, during the USA QC or Government QA of any grid, a piece of ferrous metal equivalent in size to a MK II hand grenade or larger, or any UXO item was found. No grids or subsurface anomaly locations failed QC or QA.

4.2.3 AMMUNITION, EXPLOSIVES, AND DANGEROUS ARTICLES AND RANGE RESIDUE

AEDA and range residue was inspected prior to release for disposal. This property was 100% properly inspected in accordance with the approved WP. Dual signatures for certifying and verifying the property were required on the DD Form 1348-1a. The UXOQCS will ensure that procedures are followed which preclude any explosive or energetic material from being released to the public and required documentation is maintained on file for inspection purposes.

4.3 QUALITY CONTROL INSPECTIONS, AUDITS AND REPORTS

The UXOQCS was responsible for the accomplishment of operational checks of instruments and equipment by site personnel and the appropriate log entries made. The UXOQCS performed inspections and or audits at random (see Appendix E), with unscheduled checks of the site to ensure personnel accomplished all work as specified in the Work Plan. The UXOQCS checked 181 subsurface and 1,353 surface grids and all were checked and accepted by the Government QA.

4.4 EXPLOSIVE TEST

In September 2003, the SUXOS received a request from the IRP PM to test surface soils in the former Open Burn/Open Detonation (OB/OD) site near Area 1. USA ordered an explosives test kit from Plexus Scientific Corporation and had it delivered directly to the site at Castner Range. The field Test Kit (Expray Test Kit) has the capabilities of testing and detecting several types of explosives and propellants. All

tests were negative for explosives and/or propellants and the results provided to the IRP PM.

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FTBL-18.A.4

USA Environmental, Inc. Draft Final Removal Report, Ordnance and Explosives (OE) Removal Action at Castner Range, Fort Bliss, Texas. 16 April 2004. Appendix C – Site Photographs.

Live 105mm projectile M314 Series w/Fuze found on Castner Range during USA's investigation, January 2004.

Live 37mm projectile MKI found on Castner Range during USA's investigation, December 2003.

Live 2.36” rocket, M6 Heat found on Castner Range during USA’s investigation, February 2004.


Live grenade, smoke, M22 found on Castner Range during USA’s investigation October 2003.

FTBL-19.A.1
Shaw Environmental, Inc. Final Summary of Test Boring Activities, Open Burn/Open Detonation Area A-1, FTBL-073, Castner Range, Fort Bliss, Texas. May 2004. pg. 1-2.

Final
Summary of Test Boring Activities
Open Burn/Open Detonation (OB/OD) Area A-1, FTBL-073
Castner Range
Fort Bliss, Texas

1.0 INTRODUCTION

Through the Total Environmental Restoration Contract (TERC) Contract No. DACA56-94-D-0020, Delivery Order No. 62, the U.S. Army Corps of Engineers (USACE) Tulsa has contracted Shaw Environmental, Inc. (Shaw) to install one test boring at the Open Burn/Open Detonation (OB/OD) Area A-1, FTBL-073, at Castner Range, Fort Bliss, Texas. The test boring was installed to determine if there was groundwater beneath the site in response to the January 8, 2004, Texas Commission of Environmental Quality letter requesting additional information for the Final Affected Property Assessment Report, OB/OD Area A-1.

The OB/OD Area A-1 is located in the northern section of Castner Range. The basic topography of the site is a valley that slopes downward on both sides to a wash area, which traverses the site. The surface water runoff flows to the north-northeast. There have been no previous investigations for groundwater at this site.

2.0 SCOPE

Shaw installed a test boring at the OB/OD Area A-1, to determine if groundwater could be a potential exposure pathway at this site. If the test boring produced groundwater, this would indicate that there is groundwater beneath the site, and a potential groundwater exposure pathway exists. If however, the test boring does not produce groundwater, a potential exposure pathway via groundwater would not exist. The test boring was drilled to bedrock, left open over night, checked for groundwater, and abandoned.

3.0 DRILLING ACTIVITIES

A Texas licensed driller was subcontracted to perform the drilling. Personnel, equipment, and subcontractors were mobilized to the site on January 28, 2004. The test boring location was placed between the road and wash area near previous sample locations C-18 and C-9 (See **Figure 1).** Since this area had previous investigation work, Shaw did not obtain any additional clearances from Fort Bliss prior to mobilization.

Boring Installation

The hollow stem auger drilling method was used to install the test boring, SBT-1, on January 28, 2004. Boring was performed using 4 ¼ inch inside diameter (ID) augers. Soils were continuously characterized from the ground surface to the total depth of the boring using a 2-inch diameter, 24-inch long split-spoon sampler. The sampler was driven by blows of a 140 pound drop hammer, falling freely for a distance of 30 inches. Upon retrieval, the sample was visually observed and the soil was classified by the geologist. The boring log is shown as **Figure 2.** The previous investigation indicated that this area is uncontaminated, and the drill cuttings were placed on the ground and spread out on the ground surface

around the test boring. Drilling continued until bedrock was reached at 48.5 feet below the ground surface.

Observation for Groundwater

The drilling of the test boring was completed by 2 p.m. on January 28, 2004. The boring was left open overnight. At 10 a.m. on January 29, 2004, the borehole was visually inspected using a mirror and rod for groundwater. No groundwater was present, and abandonment activities began.

Boring Abandonment

Abandonment activities were conducted on January 29, 2004, by filling the boring with a Portland cement and bentonite mixture. A tremie pipe was used to place the mixture from the bottom of the boring up to the ground surface. The discharge of the tremie pipe remained beneath the surface of the mixture to ensure that no bridging was occurring. After the boring was filled, the mixture was allowed to set. After about 2 ½ hours, the mixture had subsided, and was topped off with additional mixture. The filled boring was then covered with native soil.

Records and Documentation

The driller kept a daily record of drilling activities.

3.0 SITE RESTORATION AND DEMOBILIZATION

Site restoration activities consisted primarily of cleaning up the site after drilling activities. In addition, the entrance to the well site was made impassable to prevent unauthorized personnel from entering. After the work was complete, Shaw demobilized all subcontractors, equipment, and personnel on January 29, 2004. The down-hole drilling equipment used on site, including the drill rig, water tank, augers, rods, samplers, and associated tools, were transported to the staging area at the Mesa well field for cleaning.

4.0 CONCLUSION

Groundwater was not present beneath the OB/OD, Area A-1, and is therefore not a potential exposure pathway.

FTBL-20.A.1
Unknown author. Memorandum for Record, Suject: Closure Decision Document for FTBL-073. Unknown date. pg. 1.

Memorandum for Record

SUBJECT: Closure Decision Document for FTBL-073

SITE NUMBER AND DESCRIPTION

OB/OD Area A-1, no SWMU #, FTBL-073
FTBL-073 was a suspected second OB/OD area located near the northwest corner of the former Castner Range. It is very isolated and accessible only by horseback or four wheeled drive vehicles.

SUMMARY OF SITE RISK

Suspected contaminants were HMX, RMX, RCRA metals and UXO.

PURPOSE OF REMEDIAL ACTION

A third RI/FS investigation conducted in the spring of 2002 took extensive soil samples to complement and complete the scope of the two limited previous investigations. Test results determined there was no release of regulated materials above EPA screening levels.

DOCUMENTATION OF INVESTIGATION

FTBL-073 Castner OB/OD Pit A-1, Drawing of Castner OB/OD A-1, Malcolm Pirnie, Inc, USACOE-Ft Worth, Draft – OB/OD Pit A-1-Castner Range, Malcolm Pirnie, USACOE-Ft Worth, December 1996, Map – Site Investigation Work Plan, U.S. Army Corps of Engineers, USACOE-Ft Worth, April 1997, Report of Sampling Activities for Ft Bliss Relative Risk Site Evaluation, Malcolm Pirnie, Inc, USACOE-Ft Worth, July 1999, Final Report Site Investigation Work Plan- OB/OD Pit A-1, Malcolm Pirnie, Inc, USACOE-Ft Worth, October 2000, Final Report – Environmental Site Assessment OB/OD Pit A-1,.

DOCUMENTATION OF CLOSURE DECISION BY STATE ENVIRONMENTAL AGENCY

Previous agreements with TCEQ (then TNRCD in IAP Coordination meeting in El Paso, 2000) stated that if there were no contaminants of concern above screening levels that the site could be cleaned when funding was available to remediate all of the closed Castner Firing Rangee..

DECLARATION

I. The selected remedy (*permitting the affected soil to remain in place)*) is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate to this site and is cost effective. This remedy satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility or volume as a principal element and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

II. Because this remedy will not result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, the five-year review will not apply to this action.

FTBL-22.A.1

Fort Bliss DOE, SAIC, Center for Ecological Management of Military Lands, USACE Fort Worth, Geo-Marine, Inc. Integrated Natural Resources Management Plan, US Army Air Defense Artillery Center, Fort Bliss. November 2001. pg. 6-1 – 6-11.

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

U.S. ARMY
AIR DEFENSE ARTILLERY CENTER
FORT BLISS

PREPARED BY

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Fort Collins, Colorado 80523-1470

U.S. Army Corps of Engineers
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Fort Worth, Texas 76102-0300

Geo-Marine, Inc.
6554 Florida Blvd.
Suite 215
Baton Rouge, Louisiana 70806

November 2001

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6.0 NATURAL RESOURCES AND CLIMATE

6.1 SETTING

6.1.1 Geographic Description

Fort Bliss is located in the northern Chihuahuan Desert, which is typically classified as semiarid (U.S. Army, 1993b). Portions of the Chihuahuan Desert occur in the states of Arizona, New Mexico, and Texas in the United States, and most of this desert is located in the Mexican states of Chihuahua, Durango, Coahuila, Zacatecas, Nuevo Leon, and San Luis Potosi. The Chihuahuan Desert is one of the highest North American deserts in terms of both maximum and mean elevation above sea level (Wells, 1977). Physiographically, it is a high plateau between the two great mountain ranges of Mexico, the Sierra Madre Occidental and the Sierra Madre Oriental, both of which attain elevation in excess of 10,000 feet. These major mountain ranges partially intercept rain-bearing air masses from the oceans, decreasing rainfall on the central plateau of northern Mexico. This plateau extends into the southwestern U.S. Topography of the Chihuahuan Desert consists of closed basins, isolated mountains, pediments, and basal plains. Elevations range from 3,000 to over 8,000 feet above sea level (Wells, 1977). Elevations in this desert generally decrease from the Continental Divide to the Gulf of Mexico and increase as you move south along the central plateau into Mexico.

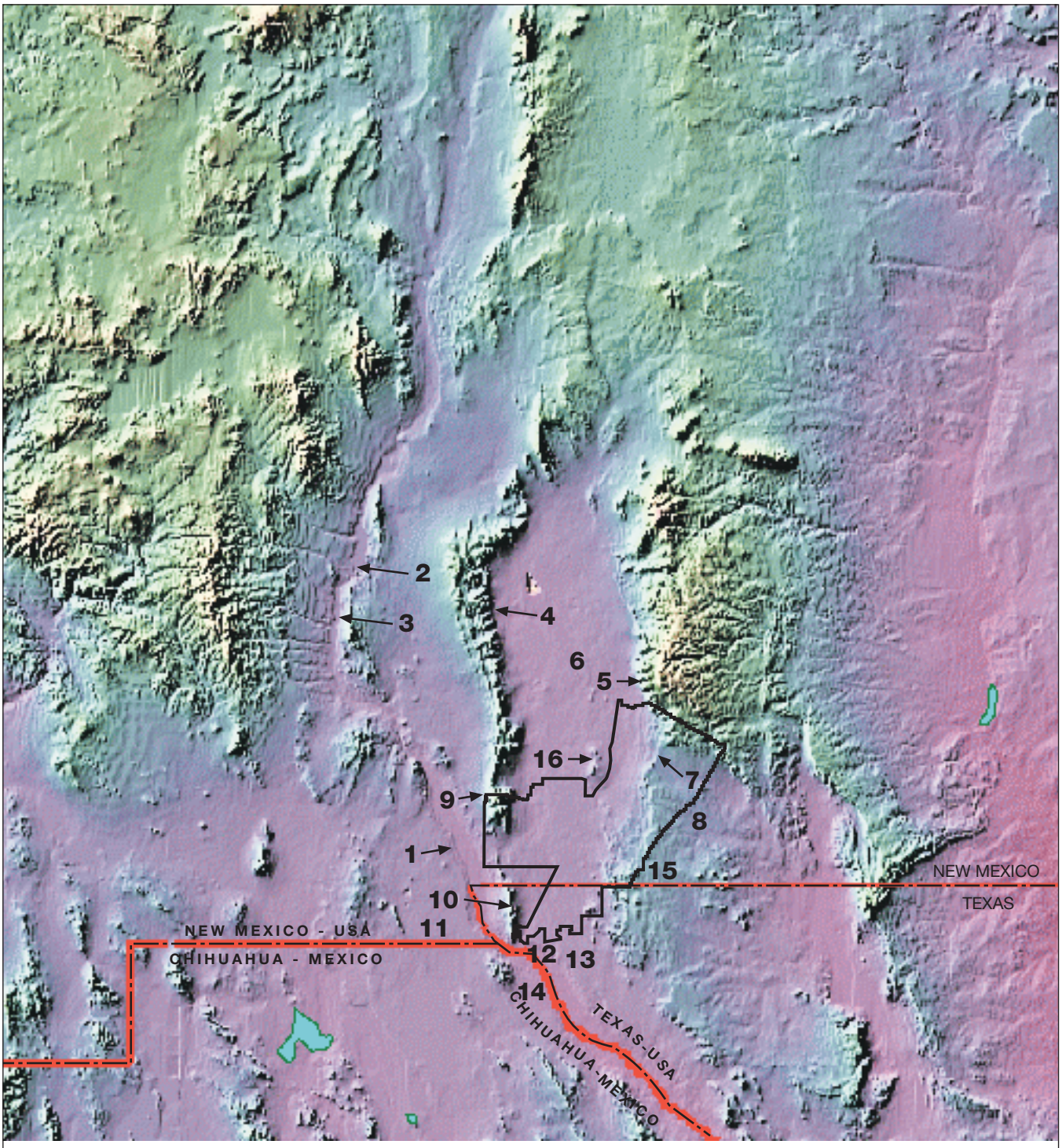
Different physiographic features found on Fort Bliss are the Tularosa Basin, Otero Mesa, and the Sacramento, Hueco, Organ, and Franklin mountains (Figure 6-1). The Tularosa Basin is the central feature with the Sacramento and Hueco mountains, and Otero Mesa, located on the east side of the Tularosa Basin; and the Organ and Franklin mountains found on the west side. The mountain ranges and Tularosa Basin have a north-south orientation. All of these landforms extend beyond Fort Bliss boundaries.

6.1.2 Climate

The climate across Fort Bliss can be characterized as having low relative humidity, hot summers, and moderate winters. Some higher elevation areas of the installation have semi- and sub-humid climatic zones due to higher precipitation. Springtime is normally moderate in temperature with high winds and blowing dust (USDA, 1980; 1981).

Temperatures at Fort Bliss are highly variable, ranging from -8 to 114°F with a daily average of 64°F. The maximum and minimum daily averages are 76 and 51°F, respectively. The first killing frost of the year occurs around November 15 and the last killing frost is expected about March 20, which allows approximately 235 frost-free days per year. Temperatures typically drop below freezing on an average of 34 days per year and rise above 90°F an average of 87 days per year. Average relative humidity ranges from 51 percent at 6 A.M. to 26 percent at 6 P.M. local standard time. Evaporation rates are very high, averaging a 97-inch precipitation deficit each year (USDA, 1980; 1981).

Annual precipitation at Fort Bliss averages from 8 inches in the valley to 20 inches in the mountains (USDA, 1980; 1981). Thunderstorms usually follow an inflow of warm, moist air from the Gulf of Mexico, and less frequently from the Pacific Ocean. Snow typically falls each winter with accumulations averaging 4.6 inches annually and seldom lasts for more than 1 day. The majority of rainfall occurs from July to September resulting from intense thunderstorm activity, with a dry season occurring from winter to early summer (USDA, 1980; 1981).



Fort Bliss Boundary

1	Rio Grande	9	Organ Mountains
2	Elephant Butte Reservoir	10	Franklin Mountains
3	Caballo Reservoir	11	Mesilla Bolson
4	San Andres Mountains	12	El Paso
5	Sacramento Mountains	13	Hueco Bolson
6	Tularosa Basin	14	Ciudad Juarez
7	Otero Mesa Escarpment	15	Hueco Mountains
8	Salt Basin	16	Jarilla Mountains

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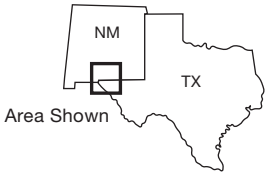

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Figure 6-1. Physiographic Features of the Area Surrounding Fort Bliss.

Wind speeds at Fort Bliss average 9 to 12 miles per hour (mph) with gusts over 60 mph in March and April. Dust and sandstorms occur in March and April due to these stronger winds and lack of precipitation. Spring winds are typically from the west while summer and winter usually bring a more southerly and northerly flow, respectively (USDA, 1981).

6.2 TOPOGRAPHY

Topographic relief on Fort Bliss is substantial and provides a diverse array of physical environments. Elevations range from about 3,900 feet above mean sea level (MSL) in the cantonment area to approximately 8,825 feet MSL in the Organ Mountains. Otero Mesa located on the east side of Fort Bliss, features broad, gently rolling grasslands. The Sacramento Mountains, bordering Fort Bliss to the northeast, are composed of steep terrain ascending from the lower slopes to an altitude of more than 7,600 feet MSL within the Fort Bliss boundary. The Organ Mountains are also composed of steep terrain and reach the highest altitudes within the Fort Bliss boundary. The northernmost reaches of the Franklin Mountains that extend into Fort Bliss are composed mostly of lower slopes and alluvial fans, which range from 4,265 to slightly over 5,000 feet. Portions of the Hueco Mountains included within Fort Bliss range from 4,500 to approximately 6,000 feet MSL. The lower slopes of the mountains containing the transition zone between the higher elevations and the Tularosa Basin feature steep slopes that eventually flatten out into alluvial fans and outwashes. Similarly, the escarpment for Otero Mesa consists of steep slopes that grade into alluvial fans.

6.3 GEOLOGIC HISTORY AND SEISMICITY OF FORT BLISS

Fort Bliss and the surrounding area were essentially a stable, relatively shallow marine shelf from late Cambrian (500 to 600 million years before present [MYBP]) through early Pennsylvanian (280 to 310 MYBP) time. The oldest sedimentary deposits in this area are approximately 400 million years old, and they consist chiefly of dolomite beds that range in age from late Cambrian to late Ordovician (425 to 500 MYBP) (U.S. Army, 1984). Deposition during Devonian (325 to 405 MYBP) time consisted mainly of marine shales and shaly limestones. A relatively thin sequence of upper Mississippian age limestone and shale disconformably overlies the Devonian rocks. Unconformably overlying the Mississippian deposits are approximately 3,000 feet of Pennsylvanian age sediments. These strata consist of limestone, sandstone, dolomite, and shale, which were deposited in a shallow marine environment. Tectonic disturbances in Virgilian time (late Pennsylvanian) altered the sedimentation origin from marine to terrestrial. The tectonic movement resulted in the subject area becoming a large depression with landmasses developed to the east, west, and southwest. In later Pennsylvanian and early Permian time, the Tularosa Basin received a thick sequence of land-derived sediments. Most sedimentary rocks in the area consist of limestone strata of the San Andres formation. These sediments mark the return of marine shelf deposition in the area (U.S. Army, 1984).

Broad regional uplift that occurred between 80 to 40 MYBP (Cenozoic Era) and differential drift within the North American Plate, which occurred 30 MYBP (Miocene), created fault patterns in the region. The result was a physiographic province characterized by down-dropped basins (grabens) bounded by tilted faultblock mountains (Seager, 1981). These grabens have been filled with heterogeneous, unconsolidated to poorly consolidated sediments, which cover underlying sediments.

By middle Cenozoic time (present to 65 MYBP), the Hueco and the Mesilla bolsons, respectively on the east and west of the Franklin Mountains, were the prominent basins of deposition. The northern boundary of the Hueco Bolson in the Tularosa Basin is obscure; however, lacustrine deposits near Culp Canyon possibly are of the Fort Hancock type, and the overlaying alluvial fan deposits are probably

coeval with the Camp Rice. There is evidence that the Tularosa Basin has had a history of continuous, closed basin deposition, with Kansas playa complexes possibly united with Lake Cabeza de Vaca and/or Lake Lucero to the north (U.S. Army, 1984).

Eroded petrocalcic horizons, braided stream deposits alternating with poorly sorted mudflows, relic and Paleozoic horizons, topographic expressions of old sediment surfaces and terrace-strand lines, and multiple superimposed petrocalcic (caliche) horizons demonstrate several periods of alternatively wetter and drier climatic trends during and since the Pleistocene (0.01 to 2 MYBP). These are probably related to pluvial-interpluvial episodes and post-Pleistocene climatic instability (Wells, 1977).

The southern portion of the Tularosa Basin contains more than 6,000 feet of valley fill, stream sand, and gravel, rock slides, alluvial fans from mountains on either side, and lake deposits rich in salt and gypsum derived from sedimentary rocks of the adjacent ranges. Any rainfall or melted snowfall that occurs in the valley either seeps into the porous valley deposits or evaporates from small pools leaving behind deposits of gypsum, salt, or other minerals. Fault lines along the edge of the Tularosa Basin may still be active, although no movement has been recorded in recent time (U.S. Army, 1984).

The mountain ranges adjacent to Fort Bliss developed during separate geologic time periods and comprise a variety of minerals and soils. These geologically different mountain ranges generally contain site-specific substrates, creating areas of unique communities. The Organ Mountains were formed as light-colored, craggy outcrops of vertically jointed tertiary granite, 27 MYBP (Miocene). The southern portion of these mountains is made up of tilted blocks of stratified, mostly Paleozoic rock. The Sacramento Mountains contain Paleozoic sedimentary rocks underlain by Precambrian granite. The Hueco Mountains are made of marine limestones deposited in the Pennsylvanian and Permian seas. These Paleozoic limestones dip steeply along chevrons on ridges (U.S. Army, 1984).

The Fort Bliss region lies in an area considered to be of moderate seismic activity (Sandford et al., 1972). Earthquake data estimate that the strongest earthquake in a 100-year period lies between a magnitude of 4.8 and 6.0 on the Richter Scale (U.S. Army, 1984).

6.4 NATURAL RESOURCES OF COMMERCIAL VALUE

Fort Bliss contains various types of mineral deposits of commercial quality. These include dolomite, sand and gravel, and limestone. In addition, geologic settings in known mining districts north and west of the range bear similarity to geologic environments on the range, especially near the Organ Mountains and portions of McGregor Range. This suggests that the range may contain base and precious metals. There also is a possibility of some oil and gas drilling opportunities and geothermal energy development on Fort Bliss. Geothermal exploration began in 1997.

There are no known deposits of other minerals such as coal, sodium, or potassium located on Fort Bliss (USDI, 1990b).

6.4.1 Fuel Oils

Five shallow petroleum exploration tests, two that reported multiple oil and gas shows, were drilled on McGregor Range prior to military occupation. At least 4,800 and 6,400 feet of potential oil-bearing rocks remain untested in the Tularosa Basin and Otero Mesa areas.

The BLM has the responsibility for permitting, inspecting, and enforcing Notices of Intent to conduct oil and gas exploration; surface management responsibilities associated with Applications for Permit to Drill;

and monitoring all "down hole" work such as ensuring aquifer protection, blowout prevention, and approved well completions, recompletions, and abandonments (USDI, 1990b).

6.4.2 Minerals

Many gypsum beds of commercial quality are located on the gentle slopes of the small cuestas (ridges or plateaus cut away by erosion from the mesa escarpment) below and west of Otero Mesa. They also occur on the steep slopes of the Otero Mesa escarpment in a varied pure form. In addition, the Hueco Mountains contain a gypsum deposit of commercial value 25- to 75-feet thick.

High-purity dolomite deposits outcrop near the base of the Sacramento escarpment. These strata contain more than 20 percent magnesium. Sand and gravel deposits, valued for use in construction, are present throughout the range including deposits near the base of the Sacramento-Otero escarpments and in the arroyos in the northern part of Otero Mesa. Limestone and sandstone strata, suitable for crushed stone for concrete aggregate, base course material, and building stone, are present near the surface over a large part of Fort Bliss.

Mineral exploration on McGregor Range is managed by the BLM in accordance with the objectives of the *Mining and Minerals Policy Act of 1970* and the *Research and Development Act of 1980*. These policies require the Federal Government to facilitate the development of mineral resources to meet national, regional, and local needs for domestic and defensive purposes while minimizing environmental damage in the process and rehabilitating any affected lands (USDI, 1990b).

6.5 SOILS

Nearly all of the 1.12 million acres of Fort Bliss is included in three, second- and third-order surveys conducted and published by the NRCS. The survey areas include Otero (USDA, 1981) and Doña Ana (USDA, 1980) county areas in New Mexico, and El Paso County, Texas (USDA, 1971). Surveys were mapped to the series, association, or complex levels. An effort is currently underway to resurvey the entire Fort Bliss area in New Mexico and Texas. The purpose of the new survey is to update and refine the current surveys, and to map soils that were not previously surveyed to the series level at a scale of 1:24,000.

The majority of soils in the Fort Bliss area are classified as either aridisols or entisols, although a few mollisols are also found in the area. Aridisols are soils with well-developed pedogenic horizons, which developed under conditions of low moisture, and have very little water leaching through the profile (Donahue et al., 1977). Consequently, some of these soils have lime-cemented hardpans (caliche). Entisols, young soils with little or no development of soil horizons, are located in areas where the soil is actively eroding (slopes) or receiving new deposits of soil materials (alluvial fans, flood plains, and eolian sand dunes). A few mollisols occur in the mountains of the Fort Bliss area. These soils are distinguished by a deep, dark-colored surface horizon, rich in organic matter and saturated with bases.

Soils in the Fort Bliss area generally consist of sandy, silty, and gravely loams, and fine sands and silts. The soils are alkaline and calcareous, having developed from the weathering of gypsum, sandstone, limestone, igneous, and metamorphic rocks. Windblown sediments from exposed lakebeds occur widely. Wind is an important soil forming agent in the Fort Bliss area. Wind-blown sand is common, with the greatest accumulations in the basins, often forming dunes.

The soils of the Fort Bliss area can be separated into two general categories based upon the following physiographic positions: (1) valleys and basin floors; (2) and mountains, mountain foot slopes, and

escarpments. Soils in valleys and basins are shallow to deep, nearly level to very steep, well-drained to excessively drained soils that formed in alluvium, alluvium modified by wind, and eolian material (USDA, 1971; 1980; 1981). Most of the basin floors are covered by coppice dunes (eolian deposits trapped by mesquite thickets) and eolian sheet deposits. These soils are found mainly in the Tularosa Basin and Hueco Bolson. Major soil units in this category include Bluepoint, Caliza-Bluepoint-Yturbide, Pajarito-Onite-Pintura, Pintura-Wink, Berino-Doña Ana, Mimbres-Stellar, Nickel-Upton, Tome-Mimbres, Philder-Armesa-Reyab, Nickel-Tencee, Bluepoint-Onite-Wink, and Pintura-Doña Ana, Hueco-Wink, and Turney-Berino. These soil units are combinations of soil associations and series that are described in greater detail in Tables 6-1 and 6-3. Table 6-2 summarizes miscellaneous landform types found in soil associations. Figures 6-2, 6-3, and 6-4 show the distribution of soil associations on the Main Cantonment Area and South Training Areas, Doña Ana Range–North Training Areas, and McGregor Range respectively. Soils in valleys and basins are used mainly for grazing, wildlife habitat, and watershed. Military uses include ground troop training, wheeled and tracked vehicle maneuvering, and missile launching.

Land surfaces on mountains, mountain foot slopes, and escarpments are either rock outcrops or shallow to deep, well-drained, and nearly level to extremely steep soils that formed in alluvium and colluvium, mostly derived from limestone (USDA, 1971; 1980; 1981). These soils are found mainly in the Sacramento, Hueco, and Organ mountains, and on Otero Mesa. Major soil units in this category include: Rock outcrop-Torriorthents, Deama-Tortugas-Rock outcrop, Ector-Rock outcrop, Delnorte-Canutio, and Lozier Rock outcrop. (See Tables 6-1 and 6-2 for a description of the distribution of soil series within associations, and more details about the soil series that make up the above general soil units.) These soils are used mainly for grazing, wildlife habitat, and watershed. Military uses are limited because of steep slopes and rough terrain, although some vehicle maneuvering, ground-troop training, and missile launching does occur on these soils.

Wind and water erosion are currently the most significant processes affecting soils in the Fort Bliss area. Soils unprotected by vegetation are susceptible to erosion from wind and water runoff. Gullying is the most prevalent form of erosion, but sheet and rill erosion from water, and wind erosion are processes that can also significantly affect soil movement.

Erodibility of soils varies considerably across the Fort Bliss area. Figure 6-5 shows the erodibility of soils as well as the location of steep slopes in the Fort Bliss area. In general, soil erodibility is a function of soil type, slope, and vegetative cover. Sandy soils are extremely wind erodible (USDA, 1981). Loamy sands are highly erodible and capable of supporting a protective vegetative cover. Soils with large amounts of clay are moderately erodible and capable of supporting vegetation. Loamy soils are generally more erodible than sands or clays because the particle size is smaller than sand, but not small enough to be cemented by chemical attraction, like a claysoil. Stony or gravelly soils and rock outcrops are not generally subject to erosion.

The majority of the steep rocky hills and mountains in the Fort Bliss area have only slight erosion potential, although during periods of severe thunderstorm activity, large volumes of runoff can build up rapidly, causing flash floods that can produce large gullies (BLM, 1988). Soils covered by grasses such as those on Otero Mesa have relatively low amounts of erosion, unless they are disturbed, while areas that are predominantly shrublands (creosotebush and mesquite) have higher rates of erosion due to the large amounts of exposed soil between shrubs.

Table 6-1. Description of Soil Series that Occur Within the Fort Bliss Area

Soil Series	*Description*
Agustin	Deep, pale-brown, gravelly soils at the base of limestone and igneous mountains and on alluvial fans, generally near gravelly arroyos.
Aladdin	Deep, well-drained soils that formed in mixed alluvium along mountain fronts and on fans and terraces. Slopes are from 2–10 percent.
Arizo	Deep, excessively drained soils formed in mixed alluvium on valley floors or wide arroyos. Slopes are 0–5 percent.
Argids	Shallow to deep, well-drained soils on hills and dry mountains. Slopes are 15–80 percent.
Armesa	Deep, well-drained soils formed in medium textured alluvium and eolian sediment that are high in carbonate. They are on old alluvial fans and terraces. Slopes are 0–5 percent.
Berino	Deep, well-drained soils formed in medium textured upland alluvium and eolian deposits. They are on nearly level to undulating sandy plains and side slopes of pediments. Slopes are 0–5 percent.
Bluepoint	Deep, somewhat excessively drained soils formed in coarse textured eolian deposits. They are on coppice dunes on sandy uplands. Slopes are 0–5 percent.
Brewster	Very shallow, stony soils on igneous mountains generally developed over granite rock. They are friable, noncalcareous, and mildly alkaline. Slopes are usually greater than 20 percent.
Bucklebar	Deep, well-drained soils formed in alluvium modified by wind on fans and coalescent fan piedmonts. Slopes are 1–5 percent.
Cacique	Moderately deep, well-drained soils formed in alluvium on level basin floors. Slopes are 0–3 percent.
Cale	Deep, well-drained soils formed in highly calcareous fine and medium textured sediment derived from weathered limestone. They are on broad dissected upland valleys. Slopes are 0–5 percent.
Caliza	Deep, well-drained soils formed in gravelly alluvium on fans or river deposits of Pleistocene age. Slopes are 15–40 percent.
Canutio	Deep, very gravelly soils formed in recently deposited gravelly, loamy sediments having high lime content, in and near the active parts of arroyos and alluvial fans. Slope is 1–8 percent.
Casito	Shallow, well-drained soils formed in very gravelly sediments on fans and terraces. Slopes are 1–8 percent.
Cave	Shallow, well-drained soils formed in gravelly alluvium in old valley fill. Slopes are 1–5 percent.
Coxwell	Moderately deep, well-drained soils formed in gravelly alluvium overweathered granitic bedrock. They are on ridges along mountain toe slopes. Slopes are 5–15 percent.
Crowflats	Deep, well-drained soils formed in calcareous mixed alluvium. They are on basin floors. Slope is 0–2 percent.
Deama	Shallow, well-drained soils formed in residuum from limestone bedrock. They are on steep limestone hills. Slopes are 0–50 percent.
Delnorte	Shallow or very shallow to hard caliche. Very gravelly soils formed over outwash material of sand and gravel. They occur on foot slopes and outwash plains of igneous and limestone mountains. Slopes are 1–8 percent.
Doña Ana	Deep, well-drained soils formed in medium and coarse textured eolian material and alluvium. They are on toe slopes of pediments and sandy uplands. Slopes are 0–5 percent.
Ector	Shallow, well-drained soils formed in material weathered from limestone bedrock. They are on sides of steep limestone hills and mesas and plateaus dissected by narrow drainage ways. Slopes are 20–50 percent.
Espy	Shallow, well-drained soils formed in mixed alluvium. They are over indurated caliche on alluvial fans and terraces. Slopes are 0–5 percent.
Harrisburg	Moderately deep, well-drained soils that formed in residuum of sandstone and eolian material from sandstone and from sandstone, volcanic ash, and shale. They are on desert mesas. Slopes are 1–10 percent.

Table 6-1. Description of Soil Series that Occur Within the Fort Bliss Area (Continued)

Soil Series	*Description*
Holloman	Shallow, well-drained soils over gypsum that formed in gypsiferous sediment of eolian and alluvial origin. They are on nearly level to gently sloping uplands. Slopes are 0–5 percent.
Hueco	Sandy, noncalcareous, and mildly or moderately alkaline soils that formed over outwash sediments from nearby mountains. Hueco soils are underlain by an indurated caliche layer at a depth of 20 to 40 inches. Slopes are 0.5–1.5 percent.
Jerag	Shallow, well-drained soils formed in medium textured eolian and alluvial sediment. They are over indurated caliche. They are on broad slightly concave uplands. Slopes are 0–3 percent.
Kerrick	Moderately deep, well-drained soils that formed in mixed alluvium. They are over indurated caliche. They are in upland valleys. Slopes are 0–2 percent.
Lozier	Shallow, well-drained soils formed in material weathered from limestone. They are on hillsides, ridgetops, benches, and escarpment caps. Slopes are 0–50 percent.
Mimbres	Deep, well-drained soils formed in silty calcareous alluvial sediment weathered from limestone. They are on broad flood plains on the lower parts of long, gently sloping alluvial fans terminating on valley floors. Slopes are 0–3 percent.
Nickel	Deep, well-drained soils formed in very gravelly alluvium mainly from limestone. They are on middle and upper parts of side slopes of pediments and on alluvial fans. Slopes are 1–30 percent.
Nolam	Deep, well-drained soils formed in very gravelly alluvium on the sides of strongly dissected terraces and ridges. Slopes are 3–15 percent.
Onite	Deep, well-drained soils formed in mixed alluvium. They are on broad alluvial fans. Slopes are 0–5 percent.
Pajarito	Deep, loamy soils that formed on alluvial fans or old terraces. They are calcareous and moderately alkaline. Slopes are 0–3 percent.
Pena	Deep, well-drained soils formed in mixed alluvium. They are in broad, dissected upland valleys. Slopes are 0–10 percent.
Pinaleno	Deep, well-drained soils formed in alluvium on fans, fan piedmonts, and terraces. Slopes are 1–0 percent.
Philder	Shallow, well-drained soils formed in alluvium influenced by eolian sediment. They are over indurated caliche and are found on upland fans on pediments. Slopes are 0–15 percent.
Pintura	Deep, somewhat excessively drained soils formed in coarse textured eolian material. They are on coppice dunes on uplands with 0–5 percent slopes. The dunes have slopes of 20 percent to more than 80 percent.
Reagan	Deep, well-drained soils formed in alluvium on fans and basin floors. Slopes are 1–3 percent.
Reakor	Deep, well-drained soils formed in mixed alluvium weathered from limestone bedrock. They are found on uplands. Slopes are 1–5 percent.
Reeves	Deep, well-drained soils formed in medium textured calcareous and gypsiferous alluvium. They are on broad valley floors and alluvial toe slopes. Slopes are 0–2 percent.
Reyab	Deep, well-drained soils formed in alluvium weathered mainly from limestone. They are on alluvial bottoms, terraces, and fans on broad uplands. Slopes are 0–5 percent.
Shanta Variant	Deep, well-drained soils formed in mixed alluvium. They are on drainage ways of dissected terraces and valley bottoms. Slopes are 0–2 percent.
Simona	Gravelly, loamy soils that formed in outwash material and are calcareous and moderately alkaline. They have a layer of indurated caliche within a depth of 20 inches.
Stellar	Deep, well-drained soils formed in sediments derived from igneous rock on basin floors and on toe slopes of fans. Slopes are 0–3 percent.
Tencee	Shallow, well-drained soils formed in gravelly calcareous alluvium. They are over indurated caliche, mainly on side slopes of pediments and the upper parts of older alluvial fans at the base of limestone hills and escarpments. Slopes are 0–10 percent.
Terino	Shallow, well-drained soils in gravelly alluvium on fans and terraces. Slopes are 1–8 percent.

Table 6-1. Description of Soil Series that Occur Within the Fort Bliss Area (Continued)

Soil Series	*Description*
Tome	Deep, well-drained soils formed in mixed alluvium. They are on broad valley floors. Slopes are 0–5 percent.
Turney	Moderately deep to weakly cemented caliche formed over outwash material from the nearby mountains. They are calcareous and moderately alkaline Slopes are 0–2 percent.
Upton	Shallow, well-drained soils formed on piedmont slopes and ridges in gravelly alluvium derived from limestone. Slopes are 3–15 percent.
Wink	Deep, well-drained soils formed in calcareous eolian sediment. They are on upland pediments. Slopes are 0–3 percent.
Yturbide	Deep, excessively drained soils formed in alluvium along side and on terminal fans of arroyos and old river deposits. Slopes are 1–5 percent.
Lithic Argiborolls	Moderately deep cobbly loams. Slopes are 16–18 percent.
Lithic Argiustolls	Shallow loams to shallow gravelly loams. Slopes are 0–80 percent.
Lithic Torriorthents	Shallow gravelly to very gravelly loams. Slopes are 0–80 percent.
Rock Outcrop	Slopes are 0–80 percent.
Typic Argiborolls	Moderately deep cobbly loams. Slopes are 16–80 percent.
Typic Argiustolls	Moderately deep gravelly to very gravelly loams. Slopes are 16–80 percent.
Typic Calciorthids	Very deep gravelly loams. Slopes are 0–10 percent.
Typic Camborthids	Moderately deep very gravelly to extremely gravelly loams. Slopes are 16–80 percent.

Sources: USDA, 1971; 1980; 1981.

Table 6-2. Miscellaneous Land Types Found in Soil Associations

Land Type	*Description*
Badlands	Heavy, plastic clay stratified with layers of calcareous very fine sandy loam. Also includes caliche ridgetops and gravelly sand overlying clay. Slopes are convex and range from 5–0 percent.
Dune land	Active sand dunes formed by noncalcareous fine sand.
Igneous rock land	Exposed, stratified igneous rocks, mostly granite, andesite, syenite, and rhyolite. Slopes range from 30 percent to almost vertical escarpments several hundred feet thick.
Limestone rock land	Exposed, stratified limestone bedrock. Slopes range from 30 percent to almost vertical escarpments.
Rock outcrop	Rough extensions and escarpments, ledges, ridges, and cliffs. Slopes are 15–90 percent.

Sources: USDA, 1971; 1980; 1981.

Table 6-3. Series Composition of Soil Associations Within the Fort Bliss Area

Association	*Series*
AGB – Agustin, undulating	65 percent Agustin, 35 percent Simona, Pajarito, Delnorte, Wink
AM – Aladdin-Coxwell	35 percent Aladdin, 30 percent Coxwell, 25 percent Rock outcrop
AMC – Armesa very fine sandy loam	20 to 90 percent Armesa, 10 to 20 percent Philder, Reyab, Lozier, Rock outcrop
BJ – Berino-Bucklebar	35 percent Berino, 25 percent Bucklebar, 25 percent Doña Ana, 15 percent Pintura, Pajarito, Onite
BK – Berino-Doña Ana	50 percent Berino, 30 percent Doña Ana, 20 percent Reagan, Stellar, Bucklebar, Cacique, Simona
B/L – Berino-Pintura complex	50 percent Berino, 25 percent Pintura, 25 percent Doña Ana, Buckelbar, Onite, Pajarito
BOA – Bluepoint-Onite-Wink	35 percent Bluepoint, 25 percent Onite, 20 percent Wink, 20 percent Pintura, Berino, Holloman
BP – Bluepoint-Caliza-Yturbide complex	25 percent Bluepoint, 25 percent Caliza, 20 percent Yturbide, 30 percent Arizo, Canutio, Tencee, Nickel
DCB – Delnorte-Canutio, undulating	75 percent Delnorte, 25 percent Canutio, and small amounts of Bluepoint and Badlands
DCD – Delnorte-Canutia, hilly	55 percent Delnorte, 18 percent Canutia, 27 percent Bluepoint, Agustin, Pajarito
DRF – Deama-Rock outcrop complex	70 percent Deama, 15 percent Rock outcrop, 15 percent Ector, Pena, Kerrick, Cale
DTB – Doña Ana-Berino	40 percent Doña Ana, 35 percent Berino, 25 percent Pintura, Bluepoint, Onite, Wink, Nickel
ECF – Ector-Rock outcrop	60 percent Ector, 25 percent Rock outcrop, 15 percent Deama, Lozier
ESB – Espy-Shanta Variant	55 percent Espy, 20 percent Shanta Variant, 25 percent Lozier
HPB – Holloman-Reeves, nearly level	60 percent Holloman, 30 percent Reeves, 10 percent Tome, Crowflat
HW – Hueco-Wink	42 percent Hueco, 38 percent Wink, 20 percent Turney, Berino, Duneland, Limestone rock land
IN – Igneous rock land-Brewster	50 to 75 percent Igneous rock land, 15 to 50 percent Brewster
JEC – Jerag-Philder, gently rolling	40 percent Jerag, 40 percent Philder, 20 percent Reyba, Shanta Variant, Lozier, Tencee,
LOB – Lozier-Rock outcrop complex	75 percent Lozier, 15 percent Rock outcrop, 10 percent Tencee, Reakor
LOD – Lozier-Rock outcrop	60 percent Lozier, 25 percent Rock outcrop, 15 percent Tencee, Nickel
MO – Mimbres silty clay loam	80 percent Mimbres silty clay loam, 20 percent Reagan, Stellar, Berino, Bucklebar, Doña Ana
MTA – Mimbres-Tome, nearly level	45 percent Mimbres, 40 percent Tome, 15 percent Nickel, Reyab
NTD – Nickel-Tencee	50 percent Nickel, 35 percent Tencee, 15 percent Lozier, Tome, Reakor
NU – Nickel-Upton	50 percent Nickel, 25 percent Upton, 25 percent Tencee, Cave, Simona

Table 6-3. Series Composition of Soil Associations Within the Fort Bliss Area (Continued)

Association	*Series*
PAA – Pajarito, level	75 percent Pajarito, 25 percent Agustin, Simona, Bluepoint, Turney, Wink, Mimbres
PCB – Penta-Cale-Kerrick	35 percent Penta, 30 percent Cale, 15 percent Kerrick, 20 percent Ector, Deama
PEC – Philder very fine sandy loam	85 percent Philder, 15 percent Reyba, Tencee, Armesa
PFB – Philder-Armesa, undulating	45 percent Philder, 40 percent Armesa, 15 percent Reyab, Tome, Tencee, Lozier
PGB – Pintura-Doña Ana complex	45 percent Pintura, 35 percent Doña Ana, 20 percent Berino, Onite, Bluepoint, Mimbres, Holloman
PHB – Pintura-Tome-Doña Ana complex	30 percent Pintura, 25 percent Tome, 20 percent Doña Ana, 25 percent Holloman, Wink, Berino
PN – Pinaleno-Nolam	45 percent Pinaleno, 35 percent Nolam 20 percent Casito, Terino
RAB – Reaker-Tome-Tencee	35 percent Reaker, 30 percent Tome, 20 percent Tencee, 15 percent Lozier
RFA – Reyab-Armesa	60 percent Reyab, 30 percent Armesa, 5 percent Philder, Lozier, Rock outcrop
RG – Rock outcrop-Argids	40 percent Rock outcrop, 30 percent Argids, 20 percent Argids, cool, 10 percent alluvium and alluvial soils
RH – Rock outcrop-Argids, cool	45 percent Rock outcrop, 35 percent Argids, cool, 20 percent colluvial and alluvial soils
RL – Rock outcrop-Lozier	45 percent Rock outcrop, 30 percent Lozier, 25 percent Sandstone, Shell and small Igneous dikes
ROG – Rock outcrop	80 percent Rock outcrop, 20 percent Lozier, Tencee
RRF – Rock outcrop-Lozier complex	50 percent Rock outcrop, 35 percent Lozier, 15 percent Reakor, Tome, Tencee
TBB – Turney-Berino, undulating	75 percent Turney, 20 percent Berino, 5 percent Pajarito, Hueco
TDB – Tome silt loam	85 percent Tome, 15 percent Crowflats, Tencee, Nickel
TE – Tencee-Upton	35 percent Tencee, 20 percent Upton, 45 percent Nickel, Cave, Simona
TF – Terino-Casito	40 percent Terino, 30 percent Casito, 10 percent Hard surface soils

Sources: USDA, 1971; 1980; 1981.

Currently, there are several areas where accelerated erosion is a problem on Fort Bliss. Soils in the coppice dunes area of the Tularosa Basin are subject to wind erosion. The acceleration of these erodible dunes is caused by a breakdown of surface crusts on the soils between dunes, caused in part by the maneuvering of tracked vehicles (Marston, 1984). Most of the soil movement in this area is localized from dune to dune, but on windy days blowing dust particles rise to the atmosphere (BLM, 1988). This process could significantly lower air quality. On maneuvering ranges in the Tularosa Basin, roads have been constructed in such a manner that they have become channels for rainwater runoff. This has caused a considerable amount of erosion (BLM, 1988). A similar problem has occurred on roads leading up to Otero Mesa (USAF, 1998). Grazing by livestock has reduced the vegetative cover and exposed the soil surface to erosion in localized areas on Otero Mesa, such as holding areas, watering points, and mineral licks.

FTBL-22.A.2

Fort Bliss DOE, SAIC, Center for Ecological Management of Military Lands, USACE Fort Worth, Geo-Marine, Inc. Integrated Natural Resources Management Plan, US Army Air Defense Artillery Center, Fort Bliss. November 2001. pg. 6-16 – 6-30.

Soil contamination is not a major problem in the Fort Bliss area, although the potential for releases of reportable soil contaminants does exist.

6.6 WATER RESOURCES

Although military water use is only about 3 percent as large as municipal use in the El Paso area, including Ciudad Juárez, factors that affect El Paso water supplies also affect military supplies. As the population and water use of El Paso continue to expand, and water supplies in the Hueco Bolson approach depletion, municipal water may become more expensive or result in indefinite deliveries to customers. Contingency plans, including the current water conservation policy, are considered for future water shortages. Water conservation is beneficial even when water supplies are plentiful. Fort Bliss already has a residential water conservation policy in effect that limits outdoor watering during the summer (Costello, 1997).

6.6.1 Surface Water

The only significant surface water body near Fort Bliss is the Rio Grande. The Rio Grande is used by local municipalities and industries to partially fulfill their water needs.

Water from the Rio Grande is part of a U.S. Bureau of Reclamation (USBR) irrigation project that regulates and administers the flow of the Rio Grande below Elephant Butte Reservoir in New Mexico. The reservoir stores and releases water for power generation. Caballo Reservoir, downstream of Elephant Butte Reservoir, regulates releases to meet downstream demands through the January to October irrigation season. Five diversion dams on the river divert flows to the Elephant Butte Irrigation District, New Mexico; the El Paso County Water Improvement District #1 (EPCWID), Texas; and to Mexico (Cushing, 1996).

The Rio Grande Compact Commission apportions water from the river among Colorado, New Mexico, and Texas by interstate agreement. The compact provides for normal releases of 790,000 acre feet per year (afy) to the irrigation districts, including 60,000 afy to Mexico. In a normal water year the EPCWID allotment is 43 percent of the available U.S. project water, or about 310,000 afy (El Paso County, 1992). Return flows and other water entering the system below Caballo Reservoir increase the amount delivered to the EPCWID in a normal year to about 360,000 afy. In years when Rio Grande flows are below normal, less than full allotments are released, and the deliveries are decreased proportionately. Provisions of the contract allow Colorado and New Mexico to incur debits in their deliveries to Texas and to cancel accrued debits when reservoir spills occur during years of high flow (Cushing, 1996). Currently, almost all of the agricultural production in El Paso County occurs within the irrigated area of the EPCWID and areas contiguous to the district that irrigate with groundwater. The EPCWID has an area of 76,114 acres, and the contiguous areas irrigated by pumping on an additional 8,600 acres (USBR, 1973).

El Paso is an EPCWID customer. Municipal and industrial supplies are obtained through water rights owned, leased, and assigned through the USBR and through purchased rights. Municipal and industrial waters are diverted at river plants in El Paso and Zaragosa, Texas, during the irrigation season. Diversions, which represent approximately 43 percent of El Paso's total municipal and industrial supply (Cushing, 1996), amounted to 46,166 acre feet (af) in 1996 (Sperka, 1997).

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The quality of the Rio Grande water, which generally is of the sodium sulfate type, varies greatly during the year because of return flows of irrigation water between Caballo Dam and El Paso. Concentrations of sulfates and total dissolved solids (TDS) increase during the irrigation season until, near the end of the season, the water quality reaches a point where it no longer meets federal drinking water standards after

treatment. The quality remains below standards until the following irrigation season. Shortly after irrigation releases begin in late winter, water quality improves sufficiently to be utilized by the treatment plants (EPWU, 1995).

Surface water is preferred over groundwater for irrigation because of its lower cost and, in the Hueco Bolson, the superior quality of the river water. However, during years of inadequate surface-water supply, shallow wells in the Rio Grande alluvium are pumped to augment the diversions. In 1985, 99 percent of the water used for irrigation was diverted from the Rio Grande. In that year almost 164,000 af, 57 percent of water used for all purposes in El Paso County, was used for irrigation (Texas Water Development Board [TWDB], 1988).

The Army controls the rights to 50,000 and 60,000 gallons per day from Carrisa Springs and the Sacramento River, respectively, (USDI, 1990b). This diverted water is transported, via three pipelines; one crosses the northwest quarter of McGregor Range to Oro Grande, New Mexico, and the other two supply water to numerous storage tanks and water troughs across Otero Mesa (Figure 6-6).

The McGregor pipeline system (exclusive of the Oro Grande system) is a large gravity-fed water network operated and maintained by the BLM for wildlife and livestock use. The system has been in existence since the early 1900s and has been modified, expanded, and relocated extensively since then, mostly in piecemeal fashion. The three intakes (sources) for the system are in the Sacramento Mountains, north of McGregor Range. Two lines feed Rim Tank, an open reservoir with a capacity of 2 million gallons, on the north boundary of McGregor Range. The system is designed to use gravity flow from this reservoir, or bypass it (or a combination of both), into the McGregor pipeline—a 65-mile trunk and branching system that feeds several branches and lines in the Sacramento Mountains foothills and the western part of Otero Mesa (BLM, 1985). A smaller system, the El Paso line, runs through El Paso Canyon to the east boundary of McGregor Range in the north part of Otero Mesa.

Wetlands and arroyo-riparian drainages have been studied on Fort Bliss. The U.S. Army Corps of Engineers (USACE) Waterways Experiment Station has mapped and characterized all Waters of the U.S., including wetlands on Fort Bliss (U.S. Army, 1996d; 1997a). Wetlands delineation follows the USACE protocol in the *Army Corps of Engineers Wetlands Delineation Manual* (U.S. Army, 1987). To qualify as a USACE jurisdictional wetland, it must have hydric soil, be saturated to within 12 inches of the surface sometime during the growing season, and contain wetland plant species (U.S. Army, 1987). Waters of the U.S. include "water such as intrastate lakes, rivers, streams (including intermittent streams)" (33 CFR 328.3[a][3]). These probable Waters of the U.S. are shown in Figure 6-7. These inventories of wetlands and Waters of the U.S. are provided for planning purposes and the boundaries of the wetlands and Waters of the U.S. have not been determined. The boundaries of wetlands and Waters of the U.S. will be delineated for site-specific projects and a final determination by the USACE district engineer is needed before a delineation is confirmed. Actively maintained man-made features such as stock tanks are not jurisdictional wetlands and therefore not regulated by the USACE. However, abandoned stock tanks and other man-made features may be regulated if they conduct and/or hold surface water (U.S. Army, 1996d).

Observations were made at 226 locations on McGregor Range and the South Training Areas, including dry washes, stock tanks, and other water resources. Data such as major plant species, and depth and width of channel, were recorded. A total of 49 sites were analyzed in greater detail, including the collection of data on plant species and percent cover, hydrology, soils, and surrounding upland vegetation. Based on this analysis, the Waters of the U.S. on McGregor Range and the South Training Areas included 1,291 dry washes with distinct stream beds and stream banks covering 2,475 miles. In addition, 13 natural dry lakes with distinct ordinary high water marks totaling 134 acres, and 110 artificial bodies

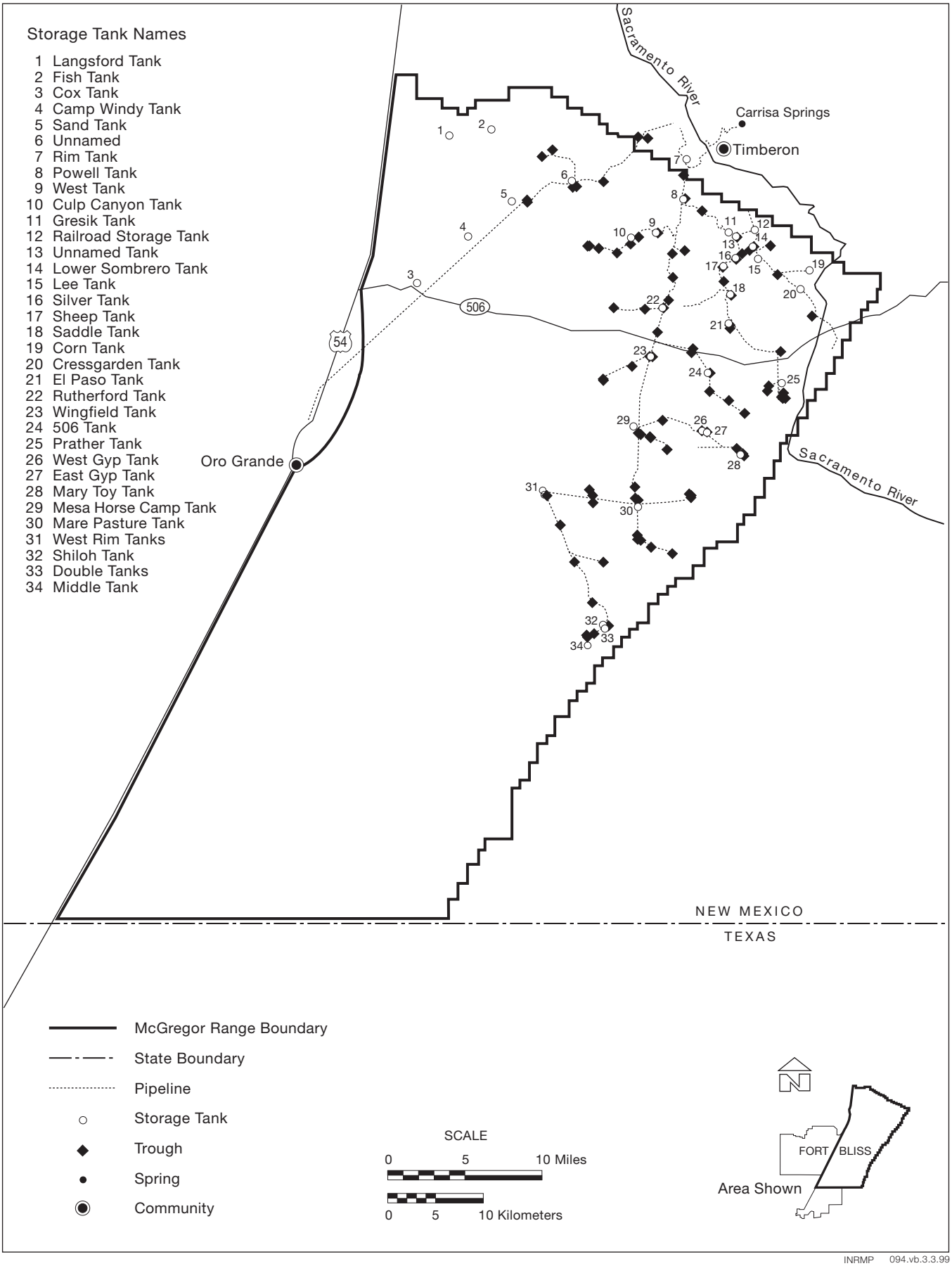

Figure 6-6. Water Pipelines, Storage Tanks, and Watering Troughs on McGregor Range.

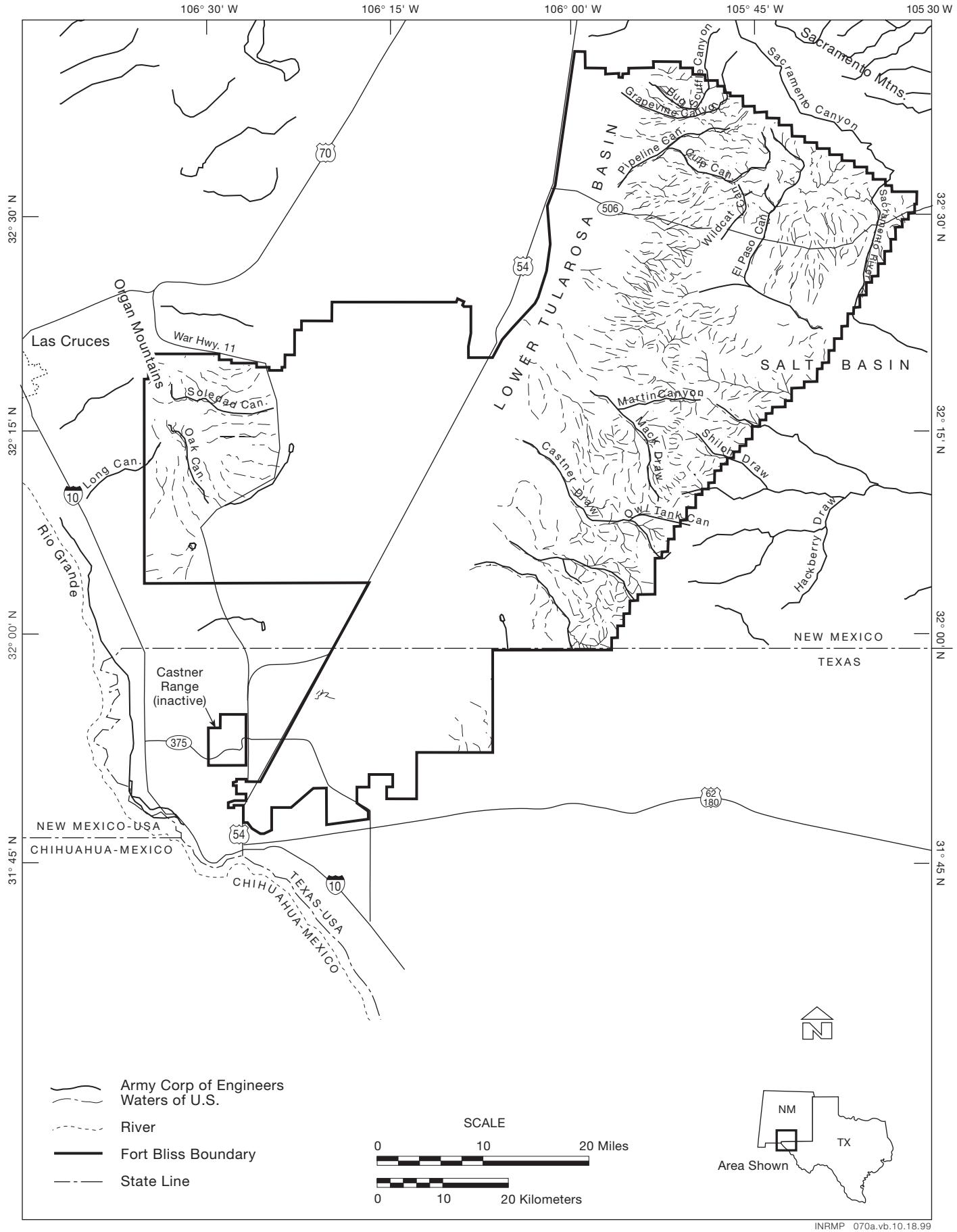

Figure 6-7. Probable Waters of the U.S. on Fort Bliss.

of water such as sewage treatment ponds, storm water retention basins, and stock tanks totaling 691 acres were mapped (U.S. Army, 1996d). Data was collected from 117 observation points and 21 sample locations on Doña Ana Range–North Training Areas and based on this, 105 dry washes with distinct stream beds and stream banks comprising 532 miles were mapped. Nine dry lakes and ponds with distinct ordinary high water marks totaling 159 acres were also mapped. In addition, 21 artificial water resources including sewage treatment ponds, storm water retention basins, and stock tanks comprising 19 acres were mapped (U.S. Army, 1997a).

The vast majority of arroyo-riparian drainages on Fort Bliss do not qualify as USACE jurisdictional wetlands but, as indicted above, thousands of miles of these water-ways are probable Waters of the U.S. Perennial riparian corridors of the western U.S. have been studied extensively and the density and diversity of flora and fauna in many of these areas have been determined. However, the flora and fauna of arroyo-riparian drainages on Fort Bliss and elsewhere have not been fully studied (Cockman, 1996; Kozma, 1995).

Playa lakes are also present on Fort Bliss in the Tularosa Basin and Hueco Bolson. Playas are depressional areas in the central portions of closed drainage basins that receive surface water flow from surrounding areas. Playas are dry for most of the year; however, fine-grained sediments, mostly sand, silt, and clay are deposited in thin horizontal layers after seasonal heavy rains. Since water permeability is slow and shallow, standing water may remain up to a few weeks following heavy rains. Playas have a higher content of silt and clay soils (more stable soils) than surrounding areas. This factor enables them to contain a higher diversity of grasses and shrubs, which increases habitat diversity and increases water-holding capacity in the arid environment. However, playas are subject to greater vegetational losses through soil compaction than adjacent areas.

6.6.2 Groundwater

Groundwater is obtained from both fluvial and lacustrine deposits, although fluvial aquifers are the primary source for the area. Groundwater at Fort Bliss comes from two major basins, the Hueco Bolson and the Mesilla Bolson, which are separated by the Franklin Mountains. Thirty-nine deep wells from the Hueco Bolson aquifer provide most of the water used at Fort Bliss. The Hueco Bolson is located in the southern half of the Tularosa Basin paralleling the eastern base of the Franklin Mountains. It contains fill material consisting primarily of fluvial and lacustrine deposits with a maximum thickness of 9,000 feet. Groundwater recharge is provided by the runoff of precipitation percolating through alluvial deposits at nearby mountain bases. The fresh water aquifers in the Hueco Bolson are of very high quality and require only chlorination. Chemical analyses (EPWU, 1990) showed that TDS, chloride, sulfate, and nitrate concentrations do not meet state and federal standards.

The Mesilla Bolson lies on the west side of the Franklin Mountains, extending along the Rio Grande Valley through New Mexico and Mexico. The geology in the Mesilla Bolson is similar to that of the Hueco Bolson, with basin fills that are contemporaneous formations of Recent and Sante Fe geologic periods. Fort Bliss uses only limited water resources from Mesilla Bolson.

6.6.3 Water Quality

6.6.3.1 Intrusion of Saline Water

Increasing dissolved solids concentrations in fresh-water zones of both the Hueco and Mesilla bolsons are attributed mainly to downward leakage of brackish water from shallow zones and possible upconing of brackish water from below as a result of pumpage. Water analyses from wells completed in the Hueco Bolson show an average annual increase in dissolved solids of about 10 milligram per liter (mg/L) since

the 1950s and 1960s in Texas, and about 30 mg/L since the 1970s in Ciudad Juárez. In parts of downtown El Paso and Ciudad Juárez, the dissolved solids concentration in groundwater has increased at rates of 40 to 60 mg/L per year during these periods. Concentrations of dissolved solids have increased also in groundwater produced from the intermediate zone of the Mesilla Bolson, at an average rate of about 9 mg/L per year (White, 1983).

In 1993, 20 city wells in the Lower Valley, Town, and Water Plant well fields produced water that exceeded the maximum contaminant level (MCL) for TDS or chloride, and were shut down. Many of those wells were being recharged with treated surface water in 1994 to extend their lives. Chloride concentrations are increasing at the Eastwood well field and the East Airport well field (adjacent to Fort Bliss wells), where water from as many as 11 wells exceeds the 300 mg/L limit. Blending of water in the Montana reservoir has been satisfactory, but it is a temporary solution (EPWU, 1995). By 1997, the water from four wells in the East Airport well field was too saline to be blended, and the wells were not being used (Sperka, 1998). The water from seven high-salinity wells was being blended successfully. The maximum field capacity of 34.38 million gallons per day (mgd) had decreased to 24.26 mgd because of salinity, and without blending, only 13.14 mgd could be produced. Projections for the East Airport well field indicate that by 2005, maximum field capacity will decrease to 7.05 mgd with blending and 8.24 mgd without blending (Orr and Risser, 1992), and by 2015 the respective quantities will be 12.48 mgd and 6.37 mgd (Sperka, 1998).

Recent analyses of water from the Fort Bliss well fields indicate a range of 300 to 500 mg/L TDS (Mathis, 1997). Evaluation of water quality data from 1992 to 1995 did not show any problems with the Fort Bliss water supply. All constituents were below regulated MCLs. Maximum concentrations of arsenic at Biggs AAF, Site Monitor, and Main Base wells are 0.0062, 0.0056, and 0.0032 mg/L, respectively. If the MCL remains at 0.05 mg/L no treatment will be necessary, but if the MCL is reduced to less than 0.0032 mg/L, as proposed, treatment will be required at all three water systems (U.S. Army, 1996d). Future declines of water levels in the Hueco Bolson can be expected to result in increasing salinity in the Fort Bliss area.

6.6.3.2 Fort Bliss Municipal Solid Waste Landfill

Domestic solid waste generated on Fort Bliss is collected and disposed of by a private contractor at a 106-acre landfill 3 miles north of the intersection of Fred Wilson Avenue and Chaffee Road. Investigations by the U.S. Geological Survey (USGS) (Abeyta, 1995) examined hydrogeologic conditions in the area and potential contamination of the local aquifer due to the landfill. The investigation determined a 200-year travel time for leachate to reach the aquifer, in the event of a leak through the engineered barrier system. No evidence was found to indicate that the landfill is causing any water-quality deterioration of the aquifer in that part of the Hueco Bolson.

6.6.3.3 Old Mesa Well Field

In the early 1900s, the Old Mesa well field, a high-density municipal well field, was located on parts of the main cantonment and Biggs AAF and on city land. The general area is bounded on the west by Railroad Drive, on the east by Airport Road, and centered on Fred Wilson Drive. Before abandonment of the field in 1926, a private company, predating EPWU, drilled 100 to 200 small-diameter wells. The firm subsequently went out of business, and most of the wells were left uncapped (Cushing, 1997). A USGS investigation (White, 1983) located nine of the Old Mesa wells, four of which had shallow groundwater seeping into them. The investigation concluded that a "substantial amount" of inferior-quality groundwater with high TDS and nitrate concentrations is being recharged into the Hueco Bolson aquifer through the abandoned wells. The seepage is believed to originate from urban runoff and possibly by deep percolation of lawn irrigation water. Fort Bliss is aware of the situation, and is planning an

investigative survey to determine the nature and extent of any contamination and to locate and cap abandoned wells in accordance with state and federal regulations (Cushing, 1997).

6.7 BIOLOGICAL RESOURCES

As a result of its large size (1.11 million acres) and varied topography, Fort Bliss exhibits a high degree of biodiversity. The vegetation mirrors this diversity in that plant communities on post range from the Chihuahuan Desert plant communities in the Tularosa Basin to Rocky Mountain conifer forests in the Organ Mountains (U.S. Army, 1996c; 1997b). Of the approximately 4,000 plant species in New Mexico, an estimated 300 nonvascular (lichen, mosses, liverworts) and 1,200 vascular (ferns, fern allies, ephedras, conifers, flowering plants) species occur on Fort Bliss, with over 800 taxa in the Organ Mountains alone (Corral, 1997; Worthington et al., 1997). Table B-1 includes an account of known and expected plants on Fort Bliss. There are several endemic plant species in the Organ (four species) and Hueco, (one species) mountains of Fort Bliss. Most of the known populations of these plant species in the Organ Mountains and the entire population in the Hueco Mountains occur on the installation.

Wildlife species diversity is also high where, for example, of the State of New Mexico's 123 species of amphibians and reptiles, 47 species occur and 19 species have the potential to occur on Fort Bliss (U.S. Army, 1997c; Degenhardt et al., 1996). There are an estimated 768 species of birds in New Mexico and 335 species (43 percent) have been recorded on Fort Bliss (U.S. Army, 1996e; 1996c; 1997d).

From a regional perspective, Fort Bliss supports some of the most important examples of southwestern ecosystem types such as black grama grasslands on McGregor Range and relatively undisturbed forests and woodlands in the Organ Mountains. The Organ Mountains are an exceptionally important area in terms of quality and diversity in the Southwest. Numerous endemic and sensitive species occur in these mountains, and they support Rocky Mountain forests and woodlands that have been left relatively undisturbed for the last 50 years with some higher elevation areas probably undisturbed since the 1880s. Other areas such as WSMR, Carlsbad Caverns National Park, Big Bend National Park, and various preserves and national parks in Arizona also support important examples of southwestern ecosystem types. However, these areas do not support the same type and mix of ecosystems as Fort Bliss, which indicates that some of the ecosystems on Fort Bliss are important from a regional perspective (U.S. Army, 1997b).

6.7.1 Vegetation Diversity of Fort Bliss

The varied and uplifted geology of the Southwest and the resulting variation in climate and soils has created a mosaic of abiotic and biotic environments. The great biodiversity of this region is the result of the interaction of several factors, including topographic relief and the associated heterogeneity of climate, influence from several biogeographic realms, variation in vegetation structure, dynamic climate, and periodic disturbance (Van Devender, 1986). Additionally, climatic and temperature gradients have long been recognized as central factors influencing distribution of habitats in the Southwest (Parmenter et al., 1995).

The major plant community types in the area of Fort Bliss are desert grasslands, Chihuahuan Desert scrub, and plains mesa sandscrub. Types that occur in the mountains in the area are juniper savanna, conifer and mixed woodlands, and montane conifer forests (Dick-Peddie, 1993). The vegetation of Fort Bliss was characterized and mapped (U.S. Army, 1996c; 1997b) and this section is based on those reports. The vegetation on Fort Bliss is diverse, ranging from Chihuahuan Desert scrub in the Tularosa Basin to Rocky Mountain conifer forests in the Organ Mountains (Figures 6-8, 6-9, and 6-10).

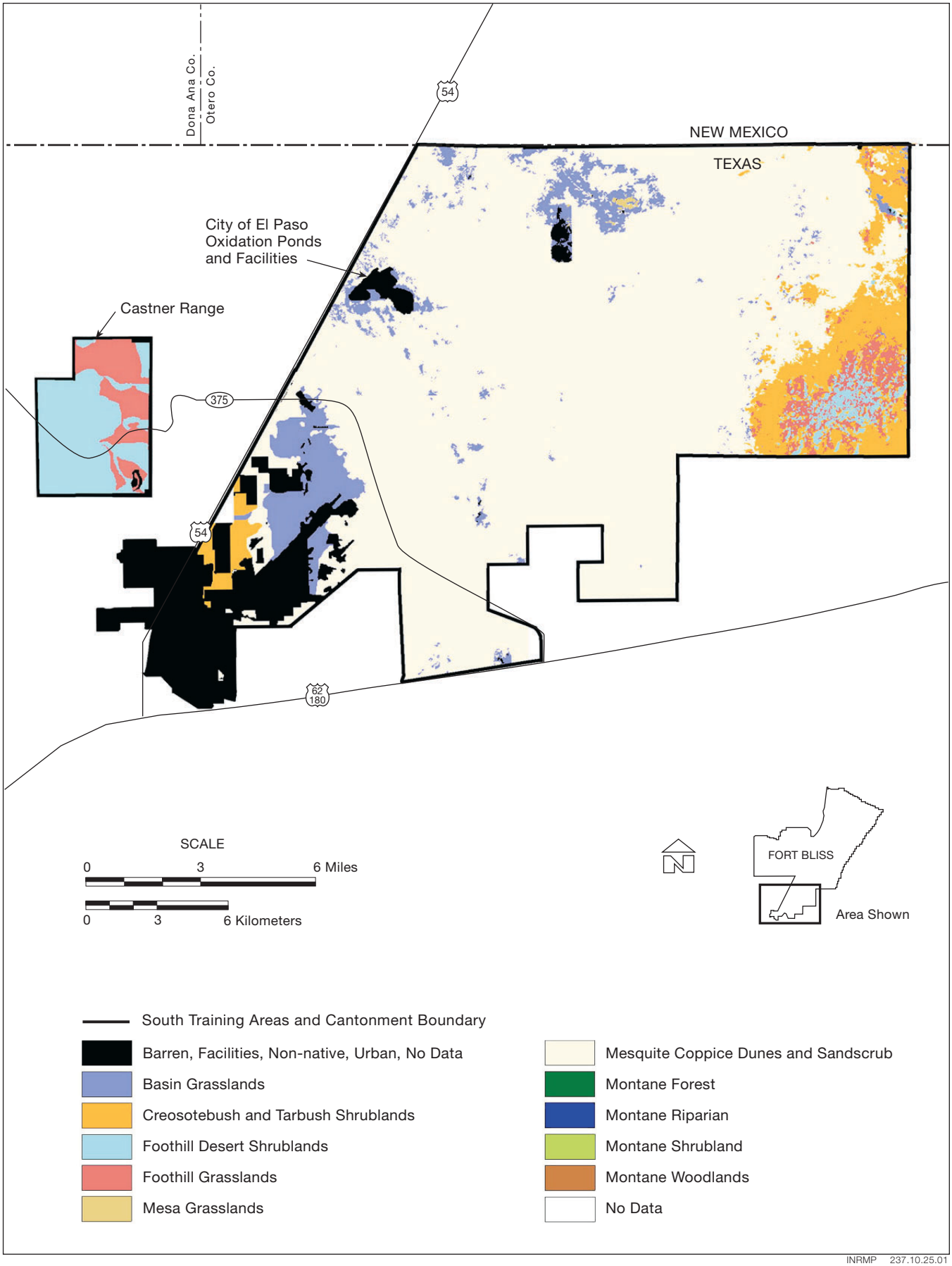

Figure 6-8. South Training Areas and Cantonment Vegetation.

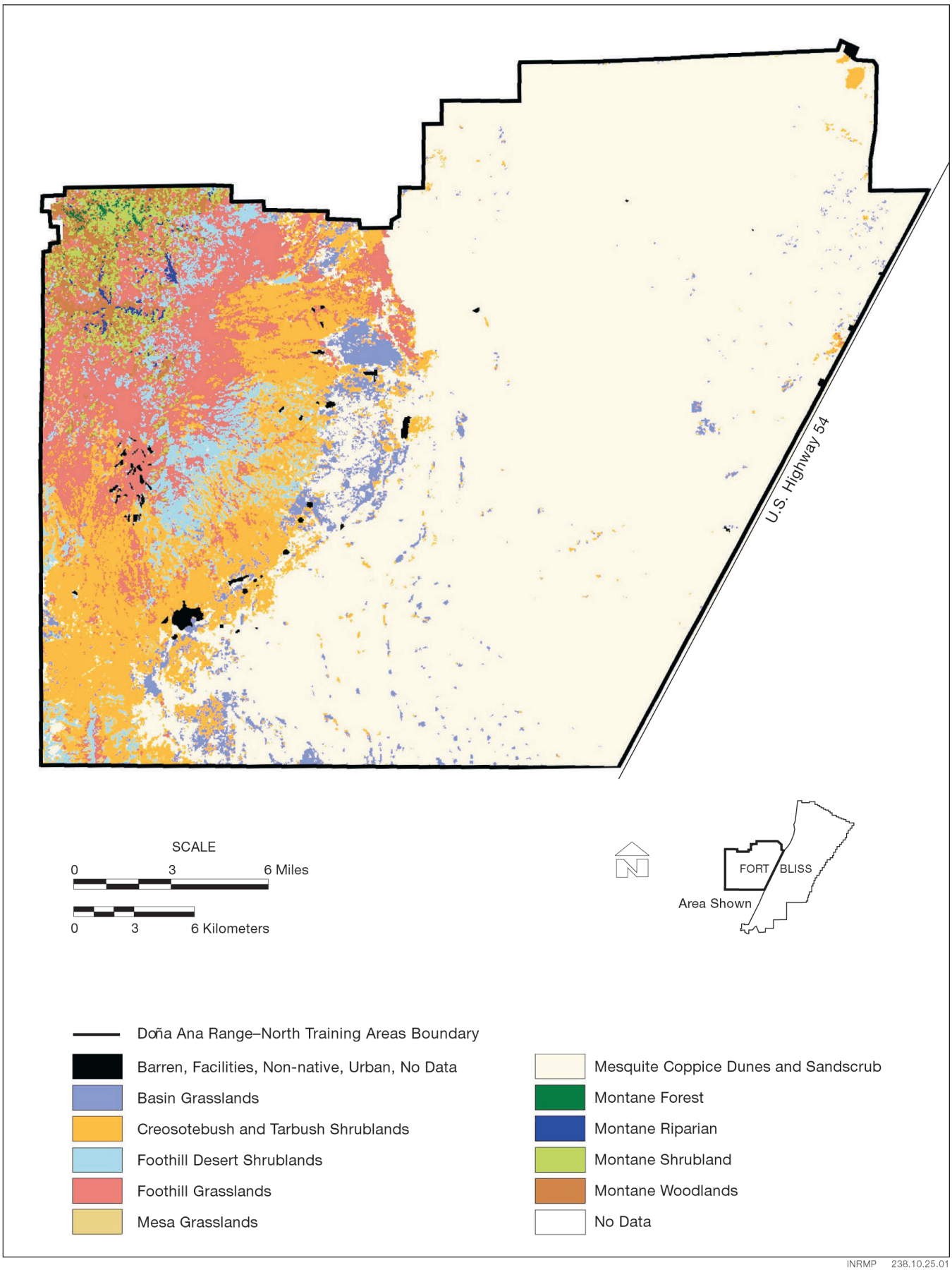

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Figure 6-9. Doña Ana Range–North Training Areas Vegetation.

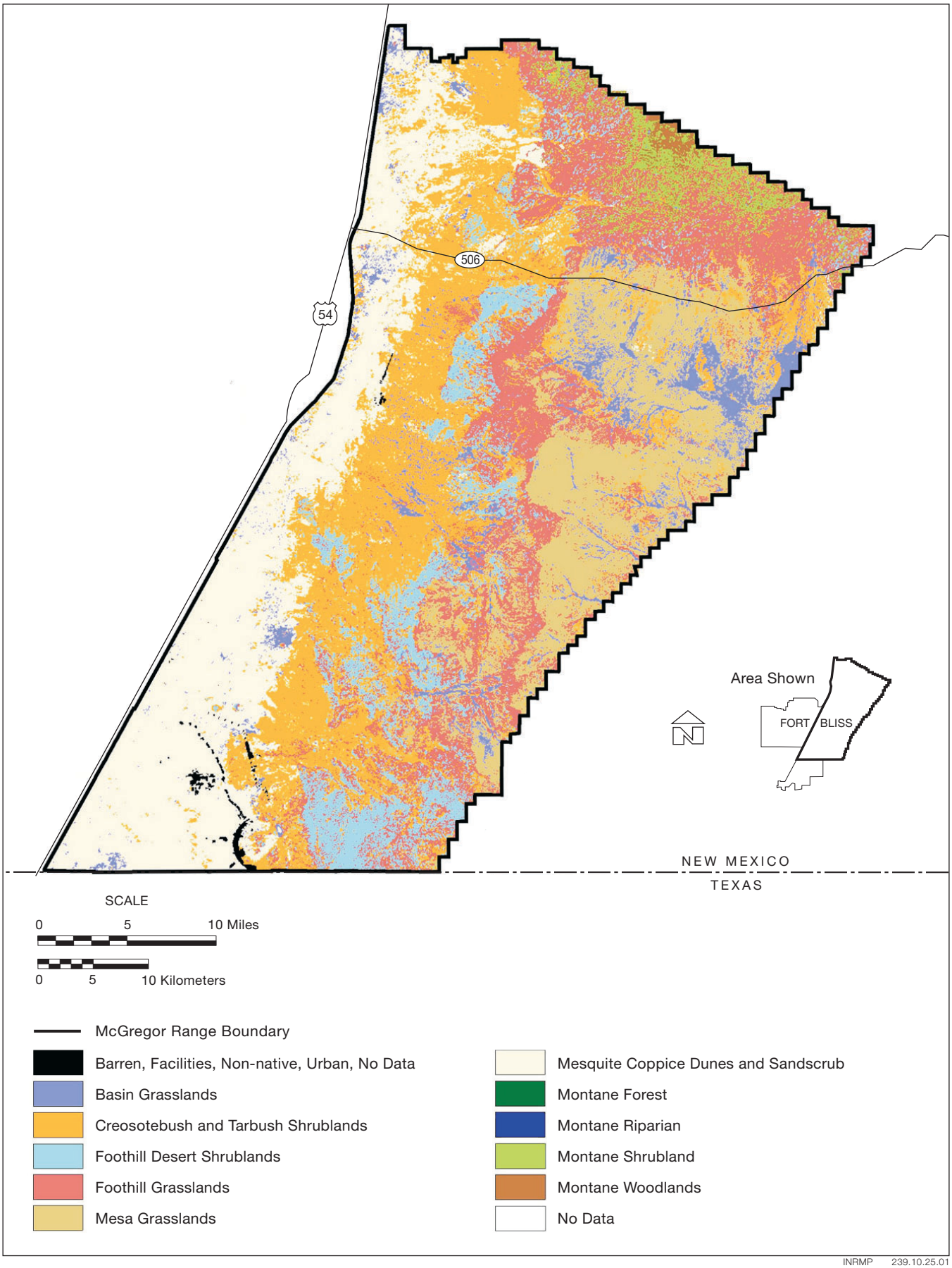

Figure 6-10. McGregor Range Vegetation.

Within the basin, alluvial fans and piedmonts support desert shrub and grassland plant communities. Desert shrub plant communities dominate the Tularosa Basin floor, and Otero Mesa generally supports desert grassland plant communities. The upper Sacramento Mountains foothills generally support a wooded plant community dominated by open and closed stands of pinyon pine (*Pinus edulis*) and juniper (*Juniperus monosperma, and J. deppeana*). This woodland type also occurs in the Organ Mountains as well as oak woodlands and Rocky Mountain montane conifer forest.

The plant communities and other areas on the main cantonment, the South Training Areas, Doña Ana Range–North Training Areas, and McGregor Range were mapped using satellite imagery (U.S. Army, 1996c). Table 6-4 lists the 36 mapping units, a description of each unit, and the approximate acreage and proportion of Fort Bliss mapped in each unit. Five of the 36 mapping units are not actual vegetation communities. Three have to do with human use; urban, non-native vegetation of golf courses, parade fields and parks, and military facilities such as the infrastructure associated with firing ranges and assembly areas. Less than 2 percent of the installation is mapped as military facilities, non-native vegetation, or urban settings. The 36 mapping units were lumped into 11 categories (Table 6-5) and mapped (Figures 6-8 through 6-10). The various types of shrubland total 746,049 acres (67.04 percent), 342,576 acres of grasslands (30.78 percent), and 10,184 acres of woodland (1 percent) (Table 6-5).

As indicated in tables above, about 67 percent of Fort Bliss is desert shrublands, mostly in the Tularosa Basin (see Figures 6-8, 6-9, and 6-10). About 438,850 acres of the shrublands (39 percent of Fort Bliss) are covered with mesquite-dominated plant communities most of which are coppice dunes. Creosote-dominated plant communities cover 209,708 acres or 18 percent of the total land. Shrub-dominated plant communities have replaced grassland plant communities (including black grama grasslands) over large areas in southern New Mexico in the last century (Buffington and Herbel, 1965). For example, more than 86,000 acres of a 144,500-acre study area on the Jornada Experimental Range were grasslands with no shrubs in 1858; no such habitat remained by 1963. During the same time period, mesquite-dominated habitat increased from 6,266 acres in 1858 to 66,151 acres in 1963, and creosote-dominated areas increased from 640 acres to about 12,000 acres during the same period. Mesquite-dominated areas have continued to expand even after livestock have been removed from the range for many years. Long-term studies in permanent enclosures at the Jornada Experiment Station from 1935 to 1980 showed that black grama grass had totally disappeared by 1980, even in areas where it was the dominant species in 1935; the greatest decline in black grama took place between 1950 and 1955 during a severe drought. These former black grama grasslands are now mesquite-dominated areas (Hennessy et al., 1983). It is believed that the formation of mesquite coppice dunes is related to cattle grazing and drought. Under heavy livestock grazing and/or drought, grass cover was reduced. In addition, cattle feed on mesquite seeds and the dispersal of these seeds is of "great importance in the spread of mesquite to adjacent areas" (Buffington and Herbal, 1965). Openings created by the reduction in grass cover were occupied by mesquite and the establishment of this species altered the site and extensive soil movement occurred, forming coppice dunes. In addition, soil moisture conditions and competition were such that black grama could not become re-established (Hennessy et al., 1983).

Table 6-4. Number of Acres and Description of 36 Mapping Units at Fort Bliss

Plant Community (Mapping Units)	*Number of Acres (% of Total)*	*Description*
Shrublands		
Basin desert shrublands (coppice dunes) (1)	342,429 (30.72)	Consists of large coppice dunes in the Tularosa Basin honey mesquite (*Prosopis glandulosa)* is the dominant shrub with four-winged saltbush (*Atriplex canescens*) common in some areas. Sparse undergrowth; mesa dropseed (*Sporobolus flexuosus)* common in some areas.

Table 6-4. Number of Acres and Description of 36 Mapping Units at Fort Bliss (Continued)

Plant Community (Mapping Units)	*Number of Acres (% of Total)*	*Description*
	Shrublands	
Plains/coppice dunes sandscrub (2)	39,773 (3.57)	Sandsage (*Artemisia filifolia)* common with some mesquite and mesa dropseed. Occurs at north and south end of coppice dune fields.
Plains sandscrub (3)	48,741 (4.37)	Sandsage/mesa dropseed common plants. Located on sandy areas mostly in Tularosa Basin with small amounts on Otero Mesa
Basin desert shrubland (4)	7,907 (0.71)	Dominated by honey mesquite and alkali sacaton (*Sporobolus airoides*) in broad clay depressions at northern edge of coppice dunes.
Basin/lowland desert shrubland (5)	40,793 (3.66)	Bottomland tarbush (*Flourensia cernua*) dominant with tobosagrass *(Hilaria mutica*) and burrograss (*Scleropogon brevifolius*) also common. Occurs on silty alluvial fan toe slopes and bottomlands on northern Otero Mesa and in the basin below mesa.
Lower piedmont desert shrubland–creosotebush and tarbush (6)	94,614 (8.49)	Dominated by creosotebush (*Larrea tridentata)* and bush muhly (*Muhlenbergia porteri)*; tarbush is common in some areas. Occurs in heavy depositional soils of the lower toe slopes and the basin bottom.
Lower piedmont desert shrubland–creosotebush and honey mesquite (7)	7,770 (0.70)	Creosotebush and honey mesquite are dominant. Occurs on gravely or silty soils on eastern piedmont of the Organ Mountains
Upper piedmont desert shrubland–creosotebush and bush muhly (8)	66,531 (5.97)	Dominated by creosotebush and bush muhly. Occurs on gravely soil of the upper piedmont and Sacramento Mountains foothills
Foothill desert shrubland–white thorn acacia (9)	42,895 (3.85)	Dominated by viscid acacia (*Acacia noevernicosa*); other species are sideoats grama (*Bouteloua curtipendula*), black grama (*B. eriopoda)*, and ocotillo (*Fouquieria splendens*). Occurs on shallow gravely soils of foothills, mesa escarpments, and upper piedmont.
Foothill desert shrubland–mimosa/sideoats grama (10)	2,373 (0.21)	Dominated by mimosa (*Mimosa aculeaticarpa*) and sideoats grama. Occurs on gravely slopes in canyons on the east side of the Organ Mountains
Foothill desert shrubland–ocotillo - mariola (11)	9,977 (0.89)	Ocotillo and mariola (*Parthenium incanum*) are common plant species. Occurs on the rocky foothills of the Sacramento, Organ, and Franklin Mountains.
Foothill desert shrubland–Lechugilla /sideoats grama (12)	13,978 (1.25)	Dominated by lechugilla (*Agave lechuguilla)* and sideoats grama. Occurs on all aspects of the Hueco Mountains and unnamed hills.
Montane shrubland–mountain mahogany (13)	22,921 (2.06)	Mountain mahogany (*Cercocarpus montanus)* , curlyleaf muhly, and New Mexico needlegrass are dominant. Occurs predominantly on rocky south facing slopes at mid-elevation in the Organ and Sacramento Mountains.
Montane shrubland–Gambel's oak (14)	716 (0.06)	Gambel's oak (*Quercus gambelii)* and whortleleaf snowberry (*Symphoricarpos oreophilus)* are dominant. Occurs in dense stands on north facing slopes at mid- to high- elevation in the Organ Mountains
	Grasslands	
Sandy plains desert grassland (15)	12,780 (1.15)	Dominated by mesa dropseed and soaptree yucca (*Yucca elata)*. Occurs mostly south of McGregor Range Camp on sandy sites.
Basin/lowland desert grassland–tobosa-grass and alkali sacaton (16)	40,882 (3.67)	Dominated by tobosagrass and alkali sacaton and occurs in heavy depositional soils on flats, bottomlands, and swales. Usually associated with drainages on Otero Mesa and Sacramento and Organ Mountains.
Basin/lowland desert grassland–burrograss (17)	2,881 (0.26)	Monotypic growth of burrograss. Occurs in drainages on Otero Mesa and broad alluvial depressions in the basin.
Upper piedmont desert grassland (18)	7,307 (0.66)	Codominants are black grama, Torrey's jointfir (*Ephedra torreyana)*, and honey mesquite in the gravely upper piedmont of the Organ Mountains

Table 6-4. Number of Acres and Description of 36 Mapping Units at Fort Bliss (Continued)

Plant Community (Mapping Units)	*Number of Acres (% of Total)*	*Description*
Foothills piedmont desert grassland (19)	32,854 (2.95)	Black and sideoats grama dominant with soaptree yucca and creosotebush. Occurs on gravely footslopes and piedmont of the Sacramento, Hueco, and, Franklin Mountains.
Foothills grassland (20)	58,269 (5.23)	Dominated by sideoats grama, sacahuista (*Nolina microcarpa)*, and curlyleaf muhly (*Muhlenbergia setifolia)*. Occurs on gravely or rocky slopes near Otero Mesa escarpment and canyon walls of the escarpment.
Mesa grassland–blue grama/alkali sacaton (21)	7,694 (0.69)	Blue grama (*Bouteloua gracilis)* and alkali sacaton common along with soaptree yucca and purple threeawn (*Aristida purpurea)*. Occurs on silty-clay soils near the Sacramento Mountains foothills.
Mesa grassland–black and blue grama/soaptree yucca (22)	89,233 (8.00)	Dominated by blue and black grama plus soaptree yucca and banana yucca (*Yucca baccata)*. Covers extensive areas on fine silty soil on Otero Mesa and low tablelands beneath the mesa.
Mesa grassland–black and blue grama/banana yucca (23)	5,867 (0.53)	Black and blue grama plus banana yucca are dominant. Occurs on shallow soils on southern Otero Mesa
Mesa/foothills grassland (24)	18,026 (1.62)	New Mexico needlegrass (*Stipa neomexicana),* sideoats grama, black grama, banana yucca common. Occurs on rocky ridges of slopes of the southern Otero Mesa
Foothills grassland–sideoats grama, curlyleaf muhly (25)	55,639 (4.99)	Sideoats grama, curleyleaf muhly, skeletonleaf goldeneye (*Viguiera stenoloba)*, ocotillo, and common sotol (*Dasylirion wheeleri)* are common. Occurs on Otero Mesa escarpment and rocky slopes of the Sacramento and Hueco Mountains.
Foothills grassland–sideoats grama/sotol (26)	5,136 (0.46)	Dominated by sideoats grama, common sotol, and hairy grama (*Bouteloua hirsuta)*. This type found on low to mid elevation slopes in canyons of the Organ Mountains
Piedmont grassland (disturbed) (27)	3,898 (0.35)	Streambed bristlegrass (*Setaria leucopila)* and Arizona cottontop (*Digitaria californica)* are common species. Occur in areas disturbed by exploded ordnance on the piedmont east and west of Rattlesnake Ridge in the Organ Mountains
Woodlands		
Montane riparian (28)	405 (0.04)	Composed of forested and shrub dominated riparian plant communities; coyote willow (*Salix exigua)*, box elder (*Acer negundo)*, and velvet ash (*Fraxinus velutina)* are common species. Occurs in mountain valley drainages in the Organ Mountains
Woodland–oneseed juniper (29)	2,878 (0.26)	Oneseed juniper, curlyleaf muhly, and hairy grama are dominant. Occurs on rocky, gravely slopes at moderately high elevation in the Sacramento and Organ Mountains.
Woodland–pinyon pine (30)	6,532 (0.59)	Pinyon pine, alligator juniper, sideoats grama, sandpaper oak (*Quercus pungens)*, and gray oak (*Quercus grisea)* are dominant. Occurs on rocky, well developed soils on high elevation slopes of the Sacramento and Organ Mountains.
Conifer forest (31)	369 (0.03)	Ponderosa pine (*Pinus ponderosa)*, Douglas fir (*Psuedotsuga menziesii)*, Gambel's oak, and mountain muhly (*Mulenbergia montana)* are common species. Occurs on the upper elevation of the Organ Mountains generally on steep slopes.

Table 6-4. Number of Acres and Description of 36 Mapping Units at Fort Bliss (Continued)

Plant Community (Mapping Units)	*Number of Acres (% of Total)*	*Description*
Other Categories		
Barren lands (32)	1,377 (0.12)	Areas with less than 10% vegetation cover, including rock outcrops.
Military facilities (33)	2,551 (0.23)	Permanent infrastructure such as found at firing ranges and assembly areas.
Non-Native Vegetation (34)	2,225 (0.20)	Parade grounds, golf courses, former farmlands, storm water catchments, and other areas.
Urban (35)	7,808 (0.70)	Buildings and paved areas.
No Data (36)	8,739 (0.78)	Areas not mapped to this level of vegetation classification, mainly Castner Range, but includes recent boundary adjustments in GIS.
Total	*1,114,768*	

U.S. Army, 1996c

Table 6-5. Summary of Desert Shrubland, Grassland, and Woodland Plant Communities and Disturbed Ground on Fort Bliss

General Plant Community Type	*Mapping Units* [a]	*Acres* [a]	
		Number	*Percent*
Shrublands			
Mesquite coppice dunes and sandscrub	1, 2, 3, 4	438,850	39.40
Creosotebush and tarbush shrublands	5, 6, 7, 8	209,708	18.08
Foothill desert shrublands	9, 10, 11, 12	73,854	6.20
Montane shrublands	13, 14	23,637	2.10
Total shrublands		*746,049*	*67.04*
Grasslands			
Basin grasslands	15, 16, 17	56,543	5.10
Mesa grasslands	21, 22, 23, 24	120,820	10.80
Foothill grasslands	18, 19, 20, 25, 26, 27	165,213	14.80
Total grasslands		*342,576*	*30.78*
Woodlands			
Montane riparian	28	405	0.04
Pinyon/juniper woodlands	29, 30	9,410	0.84
Conifer forest	31	369	0.03
Total woodlands		*10,184*	*0.91*
Other			
Barren, Facilities, Non-Native, Urban, and No Data	32, 33, 34, 35, 36	15,959	1.43
Total		*1,114,768*	*100.00*

[a] From Table 6-2.
Source: U.S. Army, 1996c.
Note: Mapping units renumbered from those presented in the source document.

Once established, coppice dunes persist. The return to grasslands, even in areas where livestock have been excluded for many years, is highly unlikely (Buffington and Hebler, 1965; Hennessy et al., 1983). Chemical treatment has proven successful in reducing mesquite growth over the short-term (about 3 years). Satellite imagery data over a several-year period was used to track photosynthetic activity on the mesquite canopy. No ground transects were sampled. The satellite data indicated that during the first 3 years of treatment, an increase in grass growth was noted. After 3 years, mesquite began to recover and a reduction in grass growth resulted (Eve and Peters, 1995).

Grassland plant communities cover about 342,576 acres, which accounts for over 30 percent of the land on Fort Bliss (Table 6-5). Within Fort Bliss, Otero Mesa covers about 152,706 acres (U.S. Army, 1996c) and most of this area is covered by grassland plant communities. The remainder of the grassland plant communities occur in the Tularosa Basin and in the foothills of the Organ Mountains.

Woodland plant communities cover about 10,184 acres or about 1 percent of Fort Bliss (Table 6-5); these plant community types are in the Organ Mountains and Sacramento Mountains foothills. Pinyon pine-juniper woodlands occur in both mountain ranges. The montane riparian and montane conifer forest occur only in the Organ Mountains. In addition, montane shrublands dominated by mountain mahogany occur in both mountain ranges, while montane shrublands dominated by Gambel's oak occur in the Organ Mountains only (U.S. Army, 1996c).

The South Training Areas are located in Texas, and Chihuahuan Desert shrublands dominate this area. Figure 6-8 shows a triangular area of roads, facilities and barren areas in the southwest corner of the South Training Areas along U.S. Highway 54. Basin desert shrublands dominated by honey mesquite coppice dunes and sandscrub are common here; four-winged saltbush is also evident in this type and mesa dropseed is in the sparse understory. In some areas, sandsage is common along with mesquite. Basin and mesa grasslands occur in the north central portion of these training areas. The mesquite dunes give way to the creosotebush plant community on the east side of the South Training Areas (Figure 6-8). Bush muhly and tarbush are common in some areas. Creosotebush gives way to foothills desert shrublands dominated by lechugilla and creosotebush on the shallow rocky slopes of the Hueco Mountains. Grasslands are supported on the alluvial deposits of these mountains and sideoats grama and black grama are common (U.S. Army, 1996c).

On the Doña Ana Range–North Training Areas the dominant plant community type in the eastern two-thirds is mesquite coppice dunes (Figure 6-9). The dunes give way to creosotebush-dominated areas which grade into foothill desert shrublands and grasslands on the Organ Mountains piedmont. The dominant shrubs in the foothill desert shrublands are creosotebush and mimosa, while black, sideoats, and hairy grama are common in the grassland plant communities. In the Organ Mountains, steep elevation gradients and diverse geological substrate combine to support the highest vegetation diversity on Fort Bliss. The mountains support Rocky Mountain conifer forests and woodlands and montane shrublands. Canyons support diverse woodland and grassland riparian plant communities (U.S. Army, 1996c).

On McGregor Range, coppice dunes and sandscrub plant communities dominate the western one-fifth of the range; honey mesquite is the dominant plant in some areas and sandsage is dominant in others (Figure 6-10). These types give way to creosotebush-dominated plant communities where tarbush and lowland grasslands are associated with loamy soils in the drainages. The Hueco Mountains are in the southeast portion of McGregor Range, and lechugilla, creosotebush, and mariola communities dominate the shallow soils on the steep slopes, while desert grasslands dominated by sideoats grama and black grama occupy the gentler slopes. The eastern part of McGregor Range is dominated by the Otero Mesa. Otero Mesa extends southeast off of McGregor Range. Vegetation on Otero Mesa is predominately basin and mesa grasslands dominated by black and blue grama with tobosa grass and burrograss in the broad drainages. New Mexico needlegrass and various shrubs can be found on rocky ridges. The Sacramento

FTBL-22.A.3

Fort Bliss DOE, SAIC, Center for Ecological Management of Military Lands, USACE Fort Worth, Geo-Marine, Inc. Integrated Natural Resources Management Plan, US Army Air Defense Artillery Center, Fort Bliss. November 2001. pg. 6-38 – 6-46.

Small mammal trapping took place at 27 sampling locations on TA 9 on the Doña Ana Range–North Training Areas and 21 species were recorded (U.S. Army, 1992a). The banner-tailed kangaroo rat (*Dipodomys spectabilis)*, Merriam's kangaroo rat, plains pocket mouse, silky pocket mouse, and spotted ground squirrel (*Spermophilis spilosoma)* showed a strong preference for grasslands and uplands. The white-throated woodrat, cactus mouse, white-footed mouse, and hispid cotton rat were more common in arroyos (U.S. Army, 1992a).

The desert cottontail (*Sylvilagus audubonii)* and black-tailed jackrabbit (*Lepus californicus)* are common on post. Smartt (1980) found these species to be more common in the desert shrubland habitat than the grassland habitat on Otero Mesa. The density of these two species in the desert shrublands of theTularosa Basin ranged from 22 in 1995 to 13 per square mile in 1994 (U.S. Army, 1996k).

The coyote, kit fox (*Vulpes macrotis*), badger, and bobcat are predators in the desert shrubland and grassland habitats. The kit fox on Fort Bliss is morphologically indistinguishable from its close relative the swift fox (*Vulpes velox)*; Fort Bliss is within the area where the ranges of these two species overlap (U.S. Army, 1996k). Mountain lions (*Puma concolor*) occur in much of Fort Bliss including the Sacramento Mountains, foothills and canyons of the Otero Mesa escarpment. Black bears occur only in the Sacramento Mountains portion of Fort Bliss, the Organ Mountains, and have been observed in locations of the Tularosa Basin.

The mule deer (*Odocoileus hemionus*) occurs throughout Fort Bliss and is most common in the mountainous portions including the foothills of the Sacramento and Organ mountains. The number of mule deer in the Sacramento Mountains foothills on McGregor Range ranged from 587 in 1984 to 206 in 1995 (NMDGF, 1997). In addition, the number of deer observed north of the New Mexico Highway 506 was substantially greater than the number observed south of this route. Data from aerial surveys of the Hueco Mountains in Texas from 1985 through 1990 indicate that the number of mule deer ranged from 1.2 to 6.1 per 1,000 acres except for 1986 when there were an estimated 23.1 per 1,000 acres (Cantu, 1990).

The pronghorn (*Antilocapra americana*) occurs mostly in the grassland communities of the Otero Mesa and adjoining grasslands below the mesa, with occasional use of the desert shrubland habitat in the Tularosa Basin. An estimated 500 to 700 pronghorn inhabit the Otero Mesa of Fort Bliss. The oryx (*Oryx gazella)* is common in the desert shrubland communities and was observed in the area of Mack Tanks in the Tularosa Basin, while sign was common at New Tank in the Hueco Mountains (U.S. Army, 1997i; USAF, 1997g). Oryx have become common in Doña Ana Range–North Training Areas in desert shrubland communities and in the Tularosa Basin portions of McGregor Range. Javelina (*Dicotyles tajacu*) are widely dispersed but uncommon in the Tularosa Basin portions of Fort Bliss and have been observed infrequently in many locations.

6.7.3 SENSITIVE SPECIES

Various species of flora and fauna occur, or have the potential to occur, on Fort Bliss are listed as threatened, endangered, or species of concern by the USFWS and the states of New Mexico and Texas (Table 6-6). Of the nine species federally listed, two species are found on Fort Bliss year around (Sneed pincushion cactus, black-tailed prairie dog), one species is a seasonal resident (bald eagle), and potential but unoccupied habitat exists for two species that have been sighted (aplomado falcon and mountain plover). Habitat for the remaining four federally listed species in Table 6-6 does not exist or is of insufficient amount to maintain a population (piping plover, interior least tern, Mexican spotted owl, southwest willow flycatcher), but these species have or may pass through portions of Fort Bliss. Table 6-6 also lists 34 species that are considered species of concern by the New Mexico Ecological Services Field Office (USFWS, 2000), and some have state designations of threatened or endangered. The

remaining 15 species have state designations of threatened or endangered, or are considered sensitive by Fort Bliss.

The ESA [16 USC 1531 *et. seq.*] of 1973 as amended was enacted to provide a program for the preservation of endangered and threatened species and to provide protection for the ecological units upon which these species depend for their survival. All federal agencies are required to implement protection programs for these designated species and to use their authorities to further the purposes of the act.

The USFWS is the primary agency responsible for implementing the ESA. The USFWS is responsible for birds and terrestrial and fresh water species. The USFWS responsibilities under the ESA include: (1) the identification of threatened and endangered species; (2) the identification of critical habitats for listed species; (3) implementation of research on, and recovery efforts for, these species; and (4) consultation with other federal agencies concerning measures to avoid harm to listed species.

An endangered species is in danger of extinction throughout all or a significant portion of its range [16 USC 1531 *et. seq.*]. A threatened species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range [16 USC 1531 *et. seq.*]. Proposed species are those which have been formally submitted to Congress for official listing as threatened or endangered [16 USC 1531 *et. seq.*].

Table 6-6. Sensitive Species Known to or Having the Potential to Occur on Fort Bliss

Species	*Status* [a]			*Location on Fort Bliss*
	Federal	*New Mexico*	*Texas*	
FEDERALLY LISTED, PROPOSED FOR LISTING, AND CANDIDATE SPECIES				
Sneed pincushion cactus *(Coryphantha sneedii var. sneedii)*	E	E	E	Limestone Hills, Doña Ana Range–North Training Areas
Interior least tern *(Sterna antillarum athalassos)*	E	E	E	Not known to occur on Fort Bliss. Could occur as very rare migrant at sewage lagoon on Fort Bliss
Northern aplomado falcon *(Falco femoralis septentrionalis)*	E	E	E	One unconfirmed sighting in 1997, two confirmed sightings in 1999. Best potential habitat in grasslands on Otero Mesa, McGregor Range
Southwestern willow flycatcher *(Empidonax trailii extimus)*	E	E	E	Occasional migrants of the species on McGregor Range; subspecies not determined
Bald eagle *(Haliaeetus leucocephalus)*	T	T	T	Winters in foothills of Sacramento Mountains McGregor Range
Piping plover *(Charadrius melodus)*	T	E	T	Rare migrant on McGregor Range observed once in 1987 at sewage lagoon on Fort Bliss
Mexican spotted owl *(Strix occidentalis lucida)*	T	—	T	Very rare on Fort Bliss Not known to breed on site, best potential habitat in Organ mountains, Doña Ana Range–North Training Areas
Mountain plover *(Charadrius montanus)*	PT	—	—	One migrant sighted in 1999. Best potential habitat is grasslands on Otero Mesa
Black-tailed prairie dog *(Cynomys ludovicianus)*	C	—	—	Occurs on Otero Mesa, McGregor Range

Table 6-6. Sensitive Species Known to or Having the Potential to Occur on Fort Bliss (Continued)

Species	*Status* [a]			*Location on Fort Bliss*
	Federal	*New Mexico*	*Texas*	
FEDERAL SPECIES OF CONCERN				
Alamo beardtongue *(Penstemon alamosensis)*	SC	SC	—	Hueco Mountains South Training Areas
Organ Mountains evening primrose *(Oenothera organensis)*	SC	SC	—	Organ Mountains Doña Ana Range–North Training Areas
Organ Mountains figwort *(Scrophularia laevis)*	SC	SC	—	Organ Mountains Doña Ana Range–North Training Areas
Standley whitlowgrass *(Draba standleyi)*	SC	SC	—	Organ Mountains Doña Ana Range–North Training Areas
Night blooming cereus *(Peniocereus greggii* var. *greggii)*	SC	E	—	Desert shrublands, Doña Ana Range–North Training Areas
Hueco Mountains rock daisy *(Perityle huecoensis)*	SC	—	—	Hueco Mountains South Training Areas
Nodding cliff daisy *(Perityle cernua)*	SC	SC	—	Organ Mountains Doña Ana Range–North Training Areas
Sand prickly pear (*Opuntia arenaria*)	SC	E	—	Not observed during species-specific or other surveys. Low potential to occur on Fort Bliss
Franklin Mountain talussnail (*Sonorella metcalfi)*	SC	—	—	Talus slopes in the Franklin Mountains and possible in the Organ Mountains, Doña Ana Range–North Training Areas
Anthony blister beetle (*Lytta mirifica)*	SC	—	—	Not known to occur on Fort Bliss, but habitat occurs in sand dunes
Los Olmos tiger beetle (*Cicindela nevadica*)	SC	—	—	Not known to occur on Fort Bliss. Could occur in areas of limestone soil
Texas horned lizard *(Phrynosoma cornutum)*	SC	—	T	Widespread throughout post
Black tern *(Chlidonias niger)*	SC	—	—	Regular migrant through McGregor Range at perennial water sources
White-faced ibis *(Plegadis chihi)*	SC	—	T	Potential regular migrant through Fort Bliss; observed at sewage lagoons and on cantonment on McGregor Range
Peregrine falcon *(Falco peregrinus anatum)*	SC	T	E	Nests in the Organ Mountains on Doña Ana Range–North Training Areas, occasional migrant elsewhere on post
Northern goshawk (*Accipiter gentiles*)	SC	—	T	Uncommon migrant on Fort Bliss
Ferruginous hawk *(Buteo regalis)*	SC	—	—	Wintering and migrant species; mostly on Otero Mesa McGregor Range
Western burrowing owl *(Athene cunicularia)*	SC	—	—	Occurs throughout Fort Bliss in desert shrubland and grassland communities
Loggerhead shrike *(Lanius ludovicianus)*	SC	—	—	Winter and breeding bird from Otero Mesa and Tularosa Basin
Baird's sparrow *(Ammodramus bairdii)*	SC	T	—	Migrates through and winters in dense grasslands
Small-footed myotis *(Myotis ciliolabrum)*	SC	—	—	Distribution unknown
Long-eared myotis *(Myotis eyotis)*	SC	—	—	Distribution unknown
Eastern small-footed bat *(Myotis leibii)*	SC	—	—	Distribution unknown

Table 6-6. Sensitive Species Known to or Having the Potential to Occur on Fort Bliss (Continued)

Species	*Status* [a]			*Location on Fort Bliss*
	Federal	*New Mexico*	*Texas*	
FEDERAL SPECIES OF CONCERN				
Occult little brown bat *(Myotis lucifugus occultus)*	SC	—	—	Distribution unknown
Fringed myotis *(Myotis thysanodes)*	SC			Reported from the Sacramento Mountains foothills, McGregor Range
Cave myotis *(Myotis velifera)*	SC	—	—	Distribution unknown
Long-legged myotis *(Myotis volans)*	SC	—	—	Distribution unknown
Yuma myotis *(Myotis yumanensis)*	SC	—	—	Distribution unknown
Spotted bat *(Euderma maculatum)*	SC	T	T	Distribution unknown
Townsend's pale big-eared bat *(Plecotus townsendii pallescens)*	SC	—	—	Distribution unknown
Big free-tailed bat *(Nyctinomops macrotis)*	SC	—	—	Distribution unknown
Greater western mastiff bat *(Eumops perotis californicus)*	SC	—	—	Distribution unknown
Gray-footed chipmunk *(Tamias canipes)*	SC	—	—	Occurs in woodland and forest habitats in the Sacramento Mountains foothills on McGregor Range
Organ Mountain Colorado chipmunk *(Eutamias quadrivittatus australis)*	SC	T	—	Occurs in Organ Mountains, Doña Ana Range–North Training Areas
STATE PROTECTED AND OTHER SENSITIVE SPECIES				
Organ Mountains pincushion cactus *(Coryphantha organensis)*	—	E	—	Organ Mountains Doña Ana Range–North Training Areas
Crested coral-root *(Hexalectris spicata)*	—	E	—	Organ Mountains Doña Ana Range–North Training Areas
Boulder woodlandsnail *(Ashmunella anriculata)*	—	—	—	Organ Mountains Doña Ana Range–North Training Areas
Maple Canyon woodlandsnail *(Ashmunella todseni)*	—	—	—	Organ Mountains Doña Ana Range–North Training Areas
Organ Mountains woodlandsnail *(Ashmunella organensis)*	—	—	—	Organ Mountains, Doña Ana Range–North Training Areas
Beasley's woodlandsnail *(Ashmunella beasleyi)*	—	—	—	Organ Mountains, Doña Ana Range–North Training Areas
Mountain short-horned lizard (*Phrynosoma douglasii hernandezii*)	—	—	T	Species observed on Doña Ana Range–North Training Areas, and McGregor Range; status unknown in South Training Areas in Texas
Mottled rock rattlesnake (*Crotalus lepidus lepidus*)	—	T	—	Species documented from the Organ Mountains; subspecies not recorded on post
Texas lyre snake (*Trimorphodon biscutatus vilkinsonii*)	—	—	T	Castner Range in Texas
Zone-tailed hawk (*Buteo albonotatus*)	—	—	T	Uncommon migrant on Fort Bliss
Costa's hummingbird (*Calypte costae*)	—	T	—	Uncommon migrant in arroyo-riparian habitat on Fort Bliss

Table 6-6. Sensitive Species Known to or Having the Potential to Occur on Fort Bliss (Continued)

Species	*Status* [a]			*Location on Fort Bliss*
	Federal	*New Mexico*	*Texas*	
STATE PROTECTED AND OTHER SENSITIVE SPECIES				
Varied bunting *(Passerina versicolor)*	—	T	—	Very rare on Fort Bliss
Bell's vireo *(Vireo bellii)*	—	T	—	Occasional on Fort Bliss
Gray vireo *(Vireo vicinior)*	—	T	—	Nests in the Organ Mountains, Doña Ana Range–North Training Areas; potential habitat on McGregor Range
Desert bighorn sheep *(Ovis canadensis mexicana)*	—	E	—	Does not occur on Fort Bliss. Previously existed in Organ Mountains on Doña Ana Range–North Training Areas

[a] SC = federal and state species of concern; C = candidate species; E = endangered species; T = threatened species; — = not listed; PT = proposed threatened species.
Sources: NMDGF, 2000; Sivinski and Lightfoot, 1995; TPWD 2001; USFWS, 2000a; USFWS, 2001, NM Rare Plant Technical Council, 1999.

Additionally, the USFWS maintains candidate and species of concern categories. Candidates are those species for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened, but for which issuance of a proposed rule is precluded by work on higher priority species (Fowler-Propst, 1996). Species of concern include those for which further biological research and field study are needed to resolve their conservation status (Fowler-Propst, 1996). Candidate species and species of concern have no legal protection under the ESA.

6.7.3.1 Federally Listed, Proposed for Listing, and Candidate Species

Sneed pincushion cactus. The Sneed pincushion cactus is a federal endangered species and is also considered endangered in New Mexico and Texas. This species is known only from steep limestone rocky slopes in the Franklin Mountains in El Paso County, Texas, and Doña Ana County, New Mexico (U.S. Army, 1980b). Three populations of this species are known to exist on separate rocky limestone hills on the Doña Ana Range–North Training Areas (U. S Army 1991b; 1998c). Surveys for this species were conducted in the Hueco Mountains in seemingly good habitat and none were observed (U.S. Army, 1991b). The vegetative cover in Sneed pincushion cactus habitat is typically very sparse due to the rocky nature if the habitat. Chihuahuan desert shrubland plant species such as ocotillo (*Fouquiera splendens*), sotol (*Dasylirion wheeleri*), mariola (*Parthenium incanum*), and prickly pear (*Opuntia* sp.) are common in Sneed pincushion cactus habitat. Long-term monitoring plots have been established within three population and 22 of these plots have been sampled from 1997 through 2000 (U. S. Army, 1997b). Monitoring data indicates the populations of Sneed pincushion cactus are in good health and the numbers appear stable.

Interior least tern. The interior least tern was listed as an endangered species in 1985 (USFWS, 1997a) and is also listed as endangered in New Mexico and Texas. The California (*Sterna antillarum brownii*) and eastern subspecies (*S. a. antillarum*) occur along the coasts of the United States and the interior least tern occurs principally along the Missouri and Mississippi river systems, although some nest along the Rio Grande drainage in the western United States. Historically, this species was abundant along the Missouri and Mississippi river systems and nested on sandbars along low gradient portions of these river systems.

The interior least tern has undergone a marked reduction and the estimated population in 1990 was 5,000 birds (USFWS, 1997a). Factors that have contributed to this reduction include habitat destruction from urbanization; construction of locks, dams, dikes, levees, and storage reservoirs; altered flow patterns in rivers resulting in the disappearance of sandbar nesting habitat; increased predation in disturbed habitats and human disturbance; and water pollution. With the disappearance of its natural nesting habitat, the interior least tern now also nests on man-made structures such dikes, dredge material islands, sand pit mines, construction fill sites, and roofs of buildings (Gore and Kennison, 1991; Whitman, 1988).

In New Mexico, the interior least tern nests at the Bitter Lakes National Wildlife Refuge on the Pecos River in Chaves County (Whitman, 1988). In the 1960s, the breeding tern population was about 60; this number declined to only three nesting pairs per year from 1987 through 1990. There has been a slight increase to four to seven pairs from 1990 to 1999. Productivity has been poor for that last 10 years (NMDGF, 2000).

Northern aplomado falcon. The northern aplomado falcon is listed as an endangered species by the federal government and the states of New Mexico and Texas. It once inhabited the grasslands of southern Texas, New Mexico, and Arizona; historic records show that it was common until about 1940 (Hector, 1987). Historic records from New Mexico show that this species occupied open yucca grasslands in southern New Mexico (Ligon, 1961) which includes the grasslands of Otero Mesa on Fort Bliss. The reasons for this species' decline are unclear. Habitat loss (e.g., grassland habitat converted to shrubland due to livestock grazing) and pesticide contamination likely contributed to this decline (Hector, 1987).

Sporadic observations of the northern aplomado falcon have been reported since 1991 in areas near Fort Bliss and on WSMR. In addition, breeding populations were discovered in 1992 in grassland habitat in the State of Chihuahua, Mexico (Montoya et al., 1997) and the nearest population to the United States is about 125 miles south of the New Mexico border. Surveys for this species have been conducted on Fort Bliss in the Grasslands of Otero Mesa from 1994 through 1999 (U.S. Army, 1994a; 1997h; 1998c; 2000a). More than 1,900 miles were surveyed during this period, and the only northern aplomado falcon observed was seen on September 11, 1999, when a juvenile female was observed perched on a fence post on Otero Mesa. The bird had been banded as a nestling during the spring of 1999 in Chihuahua, Mexico, about 190 miles south of Fort Bliss (USAF, 2000). This bird was observed again on September 18 during aplomado falcon surveys conducted for the USAF. An unconfirmed sighting of an aplomado falcon occurred in May of 1997 during raptor surveys along the Otero Mesa escarpment. The bird was in foothill grassland habitat below the escarpment south of Martin Canyon (U. S. Army, 1998b). It was also an immature and was feeding on a lizard; no bands were noted.

In 1996, the northern aplomado falcon survey was expanded to include habitat evaluation and avian prey base studies (U.S. Army, 1997h) for comparison with the habitats occupied by aplomado falcons in Chihuahua, Mexico (Montoya et al., 1997). The grasslands with scattered yuccas and shrubs found on Otero Mesa are similar to the open habitat found in occupied habitats in Mexico and considered necessary to support a breeding population of northern aplomado falcons. The area also had an abundance of large stick nests constructed by ravens or other raptors, which the falcons use for nesting. However, mean basal grass cover on Otero Mesa was less than half that observed on the Mexican habitat, and the biomass of potential prey species was about 60 percent of that observed in Mexico (U.S. Army, 1997h; Montoya et al., 1997). The Tularosa Basin had shrub densities much higher than on Otero Mesa or in Mexico (U.S. Army, 1997h). These results indicate that the grassland habitat on Otero Mesa may have a reduced capacity to support northern aplomado falcons compared to occupied territories in Mexico. The potential cause of this difference is not confirmed, but historically heavy grazing has been implicated. Further study is needed to investigate these differences.

Southwestern willow flycatcher. The southwestern willow flycatcher is a federal and State of New Mexico listed endangered species. This flycatcher is a neotropical migrant that breeds in the southwestern United States and winters in Central and South America. The southwestern willow flycatcher breeds only in dense riparian vegetation near surface water or saturated soil in linear or irregularly shaped stands with patches of dense vegetation interspersed with small openings (Sferra et al., 1997; Sogge et al., 1997). There is no such habitat on Fort Bliss. The southwestern willow flycatcher has not been observed on Fort Bliss, nor have any breeding willow flycatchers.

The southwestern willow flycatcher populations have experienced significant declines, and breeding populations are known from only about 75 locations and there are an estimated 300 to 500 pairs in existence, though new populations are being found (Sogge et al., 1997). The principal factors resulting in these declines are the extensive loss, modification, and fragmentation of riparian breeding habitat and brood parasitism by brown-headed cowbirds (Sogge et al., 1997). There are likely less then 200 breeding pairs of southwestern willow flycatchers in New Mexico based on recent surveys (Williams, 1997).

The willow flycatcher has been recorded occasionally on McGregor Range. Willow flycatchers were heard singing in an arroyo on McGregor Range in early June 1996. These birds were apparently migrants because they did not stay in the area (U.S. Army, 1997f). This species has also been recorded in arroyos during breeding bird surveys in 1996 and 1997 (U.S. Army, 1996i; 1997g). These birds are also assumed to be migrants. The particular subspecies of willow flycatcher observed on McGregor Range was not determined, so they could have been one of the nonlisted subspecies. Appropriate nesting habitat for the southwestern willow flycatcher does not exist on McGregor Range. There are stands of willows at some stock tanks, but these stands are likely too small to support nesting southwestern willow flycatchers. For example, a stand of willows exists at Mack Tanks in the Tularosa Basin. This tank typically holds water all year and the stand of willows covers about 0.4 acre (USAF, 1997g), which is assumed to be too small to support nesting willow flycatchers. Willow flycatcher surveys have been conducted in some riparian areas in the Organ Mountains and the species has not been recorded (U.S. Army, 1997o). Therefore, it is assumed that the willow flycatcher does not breed on Fort Bliss and birds observed on post were migrants.

Bald eagle. The bald eagle is a federal and state threatened species. The bald eagle winters along lakes and rivers in large numbers (Steenhof et al., 1980) and uses terrestrial habitat well away from aquatic habitat (Fischer et al., 1984; Grubb and Kennedy, 1982; and Grubb et al., 1989). A small population (20 to 30 individuals) of bald eagles winters in the Sacramento Mountains. One of the known roost sites is about 4 miles from the northern border of Fort Bliss (U.S. Army, 1995b). Given that bald eagles are known to travel up to about 22 miles from roost sites to feeding sites (Grubb et al., 1989), the northern portion of Fort Bliss is within the range of eagles wintering in the Sacramento Mountains.

Surveys for wintering bald eagles in the Sacramento Mountains foothills on Fort Bliss were conducted during the winters of 1994 to 1995 through 1997 to 1998 (U.S. Army, 1995b; 1996j; 1998c). Surveys were conducted in the wooded habitat of the foothills, in the desert shrubland habitat, and in the adjacent grassland habitat on Otero Mesa. During these surveys, the bald eagles were observed 71 times, ranging from 8 sightings during the winter of 1997 to 1998 and 28 observations during the winter of 1994 to 1995. Based on plumage characteristics, it was determined that 42 observations were of adults and 29 were immature. During both winters, most bald eagles were observed along the northern boundary of the McGregor Range where high ridges and hills provide favorable perch sites and updrafts. Vegetation in this area is mainly grassland with varying amounts of shrubs (mountain mahogany and oak) and trees (pinyon pine and juniper) providing favorable foraging conditions (U.S. Army, 1995b). Only one bald eagle was observed over the grasslands of Otero Mesa. Most birds were in flight when first observed and in many cases bald and golden eagles were observed together. There were no observations of eagles feeding or hunting. Food sources on Fort Bliss may include deer carrion and rabbits.

Observations indicate that bald eagles using the northern portion of McGregor Range roost off post, most likely at a known roost site about 5 miles north of Fort Bliss. Surveys were conducted at this roost site during the winters of 1994 to 1995 through 1998 to 1999, and the eagles were most abundant during January of 1998 (26 eagles) and January of 1999 (22 eagles).

Piping plover. The piping plover is an endangered species in the Great Lakes region and threatened elsewhere in the United States. This species is considered endangered in New Mexico and threatened in Texas. The piping plover has experienced range-wide declines (Haig and Oring, 1985) and the principal factors are habitat deterioration (Haig and Oring, 1985), human disturbance (Flemming et al., 1988), and predation (Gaines and Ryan, 1988). The piping plover nests on beaches along the Atlantic coast and Great Lakes and along lakes and rivers in the Great Plains in Canada and the United States (Haig and Oring, 1985). This species is a very rare migrant in New Mexico, having been observed six times (NMDGF, 2000). It was observed once on Fort Bliss at sewage lagoons in 1987 (U.S. Army, 1997l) and is considered a very rare migrant on Fort Bliss.

Mexican spotted owl. The Mexican spotted owl is a federal threatened species, is not listed by New Mexico, and is considered a threatened species in Texas. Its range includes southern New Mexico where it occurs in suitable habitat in isolated mountain ranges (U.S. Army, 1996n). During the breeding season, the Mexican spotted owl inhabits mountain forests and canyons and the most commonly used habitat types for nesting and roosting are mixed conifer (Douglas fir, white fir [*Abies concolor*], southwestern white pine [*Pinus strobiformis*], and ponderosa pine) while pine and pinyon pine-juniper forests are used to a lesser degree (Skaggs and Raitt, 1988; Ganey and Balda, 1989; and Zwank et al., 1995). The Sacramento Mountains just to the north of Fort Bliss contains a breeding population of Mexican spotted owls and the closest known breeding pair is 10 miles from the Fort Bliss boundary (U.S. Army, 1996n).

The Mexican spotted owl has been observed in the past on or near Fort Bliss on two occasions. In June 1979 an adult spotted owl and young were photographed in the Organ Mountains on BLM land near Fort Bliss boundary (New Mexico Ornithological Society, 1979, as cited in U.S. Army, 1991a); this represents the only known sighting of the spotted owl in the Organ Mountains. More recently, two spotted owls were observed on McGregor Range during the winter of 1989 to 1990 (U.S Army, 1996p). Given that mixed conifer plant communities occur in the Organ Mountains and the spotted owl has been observed on Fort Bliss, a survey for this species was conducted on 5 square miles of land in the Organ Mountains in the spring and summer of 1991 (U.S. Army, 1991a). Three complete surveys of the area using nocturnal call counts were conducted. The spotted owl was neither heard nor observed during these surveys. Three-day time call surveys in the area of the 1979 sighting also failed to detect spotted owls. Searches for roost sites in the historic location also took place and no sign of spotted owl activity was observed.

Since spotted owls had been observed on McGregor Range during the winter, surveys for this species were conducted in the Sacramento Mountains foothills on the McGregor Range from December 12, 1995, to February 21, 1996, and the Organ Mountains in March 1996. No spotted owls were heard or observed during these surveys (U.S. Army, 1996n). No mixed conifer habitat and only a few isolated ponderosa pine occur in the Sacramento Mountains foothills on McGregor Range. Studies elsewhere in New Mexico showed that the Mexican spotted owl rarely roost and does not nest in pinyon pine-juniper habitat (Seamans and Gutierrez, 1995; Zwank et al., 1995). Based on the habitat in the foothills on Fort Bliss and the ecology of the spotted owl, it seems likely that the southern Sacramento Mountains are only used by spotted owls on an occasional basis during the winter or dispersal (U.S. Army, 1996n).

Skaggs (U.S. Army, 1991a) estimated that about 10 square miles of the Organ Mountains contain potential spotted owl habitat and within this area, suitable habitat is highly fragmented. Most of this habitat is outside Fort Bliss boundaries. Recent fires may have reduced the amount of available habitat. Based on work in the Sacramento Mountains (Skaggs and Raitt, 1988), it is estimated that the Organ

Mountains could support a maximum of two or three spotted owl territories (U.S. Army, 1991a). The spotted owl may occasionally occur in the Organ Mountains given the existence of suitable habitat. However, its occurrence will likely be sporadic given the small amount of potential habitat and the high potential for local extinction (U.S. Army, 1991a).

Mountain plover. The mountain plover is a federal proposed threatened species and has declined by 63 percent since 1966 (Knopf, 1994). This species is generally considered an associate of the short grass prairie dominated by blue grama and buffalo grass (*Buchloe dactyloides)* (Knopf and Miller, 1994) although it is known to nest in Utah in habitat dominated by low growing shrubs such as sagebrush (*Artemesia* sp.) and rabbitbrush (*Chrysothamnus* sp.) (Day, 1994). Various observers have noted that the mountain plover nests and forages in areas of disturbed ground such as occur at prairie-dog towns and areas heavily grazed by livestock (Knopf and Miller, 1994; Miller and Knopf, 1993; Sager, 1996). The bulk of the mountain plover population winters in the central valley of California and seems to have adapted to the conversion of much of the native habitat to agricultural fields in that area. The survival rate of mountain plovers on their wintering ground is high, so it appears that the declines noted for this species are attributable to factors on the breeding grounds (Knopf and Rupert, 1995).

In a recent statewide survey, the mountain plover was observed at 35 sites in 11 counties during the breeding season in New Mexico. This species was observed in a variety of habitats, but bare ground was a common feature at all the sites and livestock grazing had created most of the bare ground. The bulk of the observations were in the northeast part of the state and none were from Otero County although there are two historic records of this species from Otero County (Sager, 1996). Based on its habitat requirements, Otero Mesa on Fort Bliss provides the best potential habitat for this species, especially in the sacrifice areas around stock tanks and troughs, and at prairie dog towns. Mountain plover surveys have been conducted on Otero Mesa on Fort Bliss from 1997 through 2000 and they consisted of ground transects, road surveys, and observations at prairie dog towns and heavily grazed areas at some stock tanks. The mountain plover was not recorded during these surveys but one individual was observed on April 5 and 6, 1999, near Mesa Horse Camp on Otero Mesa (U. S. Army, 1999a). This bird was in breeding plumage and was observed foraging in the area of a corral. This area is heavily grazed by livestock and a large prairie dog town is also in the area. The mountain plover was not observed in the Mesa Horse Camp area or at any other location on Fort Bliss during subsequent observations. It is assumed that this bird was probably migrating through the area. It is also assumed that given all the biological surveys that have been conducted on Otero Mesa in recent years and the fact that only one migrant has been observed; the mountain plover is not a breeding bird species on the mesa or elsewhere on Fort Bliss (Locke, 1999).

Black-tailed prairie dog. The black-tailed prairie dog is a federal candidate species but is not listed by the states of New Mexico or Texas. The USFWS has found there to be sufficient information to list the black-tailed prairie dog as a threatened species throughout its range but a proposed rule on this species is precluded at this time because of work on higher priority species (Fed. Reg. 2000, Vol. 65, No., 24, pp. 5476-5488) (USFWS, 2000b). It is estimated that this species inhabits less then 0.5 percent of its historic range and has undergone a 98 percent reduction in population reduction. This reduction is mirrored in New Mexico where about 0.5 percent of the historic range is occupied (Fed Reg., 2000). This species is a unique resource on Otero Mesa and it provides habitat for sensitive species such as the burrowing owl and ferruginous hawk and other wildlife.

A combination of survey techniques were used to study black-tailed prairie dogs on Otero Mesa including surveys on foot and vehicle, extended observations in some prairie-dog towns, counts of burrows, and vegetation analysis (U.S. Army, 1996o; 1998c; 2001b). The number of active prairie-dog towns ranged from 10 in 1996 to 17 in 1999 while the number of adults also showed an increase from 399 in 1996 to 686 in 1999. Prairie dog densities were low throughout this period (3.6 to 5.3 prairie dogs per acre of

FTBL-22.A.4

Fort Bliss DOE, SAIC, Center for Ecological Management of Military Lands, USACE Fort Worth, Geo-Marine, Inc. Integrated Natural Resources Management Plan, US Army Air Defense Artillery Center, Fort Bliss. November 2001. pg. 14-1 – 14-2.

14.0 CULTURAL RESOURCES PROTECTION

Cultural resources protection programs on Fort Bliss are provided in accordance with all pertinent federal and state legislation and laws and Army regulations. These include Sections 106 of the NHPA of 1996 (16 USC 470), as amended, the ARPA of 1979, 36 CFR 800, and AR-420-40.

14.1 OBJECTIVE

> Ensure implementation of this INRMP is consistent with the protection of historic properties (those determined to be eligible or potentially eligible for inclusion in the National Register of Historic Places [NRHP]) on Fort Bliss as directed by applicable laws and regulations.

To meet this objective, it is vital that the directives and SOPs as outlined in the *Integrated Cultural Resources Management Plan* (ICRMP) for Fort Bliss (U.S. Army, 1998e) are coordinated with natural resources management activities. Coordination of these activities is normally conducted through consultation with the Conservation Division Chief of the DOE, who functions as the Historic Preservation Officer (HPO) and oversees all cultural resources management activities on Fort Bliss.

Priorities relative to the cultural resources management program on the installation, including costs, personnel requirements, and a formal, 5-year work plan, are provided in the ICRMP for Fort Bliss (U.S. Army, 1998e).

14.2 CULTURAL AND HISTORIC RESOURCES

As of November 24, 1997, the Fort Bliss cultural resource database contained information on over 15,405 cultural resources sites. The number and management status of cultural resources in the different portions of the Region of Influence (ROI) are summarized in the database.

14.2.1 Fort Bliss Cantonment

The Fort Bliss cantonment contains a number of historic structures and the potential, in some areas, for historic archaeological resources. The earliest of the structures date to 1893 and include Victorian buildings originally used for medical purposes; barracks, mess halls, and recreational activities; officer's residences; and, stables, warehouses and magazines. Many of these buildings are still used today, but for other purposes. A total of 377 structures constitute the Fort Bliss Historic District. Whalen (1978) reports no prehistoric sites on the main post, Logan Heights, or WBAMC, but does note 30 small prehistoric sites on Biggs AAF. Prehistoric archaeological resources are uncommon within the cantonment area because of the extensive construction. Seventeen historic archeological sites have been identified in the cantonment. No traditional cultural properties (TCPs) have been identified to date on the Fort Bliss cantonment.

14.2.2 South Training Areas

The South Training Areas contain portions of the Hueco Mountains. These limestone deposits are conducive to the formation of caves and rockshelters, many of which were used by prehistoric people. Almost 4,090 prehistoric archeological sites have been recorded from this area. The South Training Areas were also used historically. Inventories of historic archaeological sites in the South Training Areas have recorded 125 sites, including a portion of the Butterfield Overland mail route (U.S. Army, 1997n).

No architectural resources or TCPs have been identified within the training areas, but both could potentially occur.

14.2.3 Doña Ana Range–North Training Areas

Portions of the Doña Ana Range–North Training Areas have been surveyed (Skelton et al, 1981; U.S. Army, 1995e; Stuart, 1997). These, and other surveys have resulted in the identification of more than 6,600 prehistoric sites, including Paleoindian (including a possible Clovis site), Archaic, and Formative Period sites. Historic resources totaling 93 sites include ranching, Civilian Conservation Corps (CCC), and military sites; a portion of the Spanish Salt Trail; historic mines; and the 1920s campsite of early paleontologists. Camp Hueco once contained World War II and Cold War architecture, but only a well house remains (Landreth, 1998). No TCPs have been identified within the Doña Ana Range–North Training Areas, although they could potentially occur.

14.2.4 McGregor Range

The McGregor Range contains a variety of environmental zones and landforms. Its cultural resources are similarly diverse and include scatters of Paleoindian, Archaic, and Formative materials, rockshelters, rock art sites, historic ranching sites, the townsite of Turquoise, several of Oliver Lee's pipelines, two reservoirs, a number of railroad related sites (U.S. Army, 1997n), and military sites, including Cold War era Nike test sites. Five pueblos have been identified on McGregor Range. The almost 100,000 acres inventoried for cultural resources to date contain over 3,600 historic and prehistoric sites. No TCPs have been identified within the range, but they could potentially occur.

14.2.5 Castner Range

Castner Range occupies 7,040 acres of land on the eastern flank of the Franklin Mountains in El Paso. The range contains numerous prehistoric and historic resources ranging from pueblos to ranching-related sites, a Spanish Salt Trail, and military training locations including a theodolite station from the 1800s and Vietnam War-era simulated village sites. The area also contains significant amounts of ordnance and explosive hazards from its use as a firing range since World War I. No architectural resources or TCPs have been identified within Castner Range, but both could potentially occur.

The results of the various projects completed on the installation indicate that the area was occupied in varying degrees of intensity from the earliest recognized prehistoric period to recent times. Fort Bliss currently has approximately 16,000 archaeological sites entered in its databases. Approximately 15,600 are prehistoric while 400 are historic. Sites currently considered eligible for inclusion in the NRHP number about 600. These numbers will continue to change as more areas are surveyed and evaluated for inclusion in the NRHP.

14.3 INTEGRATION

Any installation operations that involve ground-disturbing activities have the potential to adversely impact prehistoric and historic archaeological sites on Fort Bliss. These include land management practices, mission changes, changes to supporting infrastructure, and other natural resources management practices.

Limitation of such activities for the protection of cultural resources is dependent upon the level of archaeological investigation already conducted in the area of concern, and the decision on what areas,

FTBL-22.A.5

Fort Bliss DOE, SAIC, Center for Ecological Management of Military Lands, USACE Fort Worth, Geo-Marine, Inc. Integrated Natural Resources Management Plan, US Army Air Defense Artillery Center, Fort Bliss. November 2001. pg. 7-1 – 7-2.

7.0 LAND USE AND MANAGEMENT UNITS

7.1 MILITARY LAND USE

Most of the land area within Fort Bliss is defined as training areas, maneuver areas, impact areas, or safety zones. Castner Range is no longer used for training activities. Much of this range contains ordnance and explosive hazards and is being restored as funding becomes available. Other land uses on Fort Bliss, including maintenance, industrial, supply/storage, troop housing, and administrative facilities, are located within the cantonment area, or to a smaller scale at range camps on Doña Ana Range–North Training Areas and McGregor Range. Family housing (e.g., Logan Heights), community facilities, Biggs AAF, and WBAMC are located within the cantonment area. General descriptions of each land use at army installations are shown on Table 7-1.

Table 7-1. Standard Land Use Definitions for Army Installations

Land Use	*Definition*
I. Airfield	Airfield-related facilities including landing and takeoff areas, aircraft maintenance areas, airfield operations and training facilities, and navigational traffic aids
II. Maintenance	Facilities and shops for maintenance and repair of all types of Army equipment found at the depot, installation, and TOE levels
III. Industrial	Facilities to house activities for manufacturing Army equipment and material, utility plants, and waste disposal facilities; includes DPWL repair shops and facilities engineering shops
IV. Supply/storage	Depot, terminal, and bulk-type storage for all classes of Army supplies
V. Administrative	Headquarters and office buildings to accommodate offices, professional and technical services, records, files, and administrative supplies
VI. Training/ranges	Academic training areas required to support entry level and continuing education, and fire and movement/maneuver areas
VII. Troop housing	Unaccompanied enlisted and officer personnel barracks, including dining, administration, supply, outdoor recreation, and community retail and service facilities
VIII. Family housing	Facilities to house military families along with support and recreational facilities
IX. Community facilities	Commercial and service facilities, the same as associated with towns in the civilian community
X. Medical	Facilities providing for both inpatient and outpatient medical and dental care for active duty and retired personnel
XI. Outdoor recreation	Outdoor athletic and recreational facilities of all types and intensities of use
XII. Open space	Safety clearances, security areas, utility easements, water areas, wetlands, conservation areas, forest stands, and grazing areas

Source: U.S. Army Master Planning Instructions.

7.1.1 Land Use of the Fort Bliss Training Complex

A numbering system used at Fort Bliss divides the major land management units (Doña Ana Range–North Training Areas, McGregor Range, South Training Areas, Cantonment Area, and Castner Range) into smaller, more manageable training areas. Division of these large land management units allows for greater access control, improves management of land uses, and helps ensure safety. Safety requirements and precautions are paramount for the firing of guided missiles, automatic weapons, tank weapons, conventional artillery, aerial gunnery, and small arms; launch and control of aerial targets; and explosive ordnance activities at the McGregor, Meyer, and Doña Ana range complexes.

Table 7-2 presents training area land use categories, designated A through I. This color-coded table shows nine mapable land use categories and the permitted uses compatible with each category (uses may not be concurrent). The individual training activities are defined in Table 3-2 of Chapter 3. Each land use category, while a discreet map unit, carries with it a number of permitted training uses that are compatible from a mission standpoint. Certain groups of training areas within the Fort Bliss Training Complex contain designated special uses, such as mission facilities or public access. The entire range complex contains three over-arching activities that occur everywhere: aircraft operations, training complex maintenance, and environmental management and conservation. Figure 7-1 illustrates how the training land use is applied to the training areas of Fort Bliss (U.S. Army, 1998a).

7.1.2 Military Land Use Access

Military units that request time on firing ranges and training areas submit FB Form 88 (Appendix C) to Range Scheduling, USACAS BN at least 45 days prior to desired use. The FB Form 88 used for Range Scheduling is available on the Fort Bliss website. All land use requests must be accompanied by an approved Environmental and Archeological Assessment form (Appendix C), which is also available on the Fort Bliss website.

The Range Facility Management Support System (RFMSS) is an automated tool designed to enhance the management of training lands and facilities located on Fort Bliss. RFMSS allows events to be tracked from the time of initial request through completion reporting. It is also the designated reporting system of training assets, utilization, and inventory for the Army and National Guard. As such, RFMSS serves as the database of record and provides the primary interface with various other DA and DoD systems (i.e., facilities engineering, airspace management, and environmental databases). Units that request a firing range or training area for a specific date and time are required to be prepared to commence operations at the requested time. FB Form 88 is accepted up to 24 months prior to the date that the scheduled training is to take place. Upon receipt of a completed FB Form 88 and approved Environmental and Archeological Form the Range Scheduling Branch furnishes the requester confirmation of approval. All units entering the training areas or ranges are required to establish and maintain FM communications with McGregor Range Control for the duration of their stay in the training areas and ranges.

7.2 NONMILITARY LAND USES

The Fort Bliss Training Area Complex is used for a variety of overlapping military and nonmilitary uses (including ground maneuvers, safety zones, recreation and hunting, grazing and natural resource field surveys). The public has limited access to some areas for recreation, hunting, and cattle grazing, to the extent that it does not conflict with military uses. Access is managed by USACAS BN through the training area numbers shown in Figure 7-1.

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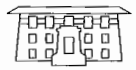
Lovejoy, Earl M. P. El Paso's Geologic Past. 1996. pg. 28-29.

EL PASO'S GEOLOGIC PAST

by Earl M. P. Lovejoy
Revisions by William C. Cornell



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CONTENTS

Mountains

Of all the geographical features on the surface of Earth, perhaps the most awesome are mountains. Geologists have classified mountains primarily by the processes which produced them. Among them are volcanic mountains such as Mount Rainer, the product of great eruptions during millions of years. Examples of small volcanic mountains are the cinder cones of the Potrillo volcanic field, each of which was produced probably in only a few years. Some mountains are produced by deep erosion processes, lasting millions of years, of highly uplifted parts of earth's crust (such as Mount Everest which contains marine sedimentary rocks over five miles above sea level). Some mountains are the result of severe deformation of originally horizontal sedimentary rocks; this deformation, which may take tens of millions of years to occur, may consist of two different types: folding and faulting. Superficially, folded strata resemble folded rugs, pushed along the floor and crumpled against the wall, sometimes only slightly rumpled, sometimes thoroughly contorted (Fig. 18A). Faulted strata resemble broken blocks of concrete; the faults are fractures in the crust of the Earth where the rocks on each side have moved along the fracture distances varying from inches to miles (Fig. 18B). Some other mountains are formed rather quickly, it is believed, by emplacement of magma into strata near the surface of the Earth; the magma may bulge the overlying strata upward like a big blister (Fig. 23).

Erosion is important in the formation of all mountains. While a mountain is being formed, rainfall tends to erode it; a constant battle is waged between the constructional processes trying to build the mountain and the erosional processes trying to tear it down. When the building processes are faster, the mountain grows; when the eroding processes are faster, the mountain shrinks.

Near El Paso are hills and mountains formed by all of these various processes. The cinder cone volcanoes of the Potrillo volcanic field have already been described. The Rio Grande is eroding into the ancient river deposits of the Fort Hancock Formation, forming a valley; the edges of the valley will look more like hills as the valley progressively deepens and the topography becomes more rugged (Fig. 19). The strata in the Sierra de Juárez, once horizontal, have been intensely folded. Although most of the folds are not readily apparent from El Paso, geological mapping of the range has shown their existence with great precision and accuracy (Fig. 20). One fold in the range is readily visible from southwestern El Paso. The strata in the

Franklin Mountains, once horizontal, have been faulted, raised thousands of feet, and tilted toward the west in the process of faulting (Fig. 21). Cerro de Cristo Rey (Fig. 22) contains a central core of igneous rock, formed when magma intruded Cretaceous strata near the surface and bulged them upward so that they dip away from the center. Since the time of that magmatic intrusion, about forty-seven million years ago, erosion has stripped off the strata which lay over the igneous rock mass called a pluton; the igneous rock of the pluton now lies bared in the center of the blister, exposed by the relentless erosion which ceaselessly attacks all mountains, large and small (Fig. 23).

The Franklin Mountains are a long, linear, north-trending range. The crustal block which includes the mountain range is bounded on the east and west by north-trending faults; this block is, therefore, called a fault block. Because the strata have been tilted from their originally horizontal position, the block is called a tilted fault block (Fig. 24). The intersection of the fault and the surface of the earth is called the trace of the fault (Fig. 25). El Paso lies in a part of the western United States which geologists refer to as the Basin and Range Province. Southern New Mexico, southern Arizona, all of Nevada, western Utah, as well as west Texas, lie in this province. It is characterized by alternating basins, like the Hueco Bolson east of the Franklin Mountains, and ranges, like the Franklin Mountains (Fig. 26). A traveler who journeys from El Paso westward to Phoenix, for example, crosses numerous basins and ranges. The type of range most characteristic of this province is the tilted fault block range. Indeed, the Franklin Mountains are perhaps one of the best developed examples of the type. Other local examples include the San Andres Mountains northeast of Las Cruces, the east Potrillo Mountains, and the Florida Mountains, south of Deming.

On the west side of South Franklin Mountain (with the white Federal Aviation Administration building on it, east of Coronado) is an erosional feature locally referred to as the Thunderbird (Fig. 27). This has been formed as the result of erosion of the gray El Paso Limestone so deeply that the underlying red rhyolite of the Thunderbird Group has been exposed so that it resembles a large bird.

FTBL-23.A.2
Lovejoy, Earl M. P. El Paso's Geologic Past. 1996. pg. 36-39.

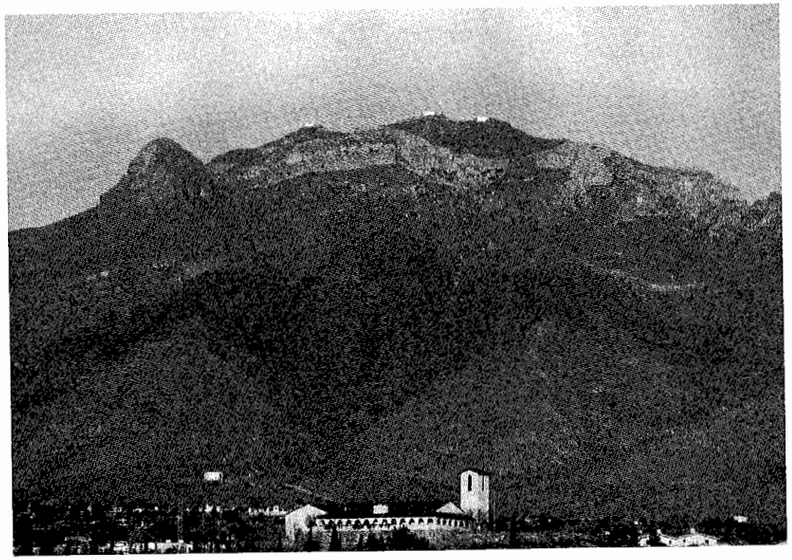

Fig. 27. This view toward the east from Cloudview Park shows the west side of South Franklin Mountain, elevation about 6,800 feet, on which are located several white buildings of the Federal Aviation Agency radio facility. Below the peak is a dark red area which resembles the outline of a thunderbird, wings outstretched, its head turned toward our left. The high light-colored peaks are formed on the Fusselman Formation of Silurian age and on the El Paso Limestone. The dark red thunderbird is formed on the Thunderbird Group of Precambrian age.

Earthquakes

Earthquakes are vibrations in the crust of the Earth caused by the movement of blocks of the crust along faults. The crust of the Earth is not stationary; it moves either up or down, to or fro, generally very slowly, but occasionally so rapidly that it produces vibrations in the rock so powerful that cracks form in the surface of the ground, parts of mountains break loose to form landslides, and poorly constructed buildings collapse. Earthquakes occur over much of the surface of the earth, but they are far more common in certain regions than in others. Earthquakes are relatively common in the Basin and Range province; historic records show no major earthquakes in the El Paso region since Don Juan de Oñate's trip in 1598, but geologic evidence indicates that major earthquakes have occurred here in the past few hundred thousand years. For example, in 1887 El Pasoans were shaken by an earthquake centered near Pueblo de Bavispe, west of El Paso in northern Mexico. Although a number of fatalities occurred near the epicenter of the earthquake, only moderate damage was recorded in the El Paso area.

The Franklin Mountains block has been rising and the Hueco Bolson block has been sinking for tens of millions of years. As each of these blocks slips past the other vertically, slowly but relentlessly, friction between them causes then to "stick" together briefly, but when they finally "slip" loose in their long-continuing slide past each other, earthquakes result. Earthquakes are associated with mountain building of the basin and are the result of this "stick-slip" process (Fig. 28).

Our present ability to predict earthquakes is very limited. Geologic evidence along the faults on either side of the Franklin Mountains suggests that the probability of significant, damaging, or catastrophic earthquakes in the El Paso region in the next hundred years is slight.

In the past few decades, minor earthquakes have been reported in the region south of El Paso International Airport. These are numerous, but they have produced no significant damage nor are they viewed as warnings of greater earthquakes to come. Neither are the few minor earthquakes reported from the eastern side of the Hueco Bolson regarded as warnings of major earthquakes. Nonetheless, the Franklin Mountains are still rising and the Hueco Bolson is still sinking. Earthquake activity is possible for hundreds of thousands of years to come.

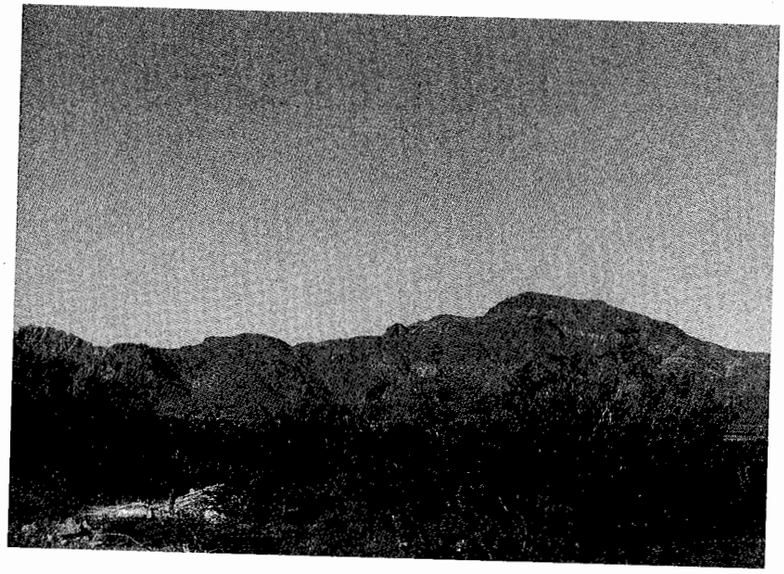

Fig. 28. This view of North Franklin Mountain from Northeast El Paso shows the highest peak, elevation 7,198 feet, in the Franklin Mountains, formed on Precambrian Thunderbird rocks. The light cliffs are made of west-dipping Precambrian Lanoria Quartzite (see Fig. 12 for a closer view). Precambrian rocks exposed here are higher than they are elsewhere in Texas, so this is called the highest structural point in Texas. The highest topographic point in Texas is Guadalupe Peak, which is formed on Permian Limestone. At Guadalupe Peak the top of the Precambrian rocks is below sea level, much lower than it is in the Franklin Mountains where the crust of the earth has been raised structurally higher than elsewhere in Texas. The constant rising of the mountain block along faults for millions of years has been accompanied by thousands of sharp, sudden fault movements which produce earthquakes. The range is still slowly rising, and earthquakes will continue, although the rate of uplift and earthquake activity seem to be declining.

Landslides

Wherever mountain ranges exist, landslides occur during the process of erosion. In the Franklin Mountains, landsliding has occurred widely and has been extremely important in eroding the range. Were it not for this important process, the Franklin Mountains would probably be ten thousand feet higher because the strata which remain in the range are only part of the sequence that used to be part of the mountain block. Thus, as the range has been raised, it also has been eroded; as the basins have sunk, they also have been filled by the erosional debris. The Hueco and Mesilla basins have been filled with debris from the Franklin Mountains as well as with river and lake sediments from the ancestral Rio Grande and Lake Cabeza de Vaca.

Around the lower slopes and flanks of the Franklin Mountains are numerous old landslide deposits. In the city limits, the most important are Crazy Cat Mountain, McMillan Quarry, and Sugar Loaf Mountain.

Crazy Cat Mountain consists of Montoya Dolomite and Fusselman Limestone which slid off the westward-dipping El Paso Limestone more than one million years ago. The landslide probably occurred in a few minutes, as do all similar slides. Today a small remnant of the Montoya Dolomite sits high on the western flank of the Franklin Mountains in Comanche Peak (Fig. 29), a piece of the mountain that did not slide. McMillan Quarry (now Jobe Cement Products) is in a large mass of rock that slid down the east side of the range probably before the Crazy Cat slide occurred.

FTBL-25.A.1
U.S. Census Bureau 2006,
State and County Quick Facts, El Paso (city), Texas.
http://quickfacts.census.gov/qfd/states/48/4824000.html.
Accessed 26 January 2006.

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El Paso (city), Texas

People QuickFacts	El Paso	Texas
Population, 2003 estimate	584,113	22,118,509
Population, percent change, April 1, 2000 to July 1, 2003	3.6%	6.1%
Population, 2000	563,662	20,851,820
Population, percent change, 1990 to 2000	9.3%	22.8%
Persons under 5 years old, percent, 2000	8.5%	7.8%
Persons under 18 years old, percent, 2000	31.0%	28.2%
Persons 65 years old and over, percent, 2000	10.7%	9.9%
Female persons, percent, 2000	52.5%	50.4%
White persons, percent, 2000 (a)	73.3%	71.0%
Black or African American persons, percent, 2000 (a)	3.1%	11.5%
American Indian and Alaska Native persons, percent, 2000 (a)	0.8%	0.6%
Asian persons, percent, 2000 (a)	1.1%	2.7%
Native Hawaiian and Other Pacific Islander, percent, 2000 (a)	0.1%	0.1%
Persons reporting some other race, percent, 2000 (a)	18.2%	11.7%
Persons reporting two or more races, percent, 2000	3.4%	2.5%
Persons of Hispanic or Latino origin, percent, 2000 (b)	76.6%	32.0%
Living in same house in 1995 and 2000', pct age 5+, 2000	54.1%	49.6%
Foreign born persons, percent, 2000	26.1%	13.9%
Language other than English spoken at home, pct age 5+, 2000	71.3%	31.2%
High school graduates, percent of persons age 25+, 2000	68.6%	75.7%
Bachelor's degree or higher, pct of persons age 25+, 2000	18.3%	23.2%
Mean travel time to work (minutes), workers age 16+, 2000	22.4	25.4
Housing units, 2000	193,663	8,157,575
Homeownership rate, 2000	61.4%	63.8%
Median value of owner-occupied housing units, 2000	$71,300	$82,500
Households, 2000	182,063	7,393,354
Persons per household, 2000	3.07	2.74
Median household income, 1999	$32,124	$39,927
Per capita money income, 1999	$14,388	$19,617
Persons below poverty, percent, 1999	22.2%	15.4%

Business QuickFacts	El Paso	Texas
Manufacturers shipments, 1997 ($1000)	7,602,078	400,008

Wholesale trade sales, 1997 ($1000)	5,954,546	323,111,661
Retail sales, 1997 ($1000)	4,588,938	182,516,112
Retail sales per capita, 1997	$7,650	$9,430
Accomodation and foodservices sales, 1997 ($1000)	687,231	22,698,848
Total number of firms, 1997	33,877	1,525,972
Minority-owned firms, percent of total, 1997	53.1%	23.9%
Women-owned firms, percent of total, 1997	23.2%	25.0%
Geography QuickFacts	**El Paso**	**Texas**
Land area, 2000 (square miles)	249	261,797
Persons per square mile, 2000	2,263.0	79.6
FIPS Code	24000	48
Counties		

|

(a) Includes persons reporting only one race.
(b) Hispanics may be of any race, so also are included in applicable race categories.

FN: Footnote on this item for this area in place of data
NA: Not available
D: Suppressed to avoid disclosure of confidential information
X: Not applicable
S: Suppressed; does not meet publication standards
Z: Value greater than zero but less than half unit of measure shown
F: Fewer than 100 firms

Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, 2000 Census of Population and Housing, 1990 Census of Population and Housing, Small Area Income and Poverty Estimates, County Business Patterns, 1997 Economic Census, Minority- and Women-Owned Business, Building Permits, Consolidated Federal Funds Report, 1997 Census of Governments

Last Revised: Thursday, 12-Jan-2006 13:35:48 EST

Census Bureau Links: · · · · · · · · · ·

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UXOINFO.com, Ordnance Fillers.
http://www.uxoinfo.com/uxoinfo/ordfillers.cfm.
Accessed 24 February 2006.

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UXOINFO.com Ordnance Fillers

Many different types of fillers are found in ordnance. Below is a description of the various ordnance filler types that are used in ordnance.

High Explosives - Fillers that are designed to detonate upon ignition. High explosive rounds have three primary hazards including blast, fragmentation and thermal effects, which are explained in further below. High explosives (HE) can be found in all categories of ordnance.

Smoke - Fillers that are designed to give off smoke when ignited. Smoke rounds are used to provide a screening effect for troops and equipment or to mark an area such as a helicopter-landing pad. Common ordnance that have smoke fillers include grenades, mortars, bombs and projectiles.

Illumination - Fillers that when ignited produce a bright light. Illumination rounds are used to provide light for night missions and are found in many different configurations. The most common ordnance that has illumination fillers includes mortars, projectiles and projectiles. Illumination projectiles usually have a time fuze, which ignites the filler at a pre-determined time after it has been deployed and a parachute, which slows the projectiles decent thus providing longer illumination. On a range it is common to find projectile bodies that are left over from a successful illumination function as well as ordnance where for some reason or another the illumination filler did not burn. Although UXO with illumination fillers as less hazardous than high explosives rounds they can still be extremely dangerous and should be dealt with accordingly.

Incendiary - Fillers designed to burn at very high temperatures. Incendiary ordnance such as the AN-M14 Hand Grenade can used to start fires in enemy structures and equipment.

White Phosphorus - A Filler, which burns extremely hot and gives off a thick cloud of white smoke. A unique characteristic of white phosphorus (WP) is that it burns when exposed to air. WP rounds can be very hazardous and should be approached with caution. WP UXO have been found on ranges that were not completed burned out because of a crust that has been formed over the once exposed filler sealing it from air. If disturbed the crust could crack and expose the WP filler to air thus re-igniting the round. WP is used mainly in grenades, mortars and projectiles. The picture to the left shows a WP explosion from a large projectile. The characteristic thick, hot white smoke is given off.

Red Phosphorus - Red Phosphorus (RP) is similar to WP in that it burns hot and gives off a smoke but in the case of RP the smoke is red.

Riot Control - Agents such as tear gas (CS) and others used to inflect minor harm or irritation to people. Riot control ordnance such as the M7A3 Hand Grenade are used to disperse crowds or to cause the enemy to move positions.

Chemical Agent - There are a whole series of chemical agent fillers including nerve, toxic and incapacitating agents. These fillers are not specifically addressed here but will be in future enhancements of UXOInfo.com.

Spotting Charge - An explosive filler that is designed to produce a flash and smoke when detonated. Spotting charges are used in practice ordnance to give observers or spotters a visual reference of ordnance impact. The MK76 practice bomb is a prime example of an ordnance item that contains a spotting charge. Practice UXO found on the ranges must be checked for the presence of unexpended spotting charges that could cause severe burns.

Fuel-Air Explosives- Fuel-Air Explosives (FAE)

Characteristics of Explosives

Explosives are grouped into two main classes, low explosives, which burn at rates of inches per second, and high explosives which burn at hundreds of meters per second. Explosives vary in other important characteristics that influence their use in specific applications. Among these characteristics are the ease with which they can be detonated and their stability to conditions of heat, cold, and humidity and the shattering effect, or brisance, of an explosive.

High Explosives

High explosives are explosives, which undergo detonation at rates of from 900 to 9,000 meters per sec (1000 to 10,000 yd per sec). High explosives fillers are used in every type or category of ordnance. There are many different types of high explosives including: TNT, RDX, Composition A, Composition B, Composition C, Torpex, PETN and Dynamite. A short description of each high explosive is outlined below.

Trinitrotoluene (TNT) forms pale yellow crystals of specific gravity 1.65 that have a melting point of 82° C (180° F). Its low melting point allows it to be melted and poured into artillery shells and other explosive devices. It burns in the open at 295° C (563° F), but it may explode if confined. In the absence of a detonator, it is a rather stable material, TNT does not: attack metals, absorb moisture, and is practically insoluble in water. High-velocity detonators, such as mercury fulminate and nitramine, induce its violent and explosive decomposition. A secondary hazard of TNT is the fact that it can be absorbed through the skin, causing headache, anemia, and skin irritation. During World War I, TNT was the high explosive most generally employed.

Cyclonite (RDX) is also called hexogen is a white crystalline solid usually used in mixtures with other explosives, oils, or waxes; it is rarely used alone. It has a high degree of stability in storage and is considered the most powerful and brisant of the military high explosives. Incorporated with other explosives or inert material at the manufacturing plants, RDX forms the base for the following common military explosives: Composition A, Composition B, Composition C, HBX, and H-6.

Composition A is a wax-coated, granular explosive consisting of RDX and plasticizing wax. Five varieties of composition A have been developed and designated as composition A-1, A-2, A-3, A-4 and A-5. Composition A is used as the bursting charge in certain Navy rockets and Landmines.

Composition B is mixture of RDX and wax and is a common high explosive filler used in bombs.

Composition C is a plastic demolition explosive consisting of RDX, other explosives, and plasticizers. It can be molded by hand (like silly putty) for use in demolition work and packed by hand into shaped charge devices. Although compositions C-3 and C-4 are the only formulations presently being used, C-1 and C-2 may still be encountered.

Torpex is mixture of TNT, wax and aluminum that is designed so that it has an underwater effect about 50 percent greater than that of TNT. Topex is used used in underwater ordnance such as torpedoes.

Pentaerythritol tetranitrate (PETN) has characteristics similar to those of cyclonite and is mixed with TNT to form the explosive pentolite. It also forms the core of the explosive primacord fuses used for detonating demolition charges and the booster charges used in blasting.

Dynamite - Military dynamite is not a true dynamite instead it is manufactured with 75- percent RDX, 15-percent TNT, 5-percent SAE 10 motor oil, and 5-percent cornstarch. It is packaged in standard dynamite cartridges of colored wax paper that is marked either M1, M2, or M3 on the cartridge. This marking identifies a cartridge size difference only, since all military dynamite detonates at about 20,000 feet per second, which is equivalent in strength to 60-percent straight dynamite. Since it contains no nitroglycerin, military dynamite is safer to store and

transport than true dynamite and is relatively insensitive to heat, shock, friction, or bullet impact. When removed from its wrapper, military dynamite is a granular substance that is yellow-white to tan in color that crumbles easily and is slightly oily and does not have the characteristic sweet odor of true nitroglycerin based dynamite.

Low Explosives

Propellants Propellants are types of explosive that are commonly used for the propulsion of projectiles, rockets, missiles and smallarms. One common propellant that is often used is smokeless powder. The term smokeless powder, however, is misleading, because it is neither free from smoke when exploded, nor is it a true powder. There are several types of smokeless powder including gelatinized nitrocellulose and a mixture of nitrocellulose with a high explosive such as nitroglycerin. The latter one is known correctly as double-base powder or compound powder. A common double-base explosive is cordite, which contains 30 to 40 percent nitroglycerin and a small quantity of petroleum jelly as a stabilizer. The rate of burning of either type of smokeless powder is controlled by the shaping of the powder grains. Because the powder grains burn from the surface inward, it is possible to produce grains that burn progressively more slowly, at an even rate, or progressively more quickly depending on the shape and dimensions of the grains. Unburned propellant can be found in rocket and guided missiles motors found on the range. Propellant is a hazard an can burn very violently when ignited.

Explosive Trains

An explosive train is a series of explosions specifically arranged to produce a desired outcome, usually the most effective detonation or explosion of a particular explosive. The simplest explosive trains require only two steps, while the more complex trains like many bombs may have four or more separate steps terminating in detonation. Explosive trains are classified as either low (propellant) or high, depending upon the classification of the final material in the train.

High-Explosive Trains

The nature of high-explosive trains is affected by the broad range of sensitivity found within the category of high-explosive compounds. Sensitivity refers to the amount of external force or effect needed to cause detonation. Some explosives are so sensitive that lightly brushing the explosive will cause it to detonate. On the other hand, other explosives (like most military high explosives) can be shot at with a 9 mm bullet and will not detonate. For the safety purposes, the extremely sensitive explosives are always used in very small quantities, while the comparatively insensitive explosives are used in bulk quantities. This natural division, by sensitivity, produces two groups within the category of high explosives. The most sensitive explosives are referred to as primary explosives and the more insensitive compounds are termed secondary explosives.

Explosives known as primary high explosives are among the most powerful as well as the most sensitive of all explosives. This combination of power plus sensitivity makes them very hazardous to handle. Primary explosives, because of their sensitivity, may be initiated by applying shock, friction, flame, heat, or any combination of these conditions. Due to their high detonation velocities, the primary high explosives are able to create extremely powerful detonation waves capable of causing complete instantaneous detonation of other less sensitive explosives. For this reason they are used as the first step in high-explosive trains. Blasting caps use primary explosives that are detonated by heat or shock. The more commonly used primary explosives are lead styphnate, lead azide, mercury fulminate, and diazodinitrophenol, which have detonation velocities ranging from 16,500 feet per second to 21,700 feet per second.

Secondary high explosives (Composition A, Composition B, Composition C, Composition D, TNT, PETN and RDX) are relatively insensitive to shock, friction, flame, or heat and are, therefore, less hazardous to handle and use. However, as a result of their relative insensitivity, the secondary high explosives must be initiated or detonated by a very strong explosive wave. Consequently, primary explosives are used to detonate secondary explosives. Secondary explosives comprise the largest single class of explosives and have detonation velocities ranging from 9,000 to over 26,000 feet per second.

Some secondary high explosives cannot be detonated simply by a primary explosive such as a blasting cap unless

the detonation wave of the primary high-explosive blasting cap is amplified or boosted. This amplification is accomplished through the use of a different and slightly more sensitive secondary explosive between the primary first step and the main explosive charge called a booster. The progression of the detonation wave from a small amount of a sensitive primary explosive, through a slightly larger amount of booster explosives to a large amount of very insensitive secondary explosive main charge, illustrates detonation through a basic three-step explosive train. Regardless of how many steps an explosive train contains, it can be described basically as a series of explosions arranged to achieve a desired end result. Some UXO are caused because during the course of functioning the explosive train is broken or interrupted.

UXOINFO.com	Ordnance Start Page	Ordnance Fuzing	Ordnance Gallery start
Mulvaney's Techncial Data	Ordnance Categories	Weapons Deployment	Ordnance Hazards

FTBL-28.A.1
Blough, Kelly. Photograph of Castner Range Warning Sign. 1999.


WARNING·DANGER
Former
ARTILLERY FIRING RANGE
No Trespassing
Unexploded projectiles or missiles are dangerous. The handling or removal of such ammunition and any other items by unauthorized personnel is prohibited. Violators will be prosecuted under the penalties provided by law. Do not remove plants or rocks.
BY ORDER OF THE FORT BLISS COMMANDER
PELIGRO
Anteriormente
ZONA DE FUEGO DE ARTILLERIA
Se Prohibe La Entrada
Proyectiles o municiones que no han sido detonados son peligrosos. Es estrictamente prohibido recoger o mover proyectiles, municiones, y otros articulos por personas sin autorizacion. Toda persona que infrinja esta orden sera procesada de acuerdo con las leyes militares. Prohibido traspasar, sacar plantas y piedras.
POR ORDEN DEL COMMANDANTE DE LA ZONA MILITAR

FTBL-29.A.1
Courcy, Lauren. El Paso Inc. 99 live explosives found at Castner Range. 26 October – 1 November 2003. pg. 3a.

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99 live explosives found at Castner Range

by Lauren Courcy
El Paso Inc. staff writer

David Dodge, Fort Bliss manager of environmental restoration, points to a sign warning of the dangers lurking in Castner Range.
photo by Danny Ramirez

What looks like a pleasant desert valley on the sloping east side of the Franklin Mountains is actually a field of dormant land mines and munitions waiting for an accidental triggering touch – leftovers of the years when the Army and its allies used the land as a firing range.

Since Fort Bliss began the cleanup of Castner Range in July, 99 pieces of unexploded artillery have been found on land bordering a quiet neighborhood in the Northeast.

The Army has done the painstaking work of locating, uncovering and exploding what it calls UXO, or unexploded ordnance, on just 155 of some 7,000 acres littered with dormant munitions.

"We've blown up some things and rattled some windows," said David Dodge, Fort Bliss manager of environmental restoration.

The project's estimated cost hovers between $25 million and $45 million. To date, Congress has allocated only $1.8 million for the Castner Range cleanup.

From 1926 to 1966, Fort Bliss used Castner Range – and much of what is now the

literally millions of acres of property used just like it," said Dodge. "It really came to a head when the Cold War was over and when the threat of global warfare with the Soviet Union diminished. The government began to reduce the military."

There is no way to tell by looking at it whether a piece will blow up or not.

There has been a nationwide move to clear the old ranges, but according to Dodge "the price tag is in the billions." Even if Congress allocated the needed funds

The cleanup requires three steps: First, workers on foot sweep an area with a metal detector and leave flags where any trace of metal is found. Then, workers dig up or examine the flagged pieces to determine whether the detected metal

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Our mission

To serve as a source of intelligence for the business community and to help the city realize its potential by using these pages to reflect and celebrate the financial, artistic, civic and social successes of those who live here.

residential Northeast – as a target for firing practice. The neighborhoods and areas immediately around Highway 54 and Transmountain Road were cleared of ordnance in years past.

But much remains elsewhere – and not only in El Paso.

"Castner Range represents [illegible] reduce the military.

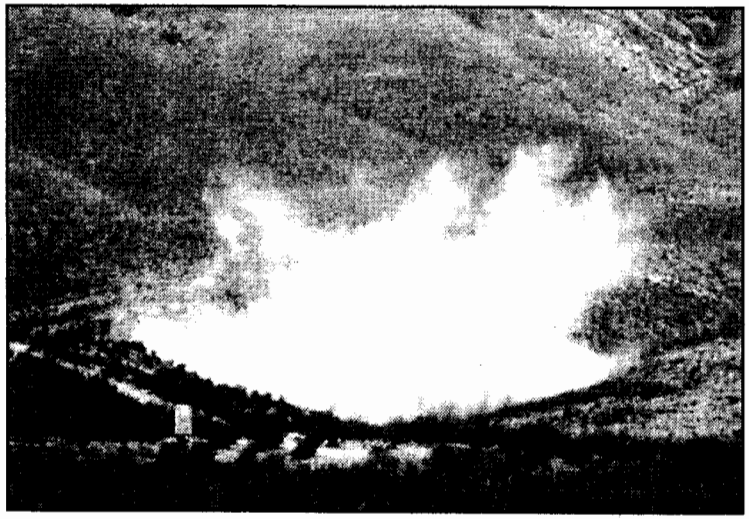
So the firing ranges of old went unused, and the fragments of exploded artillery began to rust, and pieces that were meant to explode – but never did – began to rust. Those aging pieces still hold enormous potential and pose a serious danger. Six people trespassing on Castner Range have died over the years.

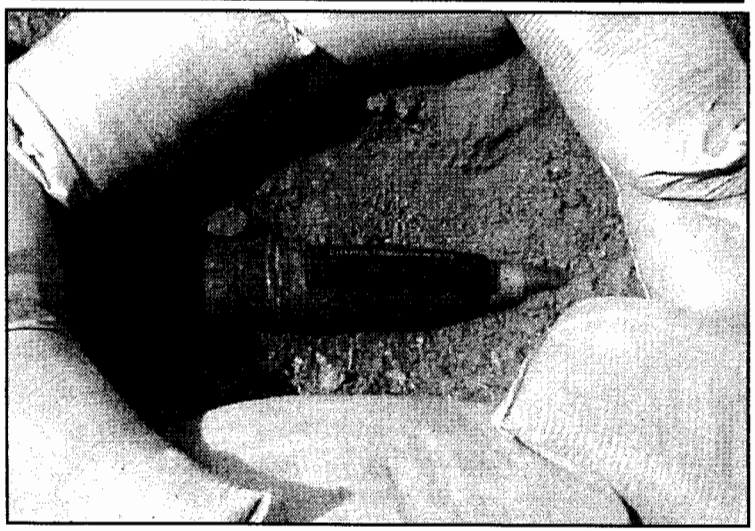
[illegible] allocated the needed funds for Castner Range, Dodge estimates the cleanup could take eight years. The process is slow and methodical because a mistake could be fatal.

The Army has contracted with U.S. Environmental, a firm out of Tampa, Fla., which specializes in this type of work.

[illegible] whether the detected metal comes from remnants of past explosions, rocks or unexploded ordnance. Lastly, workers must detonate any unexploded devices where they are found.

Castner Range is off-limits to the public. There are no fences guarding against trespassers, but signs rim the area to warn of its dangers.





Top: A recent explosion of decades-old artillery
Bottom: Dormant ordnance comes in many shapes and sizes

photos courtesy Fort Bliss