

PERMIT ATTACHMENTS

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ATTACHMENT 1
General Facility Description

ATTACHMENT 1 General Facility Description

Facility Location and Description

Melrose Air Force Range (MAFR or the Range) is an active United States Air Force (USAF) bombing, air-to-ground gunnery and training range located approximately 25 miles west of Cannon Air Force Base (CAFB) and approximately eight miles southwest of the village of Melrose, New Mexico. MAFR is located predominately in Roosevelt County with a small parcel in Curry County, New Mexico. Access to MAFR is achieved by traveling south from Melrose on New Mexico State Road (SR) 267 for approximately 9.3 miles, then west on Sundale Valley Road for approximately seven miles to the security gate.

The U.S. Army Air Corps (predecessor to the USAF) used MAFR for training during World War II. The Range was expanded in 1952 when the Air Force leased 7,771 acres of grassland for use as a bombing and air-to-ground gunnery range. Range expansion has occurred several times since 1952 by way of various land purchases and leases. MAFR has been continuously used by the USAF since World War II to the present. Currently, the total area of MAFR is 70,910 acres.

MAFR is a composite day-and-night simulated special and conventional weapons delivery range and a day-only tactical range currently used by the USAF 27th Special Operations Wing (27 SOW) based at CAFB. MAFR currently provides air and ground training capabilities and supporting range facilities for the 27 SOW. Training-related features include ground training areas, landing zones, helicopter landing and drop zones, a 10,600-acre impact area, an electronic combat range, and special use airspace.

Supporting facilities are situated on 11 acres at the Range Support Complex (RSC) located near the center of the range in the northern portion of both the western target area and eastern target area. The RSC includes training supervision and surveillance, emergency fire services, range communications, equipment and vehicle maintenance, target construction, and other administrative function facilities.

The Range Impact Area (the original area of MAFR) consists of a grid of access roads and bombing targets situated on generally flat grasslands. The 10,600-acre Impact Area currently contains two live target areas (i.e., Jockey and Spirit) for explosive and non-explosive munitions, manned sites, small arms ranges, and fire breaks. High-explosives-filled ordnance was used on the Range prior to 1969. Currently, explosive and non-explosive munitions and practice and inert bombs are used at MAFR. Practice bombs typically contain only small explosives or pyrotechnic spotting charges. Live gun ammunition has been continuously used on the Range during target practice. Range clearance and maintenance activities are conducted in accordance with Air Force Instruction 13-212, Range Planning and Operations and includes clearance of unexploded ordnance (UXO) from the surface of target areas on a regular basis by explosive ordnance disposal (EOD) technicians.

Ground training may occur within the MAFR Impact Area at various training areas or maneuver areas. Training areas contain features such as urban terrain sites, vehicle hulks, and weapons ranges. Maneuver areas are large areas configured for maneuver or overland navigation. Use of maneuver and training areas may include movements by troops on foot and in vehicles and small

arms firing. Ground training at MAFR is conducted by the USAF and visiting personnel from the U.S. Army, Navy, and Marine Corps. The 27th Security Forces Squadron uses a small arms range on MAFR for weapons systems that cannot be fired on CAFB and when the primary firing range on CAFB is unavailable.

Designated solid waste management units (SWMUs) and areas of concern (AOCs) listed in Permit Attachment 4, Corrective Action Status Tables, have been identified as areas previously used for disposal of a variety of military and industrial waste from MAFR and CAFB. Historical solid waste disposal documented at MAFR at SWMUs and AOCs have included UXO, munitions and explosives of concern (MEC), exploded ordnance, scrap metal, paints, solvents, pesticides, herbicides, and putrescible waste.

Physical and Geologic Setting

MAFR is primarily oriented north to south on relatively flat land composed of mixed-grass prairie. The range is bounded on two sides by a mesa reaching an elevation approximately 200 feet above the range.

Geologically significant formations at MAFR are the Chinle, Ogallala, and Blackwater Draw Formations. The Triassic age Chinle Formation is composed of red shales (locally referred to as “redbeds”) with interbedded sands deposited by low-energy streams in floodplains and deltas. The top of the Chinle Formation is marked by an erosional unconformity that may contain up to several hundred feet of relief. The Tertiary age Ogallala Formation unconformably overlies the upper unit of the Chinle Formation and dips gently to the southeast at MAFR and the surrounding vicinity. The Ogallala Formation is comprised of unconsolidated clay, silt, fine-to coarse-grained sand, and gravel derived from streams and valleys that previously flowed east from the mountains of central and southern New Mexico. Typically, sediments in the upper portion of the of the Ogallala Formation are cemented by calcium carbonate (locally referred to as “caliche”). The degree, thickness and extent of cementation varies greatly throughout the formation. The Quaternary age Blackwater Draw Formation overlies the Ogallala Formation in the northern part of MAFR and is predominantly comprised of very fine to medium-grained windblown sand. No faulting or structural lineaments are present in the vicinity of MAFR.

MAFR is located near the western margin of the Southern High Plains Aquifer. The Southern High Plains Aquifer is an unconfined aquifer with a general eastward flow that serves as the primary water source for irrigation, livestock, and potable water in eastern New Mexico. No other viable groundwater source has been identified in the region; however, limited groundwater of poor quality does occur in the Chinle Formation. In Eastern New Mexico the Ogallala and Blackwater Draw Formations form the Southern High Plains Aquifer which is part of a larger aquifer system extending from Eastern New Mexico and Colorado into Texas, Oklahoma, Kansas, Nebraska, and South Dakota. The Chinle Formation underlies the Southern High Plains Aquifer at MAFR and provides regional confinement to the aquifer at its base, generally forming an impermeable confining layer.

Stream valleys in the region tend to be fairly broad, widely spaced, and ephemeral in nature with poorly developed drainage patterns. The closest named drainages to MAFR are Chapman Draw, approximately two miles to the west and Cañada del Tule, approximately two miles southeast of

the southeast corner of MAFR. MAFR falls within the Southern High Plains, Southwestern Part Major Land Resource Area physiographic classification, a southeastward sloping regional plateau that stretches through southeastern New Mexico and a portion of the southwestern panhandle of Texas. MAFR is situated on the Llano Estacado, a sub-province of the Southern High Plains. The Llano Estacado is a nearly flat plain that slopes gently to the east/southeast, with elevations in the general range of 4,000 feet above mean sea level. This area of New Mexico and west Texas is typified by smooth and gently sloping or undulating surfaces with scattered, normally dry, flat-bottomed depressions forming the dominant relief feature.

Elevations at MAFR range from approximately 4,200 feet above sea level in the northeast portion to over 4,700 feet above sea level in the southwest portion. The largest topographic feature and highest point on MAFR is an unnamed mesa, referred to as “the Mesa” and is a northeast-trending, flat-topped hill rising over 4,700 feet above sea level and located on the southwest side of the range. The semi-arid climate of the region contributes to the development of alluvium and thin topsoils with low organic content. Some areas are underlain by caliche, a leached clay-carbonate hardpan consisting of precipitated calcium carbonate that has been solubilized from overlying sediments and soils. Soils on MAFR tend to be low in organic matter, slightly alkaline, and have a low capacity to hold water; therefore, ponding or flooding is rarely an issue. Area soils tend to be deep to moderately deep in profile and are moderately well to excessively well-drained. Soils are typically characterized by coarse-textured materials.

Stormwater runoff from the southeastern half of MAFR is generally carried by the Canada del Tule draw and the Mesa is drained from the northeast by the Sheep Canyon drainage. Much of the runoff on MAFR is captured in numerous impoundments that are used as sources of water for livestock. Small playas are present throughout the level portions of MAFR. Surface water runoff is managed through a stormwater system consisting of a combination of swales, inlets, culverts, and pipes currently having adequate capacity to handle flows. Stormwater discharges are managed in compliance with National Pollution Discharge Elimination System requirements for construction activity under a program administered by the United States Environmental Protection Agency.

MAFR has seasonally inundated areas and seasonal aquatic habitats, including several minor surface water features and ephemeral streams and drainages. There are no permanently flooded areas located on the range. Two wetlands are present on the northern end of the Range. Both are emergent marsh areas, created from overflows from adjacent wells that have been allowed to naturalize over time.

ATTACHMENT 2

Figures

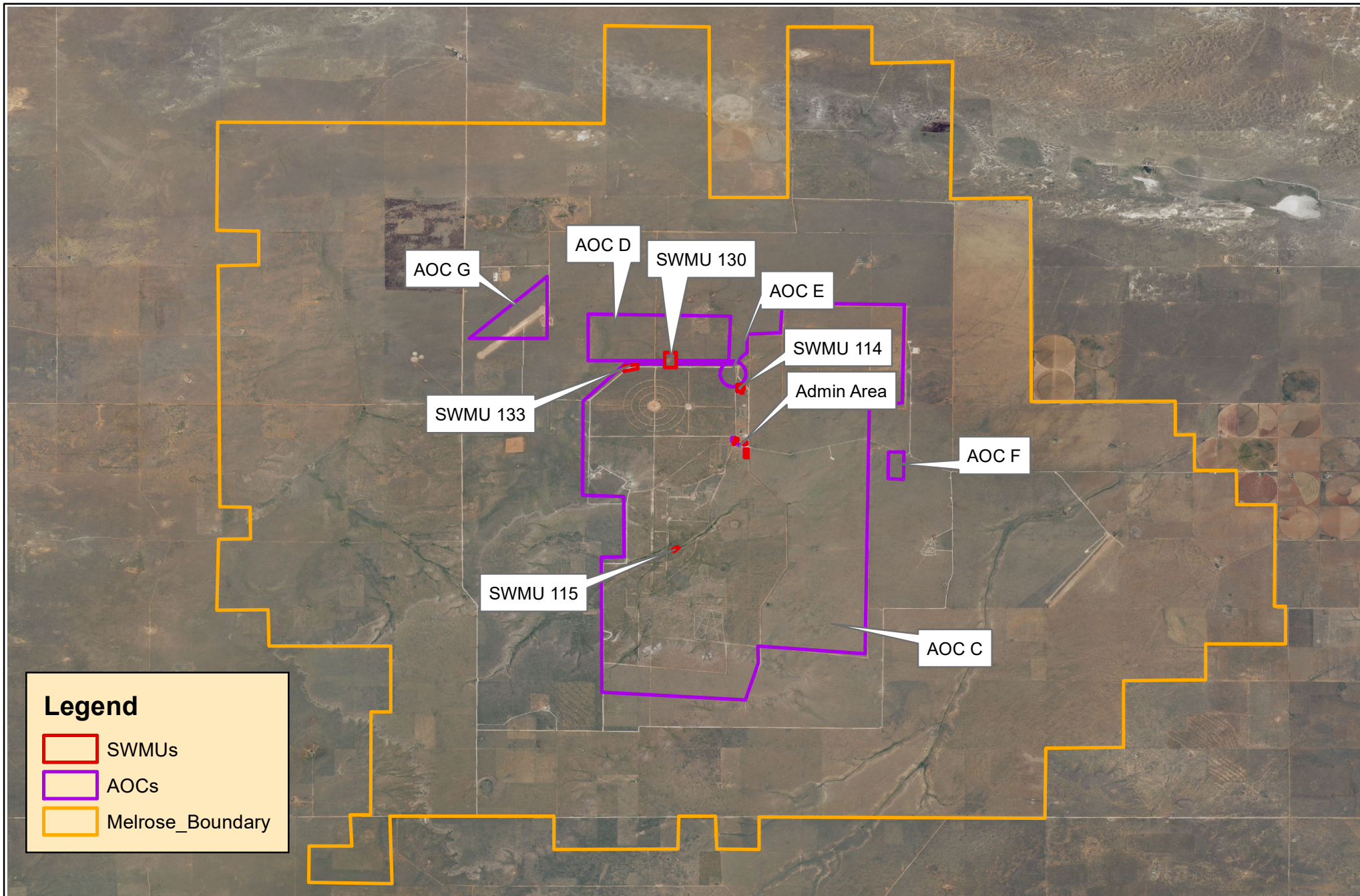


Figure 1: Melrose Air Force Range Draft Permit SWMUs and AOCs

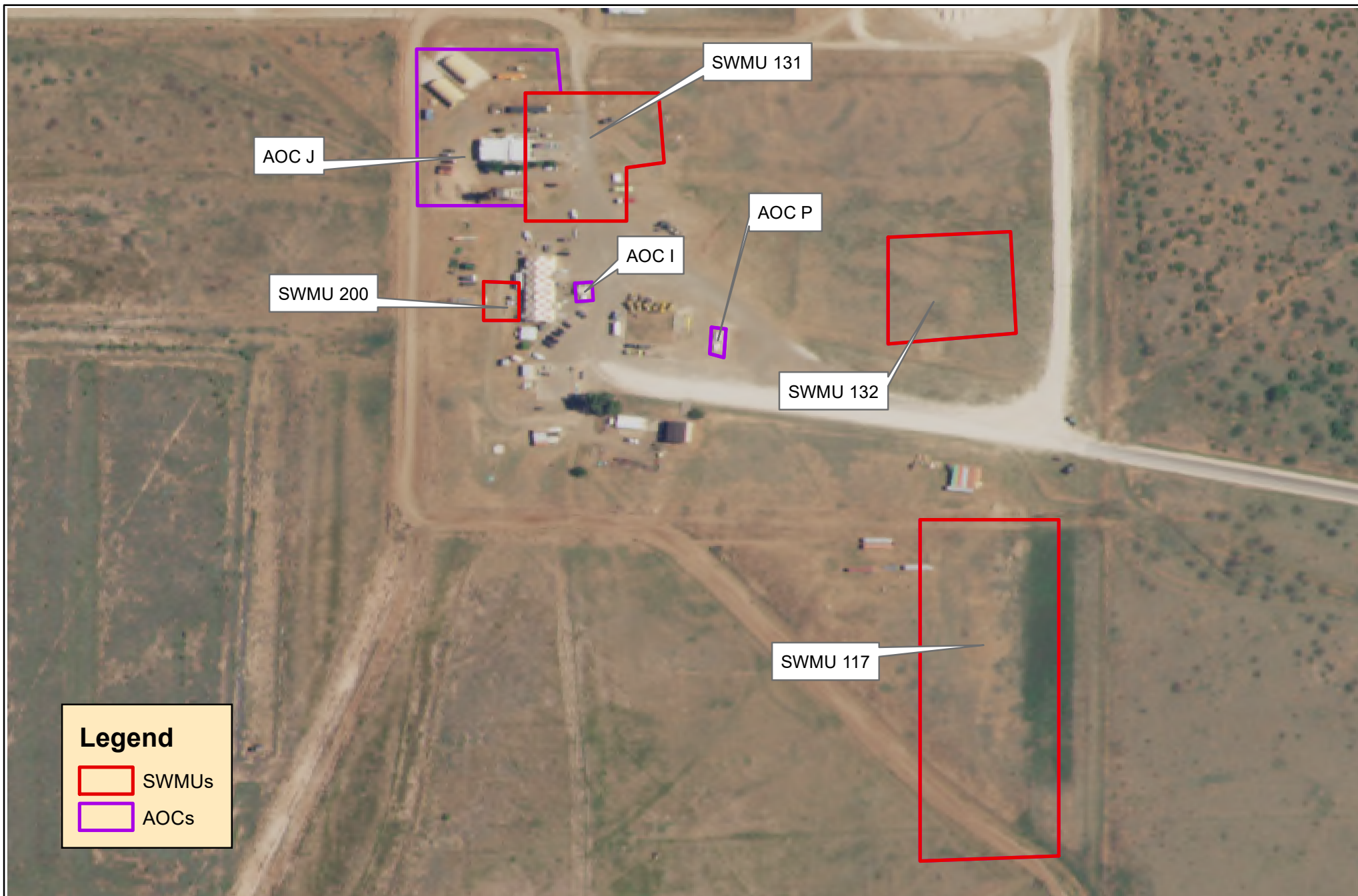
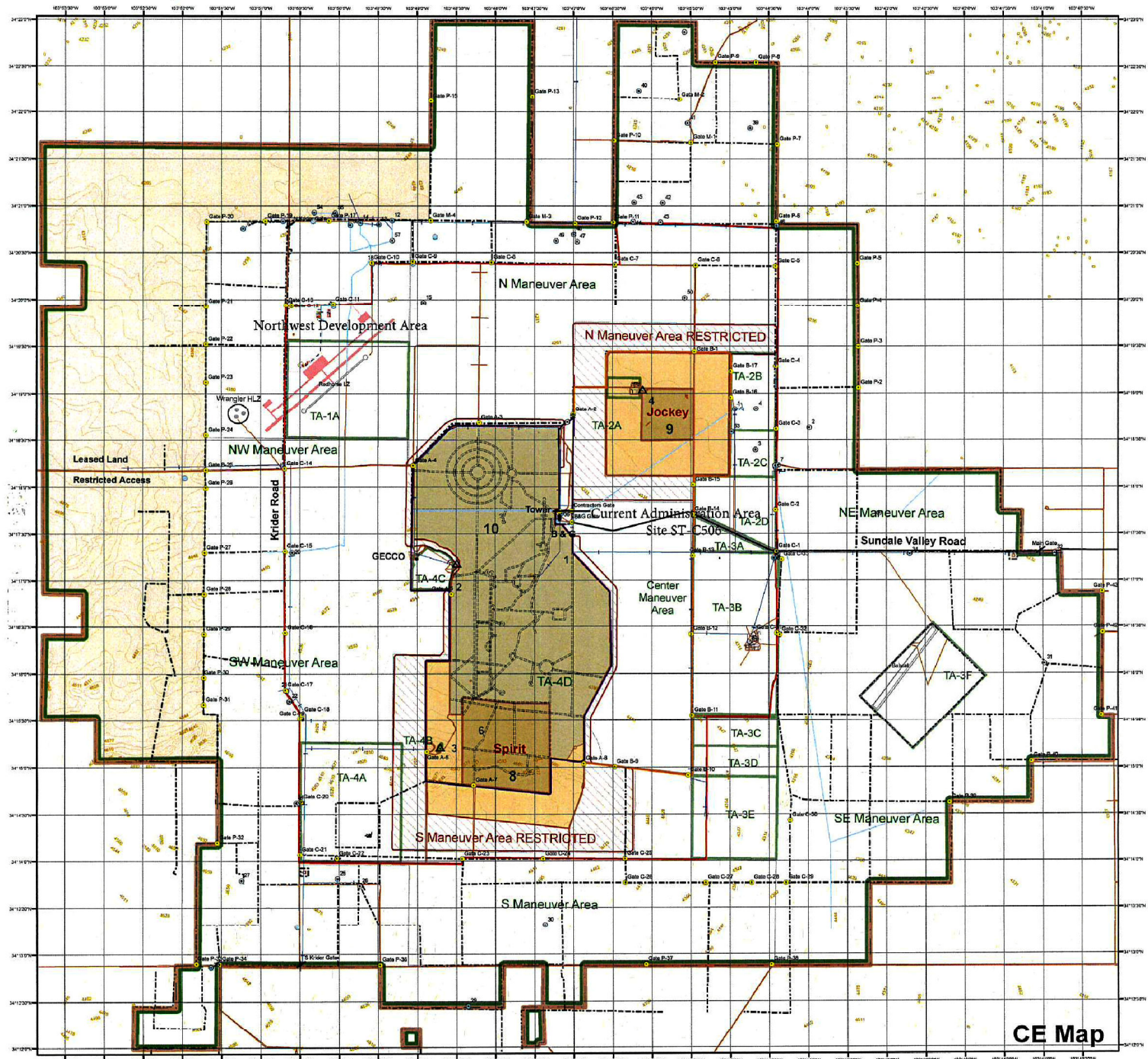


Figure 2: Melrose Air Force Range Draft Permit SWMUs and AOCs in Administrative Area

0 100 200 400 600 800 Feet
1 inch = 250 feet





Legend

- Melrose Boundary
- Dashed Impact Area
- Hazard Area
- Restricted or Limited Access
- Landing Zone (LZ)
- Maneuver Area
- Training Area (TA)
- MOUT Site
- Range Tower / BMG / GECCO Site
- Observation Points
- RSCG/PDF/DB
- Proposed Buildings
- Proposed Runway/Road
- Proposed Fire Suppression Tanks
- Proposed Fence Line
- Range Walls
- Water Sources
- Water Line
- Leased Land
- Contour Line
- Boundary Gates (P)
- Power Lines
- Proposed Power Lines
- Alpha Firebreak
- Bare Firebreak
- Charley Firebreak
- Paved Roads
- Range Roads
- Existing Roads Off Limits
- Main Entry Gates
- Fire Break Gates (A, B, C)

NOTES

THIS MAP DOES NOT MEET NDA TOPOGRAPHICAL LINE MAP PRODUCTION SPECIFICATIONS. THESE ARE APPROXIMATE LINES AND SHOULD BE USED AS A GENERAL REFERENCE ONLY. A LAND CONTAINMENT PERMIT IS REQUIRED FOR ALL MOUNTAIN VIEW FIRE. ROAD CLASSIFICATIONS SHOULD BE REFERRED TO WITH CAUTION. TRAILERS ARE ALONG THE BOUNDARY OF THE RANGE WITHIN THE MILITARY RESERVATION BOUNDARY.

WORLD GEODETIC SYSTEM 1984
 DATUM: NAD 83
 ELLIPSOID: GRS 80
 MERIDIAN: CENTRAL
 AUTHORITY: NAD 83
 PRINTED BY: 2D LOW RANGE MANAGEMENT OFFICE, 14 APRIL 2016

MESA DEVELOPMENT AREA
 Fire Suppression Tanks NG4 17.27 W103 49.058

NORTHWEST DEVELOPMENT
 Range Support Complex NG4 19.307 W103 50.448
 Performance Observation Facility NG4 19.040 W103 50.200
 Forward Operating Base NG4 19.854 W103 50.138
 Fire Suppression Tanks NG4 19.70 W103 50.200

CONVERSION GRAPH
 1 inch = 1.9 mile

SLOPE GUIDE
 PERCENTAGE DEGREE

ELEVATIONS IN FEET
 CONTOUR INTERVAL 17 FEET

SCALE 1:50,000
 Meters 0 500 1 2 3 4 5 Kilometers
 0.5 1 2 3 4 5 Statute Miles

RANGES HILLS

- Well 13
- Irrigation Well by Power Line on Grizzle Lease
- North Circle on Grizzle
- North Circle on Grizzle Lease
- South Submersible on SE Corner of Grizzle
- North Submersible on SE Corner of Grizzle
- Asley Submersible on SEC 18
- North Monitoring Well
- South Monitoring Well
- Windmill on Older West of Kinder RD
- Windmill on Older West of Kinder SEC 1
- Irrigation Well on Russel Grizer Lease
- Submersible on Russel Grizer Lease
- Submersible on Older at Thicket
- Old Windmill on Russel Grizer Lease-Not Used
- North Monitoring Well
- South Monitoring Well
- Submersible on Conshaw on Old Rogers Lease
- Windmill at Jog Below School on Davis East of Kinder RD
- Steel Tower Windmill Below by Dkt Tank West of Kinder RD
- West Well at Davis Jog
- Submersible by Tanks at Davis Jog
- Submersible on Davis at W 10.000 GAL Tank
- Submersible at Parker Homestead
- Windmill on Luco SEC 13
- Windmill on Luco SEC 23

LANDING ZONES

Red Horse N 34-18-102 W 103-50-677
 Bobcat N 34-18-077 W 103-42-760

Helicopter Land Zone
 Wrangler N 34-18-751 W 103-51-307

TRAINING AREAS

TA-1A Red Horse LZ	N04 19.107 W103 50.957
TA-2A Jockey MOUT site	N04 19.257 W103 50.212
TA-2B Tail Compound	N04 19.872 W103 50.882
TA-2C Gas Station	N04 18.191 W103 49.942
TA-3A Roadside Market	N04 17.256 W103 49.492
TA-3B City	N04 16.356 W103 49.692
TA-3C Border Checkpoint	N04 15.543 W103 49.325
TA-3D T Intersection	N04 14.902 W103 49.305
TA-3E Village	N04 14.511 W103 49.306
TA-3F Bobcat LZ	N04 19.078 W103 49.734
TA-4A Southwest MOUT	N04 14.079 W103 49.614
TA-4B Split CP	N04 15.212 W103 48.716
TA-4C FOB Mocket	N04 17.153 W103 48.944

Figure 3: Melrose Air Force Range Draft Permit SWMUs and AOCs - Map Indicating Training and Maneuver Areas

Figure above provided to NMED by Sheen Kottkamp



ATTACHMENT 3
Compliance Schedule

ATTACHMENT 3

Compliance Schedule

Table 3-1 Compliance Schedule

Permit Section	Requirement	Due Date
Submittals Due After Permit Issuance		
1.9.5	Permit Renewal	180 calendar days before expiration date
2.8.5	Biennial Report	March 1 st of even numbered years
1.15	Quarterly Update	February 28, May 31, August 31, November 30
3.3.1	Facility-Wide Groundwater Monitoring Work Plan	April 1 st
3.3.2	Facility-Wide Groundwater Monitoring Report	September 1 st

ATTACHMENT 4
Corrective Action Status Tables

ATTACHMENT 4

Corrective Action Status Tables

Table 4-1 SWMUs and AOCs Requiring Corrective Action

Unit ID	Unit Name	Unit Description	Release Assessment or Work Plan Submittal Date
SWMU 114	Expended Ordnance and Industrial Waste Burial Site (Motor Pool Trenches)	<p>SWMU 114 was used to dispose of military and industrial wastes. SWMU 114 is located in the southeast quarter of the southwest quarter of Section 15 and the northeast quarter of Section 22, Township 1 North, Range 30 East in Roosevelt County, New Mexico. The site is sparsely vegetated and the surrounding area is flat with mixed desert scrub that consists of prairie grass and cactus. A MAFR production well is located approximately one-half mile from the unit. SWMU 114 is approximately 6 acres and consists of eight unlined former burial trenches that were 20 to 40 feet wide, 100 to 200 feet long, and up to 50 feet deep. A variety of military and industrial wastes from MAFR and CAFB were disposed at the site from 1952 to 1962. Drummed liquids, including fuels, paints, sludge, and solvents were poured into the trenches and burned. Full drums of liquids may also have been placed in the trenches. Approximately 12,000 to 15,000 pounds of scrap metal from practice bombs and munitions were disposed of in the trenches every month.</p>	Deferred

Unit ID	Unit Name	Unit Description	Release Assessment or Work Plan Submittal Date
		<p>Munitions include Mark V and Mark VI (F-84 and F-86) munitions, antiaircraft ordnance (40 millimeter), and approximately 20 to 30 pounds of unexploded ordnance (UXO) residue. Live munitions continued to be buried at SWMU 114 until 1969. The eight trenches were cleared of ordnance over a 2-year period (2000 to 2002), and signage was posted indicating the trench sites have been cleared.</p>	
<p>SWMU 115</p>	<p>Explosives-Contaminated Burial Site (Arroyo Burial Site)</p>	<p>SWMU 115 is located in the northeast quarter of the northeast quarter of Section 33, Township 1 North, Range 30 East in Roosevelt County, New Mexico. The site lies within a small arroyo located in the south-central portion of MAFR. Surface water flows intermittently down a shallow drainage during heavy rains.</p> <p>SWMU 115 was used for the disposal and burial of UXO in 1989. Surficial debris was removed from the site between 1995 and 2002. The disposal area is 600 feet long, 15 to 20 feet wide, and 15 to 20 feet deep. The contents of SWMU 115 are believed to have consisted entirely of UXO and other exploded ordnance, including 750-pound and 2,000-pound bombs.</p>	<p>Deferred</p>
<p>SWMU 117</p>	<p>Domestic Waste Burial Site (southeast of Main Building)</p>	<p>SWMU 117 is located to the southeast of the main building of the Melrose main operational area. SWMU 117 is located south of the MAFR entrance road in the northeast quarter of the southwest quarter of Section 22, Township 1</p>	<p>Deferred</p>

Unit ID	Unit Name	Unit Description	Release Assessment or Work Plan Submittal Date
		<p>North, Range 30 East in Roosevelt County, New Mexico. This low-lying area with a slight topographic depression is most likely a semi-permanent playa that receives surface runoff from surrounding areas.</p> <p>Domestic waste from the control building and possibly UXO were disposed at the site. Domestic wastes disposed at the site include food waste, solid waste, common household items, and possibly paints, solvents, batteries, pesticides, and herbicides. Large quantities of paint were reportedly buried at SWMU 117. The disposal area covers an area 300 feet by 300 feet.</p>	
SWMU 130	World War II Cantonment Disposal Site	<p>Formerly Area of Concern (AOC 1) located in the northwest quarter of Section 17, Township 1 North, Range 30 East in Roosevelt, New Mexico; however, the exact location is unknown. SWMU 130 was a sanitary landfill/disposal site. Disposal at SWMU 130 occurred across an area of approximately 15 acres. During World War II, this area was used as a cantonment dump/landfill site. From 1952 to 1960, UXO and other munitions were disposed at the site. The specific types and quantities of waste disposed are unknown.</p>	Deferred
SWMU 131	Domestic Waste Burial Site East of Fire Station	<p>Formerly AOC 2 located to the east of the MAFR fire station in the northeast quarter of the southwest quarter of Section 22, Township 1</p>	Deferred

Unit ID	Unit Name	Unit Description	Release Assessment or Work Plan Submittal Date
		<p>North, Range 30 East in Roosevelt County, New Mexico.</p> <p>SWMU 131 was used for disposal and/or burning of wastes, but the type and volume of disposed waste is unknown. The site may contain domestic waste, spent fuels, motor oil, batteries, paint, pesticides, and metals. There is no mention of military munitions disposal in this area in historical documents.</p>	
SWMU 132	Disposal/Burn Site (North Helicopter Pad)	<p>Formerly AOC 3, SWMU 132 is located north of the helicopter pad at the MAFR operations area in the northeast quarter of the southwest quarter of Section 22, Township 1 North, Range 30 East in Roosevelt County, New Mexico.</p> <p>This site was used for burning and/or disposal of waste of unknown type and quantity. Possible wastes include garbage, residue from burning, motor oil, and metals. There is no mention of military munitions disposal in this area in historical documents.</p>	Deferred
SWMU 133	Northwest Munitions Disposal Site (Northwest Corner Impact Area)	<p>Formerly AOC 4, SWMU 133 is located in the northwestern corner of the impact area at MAFR. It is located in the east-central portion of Section 17 with some overlap into Section 16, Township 1 North, Range 30 East in Roosevelt County, New Mexico.</p>	Deferred

Unit ID	Unit Name	Unit Description	Release Assessment or Work Plan Submittal Date
		SWMU 133 was used from 1952 to 1960 for disposal of exploded ordnance and UXO.	
SWMU 200	USTs at Building 3121 (Site ST-C506)	In November 1994, petroleum contaminated soil was discovered at the site during the excavation of two underground storage tanks (USTs). The USTs were associated with the former heating system at Building 3121. Monitoring well MAO2MW001D (SWMU-131) is located approximately 1500 feet to the northeast of ST-506.	Deferred
AOC A	Maneuver Areas	North, North Restricted, Northwest, Southwest, South Restricted, Southeast, Northeast, Center	Deferred
AOC B	Training Areas	TA-1A (Red Horse LZ), TA-2A Jockey MOUT Site, TA-2B (Twin Compounds), TA-2C (Gas Station), TA-3A (Roadside Market), TA-3B (City), TA-3C (Border Checkpoint), TA-3D (T Intersection), TA-3E (Village), TA-3F (Bobcat LZ), TA-4A (Southwest MOUT), TA-4B (Spirit OP), TA-4C (FOB Mockup)	Deferred
AOC C	Target Areas	Includes the Western Target Area, Jockey Live Target Area, Eastern Target Area, and Spirit Live Target Area located within the Impact Area	Deferred
AOC D	Multi-purpose Small Arms Range	Located north of the Impact Area. Includes ammunition breakdown building, multi-purpose small arms range	Deferred
AOC E	Mortar Pits	Located within the Impact Area	Deferred
AOC F	Live-Fire Compound and Shoot House	Located east of the Impact Area. Included within the live-fire compound area would be a close-quarters combat multi-story shoot house	Deferred

Unit ID	Unit Name	Unit Description	Release Assessment or Work Plan Submittal Date
AOC G	Special Skills Training Facilities	Located northwest of the Impact Area near the Range Support Facilities. Includes breaching ranges and facilities; demolition range, tunnels and sewers	Deferred
AOC H	Above ground storage tanks (ASTs)	Five portable ASTs containing gasoline or diesel fuel: 1,000 gallon double walled AST gasoline; 2,000 gallon double walled AST diesel; 1,000 gallon double-walled AST diesel; 500 gallon AST single walled diesel; and 500 gallon AST diesel	Deferred
AOC I	Generator Shed	Building 3114, 178 sq ft in Administrative Area; includes single walled AST built into base of generator	Deferred
AOC J	Fire Department	Building 3123 in Administrative Area	Deferred
AOC K	Septic System	Six septic tanks	Deferred
AOC L	Range Vehicle Maintenance Facility		Deferred
AOC M	Demilitarization and target prep building and boneyard area	A new target processing building would include a concrete explosives residue storage pad. This area would include a fenced boneyard and small concrete pads for hazardous materials fluid storage.	Deferred
AOC N	Fuel Storage Tanks	New fuel tanks and vehicle fuel station would be constructed in the new range control area on concrete pads. Construction projects include a vehicle fueling station; a 2,000-gallon diesel fuel tank; a 2,000-gallon mobile gasoline fuel tank; and a regular gas 1,000-gallon fuel tank.	Deferred
AOC O	Fire Suppression Tanks		Deferred

Unit ID	Unit Name	Unit Description	Release Assessment or Work Plan Submittal Date
AOC P	Gas Station USTs	Identified as a two approximately 1,000-gallon storage tanks used for the storage of diesel fuel and gasoline at Range historical gas station.	Deferred

The term “deferred” in the Release Assessment or Investigation Work Plan Due Date in Table 1 for any SWMU or AOC shall have the following meaning: SWMUs and AOCs are deferred from full investigation or remediation until such time as the unit is no longer active range or otherwise becomes accessible. Partial corrective action or investigations must be proposed if portions of the unit become accessible. The Permittee shall, at its discretion, determine when a unit is accessible or partially accessible.

Table 4-2 SWMUs and AOCs with Corrective Action Complete with Controls

Unit ID	Unit Name	Unit Description	Comments

Table 4-3 SWMUs and AOCs with Corrective Action Complete without Controls

Unit ID	Unit Name	Unit Description	Comments