

**FINDING OF NO SIGNIFICANT IMPACT
FOR THE
ENVIRONMENTAL ASSESSMENT
ADDRESSING CONSTRUCTION, OPERATION, AND
MAINTENANCE OF A MILITARY WORKING DOG FACILITY AT
KIRTLAND AIR FORCE BASE, NEW MEXICO**



MARCH 2011

Report Documentation Page

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14. ABSTRACT The 377 ABW proposes to construct, operate, and maintain a new MWD facility for the 377 SFS on Kirtland AFB. The facility would consist of 14 indoor/outdoor kennels, 4 isolation kennels storage and staff space, restrooms, food storage room, a covered walkway, and a veterinarian examining room, for a total of approximately 8,000 square feet. The MWD facility would be constructed in accordance with the Design Guide for Military Working Dog Facilities. The Proposed Action would also provide a heating, ventilation, and air conditioning (HVAC) system; fire detection and suppression systems; all necessary utilities including natural gas service to replace propane tanks; and a 150-kilovolt-ampere natural gas-powered emergency generator to maintain HVAC system operations and stable temperatures during power outages. Depending on the site that is selected for the Proposed Action construction of a new obedience course for the MWDs, a parking area of up to 25 spaces (approximately 11,000 square feet), and a new access road might also be required. The existing MWD facility (Building 30126) would be demolished under the Proposed Action. The site of the existing MWD facility would be revegetated and returned to natural conditions following demolition. Depending on the site that is selected for the Proposed Action, demolition of the existing MWD obedience course might be required. Demolition would include removal of the chain-link fencing surrounding the obedience course and removal of the obstacles. The analysis in the EA considers the Proposed Action with three site location alternatives and the No Action Alternative. Two alternatives to the Proposed Action were considered, but eliminated from detailed analysis due to infeasibility.					
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FINDING OF NO SIGNIFICANT IMPACT (FONSI)
ADDRESSING CONSTRUCTION, OPERATION, AND MAINTENANCE OF A
MILITARY WORKING DOG FACILITY AT KIRTLAND AIR FORCE BASE, NEW MEXICO

Introduction

The U.S. Air Force (USAF) prepared an Environmental Assessment (EA) to identify and evaluate potential environmental impacts from construction, operation, and maintenance of a new Military Working Dog (MWD) facility at Kirtland Air Force Base (AFB), New Mexico. The USAF prepared the EA in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA) (42 United States Code [U.S.C.] Section 4321–4347), as amended, and the Council on Environmental Quality’s (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500–1508).

1. Description of Proposed Action and Alternatives

Proposed Action. The USAF proposes to construct, operate, and maintain a new MWD facility for the 377th Security Forces Squadron (377 SFS). The facility would consist of 14 indoor/outdoor kennels, 4 isolation kennels, storage and staff space, restrooms, food storage room, a covered walkway, and a veterinarian examining room, for a total of 8,000 square feet. The facility would be constructed according to the Department of Defense *Design Guide for MWD Facilities*.

The kennel building would be approximately 5,000 square feet with indoor/outdoor kennels and isolation kennels, joined by a 130-square-foot covered walkway to a 2,870-square-foot administrative and support building. The Proposed Action would also provide a heating, ventilation, and air conditioning (HVAC) system, fire detection and suppression systems, all necessary utilities including natural gas service to replace propane tanks, and a 150-kilovolt-ampere (kVA) natural gas-powered emergency generator to maintain HVAC system operations and stable temperatures during power outages. Per the Design Guide for MWD Facilities, the new MWD facility would not be sited where the day-night average sound level (DNL) for any 24-hour period exceeds 75 A-weighted decibels (dBA). The entire complex would be enclosed with a heavy-duty, 10-foot-high, chain-link fence to prevent an MWD from climbing or jumping out. There are three site alternative locations for the Proposed Action. Depending on the site that is selected for the Proposed Action, construction of a new obedience course for the MWDs, a parking area of up to 25 spaces (approximately 11,000 square feet), and a new access road might also be required. Total impervious surfaces for the proposed MWD facility could be approximately 19,000 square feet if the parking area and access drive were constructed.

Daily operations would presently consist of housing and training of up to 12 MWDs at Kirtland AFB and administrative support. All phases of MWD training for patrol and detection would take place on the grounds of the MWD facility. The MWDs would be housed in the kennels and trained daily in the obedience course. Fenced exercise areas, separate from the obedience course, would also be used. Maintenance activities would include general housekeeping activities within the kennels (e.g., hosing floors, sanitizing) and administrative support areas; and landscaping maintenance of the exterior grounds and obedience course. The three site location alternatives under consideration for the implementation of the Proposed Action include the following:

- ***Site Alternative 1.*** Site Alternative 1 is north of the existing MWD facility near the intersection of Barrack Road and Manzano Road. This site is a level site adjoining the existing MWD

training area. The site has been previously disturbed, but is generally undeveloped. Piped natural gas lines would need to be extended to the site for a reliable heating system within the facility. Site Alternative 1 is outside of the cantonment area and is far from the urbanized, busy areas of Kirtland AFB, distracting noises, and other occupied facilities. The site has a noise level of less than DNL 65 dBA. This site alternative would not require the construction of an obedience course, as the existing course could be used. The construction of up to 25 additional parking spaces might be required for Site Alternative 1. However, the existing parking area and access roads at the existing MWD facility could potentially be re-used for the proposed new MWD facility, in which case the re-paving of the existing drives and parking areas might be required. Any parking area and road improvements would occur on previously disturbed lands.

- **Site Alternative 2.** Site Alternative 2 is in the southern portion of the cantonment area near the intersection of Wyoming Boulevard and Pennsylvania Street. The site is a level site and is generally undeveloped. Site Alternative 2 has a noise level of less than DNL 65 dBA. All required utilities would be accessible from the site; however, natural gas, water, sanitary sewer, and underground electrical lines would need to be extended to the proposed MWD facility. Piped natural gas lines would need to be extended approximately 1,000 feet to the site for a reliable heating system within the facility. The water line would be extended 1,000 feet and the sanitary sewer and electrical lines would be extended 800 feet. Site Alternative 2 would also require the construction of a 22,500-square-foot obedience course for the MWDs, a parking area of up to 25 spaces (approximately 11,000 square feet), and a new access drive. In addition, Site Alternative 2 would require the installation of a 50 to 100 kilowatt step-down transformer (mini substation), assumed to be approximately 25 square feet in size, to step down power from the nearby overhead 46-kilovolt power line to 480 volts or 240 volts.
- **Site Alternative 3.** Site Alternative 3 is inside the cantonment area at the southeastern corner of the intersection of M Avenue and Pennsylvania Street. Site Alternative 3 is a level site that is currently undeveloped and regularly mowed. All required utilities would be accessible from the site. Site Alternative 3 is within the noise zone of DNL 65 to 69 dBA associated with aircraft operations on the runway. Site Alternative 3 would also require the construction of a 22,500-square-foot obedience course for the MWDs, a parking area of up to 25 spaces (approximately 11,000 square feet), and a new access drive.

The Proposed Action would also include the demolition of the existing MWD facility (Building 30126), which is approximately 2,520 square feet. The site of the existing MWD facility would be revegetated and returned to natural conditions following demolition. Depending on the site that is selected for the Proposed Action, demolition of the existing MWD obedience course might be required. The existing obedience course is fenced and is composed of turf lawn and several portable obstacles that could be reused. If Site Alternative 1 was chosen, the existing MWD obedience course would be used; however, if Site Alternatives 2 or 3 were chosen, a new obedience course would need to be constructed and the existing obedience course would be demolished. Demolition would include removal of the chain-link fencing surrounding the obedience course and removal of the obstacles

In addition to the site location alternatives for the Proposed Action, the No Action Alternative of not constructing, operating, and maintaining a MWD facility was analyzed in the EA.

2. Environmental Analysis

Based on the analysis contained in the Environmental Assessment Addressing Construction, Operation, and Maintenance of a Military Working Dog Facility at Kirtland Air Force Base, New Mexico, which is herewith incorporated by reference, the USAF has determined that the Proposed Action has the potential

to result in less than significant adverse environmental impacts. The following summarizes the results of the EA.

Land Use. The Proposed Action would be in compliance with the land use policies presented in the *2002 Kirtland Air Force Base General Plan*, including the main goals of providing operational support for missions; ensuring the management of human, financial, natural, and constructed resources; and promoting the health, safety, and quality of life of Kirtland AFB's personnel. Implementation of Site Alternatives 1 and 2 would require the land use designation at these sites to be changed from undetermined land use (Site Alternative 1) or Open Space (Site Alternative 2) to Industrial; however, this is consistent with the Kirtland AFB Future Land Use Plan. Site Alternative 3 is currently designated as an Industrial land use and would therefore not need to be changed. Demolition of Building 30126 would not require a change to the existing land use designation. No impacts on municipal land use plans or policies, or existing land use viability or continued land occupation would be expected. The Proposed Action would not result in impacts on land use compatibility from noise production.

Noise. The sources of noise under the Proposed Action that could impact populations include construction and demolition activities and the operational noise from the completed facility. Additionally, as directed by Air Force Instruction (AFI) 31-202, *Military Working Dog Program*, the MWDs proposed to be housed at this facility are included in the population of receptors that could be impacted by noise. Construction and demolition activities at Kirtland AFB would result in impacts on the noise environment; however, these impacts would be temporary and less than significant. The noise environment inside the proposed MWD facility throughout its operation and maintenance would not result in impacts above those considered acceptable (75 dBA) for the MWD kennel, as stipulated in AFI 31-202. It is estimated that the noise environment outside the proposed MWD facility throughout the operation and maintenance of the facility would result in less than significant impacts on the noise environment.

Visual Resources. The implementation of the Proposed Action would result in less than significant, temporary, adverse impacts on visual resources. Appropriate planning and maintenance of the MWD facility would minimize adverse impacts. Construction and demolition activities would result in a temporary impact on the overall aesthetic appeal at the proposed MWD facility site. Construction equipment, materials, and wastes would be visible at the site, other areas of the installation, and off-installation during transport. Following the construction of the proposed MWD facility, the visual landscape of Kirtland AFB would be altered due to the presence of a new facility at a previously undeveloped site. To minimize any potential adverse visual impacts, the proposed MWD facility would be designed to comply with the architectural compatibility standards as described in the *Kirtland Air Force Base Architectural Compatibility Plan* and the Design Guide for MWD Facilities.

Air Quality. The Proposed Action would generate particulate matter emissions as fugitive dust from ground-disturbing activities (e.g., grading, paving, construction, and demolition). Appropriate fugitive dust-control measures would be employed during construction and demolition activities to suppress emissions. Combustion emissions of all criteria pollutants would result from the operation of construction equipment and portable generators during construction activities, hauling debris from the project site, construction workers commuting to the project site, and operation of the 150-kVA natural gas-powered emergency generator used during power outages. Fugitive dust and combustion emissions associated with construction equipment would produce slightly elevated air pollutant concentrations. However, the majority of impacts would be temporary, fall off rapidly with distance from the project site, and would not result in any long-term impacts. Since Kirtland AFB is in attainment for all criteria pollutants, General Conformity Rule requirements are not applicable. In addition, the Proposed Action would generate emissions below 10 percent of the emissions inventory for the Albuquerque-Mid Rio

Grande Intrastate Air Quality Control Region and the majority of emissions would be temporary. Therefore, the construction and operation activities associated with the Proposed Action would have less than significant impacts on air quality at Kirtland AFB and on regional or local air quality. Approximately 682 metric tons of carbon dioxide (CO₂) (752 tons) were estimated to be emitted by the Proposed Action at each site alternative. The CO₂ emitted is approximately 0.0012 percent of the New Mexico statewide CO₂. Therefore, the Proposed Action, at any of the site alternatives chosen, would have negligible contribution towards the New Mexico statewide greenhouse gas inventory.

Geology and Soils. Under the Proposed Action, less than significant impacts on geological resources and soils would be expected. Construction activities would require clearing of vegetation, grading, and paving, which could increase erosion and sedimentation potential. As all site alternatives are generally only sparsely vegetated and have been previously disturbed, it is anticipated that clearing of vegetation would not result in a significant impact on soil erosion at any of the sites. Soil erosion and sedimentation would be minimized for all construction and demolition operations as a result of following an approved sediment-and-erosion-control plan and best management practices (BMPs). Soils would be compacted and soil structure would be disturbed and modified as a result of construction activities. Soil productivity, which is the capacity of the soil to produce vegetative biomass, would decline in disturbed areas and would be eliminated in those areas within the footprint of the proposed MWD facility. Loss of soil structure due to compaction could result in changes in drainage patterns. Use of storm water-control measures that favor infiltration would minimize the potential for erosion and sediment production as a result of future storm events. Long-term, beneficial impacts on soils would be expected from the return of the site of the existing MWD facility to natural conditions and a reduction in storm water runoff and soil erosion from the decrease in impervious surfaces in the vicinity. Construction of the MWD facility would be in accordance with building code requirements for Kirtland AFB, which would ensure protection from earthquakes. No impacts from geologic hazards would be expected.

Water Resources. Groundwater might be temporarily used for dust suppression during construction and demolition activities, depending on site conditions. Due to sufficient groundwater supply on Kirtland AFB, less than significant adverse impacts on groundwater availability would be expected from this use. The Proposed Action would create ground disturbance on a small scale, which could increase storm water runoff and erosion potential during heavy precipitation events. Implementation of BMPs and post-construction restabilization and revegetation would reduce storm water runoff and erosion potential; therefore, adverse impacts on surface waters would be less than significant. Storm water runoff from the proposed MWD facility would be incorporated into Kirtland AFB's Municipal Separate Storm Sewer System (MS4); therefore, less than significant, long-term, adverse impacts on water resources from storm water runoff due to increased impervious surfaces would be expected. Less than significant adverse impacts on water quality would be expected from implementation of the Proposed Action. BMPs would be implemented to protect against potential petroleum or hazardous materials spills from construction equipment. In the event of a spill, procedures outlined in Kirtland AFB's *Spill Prevention Control and Countermeasures Plan* would be followed to quickly contain and clean up the spill. No direct impacts on floodplains would be expected as the proposed MWD facility site alternatives are all outside of the 100-year floodplains of the Tijeras Arroyo and the Arroyo del Coyote. Although the quantity of storm water sheet flow from disturbed sites to the intermittent streams on Kirtland AFB could increase during construction activities, this increase is not anticipated to be significant. Therefore, the Proposed Action would have less than significant indirect impacts on floodplain flow characteristics.

Biological Resources. Implementation of the Proposed Action would result in less than significant impacts on vegetation because the proposed site alternatives have been previously disturbed and consist of sparse vegetation. No wetlands are located within or near any of the site alternatives; therefore, no impacts on wetlands would be expected. Noise created during construction and demolition activities

could potentially result in adverse impacts on nearby wildlife. These impacts would include subtle, widespread effects from the overall elevation of ambient noise levels, potentially resulting in reduced communication ranges, interference with predator/prey detection, or habitat avoidance. Wildlife species inhabiting Site Alternatives 1, 2, or 3 might be temporarily or permanently displaced from the Proposed Action. Certain wildlife species would be expected to temporarily move to adjacent habitats during construction due to increased noise and ground disturbances and then potentially return to the area once construction activities have ceased. Other species would be permanently displaced due to a loss of habitat from the construction of a new facility. Increased mortality of less-mobile species would be expected as the result of unavoidable direct impacts associated with construction activities. Long-term, beneficial impacts on wildlife and habitat would be expected from the return of the existing MWD facility site to natural conditions due to a creation of more wildlife habitat within the site. Overall, impacts on wildlife would be less than significant.

No federally or state-listed threatened or endangered species are known to inhabit the site of the existing MWD facility or any of the site alternatives. Because of the disturbed nature of these sites, they are not considered to be high-quality wildlife habitat and impacts on threatened and endangered species from construction would be less than significant. The burrowing owl (*Athene cunicularia*) is the only species of concern listed by the U.S. Fish and Wildlife Service (USFWS) in the vicinity. There are no known burrowing owl nests within Site Alternatives 1, 2, and 3; however, known burrowing owl nesting locations are within close proximity to Site Alternatives 2 and 3. In addition, owls vary their nesting sites from year to year; therefore, potential exists to directly impact (e.g., burrow damage) or indirectly impact (e.g., noise disturbances) burrowing owls under the Proposed Action. Surveys prior to construction and flagging of nests or relocation of owls would minimize these impacts. Overall, impacts on burrowing owls would be less than significant.

Cultural Resources. There are no known cultural resources within the Area of Potential Effect (APE) of Site Alternatives 1, 2, or 3; therefore, no adverse impacts on cultural resources would be expected from the implementation of the Proposed Action within these sites. The existing MWD facility (Building 30126) was built in 1954 as a hobby shop for the former Manzano weapons depot and was converted to a kennel in 1978. Under the Proposed Action, the demolition of Building 30126 would require an architectural evaluation for National Register of Historic Places (NRHP) eligibility. If Building 30126 is determined to be eligible for the NRHP, then mitigation of adverse impacts through Historic American Buildings Survey documentation and a Historic Cultural Properties Inventory form would need to be completed prior to the commencement of the Proposed Action. Therefore, less than significant impacts on cultural resources would be expected from the demolition of the existing MWD facility.

Infrastructure. The construction of a new MWD facility would result in less than significant impacts on electrical, natural gas, water supply, sanitary and wastewater, and communications systems. Interruptions of service of these systems might be expected during construction; however, these interruptions would be temporary. The demand for these utilities would negligibly increase during operation of the proposed MWD facility; however, this would be negligible in comparison to the current available capacities of these utilities. In addition, because the existing MWD facility would be demolished, the added demand of these utilities from the proposed MWD facility would be partially offset by the reduction in demand from the existing MWD facility. The expansion of Kirtland AFB's natural gas system would be an overall beneficial effect on installation infrastructure. Less than significant adverse impacts on electrical systems, central heating and cooling systems, water systems, sanitary sewer and wastewater systems, storm water systems, and communications systems would be expected from the demolition of the existing MWD facility; and no impacts on natural gas systems or liquid fuels would be expected.

The Proposed Action would have less than significant adverse impacts on storm water systems due to an increase in storm water runoff and sedimentation during construction activities, and the increase of impervious surfaces from the presence of the proposed MWD facility. BMPs would be employed during construction and demolition activities and operation of the proposed MWD facility to minimize impacts on the storm water system. Storm water drainage from the MWD facility would be incorporated into Kirtland AFB's MS4, resulting in an increase in demand for this system. A temporary increase in demand on the solid waste management system would occur due to generation of solid waste during construction and demolition activities; however, this demand is not expected to overburden the system and less than significant impacts would be expected.

Hazardous Materials and Waste. Less than significant impacts on hazardous materials management would be expected from the construction of the proposed MWD facility. Petroleum products and minimal amounts of hazardous materials would be used during construction; however, no new chemicals or toxic substances would be used or stored at the installation. Less than significant impacts would be expected from the generation of hazardous and wastes during construction activities. It is anticipated that the quantity of hazardous wastes generated would be negligible, and would be properly disposed of. BMPs would be used to ensure that contamination from a spill would not occur. Less than significant impacts on hazardous materials and wastes management would be expected from the operation and maintenance of the proposed MWD facility. No Environmental Restoration Program (ERP) sites overlap with the boundaries of the three-site location alternatives; therefore, no impacts on ERP sites would be expected from the construction of the proposed MWD facility. While an incremental increase in hazardous materials and wastes would be expected from the Proposed Action, adherence to the Pollution Prevention Program and associated plans and use of BMPs would ensure adverse impacts are less than significant.

Less than significant impacts on hazardous materials and hazardous waste management and Kirtland AFB's pollution prevention program would be expected from demolition activities. No impacts from ERP sites would be expected. Short-term, adverse impacts on asbestos, lead-based paint, and polychlorinated biphenyl management would be expected; however, these impacts would be less than significant.

Safety. Construction and demolition activities under the Proposed Action would result in impacts on contractor safety; however, these impacts are expected to be less than significant due to implementation of effective health and safety programs. Temporary adverse impacts on the health of the MWDs might occur if the new MWD facility is constructed in Site Alternative 1, as noise disturbances from nearby demolition of the existing MWD facility could disturb the MWDs and increase anxiety levels. However, impacts would be expected to be less than significant. No impacts on MWD health and safety would be expected during the construction of the proposed MWD facility in Site Alternatives 2 or 3.

The operation of the proposed MWD facility would result in significant beneficial impacts on MWD health and safety because it would meet the MWD facility standards, which would help to improve the comfort, health, and safety of the MWDs at Kirtland AFB. Consequently, the MWDs would no longer be subjected to an increased risk for injury while at the MWD facility, and the MWDs and their handlers would be able to train more effectively. MWDs that are better trained would be able to perform their jobs better and ultimately be safer while on deployment. Because Site Alternatives 2 and 3 are within the cantonment area, there would be greater visible and audible distractions to the MWDs than at the existing MWD facility and Site Alternative 1. As such, a slightly increased potential for adverse impacts on the health and safety of the MWDs would be expected due to increased anxiety. Because Site Alternative 3 is in the most developed location of the three site alternatives, it would have the greatest potential for adverse impacts on the health and safety of the MWDs. However, the adverse health and safety impacts on the MWDs due to increased distractions at Site Alternatives 2 and 3 would be expected to be less than

significant and the total net impact would remain beneficial to MWD health and safety. Long-term, beneficial impacts on military personnel health and safety would be expected from operation of the new facility.

No impacts on military personnel health and safety would be expected during the construction of the MWD facility or demolition of the existing MWD facility. No impacts on public health and safety would be expected from the Proposed Action. Because Site Alternatives 2 and 3 are within a more developed portion of Kirtland AFB, there would be a greater perception of adverse health and safety impacts on the public. However, with appropriate planning and design efforts, no impacts on public health and safety would be realized and the public's perception of health and safety risk would be negligible.

Socioeconomics and Environmental Justice. Less than significant impacts on socioeconomics and environmental justice would be expected from the Proposed Action. Relocation of workers required for construction and demolition activities would not be necessary, and no new staff is anticipated to be hired or transferred to Kirtland AFB for operation of the proposed MWD facility. Construction and demolition activities would result in indirect, beneficial impacts from the increase in payroll tax revenues, purchase of materials, and purchases of goods and services in the local area. The Proposed Action would not negatively impact minority populations or children.

The preferred alternative is implementation of the Proposed Action at Site Alternative 1.

BMPs/Mitigation. BMPs associated with implementing the Proposed Action are discussed throughout the EA. Potential construction and demolition BMPs include fencing off work areas, protecting storm water inlets in the project area with hay bales and sand bags to prevent sediment from entering local waterways, and implementing measures to protect against potential petroleum and hazardous materials releases. BMPs that would be implemented after construction include revegetating and restabilizing the post-construction site and implementing storm water control measures favoring infiltration to prevent long-term soil erosion and minimize runoff.

3. Regulations

The Proposed Action would not violate NEPA; CEQ regulations; or any other Federal, state, or local environmental regulations.

4. Commitment to Implementation

The USAF affirms their commitment to implement this Proposed Action in accordance with NEPA. Implementation is dependent on funding. The USAF would ensure that adequate funds are requested in future years' budgets to achieve the goals and objectives set forth in this EA.

5. Public Review and Comment

The Draft EA was available for public review and comment from November 14, 2010 through December 13, 2010 at Central New Mexico Community College, Montoya Library, 4700 Morris NE, Albuquerque, New Mexico 87102 and Kirtland AFB Library, Building 20204, Kirtland AFB, New Mexico 87117, and <http://www.kirtland.af.mil/>. No public comments were received during this review period. Three comments were received from agencies (i.e., Albuquerque Environmental Health Department Air Quality Division, New Mexico Department of Game and Fish, and New Mexico Environment Department) and their comments were incorporated into the analysis of potential environmental impacts performed as part of this EA, where applicable.

EA and proposed FONSI were made available for a 30-day public review and comment period. After reviewing the comments, the USAF has determined that the Proposed Action would have no significant impact on the quality of the human or natural environment and, therefore, an Environmental Impact Statement does not need to be prepared. This analysis fulfills the requirements of NEPA and the CEQ Regulations.

Date

Signature on file, Signed 25 March 2011

ROBERT L. MANESS, Colonel, USAF
Commander

Attachment: Environmental Assessment

FINAL
ENVIRONMENTAL ASSESSMENT
ADDRESSING
CONSTRUCTION, OPERATION, AND MAINTENANCE
OF A MILITARY WORKING DOG FACILITY
AT KIRTLAND AIR FORCE BASE, NEW MEXICO



MARCH 2011

ACRONYMS AND ABBREVIATIONS

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter	DERP	Defense Environmental Restoration Program
377 ABW	377th Air Base Wing	DNL	day-night average sound level
377 SFS	377th Security Forces Squadron	DOD	Department of Defense
AAFES	Army and Air Force Exchange Service	DOE	U.S. Department of Energy
ACHP	Advisory Council on Historic Preservation	EA	Environmental Assessment
ACM	asbestos-containing material	EISA	Energy Independence and Security Act
AFB	Air Force Base	EO	Executive Order
AFI	Air Force Instruction	ERP	Environmental Restoration Program
AFMC	Air Force Materiel Command	ESA	Endangered Species Act
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health	FAA	Federal Aviation Administration
AFPD	Air Force Policy Directive	FONSI	Finding of No Significant Impact
AMRGI	Albuquerque-Mid Rio Grande Intrastate	FPPA	Farmland Protection Policy Act
APE	area of potential effect	GHG	greenhouse gas
AQCB	Air Quality Control Board	GWP	global warming potential
AQCR	Air Quality Control Region	HABS	Historic American Buildings Survey
BMP	best management practice	HMMS	Hazardous Materials Management System
CAA	Clean Air Act	HVAC	heating, ventilation, and air conditioning
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	HUD	U.S. Department of Housing and Urban Development
CEQ	Council on Environmental Quality	IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
CFR	Code of Federal Regulations	JD	Jurisdictional Determination
CH_4	methane	LA	Laboratory of Anthropology
CO	carbon monoxide	LBP	lead-based paint
CO_2	carbon dioxide	MBTA	Migratory Bird Treaty Act
CWA	Clean Water Act		
dba	A-weighted decibel		

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mg/m ³	milligrams per cubic meter	Pb	lead
MGD	million gallons per day	PCB	polychlorinated biphenyl
MMRP	Military Munitions Response Program	percent g	percentage of the force of gravity
MS4	Municipal Separate Storm Sewer System	PM _{2.5}	particulate matter equal to or less than 2.5 microns in diameter
MSA	Metropolitan Statistical Area	PM ₁₀	particulate matter equal to or less than 10 microns in diameter
MWD	Military Working Dog	PPE	personal protective equipment
NAAQS	National Ambient Air Quality Standards	ppm	parts per million
NEPA	National Environmental Policy Act	PSD	Prevention of Significant Deterioration
NHPA	National Historic Preservation Act	RCRA	Resource Conservation and Recovery Act
NMAC	New Mexico Administrative Code	QD	quantity-distance
NMDGF	New Mexico Department of Game and Fish	SHPO	State Historic Preservation Officer
NMED	New Mexico Environment Department	SIP	State Implementation Plan
NO ₂	nitrogen dioxide	SO ₂	sulfur dioxide
NOA	Notice of Availability	SPCC	Spill Prevention, Control, and Countermeasures
NO _x	nitrogen oxides	SWPPP	Storm Water Pollution Prevention Plan
NPDES	National Pollutant Discharge Elimination System	TNW	Traditional Navigable Water
NRCS	Natural Resources Conservation Service	tpy	tons per year
NRHP	National Register of Historic Places	TSCA	Toxic Substances Control Act
O ₃	ozone	USACE	U.S. Army Corps of Engineers
ODS	ozone-depleting substance	USAF	U.S. Air Force
OSH	occupational safety and health	USEPA	U.S. Environmental Protection Agency
OSHA	Occupational Safety and Health Administration	USFWS	U.S. Fish and Wildlife Service
		U.S.C.	United States Code
		VOC	volatile organic compound

FINAL

**ENVIRONMENTAL ASSESSMENT
ADDRESSING
CONSTRUCTION, OPERATION, AND MAINTENANCE
OF A MILITARY WORKING DOG FACILITY
AT
KIRTLAND AIR FORCE BASE, NEW MEXICO**

**377th Air Base Wing
Kirtland Air Force Base, New Mexico**

MARCH 2011

COVER SHEET
FINAL ENVIRONMENTAL ASSESSMENT
ADDRESSING CONSTRUCTION, OPERATION, AND MAINTENANCE
OF A MILITARY WORKING DOG FACILITY
AT KIRTLAND AIR FORCE BASE, NEW MEXICO

Proposed Action: The 377th Air Base Wing (377 ABW) proposes to construct, operate, and maintain a new Military Working Dog (MWD) facility for the 377th Security Forces Squadron (377 SFS) at Kirtland Air Force Base (AFB).

Report Designation: Final Environmental Assessment (EA).

Responsible Agency: U.S. Air Force (USAF), 377 ABW, Kirtland AFB.

Affected Location: Kirtland AFB, New Mexico.

Abstract: The 377 ABW proposes to construct, operate, and maintain a new MWD facility for the 377 SFS on Kirtland AFB. The facility would consist of 14 indoor/outdoor kennels, 4 isolation kennels, storage and staff space, restrooms, food storage room, a covered walkway, and a veterinarian examining room, for a total of approximately 8,000 square feet. The MWD facility would be constructed in accordance with the *Design Guide for Military Working Dog Facilities*. The Proposed Action would also provide a heating, ventilation, and air conditioning (HVAC) system; fire detection and suppression systems; all necessary utilities including natural gas service to replace propane tanks; and a 150-kilovolt-ampere natural gas-powered emergency generator to maintain HVAC system operations and stable temperatures during power outages. Depending on the site that is selected for the Proposed Action, construction of a new obedience course for the MWDs, a parking area of up to 25 spaces (approximately 11,000 square feet), and a new access road might also be required.

The existing MWD facility (Building 30126) would be demolished under the Proposed Action. The site of the existing MWD facility would be revegetated and returned to natural conditions following demolition. Depending on the site that is selected for the Proposed Action, demolition of the existing MWD obedience course might be required. Demolition would include removal of the chain-link fencing surrounding the obedience course and removal of the obstacles.

The analysis in the EA considers the Proposed Action with three site location alternatives and the No Action Alternative. Two alternatives to the Proposed Action were considered, but eliminated from detailed analysis due to infeasibility.

For additional information on this EA, contact Kirtland AFB NEPA Program Manager by mail at 377 MSG/CEANQ, 2050 Wyoming Boulevard SE, Suite 125, Kirtland Air Force Base, NM 87117-5270, or by email at nepa@kirtland.af.mil.

EXECUTIVE SUMMARY

Introduction

This Environmental Assessment (EA) has been prepared for the 377th Air Base Wing (377 ABW) at Kirtland Air Force Base (AFB), New Mexico, to identify and assess the potential environmental impacts associated with constructing, operating, and maintaining a new Military Working Dog (MWD) facility at Kirtland AFB.

Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to construct, operate, and maintain a new, up-to-date facility for MWDs at Kirtland AFB in accordance with current size and sanitation standards, as specified in the *Design Guide for Military Working Dog Facilities*, hereafter referred to as the Design Guide for MWD Facilities (DOD 2003).

The need for the Proposed Action is to provide a facility that is adequate for MWD housing and care at Kirtland AFB. MWDs perform numerous important security functions to complement and enhance the capabilities of security personnel. To properly perform these functions, MWDs require intensive training and care, and specialized housing and training facilities. All phases of MWD training for patrol and detection take place on the grounds of the MWD facility. The existing MWD facility in Building 30126 is extremely deficient in several aspects, including space; structure; sanitation; heating, ventilation, and air conditioning (HVAC); lighting; and utilities. The building's deficient structure and unsuitable dimensions make any remodel or expansion unfeasible, due to high cost, to meet current MWD space and facility standards.

Description of Proposed Action and Alternatives

Proposed Action. The 377 ABW proposes to construct, operate, and maintain a new MWD facility for the 377th Security Forces Squadron (377 SFS). The facility would consist of 14 indoor/outdoor kennels, 4 isolation kennels, storage and staff space, restrooms, food storage room, a covered walkway, and a veterinarian examining room, for a total of approximately 8,000 square feet. The facility would be constructed according to the Department of Defense *Design Guide for MWD Facilities*.

The kennel building would be approximately 5,000 square feet with indoor/outdoor kennels and isolation kennels, joined by a 130-square-foot covered walkway to a 2,870-square-foot administrative and support building. The Proposed Action would also provide an HVAC system, fire detection and suppression systems, all necessary utilities including natural gas service to replace propane tanks, and a 150-kilovolt-ampere natural gas-powered emergency generator to maintain HVAC system operations and stable temperatures during power outages. Buildings would be constructed with reinforced concrete foundations and floors, and reinforced masonry walls with insulated standing seam metal roofs. Per the Design Guide for MWD Facilities, the new MWD facility would not be sited where the day-night average sound level (DNL) for any 24-hour period exceeds 75 A-weighted decibels (dBA). The entire complex would be enclosed with a heavy-duty, 10-foot-high, chain-link fence to prevent an MWD from climbing or jumping out. There are three site alternative locations for the Proposed Action. Depending on the site that is selected for the Proposed Action, construction of a new obedience course for the MWDs, a parking area of up to 25 spaces (approximately 11,000 square feet), and a new access road might also be required. Total impervious surfaces for the proposed MWD facility could be approximately 19,000 square feet if the parking area and access drive were constructed.

Daily operations presently would consist of housing and training of up to 12 MWDs at Kirtland AFB and administrative support. All phases of MWD training for patrol and detection would take place on the grounds of the MWD facility. The MWDs would be housed in the kennels and trained daily in the obedience course. Fenced exercise areas, separate from the obedience course, would also be used. A veterinary treatment area would also be included in the MWD facility for performance of routine physical examinations and emergency first aid treatment. The facility would also be used for storage of handler and MWD documentation and equipment connected to training, mobility, contingencies, and protection; and for handler training classes. Maintenance activities would include general housekeeping activities within the kennels (e.g., hosing floors, sanitizing) and administrative support areas and landscaping maintenance of the exterior grounds. Maintenance activities within the obedience course would be related to turf care and removal of objects and debris that could be harmful to the MWDs and handlers.

The three site location alternatives under consideration for the implementation of the Proposed Action include the following:

- **Site Alternative 1.** Site Alternative 1 is north of the existing MWD facility near the intersection of Barrack Road and Manzano Road. This site is a level site adjoining the existing MWD training area. The site has been previously disturbed, but is generally undeveloped. Piped natural gas lines would need to be extended to the site for a reliable heating system within the facility. Site Alternative 1 is outside of the cantonment area and is far from the urbanized, busy areas of Kirtland AFB, distracting noises, and other occupied facilities. The site has a noise level of less than 65 dBA DNL. This site alternative would not require the construction of an obedience course, as the existing course could be used. The construction of up to 25 additional parking spaces might be required for Site Alternative 1. However, the existing parking area and access roads at the existing MWD facility could potentially be re-used for the proposed new MWD facility, in which case the re-paving of the existing drives and parking areas might be required. Any parking area and road improvements would occur on previously disturbed lands. Site Alternative 1 is the preferred site location alternative.
- **Site Alternative 2.** Site Alternative 2 is in the southern portion of the cantonment area near the intersection of Wyoming Boulevard and Pennsylvania Street. The site is a level site and is generally undeveloped. Site Alternative 2 has a noise level of less than 65 dBA DNL. Site Alternative 2 was historically used as a skeet range. Presently, there is a small structure used periodically by the Boy Scouts approximately 150 feet southwest of this site. All required utilities would be accessible from the site; however, natural gas, water, sanitary sewer, and underground electrical lines would need to be extended to the proposed MWD facility. Piped natural gas lines would need to be extended approximately 1,000 feet to the site for a reliable heating system within the facility. The water line would be extended 1,000 feet and the sanitary sewer and electrical lines would be extended 800 feet. Site Alternative 2 would also require the construction of a 22,500-square-foot obedience course for the MWDs, a parking area of up to 25 spaces (approximately 11,000 square feet), and a new access drive. In addition, Site Alternative 2 would require the installation of a 50 to 100 kilowatt step-down transformer (mini substation), assumed to be approximately 25 square feet in size, to step down power from the nearby overhead 46-kilovolt power line to 480 volts or 240 volts.
- **Site Alternative 3.** Site Alternative 3 is inside the cantonment area at the southeastern corner of the intersection of M Avenue and Pennsylvania Street. Site Alternative 3 is a level site that is currently undeveloped and regularly mowed. All required utilities would be accessible from the site. Site Alternative 3 is within the noise zone of 65 to 69 dBA DNL associated with aircraft operations on the runway. Site Alternative 3 would also require the construction of a 22,500-square-foot obedience course for the MWDs, a parking area of up to 25 spaces (approximately 11,000 square feet), and a new access drive.

The Proposed Action would also include the demolition of the existing MWD facility (Building 30126), which is approximately 2,520 square feet. The site of the existing MWD facility would be revegetated and returned to natural conditions following demolition. Depending on the site that is selected for the Proposed Action, demolition of the existing MWD obedience course might be required. The existing obedience course is fenced and is composed of turf lawn and several portable obstacles that could be reused. If Site Alternative 1 was chosen, the existing MWD obedience course would be used; however, if Site Alternatives 2 or 3 were chosen, a new obedience course would need to be constructed and the existing obedience course could be demolished. Demolition would include removal of the chain-link fencing surrounding the obedience course and removal of the obstacles.

No Action Alternative. Under the No Action Alternative, the 377 ABW would not construct a new MWD facility or demolish the existing MWD facility (Building 30126). Maintenance and repair of the existing MWD facility would increase to unfeasible and uneconomical levels. The highly trained and difficult to replace MWDs would continue to be housed and cared for in inadequate facilities. Limited staff would have to work increasingly harder to keep the facilities clean. Both staff and dogs would not be as efficient as they could be in up-to-date facilities.

Alternatives Considered But Eliminated from Detailed Analysis. One alternative to the Proposed Action and an additional site location alternative for the Proposed Action were considered. The 377 ABW considered the alternative of remodeling or expanding the existing MWD facility to meet current MWD facility standards. This alternative is unfeasible, due to a considerably high cost, because the structure does not meet current structural codes and has unsuitable dimensions. Therefore, this alternative was not carried forward for further detailed analysis in this EA. A site alternative in the northeastern corner of Zia Park was initially considered. The Zia Park housing area is in the central part of the cantonment area and was previously used as a military family housing development. As part of Kirtland AFB's military family housing privatization project, all military family housing units within Zia Park have been demolished and the site is now vacant and available for development. Due to anticipated disturbances to the public from the MWDs, the operation of an MWD facility within this area would not be compatible with current development plans for Zia Park, which include land uses related to community functions and administrative facilities. Therefore, this alternative was not carried forward for further detailed analysis in this EA.

Summary of Environmental Impacts

Table ES-1 provides an overview of potential impacts anticipated under the Proposed Action and the No Action Alternative broken down by resource area. **Section 4** of this EA addresses these impacts in more detail.

Table ES-1. Summary of Environmental Impacts

Resource Area	Proposed Action			No Action Alternative	
	Construction, Operation, and Maintenance of an MWD Facility		Demolition of Existing MWD Facility		
	Site Alternative 1	Site Alternative 2			Site Alternative 3
Land Use	<p>Less than significant impacts on land use plans and policies would be expected. Implementation of the Proposed Action within Site Alternative 1 would require the current land use designation to be changed from an undetermined land use (likely Administration and Research) to Industrial; however, this is consistent with the Kirtland AFB Future Land Use Plan. No impacts on municipal land use plans or policies, or existing land use viability or continued land occupation would be expected.</p>	<p>Impacts on land use would be similar to those under Site Alternative 1. Implementation of Site Alternative 2 would require the land use designation to be changed from Open Space to Industrial; however, this is consistent with the Kirtland AFB Future Land Use Plan.</p>	<p>Impacts on land use would be similar to those under Site Alternative 1. Implementation of the Proposed Action in Site Alternative 3 would not require a change to the existing land use designation (Industrial).</p>	<p>Less than significant impacts on land use would be expected. Demolition of Building 30126 would not require a change to the existing land use designation. The observable noise levels to people in the immediate vicinity would be short-term and last only for the duration of building construction; therefore, noise disturbances during demolition would result in less than significant impacts on land use compatibility.</p>	<p>No impacts on land use would be expected.</p>
Noise	<p>Construction activities would result in impacts on the noise environment; however, these impacts would be temporary and less than significant. The noise environment inside the proposed MWD facility throughout its operation and maintenance would not result in impacts above those considered acceptable (75 dBA) for the MWD kennel. The operation and maintenance of the proposed MWD facility would result in impacts on the outside noise environment; however, these impacts would be less than significant.</p>	<p>Impacts on the noise environment from construction activities and the operation and maintenance of the MWD facility would be similar to those described for Site Alternative 1.</p>	<p>Impacts on the noise environment from construction activities and the operation and maintenance of the MWD facility would be similar to those described for Site Alternative 1.</p>	<p>Impacts from noise generated from demolition activities would be temporary and less than significant. If Site Alternative 1 is chosen for the proposed MWD facility, MWDs at Site Alternative 1 would be initially disrupted and thus the Proposed Action could interfere with training activities; however, the MWDs would likely habituate to the noises after a period of time.</p>	<p>No impacts on the noise environment would be expected.</p>

Resource Area	Proposed Action			No Action Alternative	
	Construction, Operation, and Maintenance of an MWD Facility				Demolition of Existing MWD Facility
	Site Alternative 1	Site Alternative 2	Site Alternative 3		
Visual Resources	<p>Less than significant adverse impacts on visual resources would be expected; however, these impacts would be temporary. The operation and maintenance of a new MWD facility at Site Alternative 1 would result in adverse impacts on visual resources; however, with appropriate planning and maintenance, the adverse impacts would be less than significant.</p>	<p>Impacts on visual resources would be similar to those in Site Alternative 1.</p>	<p>Impacts on visual resources would be similar to those in Site Alternative 1.</p>	<p>Demolition activities would adversely impact the installation's overall aesthetic appeal; however, adverse impacts would be temporary and the site would be returned to natural conditions; therefore, impacts would be less than significant.</p>	<p>No impacts on visual resources would be expected.</p>
Air Quality	<p>Less than significant impacts on air quality resources would be expected from construction activities and operation of the MWD facility. Less than significant impacts on air quality at Kirtland AFB or on regional or local air quality would be expected. The Proposed Action would result in a negligible contribution towards the New Mexico statewide greenhouse gas inventory and less than significant impacts would be expected.</p>	<p>Impacts on air quality would be similar to, but slightly greater than, those in Site Alternative 1. The selection of Site Alternative 2 would require the construction of an obedience course, which would result in more construction activities and associated emissions.</p>	<p>Impacts on air quality would be similar to, but slightly greater than, those in Site Alternative 1. The selection of Site Alternative 3 would require the construction of an obedience course, which would result in more construction activities and associated emissions.</p>	<p>Demolition activities would result in less than significant impacts on air quality. Air quality impacts would primarily result from site-disturbing activities and operation of construction equipment. All emissions associated with demolition operations would be temporary in nature. It is not expected that emissions from demolition would contribute to or affect local or regional attainment status with the National Ambient Air Quality Standards.</p>	<p>No impacts on air quality would be expected.</p>

Resource Area	Proposed Action			Demolition of Existing MWD Facility	No Action Alternative
	Construction, Operation, and Maintenance of an MWD Facility				
	Site Alternative 1	Site Alternative 2	Site Alternative 3		
Geology and Soils	Less than significant impacts on geological resources and soils would be expected. Use of best management practices (BMPs) could minimize impacts on soils from soil erosion and sedimentation. No impacts from geologic hazards would be expected.	Impacts would be similar to those under Site Alternative 1.	Impacts would be similar to those under Site Alternative 1.	Less than significant impacts on geology and soils would be expected. The use of BMPs during demolition would minimize impacts on soils. Long-term, beneficial impacts on soils would be expected from the return of the site of the existing MWD facility to natural conditions. The decrease in impervious surfaces in the vicinity would cause a decrease in storm water runoff and soil erosion.	No impacts on geology and soils would be expected.
Water Resources	Less than significant adverse impacts on groundwater availability would be expected due to potential use of groundwater for dust suppression. Less than significant impacts on surface water resources, water quality, and floodplains would be expected due to ground disturbances. The implementation of a sediment and erosion control plan, storm water pollution prevention plan, the storm water design requirements of Section 438 of the Energy Independence and Security Act, and other BMPs would minimize impacts. Storm water from the proposed MWD facility would be incorporated into Kirtland's MS4; therefore, no long-term adverse impacts on water resources from sheet runoff during storm events would be expected from the operation of the MWD facility.	Impacts on groundwater and floodplains would be similar to those described in Alternative 1. Impacts on surface waters would be similar to, but slightly greater than, those for Site Alternative 1. Less than significant long-term, adverse impacts on water resources from sheet runoff during storm events would be expected from the operation of the MWD facility.	Impacts on groundwater and floodplains would be similar to those described in Alternative 1. Impacts on surface waters would be similar to, but slightly greater than, those for Site Alternative 1. Less than significant long-term, adverse impacts on water resources from sheet runoff during storm events would be expected from the operation of the MWD facility.	Less than significant adverse impacts on groundwater availability would be expected due to potential use of groundwater for dust suppression. Less than significant impacts on surface water resources, water quality, and floodplains would be expected due to ground disturbances. The implementation of BMPs as required by Kirtland AFB's MS4 permit would minimize impacts on water resources.	No impacts on water resources would be expected.

Resource Area	Proposed Action			No Action Alternative	
	Construction, Operation, and Maintenance of an MWD Facility				Demolition of Existing MWD Facility
	Site Alternative 1	Site Alternative 2	Site Alternative 3		
Biological Resources	<p>Impacts on vegetation, wildlife, and threatened and endangered species would be less than significant. Less than significant adverse impacts on burrowing owls (<i>Athene cunicularia</i>) would be expected. Although there are no burrowing owl nests currently at Site Alternative 1, owls vary their nesting sites from year to year and a possibility exists for a nest to be disturbed during construction. Surveys prior to demolition and construction, and flagging of nests or relocation of owls would minimize the impact. No impacts on wetlands would be expected.</p>	<p>Impacts on biological resources would be similar to those described in Site Alternative 1. A burrowing owl nesting location is within close proximity to the site. Although owls vary their nesting sites from year to year, there is the possibility that at least one of these nests could be disturbed during construction. Surveys prior to demolition and construction, and flagging of nests or relocation of owls would minimize the impact. Less than significant impacts on burrowing owls would be expected.</p>	<p>Impacts on biological resources would be similar to those described in Site Alternative 1. There are three burrowing owl nesting locations within close proximity to the site. Although owls vary their nesting sites from year to year, there is the possibility that at least one of these nests could be disturbed during construction. Surveys prior to demolition and construction, and flagging of nests or relocation of owls would minimize the impact. Less than significant impacts on burrowing owls would be expected.</p>	<p>Impacts on vegetation, wildlife, and threatened and endangered species would be less than significant. No adverse impacts on natural vegetation would be expected. Less than significant adverse impacts on landscaped vegetation would be expected due to direct removal or trampling. Temporary adverse impacts on wildlife would be expected from noise disturbances during demolition. Long-term, beneficial impacts on wildlife would be expected from the return of the existing MWD facility site to natural conditions due to a creation of more wildlife habitat. No impacts on wetlands would be expected.</p>	<p>No impacts on biological resources would be expected.</p>

Resource Area	Proposed Action			Demolition of Existing MWD Facility	No Action Alternative
	Construction, Operation, and Maintenance of an MWD Facility				
	Site Alternative 1	Site Alternative 2	Site Alternative 3		
Cultural Resources	There are no known cultural resources within the Area of Potential Effect (APE) of Site Alternative 1; therefore, no adverse impacts on cultural resources would be expected from the Proposed Action.	No known archaeological resources occur within the APE of Site Alternative 2. Therefore, no adverse impacts on archaeological resources would be expected. One architectural resource is within the APE of Site Alternative 2 (Boy Scouts structure). An architectural evaluation of this building for National Register of Historic Places (NRHP) eligibility should be undertaken prior to the Proposed Action. If the building is determined eligible for the NRHP, then mitigation of adverse impacts through Historic American Buildings Survey documentation and a Historic Cultural Properties Inventory form would need to be completed.	There are no known cultural resources within the APE of Site Alternative 3; therefore, no adverse impacts on cultural resources would be expected from the Proposed Action.	The demolition of Building 30126 would require an architectural evaluation for NRHP eligibility. If Building 30126 is determined to be eligible for the NRHP, then mitigation of adverse impacts through HABS documentation and a Historic Cultural Properties Inventory form would need to be completed prior to the demolition of Building 30126. Therefore, less than significant impacts on cultural resources would be expected.	No impacts on cultural resources would be expected.
Infrastructure	Less than significant adverse impacts on electrical systems, natural gas systems, water systems, sanitary sewer and wastewater systems, storm water systems, communications systems, and solid waste management would be expected from Site Alternative 1. The expansion of Kirtland AFB's natural gas system would be an overall beneficial impact on installation infrastructure. No impacts on central heating and cooling systems and liquid fuels would be expected.	Impacts on electrical systems, natural gas systems, water systems, sanitary sewer and wastewater systems, communications systems, solid waste management, central heating and cooling systems, and liquid fuels would be similar to those in Site Alternative 1. Impacts on storm water systems and solid waste management would be similar to, but slightly greater than, those for Site Alternative 1. Despite the slightly larger impact area for Site Alternative 2, with appropriate BMPs, impacts on storm water systems would be less than significant.	Impacts on electrical systems, natural gas systems, water systems, sanitary sewer and wastewater systems, communications systems, central heating and cooling systems, and liquid fuels would be less than significant and similar to those in Site Alternative 1. Impacts on storm water systems and solid waste management would be less than significant and similar to those described for Site Alternative 2.	Less than significant adverse impacts on electrical systems, central heating and cooling systems, water systems, sanitary sewer and wastewater systems, storm water systems, communications systems, and solid waste management would be expected. No impacts on natural gas systems or liquid fuels would be expected.	The implementation of the No Action Alternative would result in the continuation of inefficiencies in temperature control, ventilating, and electricity and an unreliable power supply. Therefore, less than significant adverse impacts on infrastructure and utilities would be expected.

Resource Area	Proposed Action			No Action Alternative	
	Construction, Operation, and Maintenance of an MWD Facility				Demolition of Existing MWD Facility
	Site Alternative 1	Site Alternative 2	Site Alternative 3		
Hazardous Materials and Waste	No impacts on hazardous materials management would be expected during construction or from operation and maintenance activities. No significant impacts would be expected from the generation of hazardous wastes during construction activities. No impacts on ERP sites would be expected. Less than significant impacts on the Pollution Prevention Program at Kirtland AFB would be expected from an incremental increase in hazardous materials and wastes used and generated during construction activities. No impacts on the Pollution Prevention Program would be expected from the operation and maintenance activities.	Impacts on hazardous materials and hazardous waste management and the Pollution Prevention Program would be less than significant and similar to those described in Site Alternative 1. No impacts on ERP sites would be expected.	Impacts on hazardous materials and hazardous waste management and the Pollution Prevention Program would be less than significant and similar to those described in Site Alternative 1. No impacts on ERP sites would be expected.	Less than significant impacts on hazardous materials and hazardous waste management and Kirtland AFB's pollution prevention program would be expected from demolition activities. No impacts from ERP sites would be expected. Short-term, adverse impacts on asbestos, lead-based paint, and polychlorinated biphenyl management would be expected; however, these impacts would be less than significant.	No impacts on hazardous materials or waste management would be expected.

Resource Area	Proposed Action			No Action Alternative	
	Construction, Operation, and Maintenance of an MWD Facility				Demolition of Existing MWD Facility
	Site Alternative 1	Site Alternative 2	Site Alternative 3		
Safety	<p>With the implementation of effective health and safety programs, less than significant impacts on contractor safety would be expected. No impacts on MWD health and safety would be expected during the construction of the proposed MWD facility. The operation of the proposed MWD facility would result in significant beneficial impacts on MWD health and safety because it would meet the MWD facility standards. No impacts on military personnel health and safety would be expected during the construction of the MWD facility. Long-term, beneficial impacts on military personnel health and safety would be expected from operation of the new facility. No impacts on public health and safety or explosives and munitions safety would be expected.</p>	<p>Impacts on contractor safety, military personnel safety, and explosives and munitions safety would be similar to those described in Site Alternative 1. Impacts on MWD health and safety would be similar to those described for Site Alternative 1; however, because Site Alternative 2 is on the outer edge of the cantonment area there are more people, cars, air traffic, and military equipment visible and audible than at the existing MWD facility and Site Alternative 1. As such, there would be a slightly increased potential for adverse impacts on the health and safety of the MWDs due to increased anxiety. Impacts on public health and safety would be similar to those described for Site Alternative 1; however, because Site Alternative 2 is in a more developed portion of Kirtland AFB, there would be a greater perception of adverse health and safety impacts on the public. Although Site Alternative 2 would have greater perceived adverse impacts on public health and safety than Site Alternative 1, with appropriate planning and design efforts the actual impacts would be negligible and similar to those expected for Site Alternative 1.</p>	<p>Impacts on contractor safety, military personnel safety, and explosives and munitions safety would be similar to those described in Site Alternative 1. Effects on MWD health and safety would be similar to those described for Site Alternative 1 and Site Alternative 2; however, because Site Alternative 3 is in the most developed location of the three site alternatives, it would have the greatest potential for adverse impacts on the health and safety of the MWDs. The adverse health and safety impacts on the MWDs at Site Alternative 3 would be expected to be less than significant and the total net impacts would remain beneficial to MWD health and safety. Impacts on public health and safety would be similar to those described for Site Alternative 2.</p>	<p>The Proposed Action would slightly increase the health and safety risk to contractors performing demolition work; however, with the implementation of effective health and safety programs, less than significant impacts on contractor safety would be expected. No adverse impacts on military personnel safety, public safety, or explosives and munitions safety would be expected. Temporary adverse impacts on the health of the MWDs might occur if the new MWD facility is constructed in Site Alternative 1, as noise disturbances from nearby demolition of the existing MWD facility could disturb the MWDs and increase anxiety levels. However, impacts would be expected to be less than significant.</p>	<p>The existing MWD facility's deficiencies would continue to jeopardize both the short- and long-term health and safety of the MWDs at Kirtland AFB, resulting in significant adverse impacts.</p>

Resource Area	Proposed Action			No Action Alternative	
	Construction, Operation, and Maintenance of an MWD Facility				Demolition of Existing MWD Facility
	Site Alternative 1	Site Alternative 2	Site Alternative 3		
Socioeconomics and Environmental Justice	Less than significant impacts on demographics and employment characteristics would be expected. Disproportionate adverse impacts on minority, low-income, and youth populations would not be expected as result of the Proposed Action.	Impacts would be similar to those described for Site Alternative 1.	Impacts would be similar to those described for Site Alternative 1.	Less than significant impacts on socioeconomics would be expected. Short-term, beneficial impacts on employment characteristics would be expected from the creation of temporary jobs and generation of revenue. No disproportionate, adverse impacts on minority, low-income, or youth populations would be expected.	No impacts on socioeconomics and environmental justice would be expected.

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**FINAL ENVIRONMENTAL ASSESSMENT
ADDRESSING CONSTRUCTION, OPERATION, AND MAINTENANCE
OF A MILITARY WORKING DOG FACILITY
AT KIRTLAND AIR FORCE BASE, NEW MEXICO**

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1. Purpose of and Need for the Action

1.1 Introduction

This section describes the purpose of and need for the Proposed Action at Kirtland Air Force Base (AFB), provides summaries of the scope of the environmental review process and the applicable regulatory requirements, and presents an overview of the organization of the document.

Federal agencies are required to consider the environmental consequences of proposed actions in the decisionmaking process under the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] Sections 4321 to 4370d) and the Council on Environmental Quality's (CEQ) implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500–1508). Kirtland AFB is also required to consider U.S. Air Force (USAF) NEPA-implementing regulation (32 11 CFR 989), and Department of Defense (DOD) Instruction 4715.9, *Environmental Planning Analysis*. An Environmental Assessment (EA) addressing the Construction, Operation, and Maintenance of a Military Working Dog (MWD) Facility at Kirtland AFB will be prepared in accordance with NEPA. The EA will evaluate the potential environmental impacts associated with the construction, operation, and maintenance of an MWD facility for the 377th Security Forces Squadron (377 SFS) at Kirtland AFB.

Kirtland AFB is just southeast of Albuquerque, New Mexico (see **Figure 1-1**), at the foot of the Manzano Mountains. These mountains define the eastern boundary of an area called East Mesa. Kirtland AFB encompasses approximately 52,000 acres of the East Mesa and has an average elevation of 5,400 feet above mean sea level. Land uses for areas adjacent to the installation include Cibola National Forest to the northeast and east, the Isleta Indian Reservation and Cibola National Forest (including Manzano Wilderness Area) to the south, and residential and business areas of the City of Albuquerque to the west and north.

Kirtland AFB was established in the late 1930s as a training base for the Army Air Corps. In 1941, construction of permanent barracks, warehouses, and a chapel was completed; and a B-18 bomber, Kirtland AFB's first military aircraft, arrived. Troops soon followed, and Kirtland AFB grew rapidly with U.S. involvement in World War II. The installation served as a training site for aircrews for many of the country's bomber aircraft, including the B-17, B-18, B-24, and the B-29. After World War II, Kirtland AFB shifted from a training facility to a test and evaluation facility for weapons delivery, working closely with both Los Alamos National Laboratory and Sandia National Laboratories. In 1971, Kirtland AFB and its adjoining neighbor to the east, Sandia Army Base, were combined. The two divisions of the installation are still referred to as Kirtland West and Kirtland East, respectively. Kirtland AFB is now operated by the 377th Air Base Wing (377 ABW).

The 377 ABW is a unit of the Air Force Materiel Command (AFMC) and is the host unit at Kirtland AFB. The 377 ABW's prime mission is to support more than 100 Mission Partners with personnel, resources, equipment, and facilities. The installation functions as a test and evaluation center for the Space and Missile Systems Center and Air Force Operational Test and Evaluation Center; and it is the headquarters for operational organizations, such as the Air Force Security Police Agency, Air Force Inspection Agency, Sandia National Laboratories, and the Albuquerque Service Center for the U.S. Department of Energy. Kirtland AFB also functions as a training base for the 58th Special Operations Wing of Air Education and Training Command's 19th Air Force. The 150th Fighter Group of the New Mexico Air National Guard is also stationed at the installation. The 377 ABW provides fire protection (including crash and rescue) for Albuquerque International Airport.

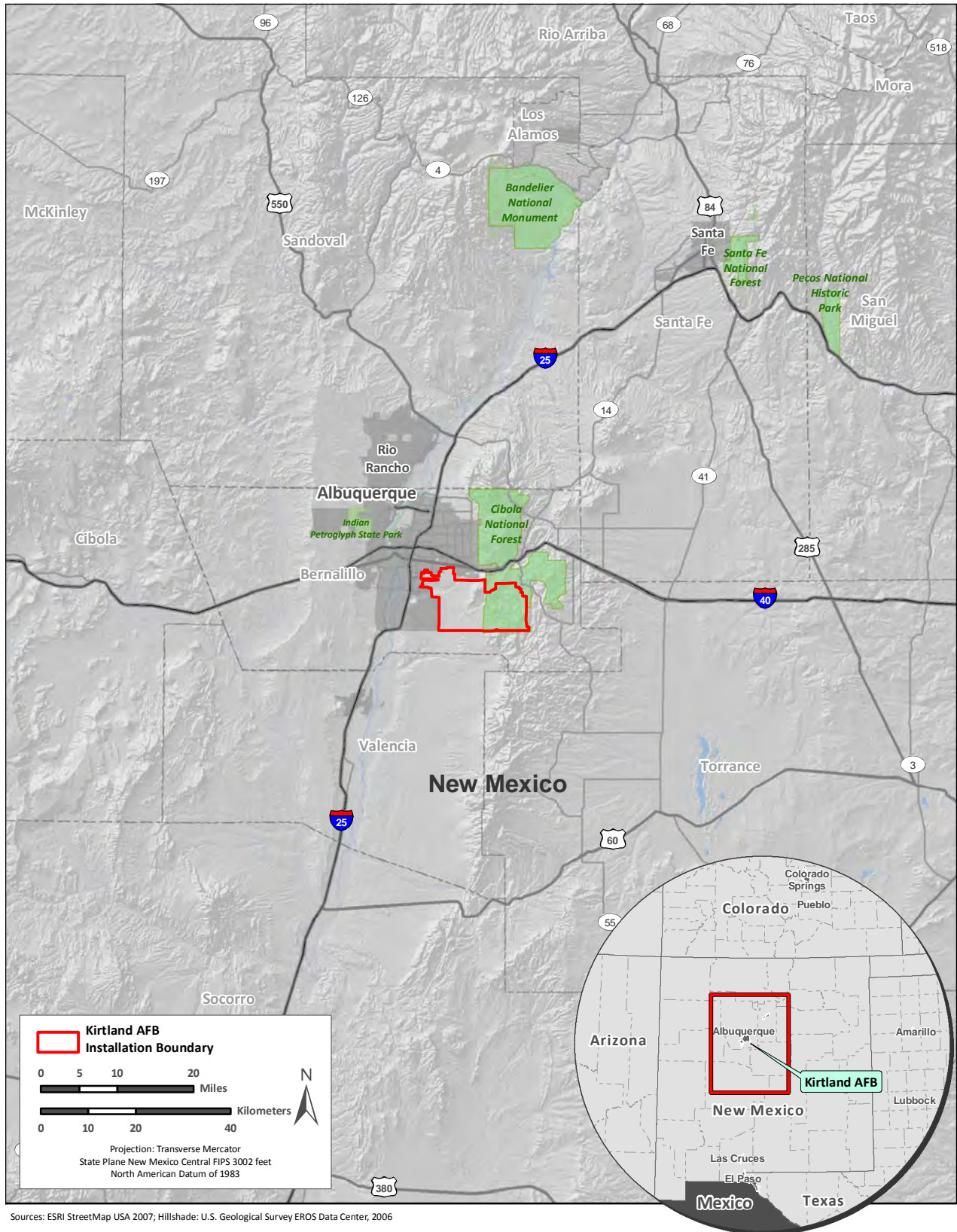


Figure 1-1. Kirtland AFB Location Map

The 377 SFS is the largest SFS in the AFMC and provides force protection for Kirtland AFB. The 377 SFS secures aircraft and critical DOD munitions, including Special Assignment Airlift Missions, and provides security for DOD's only underground munitions facility. Other responsibilities include providing law enforcement, police services, installation entry control, and training and equipping unit and installation defense forces in support of war and mobilization plans.

The EA will be organized into six sections and appendices. **Section 1** states the purpose, need, scope, and public involvement efforts for the Proposed Action. **Section 2** contains a detailed description of the Proposed Action and the alternatives considered. **Section 3** describes the existing conditions of the potentially affected environment. **Section 4** identifies the environmental consequences of implementing all reasonable alternatives, including direct, indirect, and cumulative impacts. **Section 5** provides the names of those persons and agencies consulted for the EA. **Section 6** lists the references used to support the analyses.

1.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to construct, operate, and maintain a new, up-to-date facility for MWDs at Kirtland AFB in accordance with current size and sanitation standards, as specified in the *Design Guide for Military Working Dog Facilities*, hereafter referred to as the Design Guide for MWD Facilities (DOD 2003).

The need for the Proposed Action is to provide a facility that is adequate for MWD housing and care at Kirtland AFB. MWDs perform numerous important security functions to complement and enhance the capabilities of security personnel. To properly perform these functions, MWDs require intensive training and care, and specialized housing and training facilities. All phases of MWD training for patrol and detection take place on the grounds of the MWD facility. The existing MWD facility in Building 30126 was originally built as a hobby shop in 1954 and was converted to a kennel in 1978. The existing MWD facility is extremely deficient in several aspects, including space; structure; sanitation; heating, ventilation, air conditioning (HVAC); lighting; and utilities. The building's deficient structure and unsuitable dimensions make any remodel or expansion unfeasible to meet current MWD space and facility standards. Major deficiencies in the existing MWD facility include the following:

- The kennels are less than half the required space (i.e., 39 square feet instead of the required 80 square feet per dog)
- The kennels are not indoor-outdoor and do not have individual dog houses, as required
- The existing building is constructed of unreinforced concrete block that does not meet current structural codes and cannot be upgraded
- Drainage of dog excrement constantly backs up due to inadequate drain pipes, water tends to pool in the kennels, and floor finishes are difficult to keep clean
- The existing facility has half of the required administrative, support, and storage space
- There is only one toilet for 15 assigned male and female personnel, there are no showers, and lockers are 100 feet away
- Inadequate HVAC systems and lack of humidity and dust control
- Deteriorated surfaces, peeling paint, and broken tile
- Structural weaknesses cause water leaks in the walls and animal/insect infestation.

1.3 Scope of the EA

Scope consists of the range of actions, alternatives, and impacts to be considered. The scope of the Proposed Action and the range of alternatives to be considered are presented in detail in **Section 2**. In accordance with CEQ regulations implementing NEPA (40 CFR 1500–1508), the No Action Alternative will be analyzed to provide the baseline against which the environmental impacts of implementing the range of alternatives addressed can be compared. The EA will identify appropriate mitigation measures that are not already included in the Proposed Action or alternatives in order to avoid, minimize, reduce, or compensate for adverse environmental impacts. The EA will examine the environmental impacts of the Proposed Action and reasonable alternatives on the following resource areas: noise; land use; air quality; health and human safety; geological resources; water resources; biological resources; cultural resources; visual resources; socioeconomics, protection of children, and environmental justice; infrastructure; and hazardous materials and wastes. The characterization of the affected environment, or baseline environmental conditions, will be discussed in **Section 3**; however, per CEQ regulations (40 CFR 1501.7 (a)(3)), only those resource areas that apply to the Proposed Action will be analyzed. Those resource areas that do not apply will be eliminated from further analysis. An analysis of potential direct, indirect, and cumulative impacts on Kirtland AFB associated with the Proposed Action and No Action Alternative will be discussed in **Section 4**.

1.3.1 Environmental Laws, Regulations, and Executive Orders

To comply with NEPA (Public Law 91-190, 42 U.S.C. Section 4321 et seq.), the planning and decisionmaking process involves a study of other relevant environmental laws, regulations, and Executive Orders (EOs). The NEPA process does not replace procedural or substantive requirements of other environmental laws; it addresses them collectively in an analysis, which enables decisionmakers to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated “with other planning and environmental review procedures required by law or by agency practice so that all such procedures run concurrently rather than consecutively” (40 CFR 11 1500.2).

As required in 40 CFR 1500.2(c), the EA contains a list of Federal permits, licenses, and coordination that might be required in implementing the Proposed Action or alternatives (see **Table 1-1**).

Table 1-1. List of Coordination and Permits Associated with the Proposed Action

Agency	Permit/Approval/Condition
U.S. Fish and Wildlife Service	<ul style="list-style-type: none"> • Endangered Species Act Section 7 Coordination • Migratory Bird Treaty Act Coordination
U.S. Army Corps of Engineers	<ul style="list-style-type: none"> • Clean Water Act Section 404 Permit
U.S. Environmental Protection Agency	<ul style="list-style-type: none"> • National Pollutant Discharge Elimination System permit
City of Albuquerque Environmental Health Department	<ul style="list-style-type: none"> • Applicable air quality permits • Title V Permit • Fugitive Dust Permit
New Mexico Historic Preservation Division	<ul style="list-style-type: none"> • National Historic Preservation Act Section 106 Consultation

Appendix A contains summaries of the environmental laws, regulations, and EOs that might apply to this project. Where relevant, these laws will be described in more detail in the appropriate resource areas presented in **Section 3** of the EA. The scope of the analysis of potential environmental consequences in **Section 4** will consider direct, indirect, and cumulative impacts.

1.4 Interagency Coordination and Public Involvement

NEPA requirements help ensure that environmental information is made available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions would be enhanced if proponents provide information to the public and involve the public in the planning process. The Intergovernmental Coordination Act and EO 12372, *Intergovernmental Review of Federal Programs*, require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal. Air Force Instruction (AFI) 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning (IICEP)*, requires the USAF to implement an agency coordination process, which is used for the purpose of facilitating and receiving agency input coordination and implements scoping requirements.

Through the IICEP process, Kirtland AFB made the Draft EA available to relevant Federal, state, and local agencies and Tribes to share the analyses of the Proposed Action and alternatives, and provide them sufficient time to make known their environmental concerns specific to the action. The IICEP process also provided Kirtland AFB the opportunity to cooperate with and consider state, local, and tribal views in implementing the Federal proposal. All IICEP materials related to this EA are included in **Appendix B**. The agencies and Tribes contacted during the IICEP process are also listed in **Appendix B**.

A Notice of Availability (NOA) for the Draft EA was published in *The Albuquerque Journal* on November 14, 2010. The publication of the NOA initiated the 30-day review period. At the closing of the public review period, no comments from the general public had been received. Three comments from government agencies (Albuquerque Environmental Health Department, Air Quality Division, New Mexico Department of Game and Fish [NMDGF], and New Mexico Environment Department [NMED]) were received. These comments were incorporated into the analysis of potential environmental impacts performed as part of this EA, where applicable. **Appendix B** contains additional details about the public review period.

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2. Description of Proposed Action and Alternatives

As discussed in **Section 1.1**, the NEPA process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for a proposed action, as defined in **Section 1.2**. In addition, CEQ regulations also specify the inclusion of a No Action Alternative against which potential impacts would be compared. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in detail in accordance with CEQ regulations. The Proposed Action consists of three site alternatives that are discussed in **Sections 2.1.1** through **2.1.3**. The preferred alternative is the implementation of the Proposed Action at Site Alternative 1.

2.1 Proposed Action

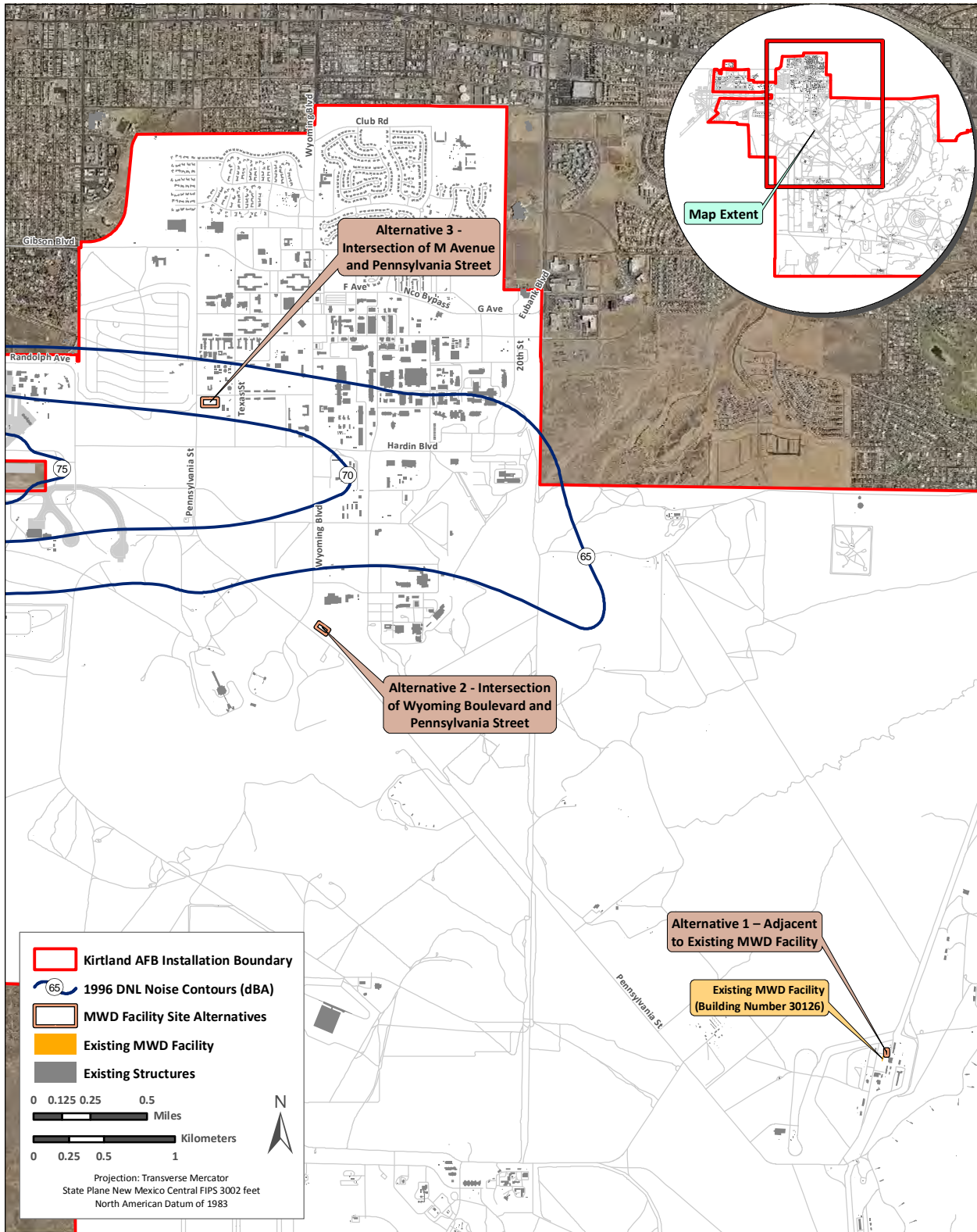
2.1.1 Construction, Operation, and Maintenance of a New MWD Facility

The 377 ABW at Kirtland AFB, New Mexico, is proposing to construct, operate, and maintain a new MWD facility for the 377 SFS. The facility would consist of 14 indoor/outdoor kennels, 4 isolation kennels, storage and staff space, restrooms, food storage room, a covered walkway, and a veterinarian examining room, for a total of 8,000 square feet. A parking area with 25 spaces (approximately 11,000 square feet) and new access roads would also be constructed. Total impervious surfaces for the proposed MWD facility would be approximately 19,000 square feet. The facility would be constructed according to the Design Guide for MWD Facilities (DOD 2003). The main facility components proposed for construction are listed in **Table 2-1**. **Figure 2-1** depicts the location of the Proposed Action site location alternatives and the existing MWD facility in Building 30126.

Table 2-1. MWD Facility Components Proposed for Construction

Facility Component	Size (approximate square feet)
Kennel Building	5,000
Covered Walkway	130
Administrative/Support Building	2,870
MWD Facility Subtotal	8,000
Parking area	11,000
Obedience course	22,500
Total	41,500

The kennel building would be approximately 5,000 square feet with indoor/outdoor kennels and isolation kennels, joined by a 130-square-foot covered walkway to a 2,870-square-foot administrative and support building. The Proposed Action would also provide an HVAC system, fire detection and suppression systems, all necessary utilities including natural gas service to replace propane tanks, and a 150-kilovolt-ampere (kVA) natural gas-powered emergency generator to maintain HVAC system operations and stable temperatures during power outages. Buildings would have reinforced concrete foundations and floors, and reinforced masonry walls with insulated standing seam metal roofs.



Source of Noise Contours: Kirtland AFB 10/2009

Figure 2-1. Location of Proposed Action Site Alternatives and Existing MWD Facility

Depending on the site that is selected for the Proposed Action, construction of a new obedience course for the MWDs might also be required. According to the Design Guide for MWD Facilities, the course should be 22,500 square feet (150 feet by 150 feet) in size (DOD 2003). The course would be grassed and free of objects (e.g., trees, large rocks, holes, burrs) that could be harmful to MWDs and handlers. The site would be graded for drainage, but minimally sloped to provide a level field for training, and would be enclosed with a heavy-duty, 10-foot-high, chain-link fence to prevent an MWD from climbing or jumping out.

The footprint for the proposed MWD facility (i.e., fenced-in area) would be approximately 24,600 square feet. The total construction footprint including the obedience course would be approximately 47,100 square feet.

Per the Design Guide for MWD Facilities, the new MWD facility would not be sited where the day-night average sound level (DNL) for any 24-hour period exceeds 75 A-weighted decibels (dBA). Site alternatives that are proposed within the cantonment area might require a cinderblock wall in addition to a chain-link fence to minimize the interface between MWDs and the public.

Daily operations would consist of housing and training of up to 12 MWDs at Kirtland AFB and administrative support. All phases of MWD training for patrol and detection would take place on the grounds of the MWD facility. The MWDs would be housed in the kennels and trained daily in the obedience course. Fenced exercise areas, separate from the obedience course, would also be used. A veterinary treatment area would also be included in the MWD facility for performance of routine physical examinations and emergency first aid treatment. The facility would also be used for storage of handler and MWD documentation and equipment connected to training, mobility, contingencies, and protection; and for handler training classes.

Maintenance activities would include general housekeeping activities within the kennels (e.g., hosing floors, sanitizing) and administrative support areas and landscaping maintenance of the exterior grounds. Maintenance activities within the obedience course would be related to turf care and removal of objects that could be harmful to the MWDs and handlers (e.g., trees, large rocks, holes, burrs).

2.1.1.1 Site Selection Criteria

In accordance with 32 CFR Part 989.8(c), the development of site selection criteria is an effective mechanism for the identification, comparison, and evaluation of reasonable alternatives. The following site selection criteria were developed to be consistent with the purpose and need for the Proposed Action and to address pertinent mission, environmental, safety, and health factors. These site selection criteria were used to identify reasonable alternatives for analysis in this EA.

- The new MWD facility meets requirements of the Design Guide for MWD Facilities, Air Force Handbook 32-1084 (*Facility Requirements*), the Unified Facilities Criteria DOD Minimum Antiterrorism Standards for Buildings, and current structural codes.
- Per the Design Guide for MWD Facilities, the new MWD facility cannot be sited where the DNL for any 24-hour period exceeds 75 dBA. MWD facilities should not be located in urbanized, busy areas of the installation where noise from surrounding areas not only affects the MWD's rest, but the noise from MWD's creates a distraction to people working in the area.
- The new MWD facility is in relatively close proximity to SFC and cantonment area for fast response times in case of a security threat.

2.1.1.2 Site Alternative 1 – Adjacent to Existing MWD Facility

Site Alternative 1 is north of the existing MWD facility near the intersection of Barrack Road and Manzano Road (see **Figure 2-1** and **Appendix C, Photograph C4**). This site is a level site adjoining the existing MWD training area. The site has been previously disturbed, but is generally undeveloped. Utilities including telephone, water, sewer, and electricity are accessible from the site. Piped natural gas lines would need to be extended to the site for a reliable heating system within the facility. Site Alternative 1 is outside of the cantonment area and is far from the urbanized, busy areas of Kirtland AFB, distracting noises, and other occupied facilities. The site is approximately 4.6 miles southeast of the runway and has a noise level of less than 65 dBA DNL. This site alternative would not require the construction of an obedience course, as the existing course could be used. Site Alternative 1 is the preferred site location alternative.

2.1.1.3 Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Site Alternative 2 is in the southern portion of the cantonment area near the intersection of Wyoming Boulevard and Pennsylvania Street (see **Figure 2-1** and **Appendix C, Photograph C5**). The site is a level site and is generally undeveloped. Site Alternative 2 is approximately 1.7 miles southeast of the runway and has a noise level of less than 65 dBA DNL. Site Alternative 2 was historically used as a skeet range. Presently, there is a small structure used periodically by the Boy Scouts approximately 150 feet southwest of this site (see **Appendix C, Photograph C6**). All required utilities would be accessible from the site; however, natural gas, water, sanitary sewer, and underground electrical lines would need to be extended to the proposed MWD facility. Piped natural gas lines would need to be extended approximately 1,000 feet to the site for a reliable heating system within the facility. The water line would be extended 1,000 feet and the sanitary sewer and electrical lines would be extended 800 feet.

Site Alternative 2 would also require the construction of a 22,500-square-foot obedience course for the MWDs as described in **Section 2.1**. In addition, Site Alternative 2 would require the installation of a 50- to 100-kilowatt step-down transformer (mini substation), assumed to be approximately 25 square feet in size, to step down power from the nearby overhead 46-kilovolt power line to 480 volts or 240 volts.

2.1.1.4 Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Site Alternative 3 is inside the cantonment area at the southeastern corner of the intersection of M Avenue and Pennsylvania Street (see **Figure 2-1** and **Appendix C, Photograph C7**). Site Alternative 3 is a level site that is currently undeveloped and regularly mowed. All required utilities would be accessible from the site. Site Alternative 3 is approximately 0.9 miles east of the runway and is within the noise zone of 65 to 69 dBA DNL associated with aircraft operations on the runway. Site Alternative 3 would also require the construction of a 22,500-square-foot obedience course for the MWDs as described in **Section 2.1**.

2.1.2 Demolition of Existing MWD Facility

The Proposed Action would also include the demolition of the existing MWD facility (Building 30126), which is approximately 2,520 square feet. The site of the existing MWD facility would be revegetated and returned to natural conditions following demolition. Depending on the site that is selected for the Proposed Action, demolition of the existing MWD obedience course might be required. The existing obedience course is fenced and is composed of turf lawn and several portable obstacles that could be reused. If Site Alternative 1 was chosen, the existing MWD obedience course would be used; however, if Site Alternatives 2 or 3 were chosen, a new obedience course would need to be constructed and the

existing obedience course would be demolished. Demolition would include removal of the chain-link fencing surrounding the obedience course and removal of the obstacles.

2.2 No Action Alternative

CEQ regulations specify the inclusion of the No Action Alternative in the alternatives analysis (40 CFR 1502.14). The No Action Alternative is analyzed to provide a baseline of the existing conditions against which the potential environmental and socioeconomic impacts of the Proposed Action and alternative actions can be compared. Under the No Action Alternative, the 377 ABW would not construct a new MWD facility or demolish the existing MWD facility (Building 30126). Maintenance and repair of the existing MWD facility would increase to unfeasible and uneconomical levels. The highly trained and difficult to replace MWDs would continue to be housed and cared for in inadequate facilities. Limited staff would have to work increasingly harder to keep the facilities clean. Both staff and dogs would not be as efficient as they could be in up-to-date facilities.

2.3 Alternatives Considered but Eliminated from Detailed Analysis

2.3.1 Remodel or Expand Existing MWD Facility

The 377 ABW considered the alternative of remodeling or expanding the existing MWD facility in order to meet current MWD facility standards. The present structure is unreinforced cinder block that does not meet current structural codes and cannot be upgraded. The building's deficient structure, unsuitable dimensions, and location on a hillside make any remodel or expansion unfeasible. The present structure does not meet anti-terrorism/force protection requirements and frequently floods during heavy rains. An entirely new facility is the only viable way to meet standards. Therefore, this alternative was not carried forward for further detailed analysis in this EA.

2.3.2 Northeastern Corner of Zia Park Site Alternative

A site alternative in the northeastern corner of Zia Park was initially considered. The Zia Park housing area is in the central area of the cantonment area and was previously used as a military family housing development. As part of Kirtland AFB's military family housing privatization project, all military family housing units within Zia Park have been demolished and the site is now vacant and available for development. Zia Park is a level site and all utilities would be accessible from the site. The site is approximately 1 mile northeast of the airfield and has a noise level of less than 65 dBA DNL. Due to anticipated disturbances to the public from the MWDs and vice versa, the operation of an MWD facility within this area would not be compatible with current development plans for Zia Park, which include land uses related to community functions and administrative facilities. Therefore, this alternative was not carried forward for further detailed analysis in this EA.

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3. Description of the Affected Environment

All potentially relevant resource areas were initially considered for analysis in this EA. In compliance with NEPA and CEQ guidelines, the discussions of the affected environment in **Section 3** and the environmental consequences in **Section 4** focus only on those resource areas considered potentially subject to impacts and with potentially significant environmental issues. This section includes land use, noise, visual resources, air quality, geology and soils, water resources, biological resources, cultural resources, infrastructure, hazardous materials and waste, safety, and socioeconomics and environmental justice. Airspace management is not addressed in this EA because the Proposed Action does not involve any resources that would impact airspace.

3.1 Land Use

3.1.1 Definition of the Resource

The term “land use” refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. However, there is no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, “labels,” and definitions vary among jurisdictions. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often used include residential, commercial, industrial, agricultural, institutional, and recreational. USAF installation land use planning commonly utilizes 12 general land use classifications: Airfield, Aircraft Operations and Maintenance, Industrial, Administrative, Community (Commercial), Community (Service), Medical, Housing (Accompanied), Housing (Unaccompanied), Outdoor Recreation, Open Space, and Water (USAF 1998).

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. According to Air Force Pamphlet 32-1010, *Land Use Planning*, land use planning is the arrangement of compatible activities in the most functionally effective and efficient manner (USAF 1998). Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning within the civilian sector include written master plans/management plans, policies, and zoning regulations. The USAF comprehensive planning process also uses functional analysis, which determines the degree of connectivity among installation land uses and between installation and off-installation land uses, to determine future installation development and facilities planning.

In appropriate cases, the location and extent of a proposed action needs to be evaluated for its potential impacts on a project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its “permanence.”

3.1.2 Existing Conditions

Surrounding Land Use. Kirtland AFB is in the southwestern portion of Bernalillo County, New Mexico (see **Figure 1-1**). It is bounded on the west and north by the City of Albuquerque, on the northeast and east by the Cibola National Forest, and on the south by Isleta Indian Reservation (Isleta Pueblo). The Albuquerque International Sunport, the City of Albuquerque’s airport, abuts Kirtland AFB’s northwestern

border and allows uses of its runways by the installation. The region surrounding Kirtland AFB includes both urban and rural areas, including generalized land uses of residential (single and multi-family), parks/recreation, and pockets of industrial/manufacturing, public/institutional (hospital and medical center), and commercial (retail and service) to the north; open space (vacant/other and low-impact recreation) to the northeast and east; open space and forest or vacant land to the south; and a mixture of open space (vacant/other and parks/recreation), transportation/utilities, and public/institutional (Zia Rifle and Pistol Club) to the west (KAFB 2002, City of Albuquerque 2008).

Several proposed developments within the City of Albuquerque pose constraints to future development at Kirtland AFB, including residential projects and improvement/extension of area roadway corridors. An approximately 13,000-acre, mixed-use, master-planned community, known as Mesa del Sol, is proposed at an area adjacent to the southwestern boundary of Kirtland AFB. In order to prevent land use incompatibility issues and avoid future conflicts from this development on the installation's operational effectiveness, it is separated by La Semilla, a 2,700-acre, 1-mile-wide nature refuge and environmental education campus that will be controlled by the U.S. Department of Energy (DOE) and have minimal structures and limited land uses (Forest City 2005). A second planned mixed-use community, Valle del Sol, is proposed for an area within Tijeras Arroyo, southwest of Kirtland AFB, in unincorporated Bernalillo County (KAFB 2002). While providing a limitation to installation expansion, the extension of Eubank Boulevard and improvement to the Gibson Boulevard corridor will also improve vehicle access and movement for Kirtland AFB employees (KAFB 2002).

On-Installation Land Use. Kirtland AFB consists of approximately 52,000 acres, making it the third largest installation in the AFMC, and the sixth largest installation in the USAF (KAFB 2002). The 377 ABW is the host organization at Kirtland AFB and provides installation operations support to more than 100 Mission Partners in more than 2,000 buildings (KAFB 2002, KAFB 2007a). The land at Kirtland AFB is primarily owned by the USAF, but several other ownerships and leases also apply. The DOE occupies the largest amount of land area of any associate units at Kirtland AFB. The DOE owns and operates facilities on approximately 7,500 acres, primarily in the eastern portion of the cantonment area, and the southwestern and northeastern portion of the installation.

The most heavily developed area of Kirtland AFB is the cantonment area in the northwestern portion of the installation. The cantonment area is commonly referred to in terms of its east or west sides; the west side is the site of the original Kirtland AFB while the east side included Sandia and Manzano Bases. Recent installation planning and infrastructure efforts have focused on unifying the formerly segregated western and eastern portions of the cantonment area into a more unified installation (KAFB 2002).

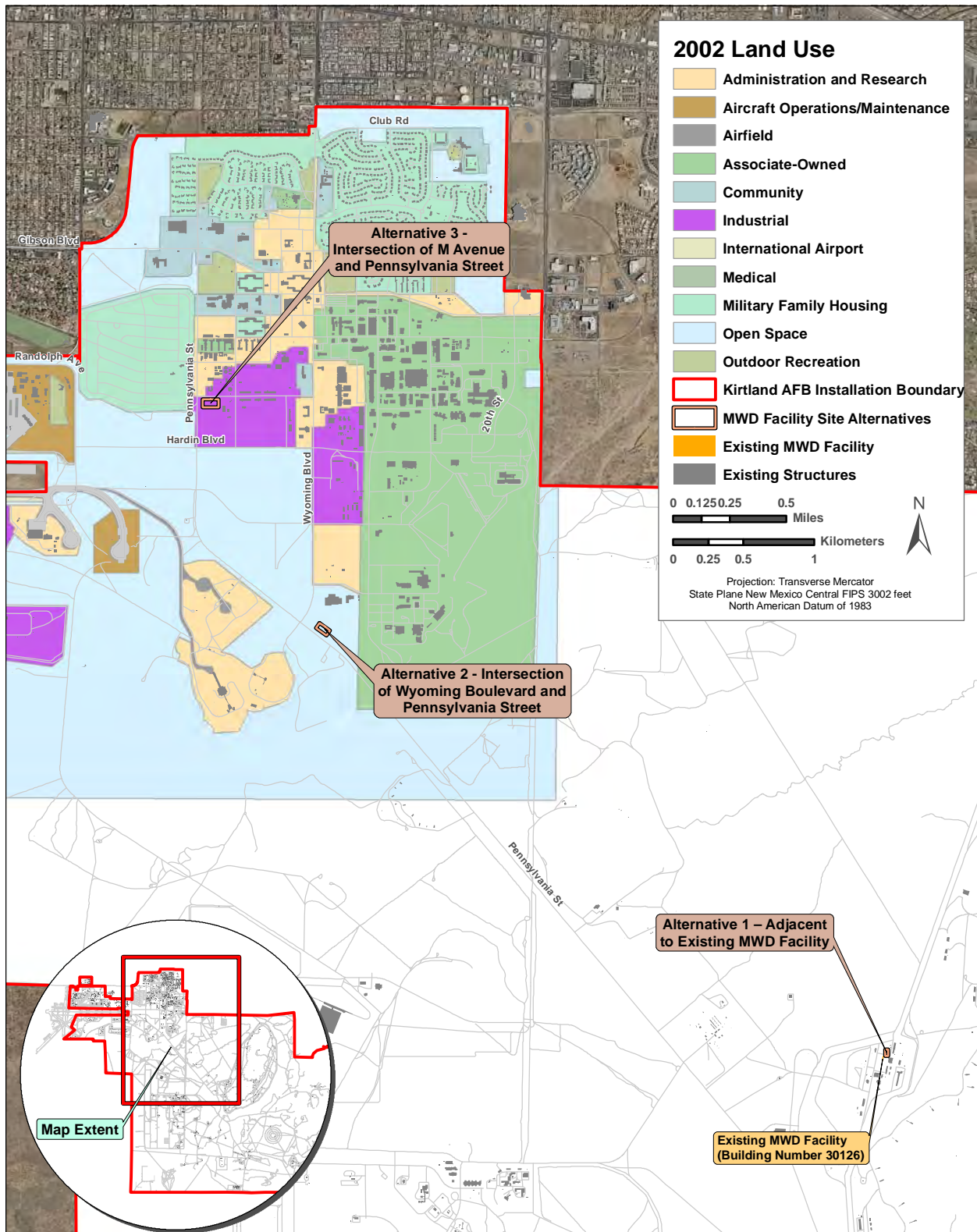
Airfield operations and aircraft support facilities are concentrated in the airfield complex area, which is in the western portion of the cantonment area adjacent to and surrounding the Albuquerque International Sunport and its runways. Several associate organizations, including the Air Force Research Laboratory, the New Mexico Air National Guard, the Space and Missiles Systems Center/Test and Evaluation, and the 58th Special Operations Wing, are also in this area. In addition, there are two housing areas in the western cantonment area along the northern border of the installation. The remaining intensive development at Kirtland AFB, including administrative, housing, medical, recreation, and commercial services uses, is in the eastern portion of the cantonment area. A majority of the 377 ABW's buildings are in this area, as well as the facilities of other major associate organizations, including Sandia National Laboratories, the DOE Albuquerque Office, the Air Force Operational Test and Evaluation Center, the Defense Threat Reduction Agency, and the Air Force Safety Center. Most military family housing and their associated community uses are at the northeastern border of the cantonment area, adjacent to existing off-installation neighborhoods.

The southern and western portions of Kirtland AFB, which represent approximately 80 percent of the installation's total land area, are largely dedicated to military training and operational facilities. Some facilities in these areas of Kirtland AFB include the Star Fire Optical Range, High Energy Research Test Facility, and the Lovelace Respiratory Research Institute. Sandia National Laboratories also operates and maintains several facilities on the installation for research, testing, and evaluation of various weapons, communications, and energy systems. While most recreational facilities are in the cantonment area, the golf course is in the southwestern portion of the installation. No outdoor recreation is permitted in the eastern portion of the installation (KAFB 2007a).

Kirtland AFB has 10 land use designations: Aircraft Operations/Maintenance, Airfield, Administration and Research, Community (includes commercial and service functions), Military Family Housing, Industrial, Medical, Outdoor Recreation, Open Space, and Associate-Owned (see **Figure 3-1**) (KAFB 2002). The installation is a closed base; therefore, hunting, trapping, fishing, and commercial forestry operations are prohibited (KAFB 2007a). In the Kirtland AFB Future Land Use Plan, presented in the *2002 Kirtland Air Force Base General Plan*, land use zones have been established to guide the type and location of development at the installation. Future land use plans include the following general land use recommendations:

- Expand and concentrate Airfield uses along the flightline. Industrial and Aircraft Operations/Maintenance land uses would also be appropriate along or near the flightline.
- Concentrate Administration and Research land uses in the western portion of the cantonment area (surrounding the Air Force Research Laboratory campus) and in the eastern portion of the cantonment area (north of Sandia National Laboratories and DOE).
- Concentrate Community land uses in the northeastern portion of the cantonment area, adjacent to Administration and Research land uses, with the intention of creating a mixed-use "town site" that would become the functional and symbolic center of the installation.
- Privatize existing housing inventory and associated improvements with the intention of removing west side housing areas and consolidating military family housing in the eastern portion of the cantonment area. Consolidation and migration of the housing areas could be accompanied by the consolidation of Community uses.
- Implement several transportation-related projects, including establishment of a new arterial between the western and eastern portions of the cantonment area, extension of Eubank Boulevard onto the installation, and construction of a new entry gate on Eubank Boulevard, to improve circulation (KAFB 2002).

Site Alternative 1 is south of the cantonment area, approximately 4.5 miles southeast of the Albuquerque International Sunport. Site Alternative 1 would be north of the existing MWD facility in an undeveloped parcel with parking lots or roadways to the north, west, and east. Site Alternative 2 is in the southern portion of the cantonment area, approximately 0.15 miles southeast of the intersection of Wyoming Boulevard and Pennsylvania Street. The location of Site Alternative 2 was historically used as a skeet shooting range and is currently undeveloped. Site Alternative 3 would be within the eastern portion of the cantonment area, and currently consists of undeveloped land. Site Alternative 3 is surrounded by other land uses, including Pennsylvania Street to the west, and M Avenue and administrative buildings to the north, several structures and a parking lot to the east, and undeveloped land to the south. Undeveloped land also stretches farther to the west (former site of Zia Park housing) and to the south.



Source of Land Use: Kirtland AFB General Plan 2002

Figure 3-1. Land Use Map for Proposed Action and Alternatives

The current land use designations of Site Alternatives 2 and 3 are Open Space and Industrial, respectively. It is likely that the current land use designation of Site Alternative 1 is Administration and Research due to its presence within a developed area with several structures and paved roadways, although the *2002 Kirtland Air Force Base General Plan* does not identify land uses south of the cantonment area (KAFB 2002). The future land use designation of Site Alternative 2 is Administration and Research, and the future land use plan identifies the general vicinity of Site Alternative 3 as “New Industrial Development” (KAFB 2002).

Site Alternatives 1 and 2 are outside of the 65 dBA DNL noise contour (i.e., noise level of less than 65 dBA DNL) of the Albuquerque International Sunport; however, Site Alternative 3 is within the 65 to 69 dBA DNL noise zone (see **Figure 2-1**). See **Section 3.2** for more information on noise at Kirtland AFB.

Site Alternative 2 is within an explosives quantity-distance (QD) clear zone, or arc, which is an area surrounding a potential explosion site that is defined by explosive limits of the potential explosion site (KAFB 2002). See **Section 3.11** for more information on safety issues at Kirtland AFB.

3.2 Noise

3.2.1 Definition of the Resource

Sound is defined as a particular auditory effect produced by a given source, for example the sound of rain on a rooftop. Sound is measured with instruments that record instantaneous sound levels in decibels. Sound levels that can be sensed by the human ear are characterized by dBA. “A-weighted” denotes the adjustment of the frequency range to what the average human ear can sense when experiencing an audible event.

Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory effect. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. How an individual responds to the sound source will determine if the sound is viewed as music to one’s ears or as annoying noise. Affected receptors are specific (e.g., schools, churches, or hospitals) or broad (e.g., nature preserves or designated districts) areas in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise Metrics and Regulations. Sound levels, resulting from multiple single events, are used to characterize community noise impacts from aircraft or vehicle activity and are measured in DNL. The DNL noise metric incorporates a “penalty” for evening and nighttime noise events to account for increased annoyance. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10-dBA penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging single event values for a given 24-hour period. DNL is the preferred sound level metric used to characterize noise impacts of the Federal Aviation Administration (FAA), U.S. Department of Housing and Urban Development (HUD), U.S. Environmental Protection Agency (USEPA), and DOD for modeling airport environments.

DNL is the metric recognized by the U.S. government for measuring noise and its impacts on humans. According to the USAF, the FAA, and the HUD criteria, residential units and other noise-sensitive land uses are “clearly unacceptable” in areas where the noise exposure exceeds 75 dBA DNL, “normally

unacceptable” in regions exposed to noise between 65 dBA and 75 dBA DNL, and “normally acceptable” in areas exposed to noise of 65 dBA DNL or under. The Federal Interagency Committee on Noise developed land use compatibility guidelines for noise in terms of DNL sound levels (FICON 1992). For outdoor activities, the USEPA recommends a sound level of 55 dBA DNL as the sound level below which there is no reason to suspect that the general population would be at risk from any of the impacts of noise (USEPA 1974).

Noise levels vary depending on the population density and proximity to land uses such as parks, schools, or industrial facilities. As shown in **Table 3-1**, noise levels in a suburban residential area are 55 dBA DNL, which increases to 60 dBA DNL for an urban residential area, and to 80 dBA DNL in the downtown section of a city (FHWA 1980).

Table 3-1. Typical Outdoor Noise Levels

DNL (dBA)	Location
50	Residential area in a small town or quiet suburban area
55	Suburban residential area
60	Urban residential area
65	Noisy urban residential area
70	Very noisy urban residential area
80	City noise (downtown of major metropolitan area)
88	3rd floor apartment in a major city next to a freeway

Source: FHWA 1980

Most people are exposed to sound levels of 50 to 55 dBA DNL or higher on a daily basis. Studies specifically conducted to determine noise impacts on various human activities show that about 90 percent of the population is not significantly bothered by outdoor sound levels below 65 dBA DNL (FICON 1992). Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with effect assessments and that there is a consistent relationship between DNL and the level of annoyance.

Construction and Demolition Sound Levels. Building construction and demolition work can cause an increase in sound that is well above the ambient level. A variety of sounds are emitted from graders, loaders, trucks, pavers, and other work activities and processes. **Table 3-2** lists noise levels associated with common types of construction equipment. Construction and demolition equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.

Table 3-2. Predicted Noise Levels for Construction and Demolition Equipment

Construction Category and Equipment	Predicted Noise Level at 50 Feet
Bulldozer	80 dBA
Dump Truck	83–94 dBA
Backhoe	72–93 dBA
Front-End Loaders	72–82 dBA
Pavers	87–88 dBA

Source: USEPA 1971

3.2.2 Existing Conditions

Ambient Noise Environment. The ambient noise environment at Kirtland AFB is affected mainly by USAF and civilian aircraft operations and military vehicles. The commercial and military aircraft operations at Albuquerque International Sunport are the primary source of noise at the installation.

Noise from aircraft operations is present throughout the northwestern portion of Kirtland AFB as a result of operations at the Albuquerque International Sunport. The 65 to 80+ dBA DNL noise contours from aircraft operations at Albuquerque International Sunport were plotted on a map (see **Figure 2-1**). The plotted contours from aircraft operations extend along the runways to the east, west, and southwest. The 65 to 70 dBA DNL noise contours encompass the site of the proposed building for Site Alternative 3 (see **Figure 2-1**). Although the proposed Site Alternative 1 and Site Alternative 2 locations are outside of the noise contours from aircraft operations at the Albuquerque International Sunport, elevated noise levels from intermittent aircraft flyovers likely dominate the noise environment.

Vehicle use associated with military operations at Kirtland AFB consists of passenger vehicles, delivery trucks, and military off- and on-road vehicles. Passenger vehicles compose most of the vehicles present at Kirtland AFB and the surrounding community roadways. Traffic from installation personnel are a contributing source to the ambient sound environment around the proposed Site Alternative 1 and Site Alternative 2 locations. Contributors include vehicles traveling along Pennsylvania Street and the other roadways within the installation boundary. The cumulative ambient sound environment of Site Alternative 1 and Site Alternative 2 is likely comparable to a suburban residential area.

3.3 Visual Resources

3.3.1 Definition of the Resource

Visual resources include the natural and man-made physical features that give a particular landscape its character and that influence the visual appeal of an area for residents and visitors. The features that form the overall visual impression a viewer receives include landforms, vegetation, water, color, adjacent scenery, scarcity, and man-made modifications. Resources such as designated scenic rivers, roads, recreational areas, or other public lands create important visual aesthetic features for the public. In general, a feature observed within a landscape can be considered as “characteristic” (or character defining) if it is inherent to the composition and function of the landscape. Landscapes do change over time, so the assessment of the environmental impacts of a proposed action on a given landscape area must be made relative to the “characteristic” features currently composing the landscape or area.

3.3.2 Existing Conditions

Military and civilian airfields compose much of the visual environment of Kirtland AFB. The prominent visual features of the installation include hangars, maintenance and support facilities, and aircraft. Off installation, the visual environment varies from urban to rangeland to forest. To the north and west of Kirtland AFB are urban areas of the City of Albuquerque; to the northeast and east open spaces, forests, and rangeland are the prominent visual features; and south of Kirtland AFB are Isleta Pueblo lands, which are generally open space, forests, or vacant land (KAFB 2003).

Site Alternative 1 is near the intersection of Barrack Road and Manzano Road. Currently, the site is mostly undeveloped but does contain a fire hydrant, aboveground storage tank, and electric utility wires. It is approximately 4.6 miles southeast of the nearest Albuquerque International Sunport runway and is away from the urbanized, busy areas of Kirtland AFB. The most prominent visual features in the area of

Site Alternative 1 are the existing MWD facility and obedience course, which are immediately to the south; the Enlisted Men's Barracks, or the Manzano Dormitory building, approximately 330 feet southwest of Site Alternative 1; and the mountainscape in the background. See **Section 3.8.2.2** for more information regarding the Enlisted Men's Barracks. **Photograph C4** in **Appendix C** shows the current visual conditions at Site Alternative 1. **Photographs C1** and **C2** show the current visual conditions of the existing MWD facility, and **Photograph C3** shows the current visual conditions at the existing MWD obedience course.

Site Alternative 2 is in the southern portion of the Kirtland AFB cantonment area near the intersection of Wyoming Boulevard and Pennsylvania Street. This site is generally undeveloped. The site is approximately 1.7 miles southeast of the nearest Albuquerque International Sunport runway and is in a more developed portion of the installation than Site Alternative 1. No prominent visual features are in the area of Site Alternative 2. **Photograph C5** in **Appendix C** shows the current visual conditions at Site Alternative 2.

Site Alternative 3 is inside of the cantonment area at the southeastern corner of the intersection of M Avenue and Pennsylvania Street. Site Alternative 3 is approximately 0.9 miles east of the nearest Albuquerque International Sunport runway and is undeveloped. No prominent visual features are in the area of Site Alternative 3; however, the area surrounding Site Alternative 3 is more developed than that of Site Alternative 1 and Site Alternative 2. **Photograph C7** in **Appendix C** shows the current visual conditions at Site Alternative 3.

3.4 Air Quality

3.4.1 Definition of the Resource

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm), milligrams per cubic meter (mg/m^3), or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). The air quality in a region is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

The CAA directed the USEPA to develop, implement, and enforce strong environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, USEPA developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to impact human health and the environment. USEPA established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$\text{PM}_{2.5}$]), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources along with maintaining visibility standards. **Table 3-3** presents the primary and secondary USEPA NAAQS.

Although O_3 is considered a criteria air pollutant and is measurable in the atmosphere, it is not often considered a regulated air pollutant when calculating emissions because O_3 is typically not emitted directly from most emissions sources. Ozone is formed in the atmosphere by photochemical reactions

Table 3-3. National Ambient Air Quality Standards

Pollutant	Averaging Time	National Standard	
		Primary	Secondary
O ₃	1 Hour ^a	0.12 ppm	Same as Primary Standard
	8 Hours ^b	0.08 ppm (157 µg/m ³)	
	8 Hours	0.075 ppm ^g	
PM ₁₀	24 Hours ^c	150 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean ^d	----	
PM _{2.5}	24 Hours ^e	35 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean ^f	15 µg/m ³	
CO	8 Hours ^c	9.0 ppm (10 mg/m ³)	None
	1 Hour ^c	35 ppm (40 mg/m ³)	
NO ₂	Annual Arithmetic Mean	0.053 ppm (100 µg/m ³)	Same as Primary Standard
	1 Hour ^h	0.053 ppm (100 µg/m ³)	0.053 ppm (100 µg/m ³)
SO ₂	Annual Arithmetic Mean	0.03 ppm (80 µg/m ³)	0.5 ppm (1,300 µg/m ³), 3-Hour averaging time
	24 Hours ^c	0.14 ppm (365 µg/m ³)	
Pb	Quarterly Average	1.5 µg/m ³	Same as Primary Standard

Source: USEPA 2009a

Notes: Parenthetical values are approximate equivalent concentrations.

- a. (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1. (b) As of June 15, 2005, USEPA revoked the 1-hour ozone standard in all areas except the 14 8-hour ozone nonattainment Early Action Compact Areas.
- b. (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm. (b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
- c. Not to be exceeded more than once per year.
- d. To attain this standard, the expected annual arithmetic mean PM₁₀ concentration at each monitor within an area must not exceed 50 µg/m³.
- e. To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³.
- f. To attain this standard, the 3-year average of the annual arithmetic mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.
- g. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)
- h. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).

involving sunlight and previously emitted pollutants or “O₃ precursors.” These O₃ precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emissions sources. For this reason, regulatory agencies attempt to limit atmospheric O₃ concentrations by controlling VOC pollutants (also identified as reactive organic gases) and NO₂.

As authorized by the CAA, USEPA has delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air

quality levels. These programs are detailed in State Implementation Plans (SIPs) that must be developed by each state or local regulatory agency and approved by USEPA. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS. Any changes to the compliance schedule or plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved by USEPA.

In 1997, USEPA initiated work on new General Conformity rules and guidance to reflect the new 8-hour O₃, PM_{2.5}, and regional haze standards that were promulgated in that year. The 1-hour O₃ standard will no longer apply to an area 1 year after the effective date of the designation of that area for the 8-hour O₃ NAAQS. The effective designation date for most areas was June 15, 2004. USEPA designated PM_{2.5} nonattainment areas in December 2004, and finalized the PM_{2.5} implementation rule in January 2005.

On September 22, 2009, the USEPA issued a final rule for mandatory greenhouse gas (GHG) reporting from large GHG emissions sources in the United States. The purpose of the rule is to collect comprehensive and accurate data on carbon dioxide (CO₂) and other GHG emissions that can be used to inform future policy decisions. In general, the threshold for reporting is 25,000 metric tons or more of CO₂ equivalent per year. The first emissions report is due in 2011 for 2010 emissions. Although GHGs are not currently regulated under the CAA, the USEPA has clearly indicated that GHG emissions and climate change are issues that need to be considered in future planning. GHGs are produced by the burning of fossil fuels and through industrial and biological processes.

Title V of the CAA Amendments of 1990 requires states and local agencies to permit major stationary sources. A major stationary source is a facility (i.e., plant, installation, or activity) that has the potential to emit more than 100 tons per year (tpy) of any one criteria air pollutant, 10 tpy of a hazardous air pollutant, or 25 tpy of any combination of hazardous air pollutants.

Federal Prevention of Significant Deterioration (PSD) regulations also define air pollutant emissions from proposed major stationary sources or modifications to be “significant” if (1) a proposed project is within 10 kilometers of any Class I area, and (2) regulated pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 µg/m³ or more [40 CFR 52.21(b)(23)(iii)]. PSD regulations also define ambient air increments, limiting the allowable increases to any area’s baseline air contaminant concentrations, based on the area’s designation as Class I, II, or III [40 CFR 52.21(c)]. Because Kirtland AFB is not within 10 kilometers of a Class I area, PSD regulations do not apply and are not discussed further in this EA.

3.4.2 Existing Conditions

Kirtland AFB is located in Bernalillo County, which is within the Albuquerque-Mid Rio Grande Intrastate (AMRGI) Air Quality Control Region (AQCR) 152 (40 CFR 81.83). The AMRGI AQCR consists of portions of Sandoval and Valencia counties, and Bernalillo County in its entirety. The City of Albuquerque and Bernalillo County, where Kirtland AFB is located, have been designated as being in maintenance status for CO effective July 15, 1996 (USEPA 1996). Kirtland AFB is in an area that is in attainment for all other criteria pollutants.

The most recent emissions inventories for Bernalillo County and the AMRGI AQCR are shown in **Table 3-4**. Bernalillo County is considered the local area of influence, and the AMRGI AQCR is considered the regional area of influence for the air quality analysis.

The U.S. Department of Energy, Energy Information Administration states that in 2007, gross CO₂ emissions in New Mexico were 59.2 million metric tons (EIA 2010).

Table 3-4. Local and Regional Air Emissions Inventory for 2002

Location	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)
Bernalillo County, New Mexico	24,930	24,310	185,250	1,568	61,892	8,183
AMRGI AQCR	36,778	31,651	245,346	2,619	137,376	16,676

Source: USEPA 2009b

The Albuquerque-Bernalillo County Air Quality Control Board (AQCB) is the air pollution control authority for Bernalillo County while the Albuquerque Environmental Health Department Air Quality Division handles air quality management functions. There are various sources on the installation that emit criteria and hazardous air pollutants, including emergency generators, boilers, hot water heaters, fuel storage tanks, gasoline service stations, surface coating, aircraft engine testing, and miscellaneous chemical usage. As required by the Albuquerque-Bernalillo County AQCB regulations, Kirtland AFB estimates annual emissions from stationary sources and provides this information to the Albuquerque Environmental Health Department Air Quality Division. **Table 3-5** summarizes the calendar year 2008 air emissions inventory for Kirtland AFB.

Table 3-5. Calendar Year 2008 Air Emissions Inventory for Kirtland AFB

	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)
2008 Actual Emissions	12.8	60.0	13.0	1.1	8.1

Source: KAFB 2009a

The Albuquerque Environmental Health Department Air Quality Division has fugitive dust control requirements in 20.11.20 New Mexico Administrative Code (NMAC) *Fugitive Dust Control*. A fugitive dust-control construction permit is required for projects disturbing 0.75 acres or more and the demolition of buildings containing more than 75,000 cubic feet of space. As stated in 20.11.20.12 NMAC *General Provisions*, each person shall use reasonably available control measures or any other effective control measure during active operations or on inactive disturbed surface areas, as necessary, to prevent the release of fugitive dust, whether or not the person is required by 20.11.20 NMAC to obtain a fugitive dust-control permit. This regulation also contains a provision for buildings containing asbestos-containing material (ACM) as stated in 20.11.20.22 NMAC *Demolition and Renovation Activities; Fugitive Dust Control Construction Permit and Asbestos Notification Requirements*: “All demolition and renovation activities shall employ reasonably available control measures at all times, and, when removing ACM, shall also comply with the federal standards incorporated in 20.11.64 NMAC, *Emission Standards for Hazardous Air Pollutants for Stationary Sources*. A person who demolishes or renovates any commercial building, residential building containing five or more dwellings, or a residential structure that will be demolished in order to build a nonresidential structure or building shall file an asbestos notification with the department no fewer than 10 calendar days before the start of such activity. Written asbestos notification certifying to the presence of ACM is required even if regulated ACM is not or may not be present in such buildings or structures.”

3.5 Geology and Soils

3.5.1 Definition of the Resource

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography and physiography, geology, soils, and, where applicable, geologic hazards and paleontology. Topography and physiography pertain to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features. Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

Prime farmland is protected under the Farmland Protection Policy Act (FPPA) of 1981. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The soil qualities, growing season, and moisture supply are needed for a well-managed soil to produce a sustained high yield of crops in an economic manner. The land could be cropland, pasture, rangeland, or other land, but not urban developed land or water. The intent of the FPPA is to minimize the extent that Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. The Act also ensures that Federal programs are administered in a manner that, to the extent practicable, will be compatible with private, state, and local government programs and policies to protect farmland.

The implementing procedures of the FPPA and Natural Resources Conservation Service (NRCS) require Federal agencies to evaluate the adverse impacts (direct and indirect) of their activities on prime and unique farmland, and farmland of statewide and local importance, and to consider alternative actions that could avoid adverse impacts. Determination of whether an area is considered prime or unique farmland and potential impacts associated with a proposed action is based on preparation of the farmland conversion impact rating form AD-1006 for areas where prime farmland soils occur and by applying criteria established at Section 658.5 of the FPPA (7 CFR 658). The NRCS is responsible for overseeing compliance with the FPPA and has developed the rules and regulations for implementation of the Act (see 7 CFR Part 658, 5 July 1984).

3.5.2 Existing Conditions

Regional Geology. Albuquerque and Kirtland AFB are near the junction of five physiographic provinces: the Colorado Plateau, the Basin and Range, the Southern Rocky Mountains, the Rio Grande rift, and the Great Plains (Grant 1981). Kirtland AFB is located in the eastern margin of the Albuquerque Basin, a major feature of the Rio Grande rift. The Rio Grande rift is approximately 620 miles long and is bordered on the west by the Colorado Plateau and on the east by the Great Plains. The Albuquerque Basin is north-trending and is approximately 90 miles long and 31 miles wide. It extends from near the Rio Grande to the foothills of the Sandia and Manzanita mountains (KAFB 2007a). The Albuquerque Basin is defined to the south by the Socorro Channel, to the north by the Nacimiento Uplift, to the west by the Puerco Plateau and Lucero Uplift, and to the east by the Sandia and Manzanita mountains. Its widest point is near Kirtland AFB and it tapers off gradually towards its north and south ends. The basin

was deepened and local mountain ranges were tilted by large-scale faulting that occurred approximately 11.2 to 5.3 million years ago. Geologic formations found within Kirtland AFB range in age from Precambrian granites to present-day windblown sands.

Topography. Most of Kirtland AFB is situated on a relatively flat mesa. This mesa is cut by the east-west trending Tijeras Arroyo, which drains into the Rio Grande. Elevations at Kirtland AFB range from 5,200 feet in the west to almost 8,000 feet in the Manzanita Mountains. In addition, five canyons (i.e., Lurance, Sol se Mete, Bonito, Otero, and Madera) are located on Kirtland AFB.

Soils. Most of the Albuquerque Basin consists of poorly consolidated sediments that eroded from the surrounding mountains. These sediments, known as the Santa Fe Group, are overlain in places by the 5.3- to 1.6-million-year-old Ortiz gravel deposits. Rio Grande soil types and volcanic deposits are also interspersed. The dominant soils of the Albuquerque Basin are well drained and loamy, with minor amounts of gravelly and stony soils also found along the mountains and arroyos. Twenty-five soil types have been identified on Kirtland AFB. Of these 25 soil types, 3 are found at the site alternatives proposed for the MWD facility (see **Figures 3-2, 3-3, and 3-4**). Embudo gravelly fine sandy loam and Tijeras gravelly fine sandy loam are found at Site Alternative 1 and at the existing MWD facility; Wink fine sandy loam is found at Site Alternative 2; and Embudo gravelly fine sandy loam is found at Site Alternative 3. **Table 3-6** provides general characteristics and limitations associated with the soils mapped within the alternative sites.

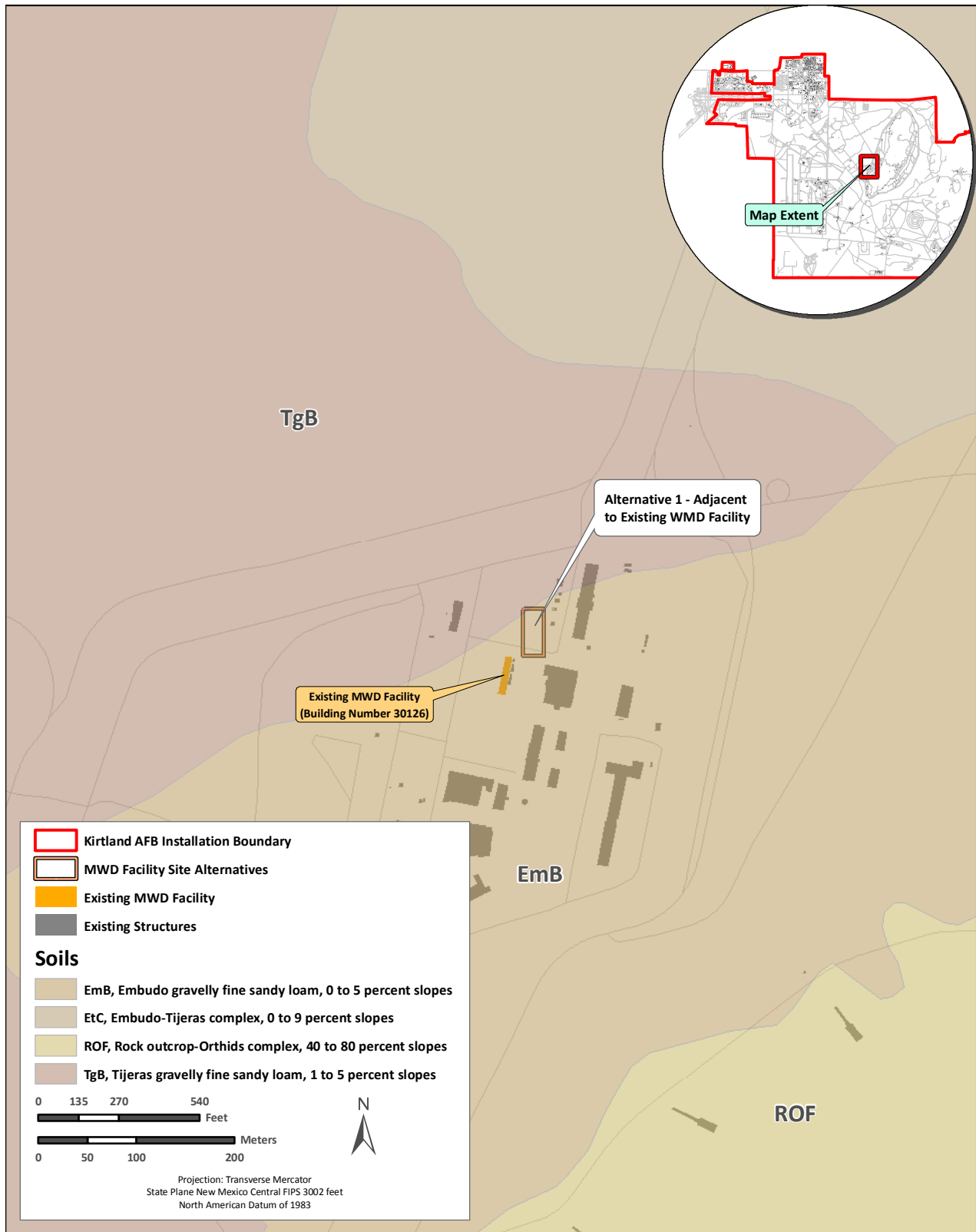
Table 3-6. Soil Properties of the Mapped Soil Type found at the Project Site

Map Unit Name	Slope (percent)	Farmland Classification	Drainage	Road Limitations	Building Limitations	Excavation Limitations
Embudo gravelly fine sandy loam	0 to 5	Not prime farmland soil	Well-drained	Somewhat limited	Very limited	Very limited
Wink fine sandy loam	0 to 5	Not prime farmland soil	Well-drained	Not limited	Not limited	Somewhat limited
Tijeras gravelly fine sandy loam	1 to 5	Not prime farmland soil	Well-drained	Not limited	Not limited	Very limited

Source: NRCS 2010

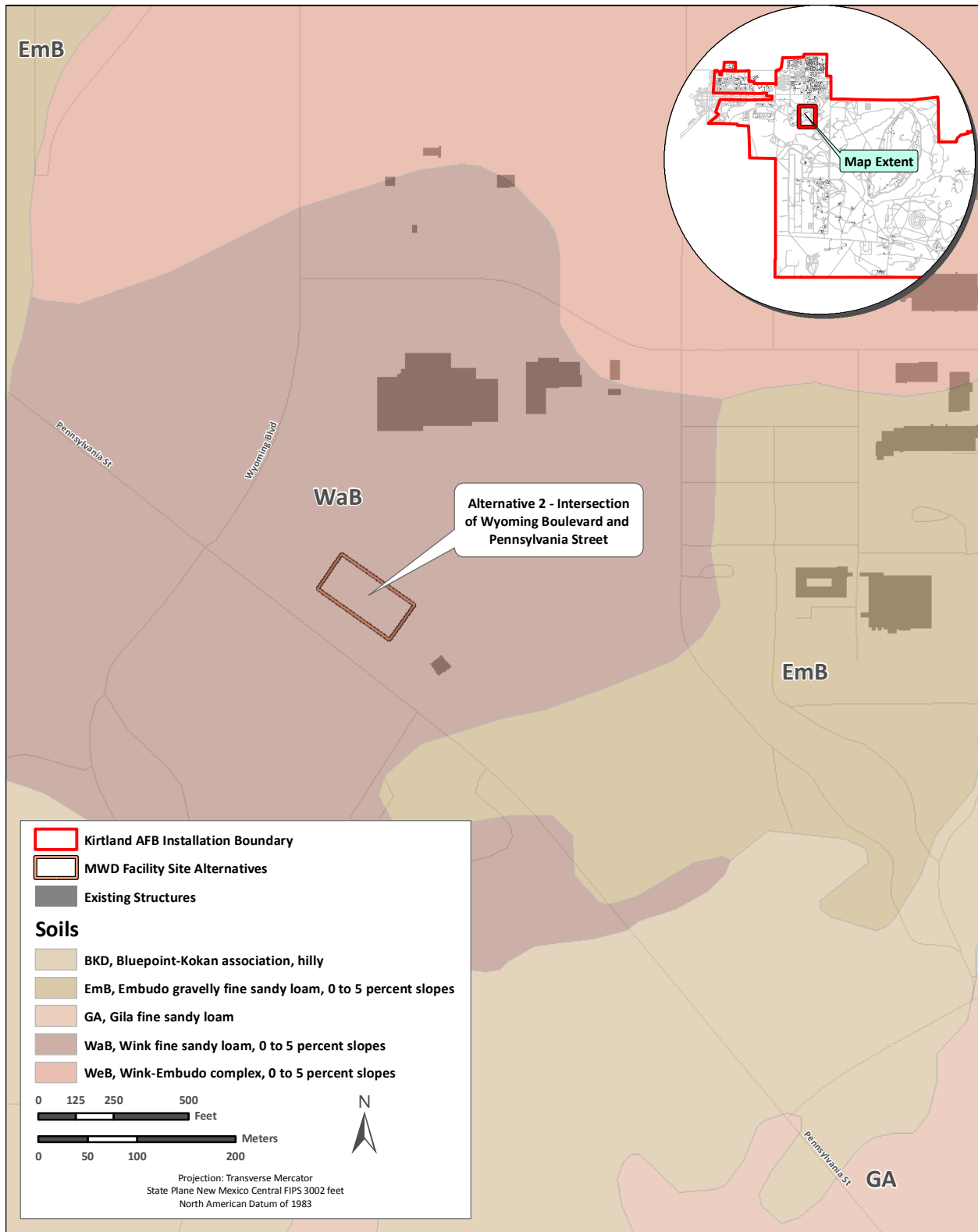
Prime Farmland. Of the 25 soil types mapped at Kirtland AFB, none are considered prime farmland soils or farmland soils of statewide importance (NRCS 2010). Kirtland AFB is not currently used for agricultural purposes, nor is any agricultural use planned for the future.

Geologic Hazards. Geologic hazards are defined as a natural geologic event that can endanger human lives and threaten property. This includes earthquakes, landslides, sinkholes, tsunamis, and volcanoes. In Albuquerque, the primary geologic hazard that could potentially endanger lives or threaten property is earthquakes. The Albuquerque area is characterized by a series of faults on the east side of the Sandia and Manzano mountains. Movement on these faults has not occurred within the past 10,000 years; however, the Albuquerque area in general has a history of relatively frequent, but low magnitude and intensity, earthquakes (KAFB 1997b). The U.S. Geological Survey has produced seismic hazards maps based on current information about the rate at which earthquakes occur in different areas and on how far strong shaking extends from the quake source. The hazard maps show the levels of horizontal shaking that have a 2 in 100 chance of being exceeded in a 50-year period. Shaking is expressed as a percentage of the force of gravity (percent g) and is proportional to the hazard faced by a particular type of building.



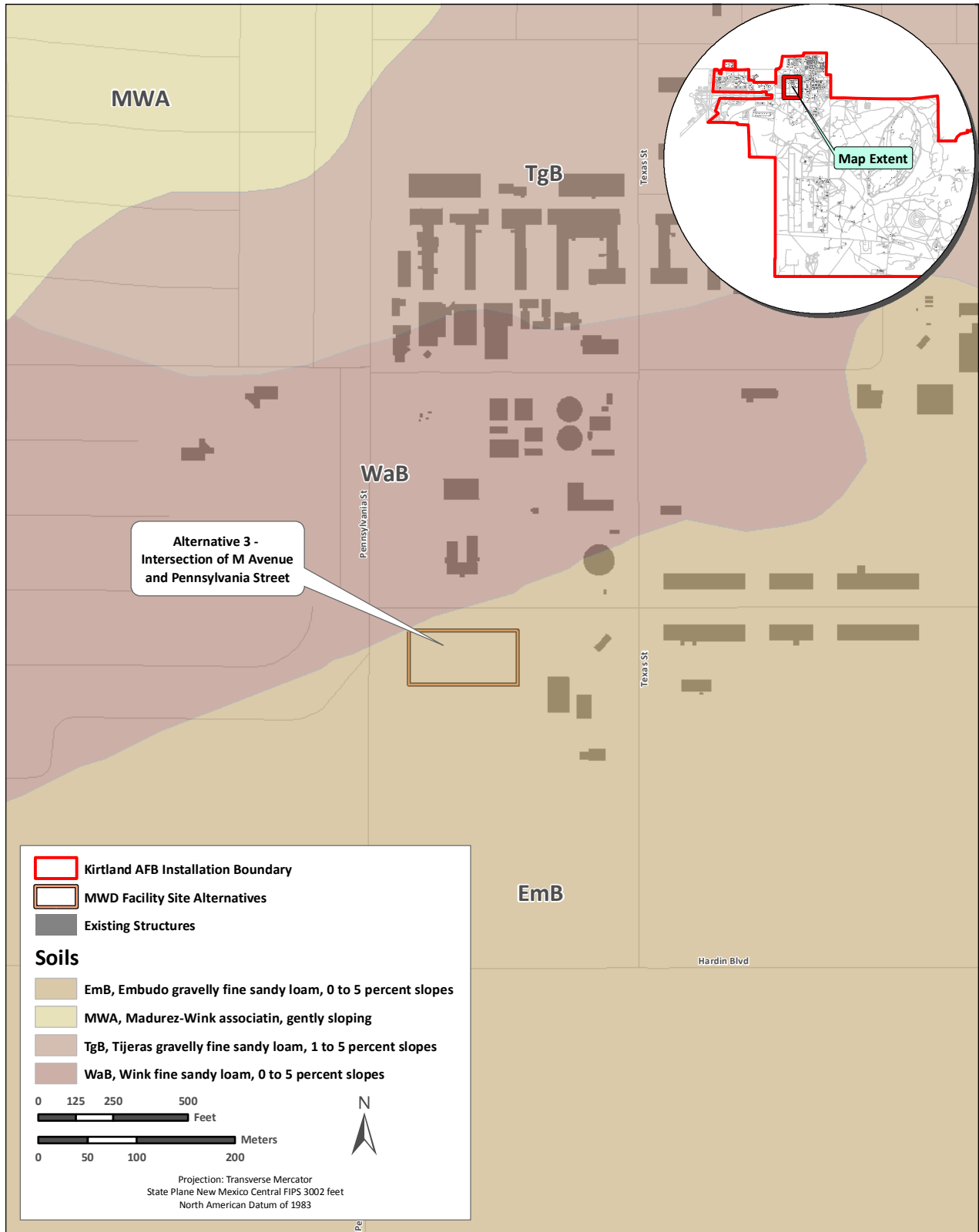
Source of Noise Zones: Kirtland AFB 10/2009

Figure 3-2. Mapped Soil Units at Site Alternative 1



Source of Noise Zones: Kirtland AFB 10/2009

Figure 3-3. Mapped Soil Units at Site Alternative 2



Source of Noise Zones: Kirtland AFB 10/2009

Figure 3-4. Mapped Soil Units at Site Alternative 3

In general, little or no damage is expected at values less than 10 percent g, moderate damage could occur at 10 to 20 percent g, and major damage could occur at values greater than 20 percent g. The region of Kirtland AFB has a seismic hazard rating of approximately 16 to 20 percent g (USGS 2009).

3.6 Water Resources

3.6.1 Definition of the Resource

Water resources include groundwater, surface water, and floodplains. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes. Groundwater consists of subsurface hydrologic resources. It is an essential resource that functions to recharge surface water and is often used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater typically can be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. The Clean Water Act (CWA) (33 U.S.C. 1251 et seq., as amended) establishes Federal limits, through the National Pollutant Discharge Elimination System (NPDES), on the amounts of specific pollutants that are discharged to surface waters in order to restore and maintain the chemical, physical, and biological integrity of the water. The NPDES program regulates the discharge of point (end of pipe) and nonpoint (storm water) sources of water pollution. Section 404 of the CWA regulates the discharge of dredge or fill material into waters of the United States, which includes wetlands. Waters of the United States are defined within the CWA, as amended, and jurisdiction is addressed by the USEPA and the USACE. See **Section 3.7.1** for further details regarding jurisdiction by these agencies and wetlands, a subset of waters of the United States.

Storm water is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade surface waters. Proper management of storm water flows, which can be intensified by high proportions of impervious surfaces associated with buildings, roads, and parking lots, is important to the management of surface water quality and natural flow characteristics. Prolonged increases in storm water volume and velocity associated with development and increased impervious surfaces has potential to impact adjacent streams as a result of stream bank erosion and channel widening or down cutting associated with the adjustment of the stream to the change in flow characteristics. Storm water management systems are typically designed to contain runoff onsite during construction and to maintain predevelopment storm water flow characteristics following development, through either the application of infiltration or retention practices. Failure to size storm water systems appropriately to hold or delay conveyance of the largest predicted precipitation event often leads to downstream flooding and the environmental and economic damages associated with flooding.

In 2010, the USEPA issued a Final Rule for the CWA concerning technology-based Effluent Limitations Guidelines and New Source Performance Standards for the Construction and Development point source category. All NPDES storm water permits issued by the USEPA or states must incorporate requirements established in the Final Rule. As of February 1, 2010, all new construction (or demolition) sites that disturb one or more acres of land are required to meet the non-numeric effluent limitations and effective erosion and sedimentation controls must be designed, installed, and maintained. These include the following:

- Control storm water volume and velocity to minimize erosion
- Control storm water discharges including both peak flow rates and total storm water volume

- Minimize the amount of soil exposed during construction activities
- Minimize the disturbance of steep slopes
- Minimize sediment discharges from the site using controls that address factors such as the amount, frequency, intensity and duration of precipitation; the nature of resulting storm water runoff; and soil characteristics, including the range of soil particle sizes expected to be present on the site
- Provide and maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration where feasible
- Minimize erosion at outlets and downstream channel and stream bank erosion
- Minimize soil compaction and preserve topsoil where feasible.

In addition, construction site owners and operators that disturb one or more acres of land are required to use best management practices (BMPs) to ensure that soil disturbed during construction activities does not pollute nearby water bodies.

Effective August 1, 2011, construction activities disturbing a total of 20 or more acres at one time, including noncontiguous land disturbances that take place at the same time and are part of a larger common plan of development, must comply with the numeric effluent limitation for turbidity in addition to the non-numeric effluent limitations. The maximum daily turbidity limitation will be 280 nephelometric turbidity units.

Section 438 of the Energy Independence and Security Act (EISA) (42 U.S.C. Section 17094) establishes into law new storm water design requirements for Federal construction projects that disturb a footprint of greater than 5,000 square feet of land. EISA Section 438 requirements are independent of storm water requirements under the CWA. The project footprint consists of all horizontal hard surfaces and disturbed areas associated with project development. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Predevelopment hydrology shall be modeled or calculated using recognized tools and must include site-specific factors such as soil type, ground cover, and ground slope. Site design shall incorporate storm water retention and reuse technologies such as bioretention areas, permeable pavements, cisterns/recycling, and green roofs to the maximum extent technically feasible. Post-construction analyses shall be conducted to evaluate the effectiveness of the as-built storm water reduction features. As stated in a DOD memorandum dated January 19, 2010, these regulations will be incorporated into applicable DOD Unified Facilities Criteria within 6 months (DOD 2010). Additional guidance is provided in the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*.

Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters that are subject to periodic or infrequent inundation due to rain or melting snow. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, nutrient cycling, water quality maintenance, and habitat for a diversity of plants and animals. Flood potential is evaluated by the Federal Emergency Management Agency, which defines the 100-year floodplain as an area within which there is a 1 percent chance of inundation by a flood event in a given year. Risk of flooding is influenced by local topography, the frequency of precipitation events, the size of the watershed above the floodplain, and upstream development. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety. EO 11988, *Floodplain Management*, directs Federal agencies to avoid siting within floodplains unless the agency determines that there is no practicable alternative.

3.6.2 Existing Conditions

Groundwater. Kirtland AFB is within the limits of the Rio Grande Underground Water Basin, which is defined as a natural resources area and is designated as a “declared underground water basin” by New Mexico. The basin is regulated by the state as a sole source of potable water, although the Albuquerque area will be supplemented in the future with surface water diverted from the San Juan and Chama rivers to the Rio Grande (KAFB 2007a). Two aquifers, a regional aquifer and a perched aquifer, underlie Kirtland AFB. The regional aquifer is present under all of Kirtland AFB and ranges in depth from near surface to depths of 200 feet below grade surface east of the major fault zones in the eastern portion of the installation, and to depths of 350 to 500 feet below grade surface west of the fault zone. The regional aquifer is used for the installation’s water supply. The perched aquifer is limited in area, straddling Tijeras Arroyo northeast of the confluence of Tijeras Arroyo and Arroyo del Coyote, and occurs at depths of 200 to 400 feet below grade surface. The perched aquifer is a result of infiltration of water from both man-made and natural origins, with a flow direction to the southeast, and is not used for any purpose. The presence of faults has a direct bearing on the movement and occurrence of groundwater in the vicinity of Kirtland AFB. The groundwater flow direction is down basin (south), with local variations and even reversals due to groundwater pumping, specific geologic structures, or shallow influences near the Rio Grande (KAFB 2002).

Surface Water. Kirtland AFB is within the Rio Grande watershed. The Rio Grande is the major surface hydrologic feature in central New Mexico, flowing north to south through Albuquerque approximately 5 miles west of Kirtland AFB (KAFB 2007a). Water resources on Kirtland AFB reflect its dry climate. The average annual precipitation in Albuquerque is 9 inches, with half of the average annual precipitation occurring from July to October during heavy thunderstorms (KAFB 2007a). Surface water generally occurs in the form of storm water sheet flow that drains into small gullies during heavy precipitation (KAFB 2007a). Surface water generally flows across Kirtland AFB in a western direction toward the Rio Grande.

There are no natural lakes or rivers on Kirtland AFB. Six man-made ponds are located on Tijeras Golf Course. At least 12 naturally occurring springs have been found on the installation (KAFB 2007a). The two main surface water drainage channels on Kirtland AFB are Tijeras Arroyo and the smaller Arroyo del Coyote, which joins Tijeras Arroyo about 1 mile west of the Tijeras Arroyo Golf Course (see **Figure 3-5**). Tijeras Arroyo and Arroyo del Coyote are tributaries to the Rio Grande. No jurisdictional determinations (JDs) have been made for these water features. If these waters were determined to be jurisdictional waters of the United States, these arroyos would be regulated under Section 404 of the CWA (see **Sections 3.7.1** and **3.7.2.4** for more information on jurisdictional wetlands).

Both arroyos flow intermittently during heavy thunderstorms and spring snowmelt, but most of the water percolates into alluvial deposits or is lost to the atmosphere via evapotranspiration (KAFB 2002). Tijeras Arroyo, which is dry for most of the year, is the primary surface channel that drains surface water from Kirtland AFB to the Rio Grande. Precipitation reaches Tijeras Arroyo through a series of storm drains, flood canals, and small, mostly unnamed arroyos. Nearly 95 percent of the precipitation that flows through Tijeras Arroyo evaporates before it reaches the Rio Grande. The remaining 5 percent is equally divided between groundwater recharge and runoff (KAFB 2002).

Site Alternative 1 and the existing MWD facility are approximately 1 mile from Arroyo del Coyote, Site Alternative 2 is approximately 0.6 miles from Tijeras Arroyo, and Site Alternative 3 is approximately 1.5 miles from Tijeras Arroyo. Based on review of aerial photographs, several minor drainage channels appear to cross Site Alternative 1 from east to west, although the channels are not evident in the developed area where Site Alternative 1 and the existing MWD facility are situated, suggesting that this area has storm water management features in place. No clearly defined drainage channels appear to cross the areas where Site Alternatives 2 and 3 are situated.

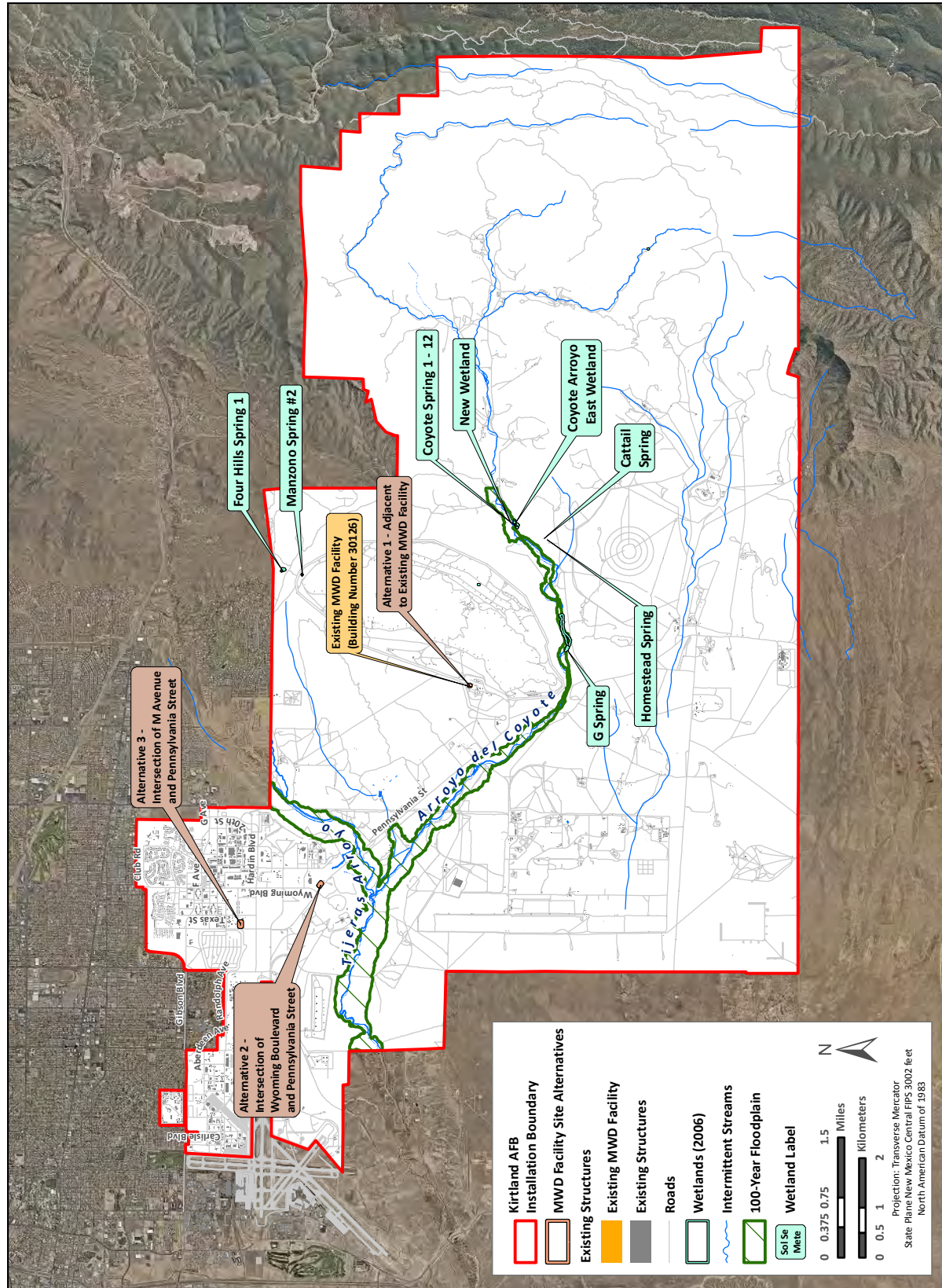


Figure 3-5. Surface Water, Floodplains, and Wetlands on Kirtland AFB

Storm water runoff on Kirtland AFB predominantly flows through the drainage patterns created by natural terrain and paved surfaces. In some areas, runoff is directed through ditches and piping, with direct discharges into a receiving stream or surface water body. Kirtland AFB has a Storm Water Municipal Separate Storm Sewer System (MS4), which collects and conveys storm water from storm drains, pipes, and ditches, and discharges storm water into Tijeras Arroyo and the City of Albuquerque's MS4. Storm water in the developed area of Kirtland AFB drains into small culverts. There are also four storm water detention ponds within the cantonment area. Storm water in the industrial/laboratory areas of Kirtland AFB discharges via surface runoff or three large culverts that drain toward the Tijeras Arroyo. Kirtland AFB has an NPDES General Storm Water Permit for industrial activities and an active program for construction projects that require an NPDES permit. Kirtland AFB must also comply with MS4 permit requirements and has developed a Storm Water Management Plan as required by the MS4 permit (KAFB 2002). When construction projects are not subject to NPDES Construction General Permit requirements due to the size of the project or waivers, the contractors must submit a list of BMPs to the Kirtland AFB water quality program that they intend to use to mitigate storm water pollutants. The list submitted by the contractor documents compliance with the Kirtland AFB MS4 permit.

Floodplains. A 100-year floodplain encompasses Tijeras Arroyo and Arroyo del Coyote (see **Figure 3-5**). These are the only two arroyos with a floodplain on the installation. Vegetation can encroach on the Tijeras Arroyo channel and obstruct the flow of water, which can cause flooding, especially during high intensity thunderstorms between May and October. Tijeras Arroyo and Arroyo del Coyote floods occur infrequently and are characterized by high peak flows, small volumes, and short durations (KAFB 2007a).

3.7 Biological Resources

3.7.1 Definition of the Resource

Biological resources include native or naturalized plants and animals and the habitats in which they occur, and native or introduced species found in landscaped or disturbed areas. Applicable laws, regulations, and policies regarding biological resources are included in **Appendix A**. Protected species are defined as those listed as threatened, endangered, or proposed or candidate for listing by the U.S. Fish and Wildlife Service (USFWS); New Mexico Energy, Minerals, and Natural Resources Department; or NMDGF. Federal species of concern are not protected by law; however, these species could become listed, and therefore are given consideration when addressing biological resource impacts of an action.

Sensitive habitats include those areas designated by the USFWS as critical habitat protected by the Endangered Species Act (ESA) and sensitive ecological areas as designated by state or Federal rulings. Sensitive habitats also include wetlands, plant communities that are unusual or of limited distribution, and important seasonal use areas for wildlife (e.g., migration routes, breeding areas, crucial summer/winter habitats).

The New Mexico Wildlife Conservation Act (New Mexico Statutes Annotated 17-2-37) authorizes the NMDGF to create a list of endangered or threatened wildlife within the state, and to take steps to protect and restore populations of species on the list. Actions causing the death of a state endangered animal are in violation of the Wildlife Conservation Act. In addition, USFWS and NMDGF maintain lists of species considered to be particularly sensitive or at risk.

Wetlands are an important natural system and habitat because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat provision, and erosion protection. Wetlands have been defined as areas that are "inundated or saturated by surface or groundwater at a

frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (USACE 1987). Wetlands are protected as a subset of “the waters of the United States” under Section 404 of the CWA. The term “waters of the United States” has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats, including wetlands. For regulatory purposes, wetlands are defined by three factors: hydrologic regime, soil characteristics, and vegetation. In addition, many states have local regulations governing wetlands and their buffer areas.

In 2006, the U.S. Supreme Court addressed the jurisdictional scope of Section 404 of the CWA, specifically the term “the waters of the United States,” in *Rapanos v. United States* and in *Carabell v. United States*. As a consequence of the associated U.S. Supreme Court decision, the USEPA and USACE, in coordination with the Office of Management and Budget and the CEQ, developed the *Clean Water Act Jurisdiction Following the U.S. Supreme Court’s Decision in Rapanos v. United States and Carabell v. United States* memorandum (USEPA and USACE 2007a). The guidance requires a greater level of documentation to support an agency JD for a particular water body. As a result of the decision, the agencies now assert jurisdiction over the following categories of water bodies: Traditional Navigable Waters (TNWs); all wetlands adjacent to TNWs; nonnavigable tributaries of TNWs that are relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally); and wetlands that directly abut such tributaries. In addition, the agencies assert jurisdiction over every water body that is not a Relatively Permanent Water if that water body is determined (on the basis of a fact-specific analysis) to have a significant nexus with a TNW. The classes of water bodies that are subject to CWA jurisdiction, only if such a significant nexus is demonstrated, are nonnavigable tributaries that do not typically flow year-round or have continuous flow at least seasonally; wetlands adjacent to such tributaries; and wetlands adjacent to but that do not directly abut a relatively permanent, nonnavigable tributary. A significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or an insubstantial impact on the chemical, physical, or biological integrity of a TNW. Principal considerations when evaluating significant nexus include the volume, duration, and frequency of the flow of water in the tributary and the proximity of the tributary to a TNW, plus the hydrologic, ecologic, and other functions performed by the tributary and all of its adjacent wetlands.

An additional memorandum regarding USEPA and USACE coordination on JDs under CWA Section 404 in light of the Solid Waste Agency of Northern Cook County and Rapanos Supreme Court Decisions was developed and signed in response to the *Rapanos* decision (USEPA and USACE 2007b). Headquarters originally required the districts to request concurrence for only those JDs where the district was considering asserting jurisdiction over a nonnavigable, intrastate, isolated water or wetland. The agencies now require that all determinations for nonnavigable, isolated waters be elevated for USACE and USEPA Headquarters review prior to the district making a final decision on the JD.

3.7.2 Existing Conditions

Kirtland AFB lies at the intersection of four major North American physiographic and biotic provinces: the Great Plains, Great Basin, Rocky Mountains, and Chihuahuan Desert. Vegetation and wildlife found within Kirtland AFB are influenced by each of these provinces, the Great Basin being the most dominant. Elevations at Kirtland AFB range from approximately 5,000 feet in the west to almost 8,000 feet in the Manzanita Mountains, providing a variety of ecosystems. Five canyons (i.e., Lurance, Sol se Mete, Bonito, Otero, and Madera) are in the eastern part of the installation; a few smaller canyons occur on Manzano Base. Kirtland AFB is near three regional natural areas: Sandia Mountain Wilderness Area, Sandia Foothills Open Space, and the Rio Grande Valley State Park. The Sandia Mountain Wilderness Area, encompassing 37,877 acres, is approximately 5 miles north of the eastern portion of the installation.

This area is home to many species of plants and animals and is also within an important raptor migration route (KAFB 2007a).

3.7.2.1 Vegetation

Four main plant communities are found on Kirtland AFB: grassland (includes sagebrush steppe and juniper woodlands), pinyon-juniper woodlands, ponderosa pine woodlands, and riparian/wetland/arroyo. Grassland and pinyon-juniper woodlands are the dominant vegetative communities at Kirtland AFB. The riparian/wetland/arroyo community is confined to drainages and isolated areas inundated by surface water during at least some part of the year. The ponderosa pine woodland community is found along the eastern boundary of the installation (KAFB 2007a).

Grassland Community. This community is found between elevations of 5,200 and 5,700 feet at Kirtland AFB (see **Table 3-7**). The grassland community at Kirtland AFB was further delineated into two community types: sagebrush steppe in the western portion of the installation and juniper woodlands in the eastern portion. In the sagebrush steppe the understory is less dense, with cryptogamic crust covering areas of exposed ground. Juniper woodlands are similar to the grasslands to the east except for the greater abundance of one seeded juniper (*Juniperus monosperma*). The presence of this shrubby tree creates a savanna-like habitat in an otherwise treeless area. Juniper woodlands are found at a slightly higher elevation than the surrounding grassland. This habitat type provides a transition into pinyon-juniper woodlands (KAFB 2007a).

Table 3-7. Kirtland AFB Vegetation Communities

Vegetation Community Type	Elevation (feet)
Grassland sagebrush steppe juniper woodlands	5,200–5,700
Pinyon-Juniper Woodlands	6,300–7,500
Ponderosa Pine Woodlands	7,600–7,988
Riparian/Wetland/Arroyo	Variable

Source: KAFB 2007a

Pinyon-Juniper Woodland Community. The pinyon-juniper woodland community ranges in elevation from 6,300 to 7,500 feet (see **Table 3-7**). This plant community is composed of primarily Colorado pinyon pine and one seeded juniper, with an understory of shrubs and grasses (KAFB 2007a).

Ponderosa Pine Woodland Community. The ponderosa pine woodland community is found in the highest elevations of the eastern portion of the installation (see **Table 3-7**). It is typically found between 7,600 to 7,988 feet (KAFB 2007a).

Riparian/Wetland/Arroyo Community. The riparian/wetland/arroyo community consists of species that have a greater moisture requirement than species common to the other communities on the installation. These plant communities are found along Tijeras Arroyo, Arroyo del Coyote, and at the various springs located throughout Kirtland AFB. Most of the small, scattered wetlands on Kirtland AFB are in good condition and occur in conjunction with other plant communities (KAFB 2007a).

Turf and Landscaped Areas. Kirtland AFB promotes water conservation landscaping by using xeriscape methods combined with native plant materials (KAFB 2007a).

Site location alternatives for the Proposed Action and the existing MWD facility site are either currently occupied by existing buildings or are located in semi-improved areas that consist largely of annual weeds, early successional perennials, and some native grasses and shrubs with areas of bare ground. Vegetation typical of the surrounding grassland community includes broom snakeweed (*Gutierrezia sarothrae*), Great Plains yucca (*Yucca glauca*), Indian ricegrass (*Oryzopsis hymenoides*), purple three-awn (*Artemisia pupurea*), black grama (*Bouteloua eriopoda*), blue grama (*Bouteloua gracilis*), galleta (*Hilaria jamesii*), foxtail barley (*Hordeum jubatum*), four-wing saltbush (*Atriplex canescens*), sand sagebrush (*Artemisia filifolia*), needle-and-thread grass (*Stipa comata*), globemallows (*Sphaeralcea* spp.), Siberian elm (*Ulmus pumila*), Mormon tea (*Ephedra viridis*), New Mexican bitterweed (*Senecio neomexicanus*), ring muhly (*Muhlenbergia torreyi*), plains prickly-pear (*Opuntia polyacantha*), and bottlebrush squirrel tail (*Elymus longifolius*) (KAFB 2003).

3.7.2.2 Wildlife Species and Habitat

Wildlife management falls under the jurisdiction of the NMDGF and the USFWS for migratory birds and federally threatened and endangered species. Sensitive and protected species are addressed in this EA under **Section 3.7.2.3**. Laws protecting wildlife include the ESA, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act of 1940. Refer to **Appendix A** for additional laws and regulations protecting wildlife and habitat (KAFB 2007a).

Wildlife species found on Kirtland AFB are representative of the species diversity common to the regional ecosystem (e.g., grassland, juniper woodland, pinyon-juniper woodland, and ponderosa pine woodlands) and species common in semideveloped grassland areas. Species can be transient and travel or inhabit several communities, or exist in transitional areas between vegetation communities.

The site location alternatives for the Proposed Action and the existing MWD facility lie within the grassland association of Kirtland AFB. Common birds associated with the grassland association at Kirtland AFB include horned lark (*Eremophila alpestris*), scaled quail (*Callipepla squamata*), mourning dove (*Zenaida macroura*), greater roadrunner (*Geococcyx californianus*), American crow (*Cowus brachyrhynchus*), northern mockingbird (*Mimus polyglottos*), curve-billed thrasher (*Toxostoma curvirostre*), lark sparrow (*Chordestes grammacus*), black-throated sparrow (*Amphispiza bilineata*), western meadowlark (*Sturnella neglecta*), brown-headed cowbird (*Molothrus ater*), and house finch (*Carpodacus mexicanus*). The raptors most commonly found in the grassland association include northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), prairie falcon (*F. mexicanus*), long-eared owl (*Asio otus*), and great homed owl (*Bubo virginianus*). The turkey vulture (*Cathartes aura*) is a common scavenger in this habitat type (KAFB 2003).

The grassland association has a mammal community dominated by rodents, rabbits, and hares. These include the desert cottontail (*Sylvilagus audubonii*), Gunnison's prairie dog (*Cynomys gunnisoni*), white-footed deer mouse (*Peromyscus maniculatus*), silky pocket mouse (*Perognathus flavus*), Merriam's kangaroo rat (*Dipodomys merriami*), and the northern grasshopper mouse (*Onychomys leucogaster*). Mammalian predators found in the grassland association include the coyote (*Canis latrans*), badger (*Taxidea taxus*), kit fox (*Vulpes macrotis*), striped skunk (*Mephitis mephitis*), and bobcat (*Lynx rufus*) (KAFB 2003).

Amphibians and reptiles found on the grasslands at Kirtland AFB include the Woodhouse's toad (*Bufo woodhousii*), New Mexico spadefoot (*Spea multiplicata*), coachwhip snake (*Masticophis flagellum*), whiptail lizards (*Cnemidophorus* spp.), lesser earless lizard (*Holbrookia maculata*), and the western rattlesnake (*Crotalus viridis*). Many of these species have extensive periods of dormancy during dry conditions and rapid breeding cycles when temporary ponds occur after rains (KAFB 2003).

3.7.2.3 Threatened and Endangered Species

The agencies that have primary responsibility for the conservation of plant and animal species in New Mexico are the USFWS, the NMDGF, and the New Mexico Energy, Minerals and Natural Resources Department. These agencies maintain lists of plant and animal species that have been classified, or are potential candidates for classification, as threatened or endangered in Bernalillo County. Of those species known to occur in the county, one state threatened species and two Federal species of concern have the potential to occur on Kirtland AFB.

Gray vireo. The gray vireo (*Vireo vicinior*), a state threatened species as listed by the NMFGF, occurs on the installation. The USFWS considers the gray vireo a sensitive species. In 2003, an installationwide gray vireo survey was conducted in which 53 territories were mapped. Territories were found throughout the juniper woodland community in an elevational belt of 5,850 to 6,600 feet. Gray vireos occupied areas with an open canopy (i.e., less than 25 percent canopy cover) with one seeded juniper as the dominate tree/shrub species (KAFB 2007a, KAFB 2007a).

Western burrowing owl. The western burrowing owl (*Athene cunicularia hypugaea*), a Federal species of concern, is a common resident at Kirtland AFB. It is very closely associated with the prairie dog colonies on the installation, as the owls use abandoned prairie dog burrows for nesting during summer months. Burrowing owls generally occur on the installation from March through October before migrating south, although a few birds might occur on the installation during mild winters. Burrowing owl inventories have been conducted every year since 1994 (see **Figure 3-6**), and in 2005 a migration study was initiated to identify where nesting owls at Kirtland AFB go to winter. Since burrowing owls use abandoned prairie dog burrows for nesting, a Prairie Dog Management Plan was developed for the installation, which takes into account burrowing owl habitat requirements (KAFB 2007a).

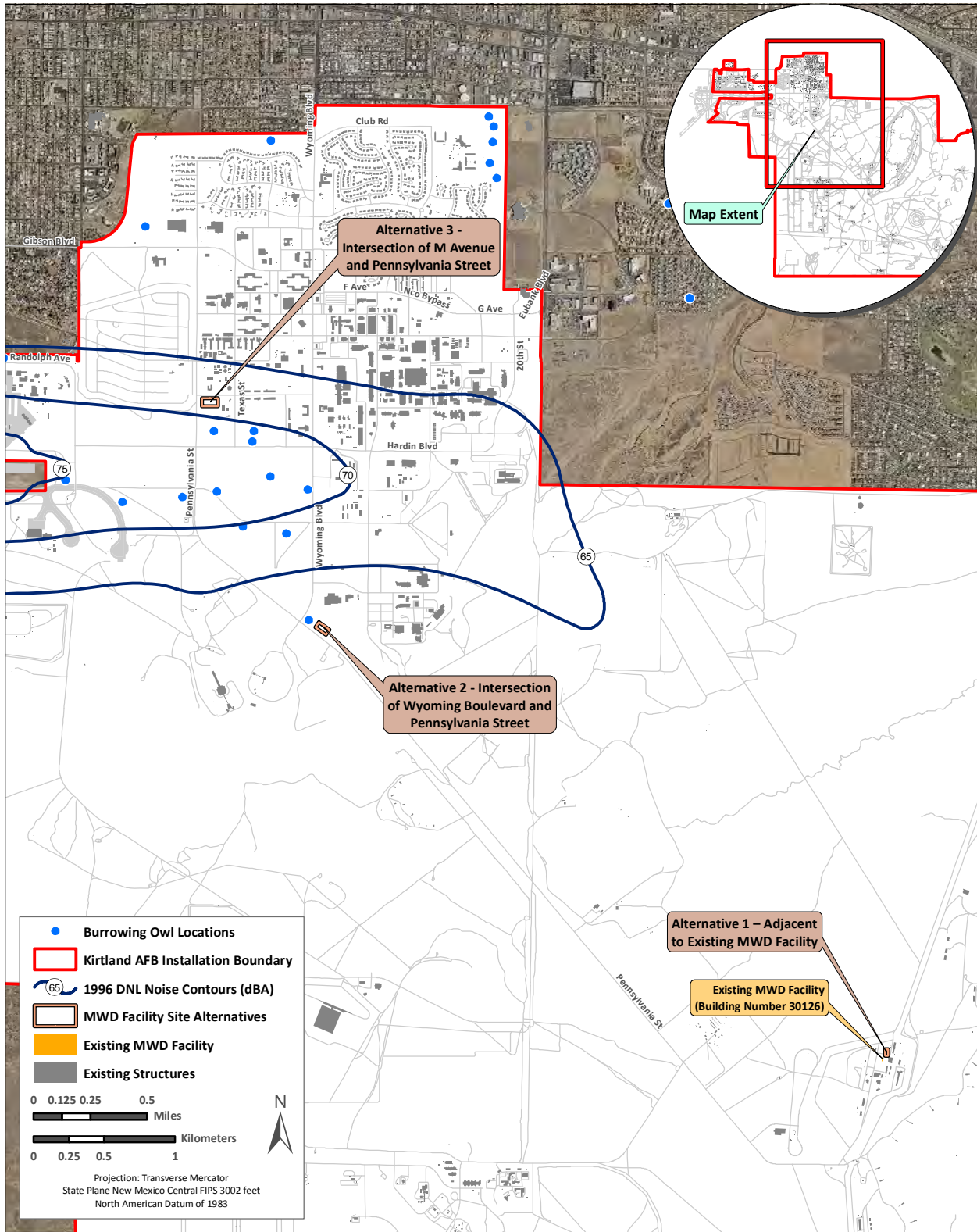
Mountain plover. The mountain plover (*Charadrius montanus*), a Federal species of concern, is not known to occur on the installation. However, in 2003, an adult with two chicks was observed just south of the installation on the Isleta Pueblo Indian Reservation (KAFB 2007a). Appropriate nesting habitat for this species is limited on the installation; therefore, it is unlikely that the mountain plover uses Kirtland AFB during the nesting season. However, the southern grasslands of the installation might potentially be used as brood-rearing habitat or during migration (KAFB 2007a).

Santa Fe milkvetch. Santa Fe milkvetch (*Astragalus feensis*), a rare plant in New Mexico, is expected to occur on Kirtland AFB (KAFB 2008a). Santa Fe milkvetch is found on gravelly hillsides in pinyon-juniper woodland or plains-mesa grassland (5,100 to 6,000 feet) (NMRPTC 1999).

Critical habitats are those areas of land, air, or water that are essential for maintaining or restoring threatened or endangered plant or animal populations. Neither the NMDGF nor the USFWS has designated or identified any critical habitat on Kirtland AFB. Surveys and literature indicate that important habitats on the installation include the wetlands, which are rare in this region, providing water in an otherwise arid environment. Other important habitats on the installation include prairie dog towns, which provide nesting habitat for the burrowing owl, and areas between 5,900 and 6,600 feet containing open juniper woodlands, which are used as nesting habitat by the gray vireo (KAFB 2007a).

3.7.2.4 Wetlands

Wetlands provide an important function in recharging aquifers and buffering streams by filtering sediment and nutrients. Wetlands have been defined by agencies responsible for their management. The term “wetland” used herein, is defined using USACE conventions. The USACE has jurisdiction to protect wetlands under Section 404 of the CWA using the following definition:



Source of Noise Contours: Kirtland AFB 10/2009

Figure 3-6. Burrowing Owl Nest Locations Observed July 2009 on Kirtland AFB

... areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3[b]). Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands have three diagnostic characteristics that include: (1) over 50 percent of the dominant species present must be classified as obligate, facultative wetland, or facultative, (2) the soils must be classified as hydric, and (3) the area is either permanently or seasonally inundated, or saturated to the surface at some time during the growing season of the prevalent vegetation (USACE 1987).

Wetlands are considered waters of the United States if they are determined to be jurisdictional by the USACE and USEPA. See **Section 3.7.1** for further details regarding jurisdiction by these agencies.

Nine wetlands were identified as jurisdictional by the USACE in 1995. These wetlands are supplied by 15 active springs on Kirtland AFB. The largest and most well-known location is the Coyote Springs and Wetlands complex that includes four semi-discrete wetlands and nine springs (see **Figure 3-5** in Water Resources). All other wetlands on Kirtland AFB are much smaller. An actual spring is visible in some, but in others there is no obvious point source of water feeding the surrounding wetland. Nearly all the springs and wetlands are in or immediately adjacent to an arroyo or other small ephemeral drainage (KAFB 2008c). A summary of the wetland sizes is presented in **Table 3-8**.

Table 3-8. Sizes of Wetlands on Kirtland AFB

Site Name	Square Feet	Acres
Coyote wetland 1	21,206	0.487
Coyote wetland 2	4,178	0.096
Coyote wetland 3	463	0.011
Coyote wetland 4	1,968	0.045
Coyote pond	6,671	0.153
New wetland	133	0.003
Cattail wetland	509	0.012
Homestead wetland	215	0.005
G Spring	2,066	0.047
Total	37,409	0.859

Source: KAFB 2009b

Since 2004, Kirtland AFB has been working to characterize, create, and enhance approximately 3 acres of degraded wetland habitat. Much of this work has focused in and around a set of artesian perennial springs called Coyote Springs. The area was once a recreational site for military personnel, but has since undergone restoration and enhancement. A permanent wetland pond, a naturalized overflow stream from the pond, and a small wet meadow have been constructed at this site (KAFB 2009b).

3.8 Cultural Resources

3.8.1 Definition of the Resource

Cultural resources include prehistoric and historic archaeological sites, structures, districts, or areas containing physical evidence of human activity. These resources are protected and identified under

several Federal laws and EOs. Federal laws include the National Historic Preservation Act (NHPA) (1966), the Archaeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990).

The NHPA requires that Federal agencies assume the responsibility for the preservation of historic and prehistoric resources located on lands owned or controlled by that agency. Section 110 (a)(2) of the NHPA requires that "...each Federal agency shall establish a program to locate, inventory, and nominate to the Secretary all properties under the agency's ownership or control...that appear to qualify for inclusion on the National Register...." Section 110 (a)(2) further requires that "each agency shall exercise caution to assure that any property that might qualify for inclusion is not inadvertently transferred, sold, demolished, substantially altered, or allowed to deteriorate significantly." These requirements are also included in DOD Directive 4710.1.

Under NHPA guidelines, cultural resources, including building, structures, objects, sites, and districts, are to be evaluated for National Register of Historic Places (NRHP) eligibility using the NRHP Criteria for Evaluation, as listed in 36 CFR 60.4. To be listed in, or considered eligible for the NRHP, a cultural resource must be 50 years or older and possess at least one of the four following criteria:

- The resource is associated with events that have made a significant contribution to the broad pattern of history (Criterion A)
- The resource is associated with the lives of people significant in the past (Criterion B)
- The resource embodies distinctive characteristics of a type, period, or method of construction; represents the work of a master; possesses high artistic value; or represents a significant and distinguishable entity whose components might lack individual distinction (Criterion C)
- The resource has yielded, or may be likely to yield, information important in prehistory or history (Criterion D).

In addition to meeting at least one of the above criteria, a cultural resource must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. Integrity is defined as the authenticity of a property's historic identity, as evidenced by the survival of physical characteristics it possessed in the past and its capacity to convey information about a culture or group of people, a historic pattern, or a specific type of architectural or engineering design or technology. Location refers to the place where an event occurred or a property was originally built. Design considers elements such as plan, form, and style of a property. Setting is the physical environment of the property. Materials refer to the physical elements used to construct the property. Workmanship refers to the craftsmanship of the creators of a property. Feeling is the ability of the property to convey its historic time and place. Association refers to the link between the property and a historically significant event or person.

Cultural resources meeting these standards (age, eligibility, and integrity) are termed "historic properties" under the NHPA. Sites or structures that are not considered individually significant can be considered eligible for listing in the NRHP as part of a historic district. According to the NRHP, a historic district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects that are historically or aesthetically united by plan or physical development.

Typically, cultural resources are grouped into three separate categories, archaeological, architectural, or sites that have a traditional religious or cultural significance to Native American tribes. Archaeological resources are defined as areas that have altered the landscape. Architectural resources are built structures of significance. In general, these architectural resources are typically more than 50 years old but newer

structures can be evaluated under the entire above criterion. Resources of traditional, religious, or cultural significance to Native American tribes can include architectural or archaeological resources, sacred sites, neighborhoods, geographic landmarks, flora or faunal habitats, mineral localities, or sites considered essential for the preservation of traditional culture.

The EA process requires the assessment of potential impacts on cultural resources. In addition, under Section 106 of the NHPA, Federal agencies must take into account the effect of their undertakings on historic properties and allow the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Under this process, the Federal agency evaluates the NRHP eligibility of resources within the proposed undertaking's Area of Potential Effect (APE) and assesses the possible impacts of the proposed undertaking on historic resources in consultation with the State Historic Preservation Officer (SHPO) and other parties. The APE is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." Under Section 110 of the NHPA, Federal agencies are required to establish programs to inventory and nominate cultural resources under their purview to the NRHP.

3.8.2 Existing Conditions

Archaeological Resources. There have been more than 150 cultural resources projects undertaken at Kirtland AFB. These projects have resulted in the identification of 661 archaeological sites and the NRHP evaluations of more than 2,000 facilities. Of the 661 archaeological sites recorded within the boundaries of Kirtland AFB, most are in the eastern portion of the installation. Laboratory of Anthropology (LA) numbers have been assigned for each of these archaeological resources. NRHP eligibility evaluations are generally complete for the sites located on the lower piedmonts and drainages of the western portions of Kirtland AFB and the eastern Manzanita Mountains. There have been no archaeological sites identified within the APE of any of the three site alternatives of the Proposed Action.

Two archaeological resources (LA 88089 and LA 108035) are near Site Alternative 1 (see **Table 3-9**). LA 88089 is a prehistoric lithic artifact scatter situated approximately 575 feet southwest of the APE. Current NRHP eligibility status for site LA 88089 is undetermined. LA 108035 is a historic sheep coral with an associated dry laid rock wall. Site LA 108035 is approximately 660 feet southeast of the APE and is listed as eligible to the NRHP under Criteria C.

Table 3-9. Known Archaeological Resources near Site Alternative 1

Site LA Number	Description	NRHP Eligibility
88089	Prehistoric lithic and ceramic artifact scatter	Undetermined
108035	Historic dry laid rock wall interpreted as a sheep coral	Eligible

No known archaeological resources occur within the APE of Site Alternative 2. One archaeological resource (LA 134605) is approximately 400 feet south of the proposed Site Alternative 2 (see **Table 3-10**). The site is historic with an undetermined NRHP eligibility status. Currently, no additional information is available.

Table 3-10. Known Archaeological Sites near Site Alternative 2

Site LA Number	Description	NRHP Eligibility
88089	Historic site, no additional information available	Undetermined

No known archaeological resources are within the APE of Site Alternative 3.

Architectural Resources. The inventory and assessment of architectural resources at Kirtland AFB have been ongoing since 1984. To date, 2,183 structures have been evaluated for NRHP eligibility. Of these, 244 buildings and structures have been determined eligible through consultation with the New Mexico SHPO.

All three site alternatives of the Proposed Action would involve the demolition of the existing MWD facility (Building 30126). Building 30126, constructed in 1954, is more than 50 years old and could therefore be designated as historic. The building has not yet been inventoried nor has it been nominated to the NRHP. In order to mitigate the potential impacts of the demolition of this building, an NRHP evaluation of the building through consultation with the New Mexico SHPO might be required. Upon the completion of this task, and pending the subsequent concurrence with the New Mexico SHPO, Historic American Buildings Survey (HABS) documentation might be required to be completed on the building. In addition to HABS documentation, a Historic Cultural Properties Inventory form might additionally be required to be completed prior to the commencement of the Proposed Action.

Site Alternative 1 is within the Manzano Base Historic District. Within the historic district, one architectural resource occurs 330 feet southwest of the APE for Site Alternative 1 (see **Table 3-11**). The building, known as the Enlisted Men’s Barracks, or the Manzano Dormitory building, was constructed in 1950 and is an example of the International Style of architecture. The building is eligible for the NRHP under Criterion C as it exemplifies a distinctive method of construction. The building is also eligible for the NRHP under Criterion A for its association with the nuclear weapons stockpiling program and its association with the Manzano District as a whole.

Table 3-11. Known Architectural Resources near Site Alternative 1

Building #	Description	Construction Date	NRHP Eligibility	NRHP Criterion	Historic District
30143	Enlisted Men's Barracks/ Manzano Dormitory Buildings	1950	Eligible	A/C	Manzano

There are no additional architectural resources that would be impacted by any of the three alternatives of the Proposed Action.

Traditional Cultural Properties. No traditional cultural properties or sacred sites have been identified on Kirtland AFB.

3.9 Infrastructure

3.9.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as “urban” or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. The infrastructure information in this section was primarily obtained from the *Kirtland Air Force Base New Mexico General Plan 2002* (KAFB 2002) and provides a brief overview of each infrastructure component and comments on its existing general condition. The infrastructure components to be discussed in this section include utilities and solid waste management.

Utilities include electrical, natural gas, liquid fuel, central heating and cooling, water supply, sanitary sewage/wastewater, storm water handling, and communications systems. Solid waste management primarily relates to the availability of landfills to support a population's residential, commercial, and industrial needs.

3.9.2 Existing Conditions

Electrical Systems. Kirtland AFB purchases electrical power from Western Area Power Administration. All electricity to the installation comes through the Sandia Switching Station on an approximately 80 million-volt amperes capacity electrical circuit. The estimated normal electrical load for Kirtland AFB is approximately 35 million-volt amperes, and the estimated historical maximum electrical load is approximately 76 million-volt amperes (KAFB 2008c).

Natural Gas and Propane. Coral Energy supplies Kirtland AFB with natural gas. Natural gas enters the installation through a 60 pound-per-square inch pipeline just east of Pennsylvania Street. There are approximately 70 miles of natural gas mains at Kirtland AFB that provide natural gas service to select buildings on the installation. The primary buildings that receive natural gas service are in the industrial complex, family housing areas, and the Sandia Steam Plant. Rural portions of the installation do not receive natural gas service and instead rely on propane, which is delivered to and stored in local propane storage tanks. Kirtland AFB's existing MWD facility, Site Alternative 1, and Site Alternative 2 are currently not supplied with natural gas. Natural gas demand at Kirtland AFB depends on weather conditions; however, the approximate consumption in 2006 was 1,100,000 million British Thermal Units (KAFB 2008c).

Liquid Fuel. Liquid fuels are supplied to Kirtland AFB by contractors. The primary liquid fuels supplied include JP-8 (jet fuel), diesel, gasoline, and heating oil. All of these fuels are purchased in bulk, delivered to the installation by tanker truck, and stored in various sized storage tanks scattered across the installation. The primary use for liquid fuels at Kirtland AFB is to power military aircraft and land-based vehicles; however, it is also used to a lesser extent to heat select buildings on the installation (KAFB 2002).

Central Heating and Cooling Systems. Kirtland AFB has approximately 20 miles of steam mains that provide heating service to select buildings on the installation. The steam system is powered by three central heating plants; however, only one, the Sandia Steam Plant, is currently in service. Natural gas is the fuel source for the Sandia Steam Plant. Kirtland AFB is in the process of gradually disconnecting buildings from the central heating system and aims to eventually shut down the entire central heating system. Kirtland AFB does not have a centralized cooling system (KAFB 2002).

Water Supply Systems. Water is supplied to Kirtland AFB by seven groundwater wells that have a collective water-pumping maximum of 9.3 million gallons per day (MGD). Kirtland AFB also purchases water from the City of Albuquerque to meet demand during peak periods; however, the amount of water purchased from the city has been negligible since 1998. The maximum water supply capacity from the City of Albuquerque is 8.6 MGD, which results in a maximum total water supply to Kirtland AFB of 17.9 MGD (KAFB 2008c). Water is stored in approximately 24 water storage tanks at Kirtland AFB, which have a collective storage capacity of approximately 5.5 million gallons. Water is transported throughout Kirtland AFB by two separate but interconnected water distribution systems. There are approximately 160 miles of potable water supply piping and approximately 50 miles of nonpotable water supply piping. Nonpotable water is primarily used for golf course irrigation and in fire protection systems. In general, the water supply piping is properly sized and is in good condition despite being approximately 50 years of age on average (KAFB 2002).

Current water demand at Kirtland AFB is approximately 6 to 10 MGD during the summer and 2 to 4 MGD during the winter. As such, the groundwater wells generally have sufficient pumping capacity to meet current water demand (KAFB 2002).

Sanitary Sewer/Wastewater Systems. Kirtland AFB does not have its own sewage treatment facility. Instead, the sanitary sewer system of Kirtland AFB, which consists of approximately 92 miles of collection mains, transports wastewater to the City of Albuquerque treatment facility. Kirtland AFB is permitted a fixed amount of 70,805,000 gallons of sewer discharge per month. Currently, Kirtland AFB discharges an average of 901,000 gallons per day (27,030,000 gallons per month) and during peak periods, 1,149,000 gallons per day (34,470,000 gallons per month) (Segura 2010). Kirtland AFB uses approximately 40 oil/water separators to collect greases and oils before they enter the wastewater collection system. Some facilities in remote portions of the installation are not serviced by the sanitary sewer system; these facilities instead use isolated, onsite septic systems to dispose of wastewater (KAFB 2002). Sanitary sewer lines are accessible from Site Alternatives 1, 2, and 3. The existing MWD facility is connected to the sanitary sewer for wastewater disposal.

Storm Water Systems. Man-made storm water drainage systems, which include gutters, culverts, ditches, and underground piping, direct storm water to receiving channels and basins in developed portions of Kirtland AFB. In less-developed portions of Kirtland AFB, man-made storm water drainage systems have not been installed, and storm water drains by sheet flow to various natural drainageways. Most storm water at Kirtland AFB that does not get absorbed into the ground drains into the Rio Grande, which eventually discharges in the Gulf of Mexico (KAFB 2002).

Communications Systems. Kirtland AFB uses copper and fiber optic cable for the telephone and data transmission services. Kirtland AFB operates its own telephone switching system, which is adequately sized to support the current needs of the installation. The data transmission system has been designed to accommodate future growth of the installation (KAFB 2002).

Solid Waste Management. Solid waste generated at Kirtland AFB is collected by contractors and disposed of at the Rio Rancho Landfill, which is off-installation in the City of Rio Rancho and is operated by Waste Management, Inc. In 2008, the Rio Rancho Landfill received a 10-year permit renewal and approval for approximately 1,179,600 cubic yards (471,840 tons assuming 800 pounds per cubic yard) of additional capacity beyond the amount approved in its 1998 NMED permit (Permit Number 231402) (NMED undated, Waste Management 2010). From 2007 to 2009, Kirtland AFB sent an average of 2,500 tons of solid waste per year to the City of Rio Rancho Landfill. Kirtland AFB operates a construction and demolition waste-only landfill on the installation. This landfill accepts only construction and demolition waste from permitted contractors working on the installation and has a total capacity of 10,164,000 cubic yards (4,065,676 tons). The remaining capacity of this landfill is 5,071,000 cubic yards (2,006,964 tons). From 2007 to 2009, Kirtland AFB disposed of an average of 23,000 tons of construction and demolition waste per year at the on-installation landfill (Kitt 2010). Kirtland AFB manages a recycling program to reduce the amount of solid waste sent to landfills. The Kirtland AFB Qualified Recycling Program is operated by contractors and collects office paper, cardboard, and aluminum from pick-up points scattered across the installation (KAFB 2002). Additional recycling efforts are oftentimes included in specific construction and demolition projects.

3.10 Hazardous Materials and Waste

3.10.1 Definition of the Resource

Hazardous materials are defined by 49 CFR 171.8 as “hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials

Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions” in 49 CFR Part 173. Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations within 49 CFR Parts 105–180.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) at 42 U.S.C. §6903(5), as amended by the Hazardous and Solid Waste Amendments, as: “a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.” Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR Part 273. Four types of waste are currently covered under the universal waste regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include ACM, polychlorinated biphenyls (PCBs), and lead-based paint (LBP). The USEPA has authority to regulate these special hazard substances by the Toxic Substances Control Act (TSCA) Title 15 U.S.C. Chapter 53. TSCA Subchapter I identifies PCBs, Subchapter II identifies ACMs and Subchapter IV identifies LBP. USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR part 763 with additional regulation concerning emissions (40 CFR 61). Whether from lead abatement or other activities, depending on the quantity or concentration the disposal of the LBP waste is potentially regulated by the RCRA at 40 CFR 260. The disposal of PCBs is addressed in 40 CFR 750 and 761. The presence of special hazards or controls over them might affect, or be affected by, a proposed action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a proposed action.

DOD has developed the Environmental Restoration Program (ERP), intended to facilitate thorough investigation and cleanup of contaminated sites on military installations. Through the ERP, DOD evaluates and cleans up sites where hazardous wastes have been spilled or released to the environment. Description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in identification of properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be restricted until remediation of a groundwater contaminant plume has been completed).

The information provided in this section will focus on the presence and management of hazardous materials and wastes associated with the proposed demolition and construction activities. Evaluation will extend to generation, storage, transportation, and disposal of hazardous wastes generated through implementation of the Proposed Action.

For the USAF, Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, and the AFI 32-7000 series incorporate the requirements of all Federal regulations, and other AFIs and DOD Directives for the management of hazardous materials, hazardous wastes, and special hazards.

3.10.2 Existing Conditions

Hazardous Materials and Petroleum Products. AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern management of hazardous materials throughout the

USAF. It applies to all USAF personnel who authorize, procure, issue, use, or dispose of hazardous materials, and to those who manage, monitor, or track any of those activities. As part of the Hazardous Waste Management Plan discussed below, Kirtland AFB has deemed the 377 MSG/CEVC as the responsible entity to oversee the storage and usage of hazardous materials on the installation. Part of the 377 MSG/CEVC responsibilities is to control the procurement and use of hazardous materials to support USAF missions, ensure the safety and health of personnel and surrounding communities, and minimize USAF dependence on hazardous materials. The 377 MSG/CEVC is charged with managing materials to reduce the amount of hazardous waste generated on the installation (KAFB 2004).

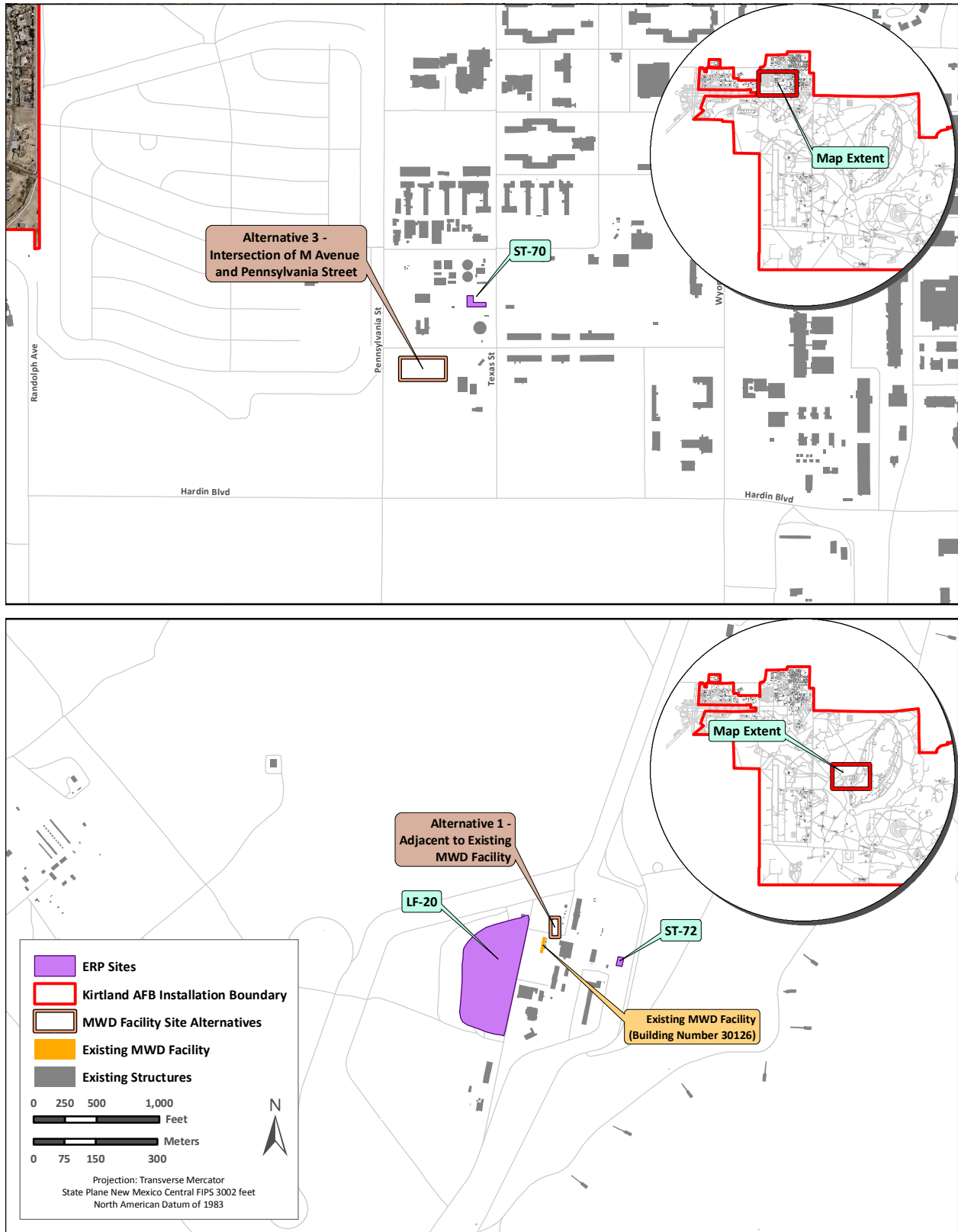
There are no known hazardous materials stored within the existing MWD facility or any of the site alternatives. An aboveground fuel storage tank is currently situated within or just adjacent to Site Alternative 1. The storage tank is clearly marked and has secondary containment.

Hazardous and Petroleum Wastes. The 377 ABW maintains a Hazardous Waste Management Plan (KAFB 2004) as directed by AFI 32-7042, *Waste Management*. This plan prescribes the roles and responsibilities of all members of Kirtland AFB with respect to the waste stream inventory, waste analysis plan, hazardous waste management procedures, training, emergency response, and pollution prevention. The plan establishes the procedures to comply with applicable Federal, state, and local standards for solid waste and hazardous waste management. Kirtland AFB is a large-quantity generator of hazardous waste (Handler Identification NM9570024423).

The Site Alternative 1, Site Alternative 2, and Site Alternative 3 areas have historically been undeveloped. No known hazardous or petroleum wastes were generated, stored, or disposed of at any of the proposed site alternative areas. Hazardous and petroleum wastes likely were historically generated at the existing MWD facility (Building 30126) when it was used as a hobby shop; however, this use ceased in 1978 when it was converted to a MWD facility and no present hazardous waste concerns at the facility are anticipated.

Environmental Restoration Program. The Defense ERP (DERP) was formally established by Congress in 1986 to provide for the cleanup of DOD sites. The ERP and the Military Munitions Response Program (MMRP) are components of the DERP. The ERP requires each DOD installation to identify, investigate, and clean up hazardous waste disposal or release sites. The MMRP addresses nonoperational range lands that are suspected or known to contain unexploded ordnance, discarded military munitions, or Munitions Constituent contamination. No MMRP sites have been identified in the vicinity of Site Alternative 1, Site Alternative 2, or Site Alternative 3.

Solid Waste Management Unit (SWMU) ST-80, the Auto Hobby Shop Building 30124, is adjacent to the existing MWD obedience course to the north and Site Alternative 1 to the west; and is approximately 150 feet northwest of the existing MWD facility. NMED approved a No Further Action (Corrective Action Complete) status for this SWMU site in 2006 (NMED 2006). Two additional ERP sites, LF-20 and ST-72, are within the vicinity of the existing MWD facility and Site Alternative 1; and one ERP site, ST-70, is within the vicinity of Site Alternative 3 (see **Figure 3-7**). The existing MWD facility is approximately 300 feet east of the former Manzano Base landfill (LF-20) and the obedience course is approximately 60 feet east of LF-20. Site Alternative 1 is approximately 300 feet east of LF-20 and approximately 600 feet northwest of the former Manzano Weapons Storage Area Security Garage Oil-Water Separator (ST-72). Site Alternative 3 is approximately 600 feet south of the former Auto Hobby Shop Oil-Water Separator (ST-70). The LF-20, ST-70, and ST-72 sites underwent multiple separate sampling events and have been determined to require No Further Action (KAFB 1997a, NMED 2005, NMED 2008, NMED 2006).



Source of ERP Sites: Kirtland AFB 10/2009

Figure 3-7. ERP Sites near Existing MWD Facility, Site Alternative 1, and Site Alternative 3

Asbestos-Containing Material. Asbestos is regulated by USEPA under the CAA, TSCA, and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). USEPA has established that any material containing more than 1 percent asbestos is considered an ACM. Friable ACM is any material containing more than 1 percent asbestos, and that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. Nonfriable ACM is any ACM that does not meet the criteria for friable ACM. The existing MWD facility (Building 30126) is reported to contain ACM. There are no records of ACM at the proposed site location alternatives. Any ACM removed from buildings proposed for demolition would be disposed at the Keers Special Waste Landfill in Mountainair, New Mexico; the City of Rio Rancho landfill; or another approved permitted site.

Lead-Based Paint. The Residential Lead-Based Paint Hazard Reduction Act of 1992, Subtitle B, Section 408 (commonly called Title X) regulates the use and disposal of LBP on Federal facilities. Federal agencies are required to comply with applicable Federal, state, and local laws relating to LBP activities and hazards. The existing MWD facility (Building 30126) was constructed in 1954 and is therefore assumed to contain LBP.

Polychlorinated Biphenyls. PCBs are a group of chemical mixtures used as insulators in electrical equipment such as transformers and fluorescent light ballasts. Federal regulations govern items containing 50 to 499 ppm PCBs. Chemicals classified as PCBs were widely manufactured and used in the United States throughout the 1950s and 1960s. PCB-containing oil is typically found in older electrical transformers and light fixtures (ballasts). Transformers containing greater than 500 ppm PCBs, between 50 and 500 ppm PCBs, and less than 50 ppm PCB are considered PCB, PCB-contaminated, and non-PCB, respectively. There are no records of PCBs at the proposed project sites. The fluorescent light ballasts within the existing MWD facility might contain PCBs. Other items that might contain PCBs include capacitors and surge protectors. Any pad-mounted transformers outside the existing MWD facility or proposed site location alternatives would be tested for PCBs prior to altering the utility and treated in accordance with Federal, USAF, and state regulations.

Pollution Prevention. AFI 32-7080, *Pollution Prevention Program*, implements the regulatory mandates in the Emergency Planning and Community Right-to-Know Act; Pollution Prevention Act of 1990; EO 12873, *Federal Acquisition, Recycling, and Waste Prevention*; and EO 12902, *Energy Efficiency and Water Conservation at Federal Facilities*. AFI 32-7080 prescribes the establishment of pollution prevention management plans, which have management and minimization strategies for ozone-depleting substances (ODSs), USEPA's 17 highest-priority industrial toxic chemicals, hazardous wastes, municipal solid wastes, affirmative procurement of environmentally friendly products, energy conservation, and air and water pollutant reduction. The 377 ABW fulfills this requirement with the following plans:

- Pollution Prevention Management Action Plan (KAFB 1999)
- Final Management Action Plan (KAFB 1997a)
- Hazardous Waste Management Plan (KAFB 2004)
- Hazardous Material Emergency Planning and Response Plan (KAFB 2008b)
- Spill Prevention, Control, and Countermeasures (SPCC) Plan (KAFB 2009c).

3.11 Safety

3.11.1 Definition of the Resource

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety addresses workers' health and

safety during construction activities as well as public health and safety during and following construction activities.

Construction site safety requires adherence to regulatory requirements imposed for the benefit of employees. It includes implementation of engineering and administrative practices that aim to reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous DOD and military branch specific regulations designed to comply with standards issued by the Federal Occupational Safety and Health Administration (OSHA), USEPA, and state occupational safety and health agencies. These standards specify health and safety requirements, the amount and type of training required for workers, the use of personal protective equipment (PPE), administrative controls, engineering controls, and permissible exposure limits for workplace stressors.

Health and safety hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. Hazards include transportation, maintenance and repair activities, and the creation of noisy environments or a potential fire hazard. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation process creates unsafe environments due to noise or fire hazards for nearby populations. Noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

3.11.2 Existing Conditions

Contractor Safety. All contractors performing construction activities are responsible for following Federal and State of New Mexico safety regulations and are required to conduct construction activities in a manner that does not increase risk to workers or the public.

New Mexico is one of several states that administer their own occupational safety and health (OSH) program according to the provisions of the Federal Occupational Safety and Health Act of 1970, which permits a state to administer its own OSH program if it meets all of the Federal requirements regarding the program's structure and operations. The New Mexico Occupational Health and Safety Bureau program has the responsibility of enforcing Occupational Health and Safety Regulations within New Mexico. Its jurisdiction includes all private and public entities such as city, county, and state government employees. Federal employees are excluded as they are covered by Federal OSHA regulations.

OSH programs address the health and safety of people at work. OSH regulations cover potential exposure to a wide range of chemical, physical, biological, and ergonomic stressors. The regulations are designed to control these hazards by eliminating exposure to the hazards via administrative or engineering controls, substitution, or use of PPE. Occupational health and safety is the responsibility of each employer, as applicable. Employer responsibilities are to review potentially hazardous workplace conditions; monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous substances), physical (e.g., noise propagation, falls), and biological (e.g., infectious waste, wildlife, poisonous plants) agents, and ergonomic stressors; recommend and evaluate controls (e.g., prevention, administrative, engineering, PPE) to ensure exposure to personnel is eliminated or adequately controlled; and ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to the use of respiratory protection, engaged in hazardous waste work, asbestos, lead, or other work requiring medical monitoring.

MWD Safety. The health and safety of MWDs is regulated under AFI 31-202, *Military Working Dog Program*. Size and sanitation standards for MWD facilities are identified in the Design Guide for MWD Facilities (DOD 2003). Kirtland AFB's existing MWD facility was not constructed to be used for kennel purposes; therefore, it does not meet USAF MWD facility design standards. The existing MWD facility has many design deficiencies, which present health and safety concerns to the MWDs of Kirtland AFB. These deficiencies include the following:

- Lack of space – kennels are less than half the required size (i.e., 39 square feet instead of the required 80 square feet per dog).
- Poor drainage – drainage of dog excrement constantly backs up due to inadequate drainpipes, and the facility floods during rain.
- The kennels are not indoor-outdoor and do not have individual doghouses, as required.
- The HVAC system is inadequate and lacks humidity and dust control.
- Animal/insect infestations are a concern. The black widow spider has been observed within the facility.

These building deficiencies jeopardize both the short- and long-term health and safety of the MWDs at Kirtland AFB. In the short-term, the MWDs are at increased risk for injury from the lack of personal space, the potential for flooding in their kennels, exposure to pathogens in improperly drained excrement, and animal/insect bites. In the long-term, these deficiencies can increase stress and reduce the efficiency and effectiveness of MWD training, which can potentially affect the MWD's health and safety when deployed. As such, the MWDs at Kirtland AFB are currently exposed to health and safety concerns.

Military Personnel Safety. Each branch of the military has its own policies and regulations that act to protect its workers, despite their work location. USAF regulation AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, which implements AFD 91-3, *Occupational Safety and Health*, governs the recognition, evaluation, control, and protection of USAF personnel from occupational health and safety hazards. The purpose of the AFOSH Program is to minimize the loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks.

The health and safety of military personnel at Kirtland AFB is adversely affected by the design deficiencies of the existing MWD facility. Much like the MWDs, military personnel also must contend with the lack of space, the potential exposure to pathogens from improperly drained MWD excrement, and unhealthy climate conditions at the existing MWD facility. Military personnel also must deal with the fact that the existing MWD facility has only one toilet for 15 assigned male and female personnel and, based on the building's age, the existing MWD facility likely contains LBP and ACM. Each of these design deficiencies presents both short- and long-term health and safety concerns to the military personnel working at the existing MWD facility.

Public Safety. Kirtland AFB has its own emergency services department. The emergency services department provides Kirtland AFB with fire suppression, crash-response, rescue, emergency medical response, hazardous substance protection, and emergency response planning and community health and safety education through the dissemination of public safety information to the installation. A Veterans Administration hospital and the 377th Medical Group's Outpatient Clinic are the primary military medical facilities at Kirtland AFB (KAFB 2009d). A number of other hospitals and clinics, which are devoted to the public, are off-installation in the City of Albuquerque. These facilities include the University of New Mexico Hospital and Kaseman Presbyterian Hospital (Google 2009).

The Fire and Rescue Emergency Services Division for the City of Albuquerque provides fire suppression, crash-response, rescue, emergency medical response, and hazardous substance response to the nearby City of Albuquerque. The Fire and Rescue Emergency Services Division includes 23 fire engine companies, 7 fire ladder companies, 3 hazardous materials response units, and 18 medical response ambulances (City of Albuquerque 2009a). The City of Albuquerque also has an approximately 500-person police force available to provide law enforcement services (City of Albuquerque 2009b). A mutual service agreement is in place between the City of Albuquerque and Kirtland AFB.

Explosives and Munitions Safety. Although explosives, munitions, and ordnance are stored and used at Kirtland AFB, they currently are not stored or used at any of the three site alternatives. MWDs are trained to identify explosive materials; as such, explosive constituents and explosive materials, including potassium chlorate, sodium chlorate, and blank ammunition, are occasionally used during training exercises at the existing MWD obedience course. The detonation of explosives is not part of the MWD training programs and training activities do not cause a release of these explosive materials to the environment. Oxidizer explosives are not permanently stored at the MWD facility but kept at the Kirtland AFB's Munitions Storage Area offsite. Per USAF requirements, less than 1,000 rounds of blank training ammunition are stored within the existing MWD facility. No MMRP sites have been documented at or near any of the three site alternatives (see **Section 3.10.2**).

3.12 Socioeconomics and Environmental Justice

3.12.1 Definition of the Resource

Socioeconomics. Socioeconomics is the relationship between economies and social elements such as population levels and economic activity. Factors that describe the socioeconomic environment represent a composite of several interrelated and nonrelated attributes. There are several factors that can be used as indicators of economic conditions for a geographic area, such as demographics, median household income, unemployment rates, percentage of families living below the poverty level, employment, and housing data. Data on employment identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on industrial, commercial, and other sectors of the economy provide baseline information about the economic health of a region.

Environmental Justice. EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, pertains to environmental justice issues and relates to various socioeconomic groups and the disproportionate impacts that could be imposed on them. This EO requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The EO was enacted to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action.

Children's Environmental Health and Safety Risks. EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, states that each Federal agency "(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

3.12.2 Existing Conditions

Demographics. The population of the Albuquerque Metropolitan Statistical Area (MSA), defined by the U.S. Census Bureau as Bernalillo, Sandoval, and Valencia counties, was estimated to be 829,644 people in 2008. The 2008 estimate represents a 16 percent increase, or a 2 percent annual increase, from the 2000 U.S. Census for the Albuquerque MSA population (U.S. Census Bureau 2000, U.S. Census Bureau 2008).

The State of New Mexico’s population totaled nearly 2,000,000 in 2008. The population of Bernalillo County was 635,139 in 2008, representing 32 percent of the total population for the State of New Mexico. Based on 2000 U.S. Census data and 2008 U.S. Census Bureau estimates, the population of Bernalillo County grew 14 percent from 2000 to 2008, while during this same time period Sandoval County experienced a 36 percent increase in population and Valencia County grew by 9 percent. The growth rate of population in the Albuquerque MSA from 2000 to 2008 (16 percent) was much greater than the growth rate of the State of New Mexico (9 percent) and of the United States (8 percent) over the same time period. See **Table 3-12** for 2000 population and 2008 population estimate data (U.S. Census Bureau 2000, U.S. Census Bureau 2008).

Table 3-12. 2000 Population and 2008 Population Estimates

Location	2000	2008	Percentage Change
United States	281,421,906	304,059,724	8.0%
New Mexico	1,819,046	1,984,356	9.1%
Albuquerque MSA	712,738	829,644	16.4%
Bernalillo County	556,678	635,139	14.1%
Sandoval County	89,908	122,298	36.0%
Valencia County	66,152	72,207	9.2%

Source: U.S. Census Bureau 2000, U.S. Census Bureau 2008

According to U.S. Census Bureau data, the State of New Mexico contains one of the largest percentages of minorities in the United States. The percentage of Hispanic population in New Mexico (42 percent) is the largest in the United States, and the percentage of Native American population in New Mexico (10 percent) is the second largest in the United States. The non-Hispanic White population in New Mexico (45 percent) is one of the smallest in the country (U.S. Census Bureau 2000). The Black or African American population in New Mexico (2 percent) and the Asian or Pacific Islander population (1 percent) are much less than the national averages (12 percent and 4 percent, respectively) (U.S. Census Bureau 2000).

Employment Characteristics. Approximately 1 percent of the Albuquerque MSA population is employed within the armed forces (U.S. Census Bureau 2000). The three largest industries and the corresponding percentage of the workforce employed within the industry are the educational, health, and social services industry (21 percent); the professional, scientific, management, administrative, and waste management services industry (13 percent); and the retail trade industry (12 percent). The construction industry represents 8 percent of the workforce (U.S. Census Bureau 2000). Unemployment in the Albuquerque MSA from 1999 to 2008, ranged from 3.9 to 5.3 percent annually. In August 2009, the unemployment rate climbed to 7.9 percent (BLS 2009).

Kirtland AFB. The number of persons employed on Kirtland AFB is greater than 31,000, making it the single largest employer in the Albuquerque MSA. There are 1,170 active-duty personnel on the installation. Direct payroll expenditures from Kirtland AFB exceed \$2 billion annually. When non-payroll expenditures associated with Kirtland AFB are included, total expenditures sum \$4.6 billion. Approximately 23,500 jobs are created as an indirect result of expenditures and employment at Kirtland AFB (KAFB 2002).

Environmental Justice and Protection of Children. To provide a baseline measure for environmental justice, an area around the installation must be established to examine the impacts on minority and low-income populations. For the purpose of this analysis, a 50-mile radius around Kirtland AFB was evaluated to identify minority and low-income populations. This 50-mile radius includes numerous towns, villages, census-designated places, and cities. The largest of these is the City of Albuquerque with a population of 448,607. In the City of Albuquerque, 40 percent of the population is Hispanic and 4 percent is Native American (see **Table 3-13**). The City of Rio Rancho is on the northwestern side of Albuquerque and has a population of 51,765 and is the second largest city within 50 miles of Kirtland AFB. The Hispanic population represents 28 percent of the total population in Rio Rancho and the Native American population represents 2 percent of the total population. The third largest population center within 50 miles of Kirtland AFB is South Valley, situated to the west of Kirtland AFB, containing 39,060 persons. In South Valley the Hispanic population is 78 percent of the total population and the Native American population is 2 percent of the total population. The percentage of individuals under the age of 5 is very similar in the City of Albuquerque, City of Rio Rancho, and South Valley when compared with the State of New Mexico and the United States. The average median household income for the Albuquerque MSA is \$39,088, slightly less than the United States average of \$41,994 (U.S. Census Bureau 2000).

The percentage of families living below the poverty level varies greatly throughout the metropolitan area of Albuquerque, with the City of Albuquerque having poverty levels similar to the State of New Mexico and the United States (see **Table 3-13**). South Valley has a higher poverty rate compared to the State of New Mexico and the United States, and Rio Rancho has a lower poverty rate than the State of New Mexico and the United States (U.S. Census Bureau 2000).

Table 3-13. Minority and Low-Income Characteristics (2000)

Race and Origin	City of Albuquerque	City of Rio Rancho	South Valley	New Mexico	United States
Total Population	448,607	51,765	39,060	1,819,046	281,421,906
Percent Under 5 Years of Age	6.9	7.5	7.9	7.2	6.8
Percent Over 65 Years of Age	12.0	11.8	10.0	11.7	12.4
Percent White	71.6	78.4	57.2	66.8	75.1
Percent Black or African American	3.1	2.7	1.1	1.9	12.3
Percent American Indian and Alaska Native	3.9	2.4	2.0	9.5	12.3
Percent Asian	2.2	1.5	0.3	1.1	12.3
Percent Native Hawaiian and Other Pacific Islander	0.1	0.2	0.1	0.1	0.1
Percent Other Race	14.8	10.9	35.0	17.0	5.5
Percent Two or More Races	4.3	4.1	4.2	3.6	2.4
Percent Hispanic or Latino	39.9	27.7	77.6	42.1	12.5
Median Household Income	\$38,272	\$47,169	\$30,879	\$34,133	\$41,994
Percent of Families Living Below Poverty	10.0	3.7	32.1	14.5	9.2

Source: U.S. Census Bureau 2000

Note: Hispanic denotes a place of origin.

4. Environmental Consequences

This section describes the potential environmental consequences on the affected environment of implementing the Proposed Action and the No Action Alternative. In **Sections 4.1 to 4.12**, each alternative is evaluated for its potential to affect physical, biological, and socioeconomic resources in accordance with 40 CFR 1508.8. Potential impacts for each resource area are described in terms of their significance. Significant impacts are those impacts that would result in substantial changes to the environment (as defined by 40 CFR 1508.27) and should receive the greatest attention in the decision-making process.

4.1 Land Use

4.1.1 Evaluation Criteria

The significance of potential land use impacts is based on the level of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. In general, a land use impact would be significant if it were to cause the following:

- Be inconsistent or in noncompliance with existing land use plans or policies
- Preclude the viability of existing land use
- Preclude continued use or occupation of an area
- Be incompatible with adjacent land use to the extent that public health or safety is threatened
- Conflict with planning criteria established to ensure the safety and protection of human life and property.

4.1.2 Proposed Action

4.1.2.1 Construction, Operation, and Maintenance of a New MWD Facility

Site Alternative 1 – Adjacent to the Existing MWD Facility

The Proposed Action would be in compliance with the land use policies presented in the *2002 Kirtland Air Force Base General Plan*, including the main goals of providing operational support for missions; ensuring the management of human, financial, natural, and constructed resources; and promoting the health, safety, and quality of life of Kirtland AFB's personnel. The Proposed Action would specifically satisfy several general development objectives identified in the General Plan to achieve these goals, such as siting facilities for maximum efficiency, and using best practices for building design and use. The General Plan specifically identifies the "South Forty area" (location of Site Alternative 1) as containing opportunities for development. Implementation of the Proposed Action within Site Alternative 1 would require the current land use designation to be changed from an undetermined land use (likely Administration and Research) to Industrial; however, with this change, Alternative 1 would comply with the General Plan and less than significant impacts on land use plans or policies would be expected.

Implementation of Site Alternative 1 would not violate local zoning ordinances and municipal zoning regulations do not apply to Federal property. Therefore, the Proposed Action would not result in any impacts on municipal land use plans or policies.

Implementation of Site Alternative 1 would not preclude the viability of existing land uses, or the continued use and occupation of areas surrounding it. Alternative 1 would be a continuation of existing conditions as it would replace the existing MWD facility to the south, and the existing obedience course would be used. In addition, Administration and Research and Industrial land uses are compatible (USAF 1998). Therefore, it would result in no impacts on existing land use viability or continued land occupation.

Construction in Site Alternative 1 would produce temporary, elevated noise levels that could be heard by persons in the immediately surrounding area for the duration of construction activities (see **Section 3.2** for a discussion of noise impacts). Operation of the MWD facility in Site Alternative 1 would not produce appreciable noise above ambient noise levels, but noise resulting from barking MWDs could periodically be heard outside of the proposed MWD facility. However, the impacts on the noise environment from barking would be expected to be less than significant, and would not prevent continued use of the surrounding area from Administration and Research. Therefore, Site Alternative 1 would not result in impacts on land use compatibility from noise production.

Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Impacts on installation and municipal land use plans and policies would be similar to those described for Site Alternative 1. Implementation of Site Alternative 2 would require the land use designation to be changed from Open Space to Industrial; however, this is consistent with the Kirtland AFB Future Land Use Plan. Open Space and Industrial land uses are compatible and normally close (USAF 1998). The implementation of the Proposed Action within Site Alternative 2 would not violate municipal planning or zoning regulations.

Site Alternative 2 would be within an established QD arc, which is not a compatible land use with the proposed MWD facility and could preclude the viability of the existing explosive site if this alternative is implemented. Infringement upon explosives QD arcs is a violation of the explosives QD siting of the potential explosion site, and waivers or exemptions would be required for the operation of the MWD facility (KAFB 2002). Prior to commencement of any work within the QD arc, all facility and roadway construction, utilities, and electromagnetic radiation sources must be coordinated with 377 ABW Weapons Safety to determine if an explosives site plan is required. If an explosives site plan is required, work cannot start until approval is granted by DOD Explosives Safety Board or Major Command. In addition, if a waiver or exemption for operation of the MWD facility within the QD arc is not approved, the explosive site would need to be reduced or moved. Compliance with this policy would ensure that the Proposed Action would result in less than significant impacts on land use compatibility from safety issues. Impacts on land use compatibility from the noise production during construction and operation of the proposed MWD facility would be similar to those described for Site Alternative 1.

Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Implementation of the Proposed Action in Site Alternative 3 would not require a change to the existing land use designation (Industrial). In addition, because Site Alternative 3 would be an Industrial land use, it would be consistent with the Kirtland AFB Future Land Use Plan, which identifies the general location of Site Alternative 3 as an area for potential future industrial development. Therefore, Site Alternative 3 would not result in any impacts on land use plans or policies.

The operation of an MWD facility in Site Alternative 3 would not preclude the viability of existing land uses or the continued use and occupation of areas surrounding the proposed MWD facility site. Therefore, the Proposed Action would result in no impacts on existing land use viability or continued land occupation.

Similar to that described for Site Alternative 1, Site Alternative 3 would not result in adverse impacts on municipal land use plans and policies. Municipal zoning regulations do not apply to Federal property. Therefore, implementation of Site Alternative 3 would not result in impacts on municipal zoning ordinances or land use compatibility from safety issues due to close proximity to an airport.

Construction of the proposed MWD facility would produce temporary, elevated noise levels and operation could produce periodic bursts of noise that could be heard by persons immediately surrounding Site Alternative 3. During both construction and operation, the observable noise levels to people in the immediate vicinity would be short-term, lasting only for the duration of building construction and barking dogs, respectively. In addition, the presence of Site Alternative 3 within the 65 to 69 dBA DNL noise zone of the Albuquerque International Sunport would not preclude the use of the site as an MWD facility. Therefore, Site Alternative 3 would result in less than significant impacts on land use compatibility from noise-related activities.

4.1.2.2 Demolition of Existing MWD Facility

Less than significant impacts on land use would be expected from the demolition of the existing MWD facility. Demolition of Building 30126 would not require a change to the existing land use designation. Similar to construction activities as described in **Section 4.1.2.1**, demolition activities would produce temporary, elevated noise levels that could be heard by persons immediately surrounding the site. The observable noise levels to people in the immediate vicinity would be short-term and last only for the duration of building construction; therefore, demolition would result in less than significant impacts on land use compatibility from noise disturbances.

4.1.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and existing land use conditions would remain the same as discussed in **Section 3.1.2**. No impacts on land use would be expected.

4.2 Noise

4.2.1 Evaluation Criteria

Noise impact analyses typically evaluate potential changes to the existing noise environment that would result from implementation of a proposed action. Potential changes in the acoustical environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels or reduce the ambient sound level), negligible (i.e., if the total number of sensitive receptors to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased sound exposure to unacceptable noise levels or ultimately increase the ambient sound level). Projected noise impacts were evaluated qualitatively for the alternatives considered.

4.2.2 Proposed Action

The sources of noise under the Proposed Action that could impact populations include demolition and construction activities and the operational noise from the completed facility. Additionally, as directed by AFI 31-202, *Military Working Dog Program*, the MWDs proposed to be housed at this facility are included in the population of receptors that could be impacted by noise. These sources are addressed as follows.

4.2.2.1 Construction, Operation, and Maintenance of a New MWD Facility

Site Alternative 1 – Adjacent to the Existing MWD Facility

Noise from construction activities varies depending on the type of equipment being used, the area that the action would occur in, and the distance from the noise source. To predict how construction activities would impact adjacent populations, noise from the probable construction was estimated. For example, as shown in **Table 3-2**, construction usually involves several pieces of equipment (e.g., backhoe, paver, and dump truck) that can be used simultaneously. Under the Proposed Action, the cumulative noise from the construction equipment, during the busiest day, was estimated to determine the total impact of noise from construction activities at a given distance (see **Table 4-1**). Construction-related noise generation would be expected to last only for the duration of construction activities (12 months) and would be isolated to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.).

Table 4-1. Predicted Noise Levels from Demolition and Construction Activities

Distance from Noise Source	Predicted Noise Level
100 feet	86 dBA
200 feet	80 dBA
400 feet	74 dBA
800 feet	68 dBA
1,200 feet	64 dBA

The Site Alternative 1 vicinity consists of open recreation space and industrial areas. Populations potentially affected by increased noise levels would include mainly USAF personnel in the facilities within an approximate 1,100-foot radius (noise level of 65 dBA and higher) of the proposed construction site; and the MWDs in the existing MWD facility, which would be approximately 50 feet to the south. Impacts from noise generated during the construction of the MWD facility in Site Alternative 1 would be anticipated to be greatest on the MWDs of all the site location alternatives, since the dogs would remain in the existing MWD facility and train in the existing obedience course while construction of the new facility takes place. It is likely that the MWDs would be initially disrupted and thus the Proposed Action could interfere with training activities; however, the MWDs would likely habituate to the noises after a period of time. Construction activities at Kirtland AFB would result in impacts on the noise environment; however, these impacts would be temporary and less than significant.

The new natural gas line in Site Alternative 1 would be connected to the existing natural gas infrastructure along Denise Avenue and would parallel Pennsylvania Street. The land adjacent to the proposed gas line is relatively undeveloped, with only two structures within 200 feet of the proposed natural gas line. Expected noise levels at these two structures would be approximately 80 dBA. Consequently, construction activities associated with the natural gas line would result in impacts on the noise environment; however, these impacts would be expected to be less than significant and would be temporary.

Several studies have been conducted to provide noise levels related to the interior spaces of kennels and other facilities that house animals. The MWD facility at Kunsan Air Base in South Korea conducted such a study, where interior noise levels were measured for three consecutive 24-hour periods in January 2006. During the sampling period, the exterior of the facility was continuously exposed to noise levels above the 75 dBA threshold established in AFI 31-202 for MWD facility placement; however, the interior noise

level over the same time period was measured to be between 58.5 dBA DNL and 67.4 dBA DNL (AFIOH 2006). Consequently, the noise environment inside the proposed MWD facility throughout its operation and maintenance would not result in impacts above those considered acceptable (75 dBA) for the MWD kennel, as stipulated in AFI 31-202.

Studies have also been conducted to provide noise levels related to the impact of kennel noise on the community environment. One study showed that the maximum attributable noise from barking dogs on the environment outside of the concrete facility was measured at approximately 62 dBA, 10 feet from the exterior door (WPH 2006). Consequently, it is estimated that the noise environment outside the proposed MWD facility throughout the operation and maintenance of the facility would result in impacts on the noise environment; however, these impacts would be expected to be less than significant.

Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Construction Activities. Site Alternative 2 consists of open space and industrial areas. Populations potentially affected by increased noise levels would include mainly USAF personnel in the facilities within an approximate 1,100-foot radius (noise level of 65 dBA and higher) of the proposed construction site. The closest populations to Site Alternative 2 would occur within the industrial buildings south and northeast approximately 500 feet from the proposed construction site. Examples of expected construction noise would be the same as discussed under Site Alternative 1 and as shown in **Table 4-1**. Consequently, construction activities at Site Alternative 2 would result in impacts on the noise environment; however, these impacts would be expected to be temporary and less than significant. Under the Proposed Action, the MWDs would remain in the existing MWD facility while the new MWD facility is constructed. Since Site Alternative 2 is several miles from the existing MWD facility, no impacts on MWDs would be expected from construction activities.

The new natural gas line in Site Alternative 1 would be connected to the existing natural gas infrastructure along Denise Avenue and would parallel an unnamed, unpaved road southeast of V Street to Pennsylvania Street where it will turn northwest to the proposed Site Alternative 2. The land adjacent to the proposed natural gas line is relatively undeveloped, with the only structures approximately 1,000 feet northwest of the proposed gas line. Expected noise levels at these structures would be approximately 66 dBA. Consequently, construction activities associated with the natural gas line would result in impacts on the noise environment; however, these impacts would be temporary and less than significant.

Impacts on the noise environment from the operation and maintenance of the MWD facility would be similar to those described for Site Alternative 1.

Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Construction Activities. Site Alternative 3 falls within the 65 to 69 dBA DNL noise zone from aircraft operations at Albuquerque International Sunport. Since multiple single noise events create the cumulative DNL value, the actual sound levels that a person hears within the area framed by the noise zone fluctuates throughout a 24-hour period. Populations adjacent to Site Alternative 3 are assumed to be accustomed to fluctuations of noise levels in the 70 to 90 dBA range. Noise generation would last only for the duration of construction activities and would be isolated to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). Consequently, construction activities at Site Alternative 3 would result in impacts on the noise environment; however, these impacts would be temporary and less than significant. Under the Proposed Action, the MWDs would remain in the existing MWD facility while the new MWD facility is constructed. Since Site Alternative 3 is several miles from the existing MWD facility, no impacts on MWDs would be expected from construction activities.

Impacts on the noise environment from the operation and maintenance of the MWD facility would be similar to those described for Site Alternative 1.

4.2.2.2 Demolition of Existing MWD Facility

Noise from demolition activities varies depending on the type of demolition equipment being used, the area that the action would occur in, and the distance from the noise source. To predict how demolition activities would impact adjacent populations, noise from the probable demolition was estimated. For example, as shown in **Table 3-2**, demolition usually involves several pieces of equipment (e.g., bulldozers and loaders) that can be used simultaneously. Under the Proposed Action, the cumulative noise from the demolition equipment, during the busiest day, was estimated to determine the total impact of noise from demolition activities at a given distance. Examples of expected cumulative demolition noise during daytime hours at specified distances are shown in **Table 4-1**. These sound levels were predicted at 100, 200, 400, 800, and 1,200 feet from the source of the noise. Building 30126 is in an area with a noise level of less than 65 dBA DNL. Since multiple single noise events create the cumulative DNL value, the actual sound levels that a person hears within the area framed by the noise zone fluctuates throughout a 24-hour period. Noise generated from demolition activities would last only for the duration of demolition and would be isolated to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.).

Populations potentially affected by increased noise levels during demolition of Building 30126 would include mainly USAF personnel in the facilities within an approximate 1,100-foot radius (noise level of 65 dBA and higher) of the proposed demolition site. If Site Alternative 1 is chosen, then the MWDs in the proposed new MWD facility, which would be approximately 50 feet to the north, would also be potentially affected by the increased noise levels. It is likely that the MWDs would be initially disrupted and thus the Proposed Action could interfere with training activities; however, the MWDs would likely habituate to the noises after a period of time. Consequently, demolition of the existing MWD facility at Kirtland AFB would result in less than significant impacts on the noise environment.

4.2.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented. There would be no increase in demolition or construction activities and consequently, the ambient noise environment would not change from existing conditions. Therefore, no impacts would be expected from the No Action Alternative.

4.3 Visual Resources

4.3.1 Evaluation Criteria

The potential for significant impacts on visual resources has been assessed based on whether the following would result from the Proposed Action:

- Adversely influence a national, state, or local park or recreation area
- Degrade or diminish a Federal, state, or local scenic resource
- Create adverse visual intrusions or visual contrasts affecting the quality of a landscape.

4.3.2 Proposed Action

4.3.2.1 Construction, Operation, and Maintenance of a New MWD Facility

Site Alternative 1 – Adjacent to the Existing MWD Facility

During the construction process, Site Alternative 1 would have little aesthetic appeal. Construction equipment, including bulldozers, backhoes, front-end loaders, dump trucks, and tractor-trailers, would be visible from the areas adjoining the site. Construction wastes temporarily stored for disposal would be visible in piles and in dumpsters at Site Alternative 1, and construction wastes would be seen in trucks on installation and public roadways being transported to landfills. Construction supplies would also be visible during transport to and temporary storage at the project site. Although the construction activities would adversely impact the installation's overall aesthetic appeal, the adverse impacts would be temporary (less than one-year duration) and, therefore, would be less than significant.

Following the construction of the proposed MWD facility at Site Alternative 1, the visual landscape of Kirtland AFB would be altered. However, because Site Alternative 1 is immediately north of Kirtland AFB's existing MWD facility, the proposed MWD facility at Site Alternative 1 would be consistent with the existing visual conditions for this area. In addition, Site Alternative 1 is in a remote portion of the installation and would only be seen by a relatively minimal number of people.

To minimize any potential adverse visual impacts, the proposed MWD facility would be designed to comply with the architectural compatibility standards as described in the *Kirtland Air Force Base Architectural Compatibility Plan* and the *Design Guide for Military Working Dog Facilities*. Appropriate exterior lighting and landscaping would be included in the design to enhance visual conditions. Kirtland AFB personnel would conduct periodic maintenance (exterior cleaning, painting, and landscaping) to prevent its appearance from gradually deteriorating. Less than significant impacts on visual resources would be expected from the implementation of the Proposed Action at Site Alternative 1. Appropriate planning and maintenance of the proposed MWD facility would minimize impacts.

Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Short-term impacts on visual resources from construction activities at Site Alternative 2 would be similar to those described for Site Alternative 1.

Following the construction of the proposed MWD facility at Site Alternative 2, similar impacts on visual resources as those described for Site Alternative 1 would be expected. However, because Site Alternative 2 is a distance from the existing MWD facility, a new MWD obedience training course would need to be constructed. As a result, the construction of this facility would disturb more land than that required for Site Alternative 1 and would introduce additional adverse impacts on the visual quality of the installation. Site Alternative 2 is also in a more developed portion of the installation than Site Alternative 1. As such, additional people would be exposed to the aesthetic conditions of the proposed MWD facility than at Site Alternative 1.

To alleviate these additional adverse impacts, additional mitigation measures would be incorporated into the design of the MWD facility at Site Alternative 2. One example is that a cinderblock wall might need to be constructed around the perimeter of the MWD facility. Although the wall would introduce its own adverse impacts on the visual condition of Kirtland AFB, the wall would block the public's view of the MWDs, kennels, and training operations, which would result in a net improvement to overall aesthetic conditions. Less than significant impacts on visual resources would be expected from the implementation

of the Proposed Action at Site Alternative 2. Appropriate planning and maintenance of the proposed MWD facility would minimize impacts.

Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Short-term impacts on visual resources from construction activities at Site Alternative 3 would be similar to those described for Site Alternative 1.

Less than significant impacts on visual resources would be expected from the implementation of the Proposed Action at Site Alternative 3. Since Site Alternative 3 is in the most developed location of the three site alternatives, it would have the greatest potential for adverse visual impacts. Similar design measures as those described for Site Alternative 2 would be implemented to mitigate potential adverse visual impacts from the proposed MWD facility on the surrounding environment.

4.3.2.2 Demolition of Existing MWD Facility

During the demolition of the existing MWD facility, demolition activities and demolition equipment would be visible from areas adjoining the site. Demolition wastes temporarily stored on site for disposal would be visible in piles and dumpsters at the site, and demolition wastes would be seen in trucks on and off installation during transport. Although the demolition activities would adversely impact the installation's overall aesthetic appeal, the adverse impacts would be temporary (less than 1-year duration) and the site would be returned to natural conditions; therefore, impacts would be less than significant.

4.3.3 No Action Alternative

The No Action Alternative would result in continuation of the existing visual and aesthetic conditions, as described in **Section 3.3**. Construction of the proposed MWD facility and demolition of the existing MWD facility would not take place, and no changes to the installation's current aesthetic appearance would occur.

4.4 Air Quality

4.4.1 Evaluation Criteria

The Federal *de minimis* threshold emissions rates were established by USEPA in the General Conformity Rule to focus analysis requirements on those Federal actions with the potential to substantially affect air quality. **Table 4-2** presents these thresholds, by regulated pollutant. As shown in **Table 4-2**, *de minimis* thresholds vary depending on the severity of the nonattainment area classification.

The environmental consequences to local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the impact in NAAQS "attainment" areas would be considered significant if the net increases in pollutant emissions from the Federal action would result in any one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Represent an increase of 10 percent or more in an affected AQCR emissions inventory
- Exceed any Evaluation Criteria established by a SIP.

Table 4-2. Conformity *de minimis* Emissions Thresholds

Pollutant	Status	Classification	<i>de minimis</i> Limit (tpy)
O ₃ (measured as NO _x or VOCs)	Nonattainment	Extreme	10
		Severe	25
		Serious	50
		Moderate/marginal (inside ozone transport region)	50 (VOCs)/ 100 (NO _x)
		All others	100
	Maintenance	Inside ozone transport region	50 (VOCs)/ 100 (NO _x)
		Outside ozone transport region	100
CO	Nonattainment/maintenance	All	100
PM ₁₀	Nonattainment/maintenance	Serious	70
		Moderate	100
		Not Applicable	100
PM _{2.5} (measured directly, as SO ₂ , or as NO _x)	Nonattainment/maintenance	All	100
SO ₂	Nonattainment/maintenance	All	100
NO _x	Nonattainment/maintenance	All	100

Source: 40 CFR 93.153

Impacts on air quality in NAAQS “nonattainment” areas are considered significant if the net changes in project-related pollutant emissions result in any of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Increase the frequency or severity of a violation of any ambient air quality standard
- Delay the attainment of any standard or other milestone contained in the SIP.

With respect to the General Conformity Rule, impacts on air quality would be considered significant if the proposed Federal action would result in an increase of a nonattainment or maintenance area’s emissions inventory by 10 percent or more for one or more nonattainment pollutants, or if such emissions exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been redesignated as a maintenance area.

In addition to the *de minimis* emissions thresholds, Federal PSD regulations define air pollutant emissions to be significant if the source is within 10 kilometers of any Class I area, and emissions would cause an increase in the concentration of any regulated pollutant in the Class I area of 1 µg/m³ or more (40 CFR 52.21(b)(23)(iii)).

Per the New Mexico Air Quality Control Act and NMAC 20.11.41, any person planning to construct a new stationary source or modify an existing stationary source of air contaminants in Bernalillo County, including the City of Albuquerque, where the stationary source emits one or more regulated air

contaminants that exceed a rate of 10 pounds per hour or 25 tpy would be required to obtain a permit to construct from the Albuquerque-Bernalillo County AQCB.

4.4.2 Proposed Action

4.4.2.1 Construction, Operation, and Maintenance of a New MWD Facility

The implementation of the Proposed Action at any of the three site alternatives would result in impacts on air quality resources; however, these impacts are expected to be less than significant. Emissions from the Proposed Action are summarized in **Table 4-3**. Emissions estimation spreadsheets and methodology are included in **Appendix D**. The Proposed Action would result in air quality impacts during construction activities, primarily from site-disturbing activities and operation of construction equipment. All emissions associated with construction operations would be temporary in nature. It is not expected that emissions from construction activities would contribute to or affect local or regional attainment status with the NAAQS. The requirement to obtain any applicable air permit for construction activities would be the responsibility of the construction contractor. However, considering construction equipment, including generators, would likely be considered mobile source emissions, it is unlikely that stationary source air permits would be required. The construction contractor should assess and confirm that air permits are not required for the construction equipment they plan to use.

The Proposed Action would also result in air quality impacts from the use of a 150-kVA natural gas-powered emergency generator that would be used to maintain HVAC system operations during power outages. Estimated emissions from the use of this backup generator are summarized in **Table 4-3**. Kirtland AFB would be required to obtain a permit to construct (20.11.41 NMAC, Authority to Construct) from the Albuquerque-Bernalillo County AQCB for the 150-kVA emergency generator. Per 20.11.41.2.B(2)(a) NMAC, all sources subject to the Federal New Source Performance Standards (e.g., new stationary internal combustion engines) are required to receive an Authority to Construct (20.11.41 NMAC) permit prior to construction.

The Proposed Action would generate particulate matter emissions as fugitive dust from ground-disturbing activities (e.g., grading, paving, and construction). Appropriate fugitive dust-control measures would be employed during construction activities to suppress emissions. Combustion emissions of all criteria pollutants would result from the operation of construction equipment and portable generators during construction activities, hauling debris from the project site, and construction workers commuting to the project site. Fugitive dust and combustion emissions associated with construction equipment would produce slightly elevated air pollutant concentrations. However, the impacts would be temporary, fall off rapidly with distance from the project site, and would not result in any long-term impacts.

Fugitive dust emissions would vary from day to day depending on the level of activity and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity. Fugitive dust emissions for various construction activities were calculated using emissions factors and methodology published by the USEPA. Fugitive dust emission estimations and methodology are included in **Appendix D**.

Specific information describing the types of construction equipment required for a specific task, the hours the equipment is operated, and operating conditions vary widely from project to project. For purposes of analysis, these parameters were estimated using established methodologies for construction and experience with similar types of construction projects. The duration of this project was assumed to occur over a one-year period. The estimated emissions for this project are presented in **Table 4-3**. Detailed assumptions used for estimating emissions are included in **Appendix D**.

Table 4-3. Estimated Air Emissions Resulting from the Proposed Action

Activity	NO _x tpy	VOC tpy	CO tpy	SO ₂ tpy	PM ₁₀ tpy	PM _{2.5} tpy	CO ₂ tpy
SITE 1 ALTERNATIVE (Construction of MWD Facility, Demolition of Building 30126, operation of emergency generator)							
<i>Construction Combustion</i>	4.88	0.46	2.15	0.38	0.35	0.34	553
<i>Construction Fugitive Dust</i>	--	--	--	--	1.14	0.23	--
<i>Haul Truck On-Road</i>	0.001	0.001	0.003	0.0001	0.001	0.0003	0.23
<i>Construction Commuter</i>	0.88	1.17	12.62	0.037	0.48	0.13	183
Subtotal Site 1 Construction Emissions	5.76	1.63	14.77	0.42	1.97	0.69	736
<i>150-kVA emergency generator</i>	0.60	0.02	0.51	0.00009	0.01	0.01	16.09
Total Site 1 Emissions	6.36	1.65	15.28	0.42	1.98	0.71	752.32
Percent of AMRGI Inventory	0.017%	0.0052%	0.0062%	0.016%	0.0014%	0.0043%	NA
SITE 2 ALTERNATIVE (Construction of MWD Facility, Construction of Obedience Course, Demolition of Building 30126, operation of emergency generator)							
<i>Construction Combustion</i>	4.88	0.51	2.15	0.38	0.35	0.34	553
<i>Construction Fugitive Dust</i>	--	--	--	--	1.55	0.31	--
<i>Haul Truck On-Road</i>	0.001	0.001	0.003	0.0001	0.001	0.0003	0.23
<i>Construction Commuter</i>	0.88	1.17	12.62	0.037	0.48	0.13	183
Subtotal Site 2 Construction Emissions	5.76	1.68	14.81	0.42	2.38	0.78	736
<i>150-kVA emergency generator</i>	0.60	0.02	0.51	0.00009	0.01	0.01	16.09
Total Site 2 Emissions	6.36	1.70	15.28	0.42	2.39	0.79	752.32
Percent of AMRGI Inventory	0.017%	0.0054%	0.0062%	0.016%	0.0017%	0.0047%	NA

Activity	NO _x tpy	VOC tpy	CO tpy	SO ₂ tpy	PM ₁₀ tpy	PM _{2.5} tpy	CO ₂ tpy
SITE 3 ALTERNATIVE (Construction of MWD Facility, Construction of Obedience Course, Demolition of Building 30126, operation of emergency generator)							
<i>Construction Combustion</i>	4.88	0.51	2.15	0.38	0.35	0.34	553
<i>Construction Fugitive Dust</i>	--	--	--	--	1.55	0.31	--
<i>Haul Truck On-Road</i>	0.001	0.001	0.003	0.0001	0.001	0.0003	0.23
<i>Construction Commuter</i>	0.88	1.17	12.62	0.037	0.48	0.13	183
Subtotal Site 3 Construction Emissions	5.76	1.68	14.81	0.42	2.38	0.78	736
<i>150-kVA emergency generator</i>	0.60	0.02	0.51	0.00009	0.01	0.01	16.09
Total Site 3 Emissions	6.36	1.70	15.28	0.42	2.39	0.79	752.32
Percent of AMRGI Inventory	0.017%	0.0054%	0.0062%	0.016%	0.0017%	0.0047%	NA

Since Kirtland AFB is in attainment for all criteria pollutants, General Conformity Rule requirements are not applicable. In addition, the Proposed Action would generate emissions below 10 percent of the emissions inventory for the AMRGI AQCR and the majority of emissions would be short-term. Therefore, construction and operation of the proposed MWD facility would not have significant impacts on air quality at Kirtland AFB or on regional or local air quality. **Appendix D** includes the air emissions estimation spreadsheets.

Greenhouse Gases. GHGs are gases that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the Earth's temperature. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative environmental, economic, and social consequences across the globe.

Recent observed changes due to global warming include shrinking glaciers, thawing permafrost, a lengthened growing season, and shifts in plant and animal ranges. Predictions of long-term negative environmental impacts due to global warming include sea level rise, changing weather patterns with increases in the severity of storms and droughts, changes to local and regional ecosystems including the potential loss of species, and a substantial reduction in winter snow pack.

The most common GHGs emitted from natural processes and human activities include CO₂, methane (CH₄), and nitrous oxide. Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydro fluorocarbons and per fluorocarbons) and sulfur hexafluoride. Each

GHG is assigned a global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO₂, which has a value of one. For example, CH₄ has a GWP of 21, which means that it has a global warming effect 21 times greater than CO₂ on an equal-mass basis. To simplify analyses, total GHG emissions from a source are often expressed as a CO₂ equivalent.

Federal agencies are, on a national scale, addressing emissions of GHGs by reductions mandated in Federal laws and EOs, most recently, EOs 13423 and 13514. Several states have promulgated laws as a means to reduce statewide levels of GHG emissions. In addition, groups of states (such as the Western Climate Initiative) have formed regionally based collectives to jointly address GHG pollutants.

The Energy Information Administration states that in 2007, gross CO₂ emissions in New Mexico were 59.2 million metric tons of CO₂ (EIA 2010). Approximately 682 metric tons of CO₂ (752 tons) were estimated to be emitted by the Proposed Action at each site alternative. The CO₂ emitted is approximately 0.0012 percent of the New Mexico statewide CO₂. Therefore, the Proposed Action, at any of the site alternatives chosen, would have negligible contribution towards the New Mexico statewide GHG inventory. CO₂ emission estimates are included in **Appendix D**.

Site Alternative 1 – Adjacent to the Existing MWD Facility

Site Alternative 1, north of the existing MWD facility near the intersection of Barrack Road and Manzano Road, would require the construction of three separate building structures, a Kennel Facility, Administrative Support Facility, and Outdoor Kennel and Storage Building; and an associated covered walkway, and natural gas lines to the buildings. The action would not require the construction of a new 22,500-square-foot obedience course because the existing course from the original MWD facility could be used. Therefore, emissions generated by implementation of the Proposed Action in Site Alternative 1 are anticipated to be less than in Site Alternatives 2 and 3. Construction activities associated with Site Alternative 1 would have less than significant impacts on air quality at Kirtland AFB or on regional or local air quality. Estimated air emissions resulting from Site Alternative 1 are shown in **Table 4-3**.

Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Site Alternative 2, at the Intersection of Wyoming Boulevard and Pennsylvania Street, would require the construction of the same three buildings and associated covered walkway as proposed in Site Alternative 1 but would use existing natural gas lines and require the construction of a 22,500-square-foot obedience course. This additional action would require site grading for drainage as well as the construction of a 10-foot, chain-link fence surrounding the obedience course. Because the construction of the proposed MWD facility and obedience course would disturb approximately 47,100 square feet (1.08 acres), Kirtland AFB would be required to obtain a Fugitive Dust Permit for the construction of the MWD facility at Site Alternative 2. Construction activities associated with Site Alternative 2 would have less than significant impacts on air quality at Kirtland AFB or on regional or local air quality. Estimated air emissions resulting from Site Alternative 2 are shown in **Table 4-3**.

Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Site Alternative 3 is on an undeveloped lot inside the cantonment area at the southeastern corner of the intersection of M Avenue and Pennsylvania Street. Site Alternative 3, like Site Alternative 2, would use existing utilities and require the construction of a 22,500-square-foot obedience course. Because the construction of the proposed MWD facility and obedience course would disturb approximately 47,100 square feet (1.08 acres), Kirtland AFB would be required to obtain a Fugitive Dust Permit for the construction of the MWD facility at Site Alternative 3. Construction activities associated with Site

Alternative 3 would have less than significant impacts on air quality at Kirtland AFB or on regional or local air quality. Estimated air emissions resulting from Site Alternative 3 are shown in **Table 4-3**.

4.4.2.2 Demolition of Existing MWD Facility

Demolition activities at Kirtland AFB under the Proposed Action would result in impacts on air quality resources; however, these impacts are expected to be less than significant. Air quality impacts from demolition activities would primarily result from site-disturbing activities and operation of construction equipment. All emissions associated with demolition operations would be temporary in nature. It is not expected that emissions from demolition would contribute to or affect local or regional attainment status with the NAAQS. Emissions from the proposed project are summarized in **Table 4-3**. Emissions estimation spreadsheets and methodology are included in **Appendix D**.

Demolition of Building 30126 would generate particulate matter emissions as fugitive dust from ground-disturbing activities (e.g., road surface demolition, grading). Appropriate fugitive dust-control measures would be employed during demolition activities to suppress emissions. Combustion emissions of all criteria pollutants would result from the operation of construction equipment and portable generators during demolition activities, hauling demolition wastes from the project site, and construction workers commuting to the project site. Fugitive dust and combustion emissions associated with construction equipment would produce slightly elevated air pollutant concentrations. However, the impacts would be temporary, fall off rapidly with distance from the project site, and would not result in any long-term impacts. Fugitive dust emissions would vary from day to day depending on the level of activity and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity. Fugitive dust emissions for various demolition activities were calculated using emissions factors and methodology published by the USEPA. Fugitive dust emissions estimations and methodology are included in **Appendix D**.

Specific information describing the types of construction equipment required for a specific task, the hours the equipment is operated, and operating conditions vary widely from project to project. For purposes of analysis, these parameters were estimated using established methodologies for demolition and experience with similar types of demolition projects. For the purpose of this analysis the duration of this project would occur over a one-year period. The estimated emissions for this project are presented in **Table 4-3**. Detailed assumptions used for estimating emissions are included in **Appendix D**.

4.4.3 No Action Alternative

Under the No Action Alternative, Kirtland AFB would not demolish the existing MWD facility or construct a new MWD facility, which would result in the continuation of the existing conditions. Therefore, no direct or indirect environmental impacts would be expected on local or regional air quality from implementation of the No Action Alternative.

4.5 Geology and Soils

4.5.1 Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating the potential impacts of a proposed action on geological resources. Generally, adverse impacts can be avoided or minimized if proper

construction techniques, erosion-control and storm water management measures, and structural engineering design are incorporated into project development.

Impacts on geology and soils would be significant if they would alter the lithology, stratigraphy, and geological structures that control groundwater quality, distribution of aquifers and confining beds, and groundwater availability; or change the soil composition, structure, or function (including prime farmland and other unique soils) within the environment.

4.5.2 Proposed Action

4.5.2.1 Construction, Operation, and Maintenance of a New MWD Facility

Site Alternative 1 – Adjacent to the Existing MWD Facility

Less than significant impacts on geological resources or soils would be expected from the implementation of the Proposed Action in Site Alternative 1. If Site Alternative 1 were selected, the Proposed Action would require construction of approximately 8,000 square feet of building space and an 11,000-square-foot parking area. Construction activities would require clearing of vegetation, grading, and paving. Clearing of vegetation could increase erosion and sedimentation potential. However, as Site Alternative 1 is generally only sparsely vegetated and has been previously disturbed, it is anticipated that clearing of vegetation would not result in a significant impact on soil erosion and sedimentation. Soil erosion and sediment production would be minimized for all construction operations as a result of following an approved sediment and erosion control plan. In addition, construction BMPs would be implemented to minimize soil erosion; therefore, less than significant impacts on soils would be anticipated at Site Alternative 1.

As a result of implementing the Proposed Action, soils would be compacted, and soil structure disturbed and modified. Soil productivity, which is the capacity of the soil to produce vegetative biomass, would decline in disturbed areas and would be eliminated in those areas within the footprint of the MWD facility. Loss of soil structure due to compaction from foot and vehicle traffic could result in changes in drainage patterns. Soil erosion and sediment control measures would be included in the site plan to minimize long-term erosion and sediment production. Use of storm water control measures that favor reinfiltration would minimize the potential for erosion and sediment production as a result of future storm events.

Construction of the MWD facility would be in accordance with building code requirements for Kirtland AFB, which would ensure protection from earthquakes. No impacts from geologic hazards would be expected.

Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Less than significant impacts on geological resources or soils would be expected from the implementation of the Proposed Action in Site Alternative 2. If Site Alternative 2 was selected, the Proposed Action would disturb approximately 41,500 square feet of land, including 8,000 square feet of building space, an 11,000-square-foot parking area, and a 22,500-square-foot obedience course. Construction activities would require clearing of vegetation, grading, and paving, which could increase erosion and sedimentation potential. However, as Site Alternative 2 is generally only sparsely vegetated and has been previously disturbed, it is anticipated that clearing of vegetation would not result in a significant impact on soil erosion and sedimentation. Soil erosion and sediment production would be minimized for all construction operations as a result of following an approved sediment and erosion control plan. In

addition, construction BMPs would be implemented to minimize soil erosion; therefore, less than significant impacts on soils would be anticipated at Site Alternative 2.

Impacts on soils from soil compaction in Site Alternative 2 would be similar to those described in Site Alternative 1.

Construction of the buildings for the MWD facility would be in accordance with building code requirements for Kirtland AFB, which would ensure protection from earthquakes. No impacts from geologic hazards would be expected.

Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Less than significant impacts on geological resources or soils would be expected from the implementation of the Proposed Action in Site Alternative 3. If Site Alternative 3 was selected, the Proposed Action would disturb approximately 41,500 square feet of land, including 8,000 square feet of building space, an 11,000-square-foot parking area, and a 22,500-square-foot obedience course. Construction activities would require clearing of vegetation, grading, and paving. Clearing of vegetation could increase erosion and sedimentation potential. However, as Site Alternative 3 is generally only sparsely vegetated and has been previously disturbed, it is anticipated that clearing of vegetation would not result in a significant impact on soil erosion and sedimentation. Soil erosion and sediment production would be minimized for all construction operations as a result of following an approved sediment and erosion control plan. In addition, construction BMPs would be implemented to minimize soil erosion; therefore, less than significant impacts on soils would be anticipated at the project site.

Impacts on soils from soil compaction in Site Alternative 3 would be similar to those described in Site Alternative 1.

Construction of the buildings for the MWD facility would be in accordance with building code requirements for Kirtland AFB, which would ensure protection from earthquakes. No impacts from geologic hazards would be expected.

4.5.2.2 Demolition of Existing MWD Facility

Less than significant impacts on geological resources and soils would be expected from the demolition of the existing MWD facility (Building 30126). The Proposed Action would require demolition of 2,520 square feet of building space. Demolition activities would occur predominantly on previously disturbed land and it is anticipated that the Proposed Action would have a minimal impact on previously undisturbed or compacted soil structure. Through the use of BMPs (e.g., minimization of soil exposure through revegetation), the impacts of demolition activities on soils surrounding Building 30126 would be expected to be localized and minimal. In addition, soil erosion and sediment production and offsite transport would be minimized for demolition activities as a result of following an approved sediment and erosion control plan and storm water pollution prevention plan (SWPPP) (see **Section 4.6.2** for additional discussion of permitting and planning).

Long-term, beneficial impacts on soils would be expected from the return of the site of the existing MWD facility to natural conditions. The Proposed Action would result in a decrease in impervious surfaces in the vicinity and thus a decrease in storm water runoff and soil erosion. However, these beneficial impacts would essentially be offset by the increase in impervious surfaces on Kirtland AFB due to the construction of a new MWD facility.

4.5.3 No Action Alternative

Under the No Action Alternative, the 377 AFW would not demolish the existing MWD facility or construct a new MWD facility; therefore, existing conditions would remain. No impacts on geological resources would be anticipated.

4.6 Water Resources

4.6.1 Evaluation Criteria

Evaluation of impacts on water resources is based on water availability, quality, and use; existence of floodplains; and associated regulations. A proposed action would be adverse if it were to substantially affect water quality; substantially reduce water availability or supply to existing users; threaten or damage hydrologic characteristics; or violate established Federal, state, or local laws and regulations. The potential impact of flood hazards on a proposed action is important if such an action occurs in an area with a high probability of flooding.

4.6.2 Proposed Action

4.6.2.1 Construction, Operation, and Maintenance of a New MWD Facility

Site Alternative 1 – Adjacent to the Existing MWD Facility

Under Site Alternative 1, less than significant impacts on water resources would be expected. Groundwater might be temporarily used for dust suppression during construction activities, depending on site conditions. If water application were required for dust suppression, sufficient water resources are available on the installation; therefore, less than significant adverse impacts on groundwater availability would be expected.

The implementation of the Proposed Action at Site Alternative 1 would disturb at least 19,000 square feet (0.44 acres), but with the assumed land required for a staging area and additional disturbances surrounding the proposed MWD facility, could disturb approximately 24,625 square feet (0.6 acres). The Proposed Action would create ground disturbances on a small scale, which could in turn increase erosion potential and runoff during heavy precipitation events. Although the Arroyo del Coyote is approximately 1 mile from Site Alternative 1, construction debris could reach tributary drainages to the arroyo through wind or surface runoff if measures were not taken to keep debris on site. Since the anticipated footprint of the proposed construction in Site Alternative 1 would be less than 1 acre, construction of the MWD facility would not require an NPDES permit for storm water discharges. In addition, the selected contractor would not be subject to the CWA Final Rule requirements regarding effluent limitations and performance standards outlined in **Section 3.6.1**. However, the selected contractor for the Proposed Action would be required to implement the new storm water design requirements of Section 438 of the EISA that require Federal construction projects that disturb 5,000 square feet or more of land to maintain or restore predevelopment site hydrology to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. A sediment and erosion control plan and an SWPPP would also be implemented during construction. The sediment and erosion control plan and SWPPP would identify BMPs to reduce erosion and runoff from construction of the proposed MWD facility. Therefore, less than significant short-term and long-term, adverse impacts on water resources would be expected from the Proposed Action.

BMPs would be developed as part of the SWPPP to manage storm water both during and after construction. Restabilization and revegetation of the area following construction along with other BMPs to abate runoff and wind erosion would reduce the impacts of erosion and runoff on the arroyos on Kirtland AFB. Proper housekeeping and retention of debris within the site boundaries would prevent construction debris from entering waterways. Therefore, short-term, adverse impacts on surface waters would be less than significant. Design of the proposed MWD facility would include storm water control. Storm water from the proposed MWD facility would be incorporated into Kirtland's MS4; therefore, no long-term, adverse impacts on water resources from sheet runoff during storm events would be expected from the operation of the MWD facility.

Heavy equipment (e.g., bulldozers, backhoes, dump trucks, concrete mixers, asphalt vehicles) and generators would be on site throughout periods of construction. Fuels, hydraulic fluids, oils, and other lubricants would be stored on site during the project to support contractor vehicles and machinery. No other hazardous materials are anticipated to be stored on site during construction activities. Construction personnel would be required to follow appropriate BMPs to protect against potential petroleum or hazardous material spills. Proper housekeeping, maintenance of equipment, and containment of fuels and other potentially hazardous materials would be conducted to minimize the potential for a release of fluids into groundwater or surface waters. In the event of a spill, procedures outlined in Kirtland AFB's Spill Prevention, Control, and Countermeasures (SPCC) Plan would be followed to quickly contain and clean up a spill (see **Sections 3.10** and **4.10**, Hazardous Materials and Wastes). Therefore, less than significant adverse impacts on water quality would be expected as a result of the Proposed Action.

Kirtland AFB's MS4 permit requires that all construction activities, regardless of size, implement BMPs to ensure that storm water pollutants do not enter the storm drainage system and that storm water pollutants are contained within the project area. All storm water drop inlets in the project area must be protected with a barrier (e.g., hay bales, socks, sand bags). Contractors must minimize stock piles and keep the construction area clean of debris, designate equipment and storage areas, ensure equipment is free of leaks, minimize exits and entrances to the project area, minimize track out, and implement good housekeeping measures to ensure practices are reducing storm water pollutants to the maximum extent practicable.

Site Alternative 1 is outside of the Tijeras Arroyo and Arroyo del Coyote 100-year floodplains; therefore, no direct impacts on floodplains would be expected. Although the quantity of storm water sheet flow from disturbed sites to the intermittent streams on Kirtland AFB could increase during construction activities, this increase is not anticipated to be significant. Therefore, the Proposed Action would have less than significant indirect impacts on floodplain flow characteristics.

Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Impacts on groundwater from the implementation of the Proposed Action in Site Alternative 2 would be similar to those described in Alternative 1.

The implementation of the Proposed Action at Site Alternative 2 would disturb at least 41,500 square feet (8,000-square-foot MWD facility, 11,000-square-foot parking area, and 22,500-square-foot MWD obedience course) but, with the assumed land required for a staging area and additional disturbances surrounding the proposed MWD facility, could disturb approximately 47,125 square feet (1.1 acres). Impacts on surface waters from the implementation of the Proposed Action in Site Alternative 2 would be similar to, but slightly greater than, those for Site Alternative 1. The construction of a 22,500-square-foot MWD obedience course in addition to the MWD facility would result in a greater amount of ground disturbance and increase in erosion and sedimentation potential in the short term. In addition, the closest

main drainage channel, the Tijeras Arroyo, is approximately 0.6 miles from Site Alternative 2, which is much closer than Site Alternative 1 is to the Arroyo del Coyote.

The NPDES storm water program requires construction site operators engaged in clearing, grading, and excavating activities that disturb 1 acre or more, including smaller sites in a larger common plan of development, to obtain coverage under an NPDES permit for their storm water discharges. The USEPA's Construction General Permit outlines a set of provisions that construction operators must follow to comply with the requirements of the NPDES storm water regulations. Kirtland AFB manages an active program for tracking and inspecting large (greater than 5 acres) and small (1 to 5 acres) construction activities that require coverage under the NPDES storm water program (KAFB 2002). The USEPA is the permitting authority in New Mexico. The implementation of the Proposed Action at Site Alternative 2 is estimated to disturb approximately 1.1 acres. Therefore, it is anticipated that the selected contractor for the Proposed Action would be required to obtain an NPDES Construction General Permit,

Construction or demolition that requires permit coverage requires preparation of a Notice of Intent to discharge storm water and an SWPPP that is implemented during construction. Kirtland AFB's MS4 permit requires that all construction activities, regardless of size, implement BMPs to ensure that storm water pollutants do not enter the storm drainage system and that storm water pollutants are contained within the project area. An SWPPP would identify BMPs, such as protecting storm water inlets in the project area with hay bales and sand bags, to reduce erosion and runoff from the proposed demolition sites (KAFB 2002).

Soil erosion and sediment production would be minimized for all construction operations as a result of following an approved sediment and erosion control plan. In addition, construction BMPs would be implemented to minimize soil erosion and introduction of pollutants into waterways during rain events; therefore, less than significant short-term impacts on water resources would be anticipated from the selection of Site Alternative 2. Since the implementation of the Proposed Action in Site Alternative 2 would be anticipated to disturb approximately 1.1 acres, the selected contractor for the Proposed Action would be required to meet the non-numeric effluent limitations of the CWA and design, install, and maintain effective erosion and sedimentation controls as described in **Section 3.6.1**. In addition, the selected contractor for the Proposed Action would be required to implement the new storm water design requirements of Section 438 of the EISA that require Federal construction projects that disturb 5,000 square feet or more of land to maintain or restore predevelopment site hydrology to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Design of the proposed MWD facility would include storm water control. Storm water from the proposed MWD facility would be incorporated into Kirtland's MS4. Therefore, less than significant long-term, adverse impacts on water resources from sheet runoff during storm events would be expected from the operation of the MWD facility.

Impacts on floodplains from the implementation of the Proposed Action in Site Alternative 2 would be similar to those described in Alternative 1.

Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Impacts on groundwater from the implementation of the Proposed Action in Site Alternative 3 would be similar to those described in Alternative 1.

The implementation of the Proposed Action at Site Alternative 3 would disturb at least 41,500 square feet (8,000-square-foot MWD facility, 11,000-square-foot parking area, and 22,500-square-foot MWD obedience course) but, with the assumed land required for a staging area and additional disturbances surrounding the proposed MWD facility, could disturb 47,125 square feet (1.1 acres). Impacts on surface

water from the implementation of the Proposed Action in Site Alternative 3 would be similar to those for Site Alternative 2. The construction of a 22,500-square-foot MWD obedience course in addition to the MWD facility would result in a greater amount of ground disturbance and increase in erosion and sedimentation potential in the short term.

Soil erosion and sediment production would be minimized for all construction operations as a result of following an approved sediment and erosion control plan. In addition, construction BMPs would be implemented to minimize soil erosion and introduction of pollutants into waterways during rain events; therefore, less than significant short-term impacts on water resources would be anticipated from the selection of Site Alternative 3. The implementation of the Proposed Action at Site Alternative 3 is estimated to disturb approximately 1.1 acres. If more than 1 acre is disturbed at one time, then the selected contractor for the Proposed Action would be required to obtain an NPDES Construction General Permit and meet the non-numeric effluent limitations of the CWA and design, install, and maintain effective erosion and sedimentation controls as described in **Section 3.6.1**.

The selected contractor for the Proposed Action would be required to implement the new storm water design requirements of Section 438 of the EISA that require Federal construction projects that disturb 5,000 square feet or more of land to maintain or restore predevelopment site hydrology to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Design of the proposed MWD facility would include storm water control. Storm water from the proposed MWD facility would be incorporated into Kirtland's MS4. Therefore, less than significant long-term, adverse impacts on water resources from sheet runoff during storm events would be expected from the operation of the MWD facility.

Impacts on floodplains from the implementation of the Proposed Action in Site Alternative 3 would be similar to those described in Alternative 1.

4.6.2.2 Demolition of Existing MWD Facility

Groundwater might be temporarily used for dust suppression during demolition activities, depending on site conditions. If water application were required for dust suppression, sufficient water resources are available on the installation; therefore, less than significant adverse impacts on groundwater availability would be expected.

Demolition of the existing MWD facility would disturb approximately 2,520 square feet (0.06 acres). The Proposed Action would create ground disturbances on a small scale, which could in turn increase erosion potential and runoff during heavy precipitation events. Demolition debris could reach waterways through wind or surface runoff if measures were not taken to keep debris on site. Proper housekeeping and retention of debris within the site boundaries would prevent construction debris from entering waterways. As the anticipated footprint from the demolition of the existing MWD facility would be approximately 2,520 square feet (0.06 acres), the selected contractor would not be required to obtain coverage under an NPDES permit; would not be subject to the CWA Final Rule requirements regarding effluent limitations and performance standards outlined in **Section 3.6.1**; and would not be required to implement the new storm water design requirements of Section 438 of the EISA.

Kirtland AFB's MS4 permit requires that all construction activities, regardless of size, implement BMPs to ensure that storm water pollutants do not enter the storm drainage system and that storm water pollutants are contained within the project area. All storm water drop inlets in the project area must be protected with a barrier (e.g., hay bales, socks, sand bags). Contractors must minimize stock piles and keep the construction area clean of debris, designate equipment and storage areas, ensure equipment are free of leaks, minimize exits and entrances to the project area, minimize track out, and implement good

housekeeping measures to ensure practices are reducing storm water pollutants to the maximum extent practicable.

Heavy equipment (e.g., bulldozers, backhoes, dump trucks, cranes) and generators would be on site throughout periods of demolition. Fuels, hydraulic fluids, oils, and other lubricants would be stored on site during the project to support contractor vehicles and machinery. No other hazardous materials are anticipated to be stored on site during demolition activities. Construction personnel would follow appropriate BMPs to protect against potential petroleum or hazardous material spills. Proper housekeeping, maintenance of equipment, and containment of fuels and other potentially hazardous materials would minimize the potential for a release of fluids into groundwater or surface waters. In the event of a spill, procedures outlined in Kirtland AFB's *Hazardous Material Emergency Planning and Response Plan* would be followed to quickly contain and clean up a spill (see **Sections 3.10** and **4.10** for more information on hazardous materials and wastes). Therefore, less than significant adverse impacts on water quality would be expected as a result of the Proposed Action.

The existing MWD facility is outside of the Tijeras Arroyo and Arroyo del Coyote 100-year floodplains; therefore, no direct impacts on floodplains would be expected. Although the quantity of storm water sheet flow from disturbed sites to the intermittent streams on Kirtland AFB could increase during demolition activities, this increase is not anticipated to be significant. Therefore, demolition of the existing MWD facility would have less than significant indirect impacts on floodplain flow characteristics.

4.6.3 No Action Alternative

Under the No Action Alternative, the existing MWD facility would not be demolished, the proposed MWD facility would not be constructed, and there would be no changes to current water resources. Therefore, no impacts on water resources would be expected as a result of the No Action Alternative.

4.7 Biological Resources

4.7.1 Evaluation Criteria

The level of impact on biological resources is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of ecological ramifications. Impacts on biological resources are considered significant if species or habitats of high concern are adversely affected over relatively large areas, or disturbances cause reductions in population size or distribution of a species of special concern. A habitat perspective is used to provide a framework for analysis of general classes of impacts (i.e., removal of critical habitat, noise, human disturbance).

Determination of the significance of wetland impacts is based on (1) the function and value of the wetland, (2) the proportion of the wetland that would be affected relative to the occurrence of similar wetlands in the region, (3) the sensitivity of the wetland to proposed activities, and (4) the duration of ecological ramifications. Impacts on wetland resources are considered significant if high value wetlands would be adversely affected.

Ground disturbance and noise associated with construction activities might directly or indirectly cause potential impacts on biological resources. Direct impacts from ground disturbance were evaluated by identifying the types and locations of potential ground-disturbing activities in correlation to important

biological resources. Mortality of individuals, habitat removal, and damage or degradation of habitats are impacts that might be associated with ground-disturbing activities.

Noise associated with a proposed action might be of sufficient magnitude to result in the direct loss of individuals and reduce reproductive output within certain ecological settings. Ultimately, extreme cases of such stresses could have the potential to lead to population declines or local or regional extinction. To evaluate impacts, considerations were given to the number of individuals or critical species involved, amount of habitat affected, relationship of the area of potential effect to total available habitat within the region, type of stressors involved, and magnitude of the effects.

As a requirement under the ESA, Federal agencies must provide documentation that ensures that agency actions do not adversely affect the existence of any threatened or endangered species. The ESA requires that all Federal agencies avoid “taking” threatened or endangered species, which includes jeopardizing threatened or endangered species habitat. Section 7 of the ESA establishes a consultation process with the USFWS that ends with USFWS concurrence or a determination of the risk of jeopardy from a Federal agency project.

4.7.2 Proposed Action

4.7.2.1 Construction, Operation, and Maintenance of a New MWD Facility

Site Alternative 1 – Adjacent to the Existing MWD Facility

Vegetation. Site Alternative 1 is outside of the cantonment area and has been previously disturbed. The site consists of minimal vegetation, mostly annual weeds and native grasses. Direct adverse impacts on vegetation would be expected from permanent removal of vegetation for the MWD facility. This site alternative would not require the construction of an obedience course, thereby decreasing the overall impacts of ground disturbance. Overall, impacts on vegetation would be less than significant.

Wildlife Species and Habitat. Noise created during construction activities could potentially result in adverse impacts on nearby wildlife. These impacts would include subtle, widespread impacts from the overall elevation of ambient noise levels, potentially resulting in reduced communication ranges, interference with predator/prey detection, or habitat avoidance. More intense impacts would include behavioral change, disorientation, or hearing loss. Predictors of wildlife response to noise include noise type (i.e., continuous or intermittent), prior experience with noise, proximity to a noise source, stage in the breeding cycle, activity, age, and sex. Prior experience with noise is the most important factor in the response of wildlife to noise, because wildlife can habituate to the noise. The rate of habituation to short-term construction and possible demolition noise is not known. Wildlife species inhabiting this site might be temporarily or permanently displaced from the area associated with the Proposed Action. Certain wildlife species would be expected to temporarily move to adjacent habitats during construction due to increased noise and ground disturbances and then potentially return to the area once construction activities have ceased. Other species would be permanently displaced due to a loss of habitat from the construction of a new facility. Increased mortality of less-mobile species would be expected as the result of unavoidable direct impacts associated with construction activities. This site alternative would not require the construction of an obedience course, thereby decreasing the overall impacts of ground disturbance. Overall, impacts on wildlife would be less than significant.

Threatened and Endangered Species. No federally or state-listed threatened or endangered species are known to inhabit Site Alternative 1. Because of the disturbed nature of the site, there is likely little wildlife currently inhabiting the site. Additionally, no potential habitat for federally or state-listed species

is located nearby. Site Alternative 1 is not suitable for quality wildlife habitat and impacts on threatened and endangered species from construction would be less than significant.

Although there are no burrowing owl nests currently at Site Alternative 1, the owls do vary their nesting sites from year to year. During construction, there is the possibility that a nest could be disturbed. The category of species of concern, which applies to the burrowing owl, carries no legal requirement, but identifies those species that deserve special consideration in management and planning. To avoid disturbances to potential nesting burrowing owls, a survey would be conducted prior to any construction activities. If owls are present, construction activities would only commence after the owls have migrated from the area (i.e., October 15–March 15). Additionally, nesting burrows would be flagged and avoided during construction activities, so that the nesting sites could still be viable after activities are completed. Kirtland AFB has standard mitigation procedures in conformance with the Migratory Bird Treaty Act (MBTA), should it be necessary to relocate an owl during construction. Thus, any impacts on burrowing owls would be less than significant.

Wetlands. No wetlands are located on the Site Alternative 1; therefore, no impacts on wetlands would be expected.

Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Vegetation. Site Alternative 2 is in the southern portion of the cantonment area and is generally undeveloped. Direct adverse impacts on vegetation would be expected from permanent removal of vegetation for the MWD facility. Site Alternative 2 would also require the construction of a 22,500-square-foot obedience course for the MWDs as described in **Section 2.1**, resulting in a larger ground disturbance than Alternative 1. Overall, impacts on vegetation would be less than significant.

Wildlife Species and Habitat. There are several potential prairie dog colonies northwest of Site Alternative 2. Noise created during construction activities could potentially result in adverse impacts on nearby wildlife. These impacts would include subtle, widespread impacts from the overall elevation of ambient noise levels, potentially resulting in reduced communication ranges, interference with predator/prey detection, or habitat avoidance. More intense impacts would include behavioral change, disorientation, or hearing loss. Predictors of wildlife response to noise include noise type (i.e., continuous or intermittent), prior experience with noise, proximity to a noise source, stage in the breeding cycle, activity, age, and sex. Prior experience with noise is the most important factor in the response of wildlife to noise, because wildlife can habituate to the noise. The rate of habituation to short-term construction noise is not known. Wildlife species inhabiting this site might be temporarily or permanently displaced from the area associated with the Proposed Action. Certain wildlife species would be expected to temporarily move to adjacent habitats during construction due to increased noise and ground disturbances and then potentially return to the area once construction activities have ceased. Other species would be permanently displaced due to a loss of habitat from the construction of a new facility. Increased mortality of less-mobile species would be expected as the result of unavoidable direct impacts associated with construction activities. Overall, impacts on wildlife would be less than significant.

The presence of ephemeral or permanent water sources and the greater diversity of trees and shrubs they support provide microhabitats that are unique in comparison to the surrounding landscape. There are no permanent water sources within the footprint of Site Alternative 2; however, there is an intermittent stream adjacent to this site. Wildlife species, especially herpetiles associated with wetland areas could be permanently displaced if activities occur during their breeding season or cause a long-term disturbance of breeding habitats. There are no wetlands within the footprint of Site Alternative 2; therefore, impacts on wildlife would be less than significant.

Threatened and Endangered Species. The burrowing owl is the only species of concern listed by the USFWS in the vicinity. Based on a survey conducted on July 15, 2009, there is one burrowing owl nesting location within 50 feet of Site Alternative 2 (see **Figure 3-6**). Although owls vary their nesting sites from year to year, there is the possibility that this nest could be disturbed during construction and demolition (if necessary). The category of species of concern, which applies to the burrowing owl, carries no legal requirement, but identifies those species that deserve special consideration in management and planning. Kirtland AFB already has a program in place that identifies locations of nesting burrowing owls and has developed procedures to relocate owls if necessary. To avoid disturbances to potential nesting burrowing owls, a survey would be conducted prior to any demolition and construction activities. If owls are present, demolition and construction activities would only commence after the owls have left the area (i.e., October 15–March 15). Additionally, nesting burrows would be flagged and avoided during demolition and construction activities, so that the nesting sites could still be viable after activities are completed. Kirtland AFB has standard mitigation procedures in conformance with the MBTA, should it be necessary to relocate an owl during demolition or construction. Therefore, any impacts on burrowing owls would be less than significant.

Wetlands. There is an intermittent stream and 100-year floodplain (see **Figure 3-5**) southeast of Site Alternative 2; however, there are no wetlands associated with these surface water features. Therefore, no impacts on wetlands would be expected.

Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Vegetation. Site Alternative 3 is inside the cantonment area and is currently undeveloped and regularly mowed. This semi-improved area consists largely of annual weeds, early successional perennials, and some native grasses and shrubs with areas of bare ground. Direct adverse impacts on vegetation would be expected from permanent removal of vegetation for the MWD facility. Site Alternative 3 would also require the construction of a 22,500-square-foot obedience course for the MWDs as described in **Section 2.1**. Overall, impacts on vegetation would be less than significant.

Wildlife Species and Habitat. There are several potential prairie dog colonies immediately south of Site Alternative 3. Noise created during construction activities could potentially result in adverse impacts on nearby wildlife. These impacts would include subtle, widespread impacts from the overall elevation of ambient noise levels, potentially resulting in reduced communication ranges, interference with predator/prey detection, or habitat avoidance. More intense impacts would include behavioral change, disorientation, or hearing loss. Predictors of wildlife response to noise include noise type (i.e., continuous or intermittent), prior experience with noise, proximity to a noise source, stage in the breeding cycle, activity, age, and sex composition. Prior experience with noise is the most important factor in the response of wildlife to noise, because wildlife can habituate to the noise. The rate of habituation to short-term construction noise is not known. Wildlife species inhabiting this site might be temporarily or permanently displaced from the area associated with the Proposed Action. Certain wildlife species would be expected to temporarily move to adjacent habitats during construction due to increased noise and ground disturbances and then potentially return to the area once construction activities have ceased. Other species would be permanently displaced due to a loss of habitat from the construction of a new facility. Increased mortality of less-mobile species would be expected as the result of unavoidable direct impacts associated with construction activities. Overall, impacts on wildlife would be less than significant.

Threatened and Endangered Species. The burrowing owl is the only species of concern listed by the USFWS in the vicinity. There are three burrowing owl nesting locations within 400 feet of Site Alternative 2, one of which is within 50 feet of the site (see **Figure 3-6**). Although owls vary their nesting sites from year to year, there is the possibility that at least one of these nests could be disturbed

during construction. The category of species of concern, which applies to the burrowing owl, carries no legal requirement, but identifies those species that deserve special consideration in management and planning. Kirtland AFB already has a program in place that identifies locations of nesting burrowing owls and has developed procedures to relocate owls if necessary. To avoid disturbances to potential nesting burrowing owls, a survey would be conducted prior to any demolition and construction activities. If owls are present, construction activities would only commence after the owls have left from the area (i.e., October 15–March 15). Additionally, nesting burrows would be flagged and avoided during construction activities, so that the nesting sites could still be viable after activities are completed. Kirtland AFB has standard mitigation procedures in conformance with the MBTA, should it be necessary to relocate an owl during demolition or construction. Therefore, any impacts on burrowing owls would be less than significant.

Wetlands. No wetlands are located on Site Alternative 3; therefore, no impacts on wetlands would be expected.

4.7.2.2 Demolition of Existing MWD Facility

Vegetation. As the site of the existing MWD facility is disturbed and little natural vegetation occurs within the demolition footprint of the facility, less than significant adverse impacts on natural vegetation would be expected from demolition activities. Less than significant adverse impacts on landscaped vegetation would be expected due to direct removal or trampling. Long-term, beneficial impacts on vegetation would be expected following demolition activities as the site would be returned to natural vegetated conditions. Overall, impacts on vegetation would be less than significant

Wildlife Species and Habitat. Noise created during demolition activities could potentially result in adverse impacts on nearby wildlife from the overall elevation of ambient noise levels. Increased noise levels could potentially result in reduced communication ranges, interference with predator/prey detection, or habitat avoidance. More intense impacts would include behavioral change, disorientation, or hearing loss. Certain wildlife species would be expected to temporarily move to adjacent habitats during demolition due to increased noise and ground disturbances and then potentially return to the area once construction activities have ceased. Long-term, beneficial impacts on wildlife and habitat would be expected from the return of the existing MWD facility site to natural conditions due to a creation of more wildlife habitat within the site. However, this would essentially be offset by the construction of a new MWD facility and associated loss of wildlife habitat, as discussed in **Section 4.7.2.1**. Overall, impacts on wildlife would be less than significant.

Threatened and Endangered Species. No threatened or endangered species occur within the site of the existing MWD facility; therefore, no impacts on threatened and endangered species would be expected from demolition of the facility.

Wetlands. No wetlands are located within or adjacent to the site of the existing MWD facility; therefore, no impacts on wetlands would be expected from demolition activities.

4.7.3 No Action Alternative

Under the No Action Alternative, the 377 ABW would not construct the MWD facility or demolish the existing MWD facility. Selection of this alternative would result in continued deterioration of the existing MWD facility that does not meet current environmental standards. Furthermore, the frequent maintenance and repair to the existing MWD facility would result in increased noise and disturbances to wildlife by maintenance personnel and vehicles.

4.8 Cultural Resources

4.8.1 Evaluation Criteria

Adverse impacts on cultural resources can include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or that alter its setting; general neglect of the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of the agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance.

4.8.2 Proposed Action

4.8.2.1 Construction, Operation, and Maintenance of a New MWD Facility

While all three of the site alternatives have varying levels of impact on cultural resources, it is recommended that any ground-disturbing maintenance or construction activities should take into consideration the potential discovery of previously undiscovered cultural resources. If any archaeological sites are identified during the demolition, construction, operation, or maintenance of the new MWD facility, these sites should be documented and evaluated for NRHP eligibility. Project impacts on unevaluated or potentially eligible cultural resources might be significant if NRHP eligibility status has not been determined. Once documented and evaluated through consultation with the SHPO, adverse impacts on NRHP-eligible and -listed cultural resources should be avoided. If avoidance is not possible, then mitigation of adverse impacts is recommended.

The three site alternatives and their potential impacts on cultural resources are described separately in the following sections.

Site Alternative 1 – Adjacent to the Existing MWD Facility

There are no known cultural resources within the APE of Site Alternative 1. Given their distances from the APE, no adverse impacts on the two archaeological resources (LA 88089 and LA 108035) or the architectural resource (Enlisted Men's Barracks/Manzano Dormitory building) near Site Alternative 1 would be anticipated. Accordingly, no impacts would be expected on cultural resources within the APE of the Proposed Action.

Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Site Alternative 2 would require the construction of a 22,500-square-foot obedience course in addition to the proposed MWD facility. This additional action would increase the APE of the Proposed Action and would require site grading for drainage. No known archaeological resources occur within the APE of Site Alternative 2. Given its distance from the APE, no adverse impacts on the archaeological resource (LA 134605) near Site Alternative 2 would be anticipated. Accordingly, no impacts would be expected on archaeological resources within the APE of the Proposed Action.

Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Site Alternative 3 is on an undeveloped lot inside the cantonment area at the southeastern corner of the intersection of M Avenue and Pennsylvania Street. Site Alternative 3, like Site Alternative 2, would require the additional construction of a 22,500-square-foot obedience course, thereby increasing the APE

of the Proposed Action. No known archaeological or architectural resources are within the APE of Site Alternative 3. Accordingly, no impacts on cultural resources within the APE of Site Alternative 3 would be expected.

4.8.2.2 Demolition of Existing MWD Facility

Building 30126 was built in 1954 as a hobby shop for the former Manzano weapons depot and was converted to a kennel in 1978. Under the Proposed Action, the demolition of Building 30126 would require an architectural evaluation for NRHP eligibility. If Building 30126 is determined to be eligible for the NRHP, then mitigation of adverse impacts through HABS documentation and a Historic Cultural Properties Inventory form would need to be completed prior to the commencement of the Proposed Action. Therefore, less than significant impacts on cultural resources would be expected from the demolition of the existing MWD facility.

4.8.3 No Action Alternative

Under the No Action Alternative, the 377 ABW would not construct a new MWD facility or demolish the existing MWD facility. The baseline conditions as described in **Section 3.8.2** would remain unchanged. Therefore, no significant impacts on cultural resources would occur as a result of the implementation of the No Action Alternative.

4.9 Infrastructure

4.9.1 Evaluation Criteria

Impacts on infrastructure are evaluated for their potential to disrupt or improve existing levels of service and create additional needs for energy (electric, natural gas, and liquid fuels), central heating and cooling, potable water, sanitary sewer, storm water systems, communications, and solid waste management. Impacts might arise from energy needs created by either direct or indirect workforce and population changes related to installation activities. An impact would be significant if implementation of the Proposed Action resulted in the following impacts on electrical power, natural gas, liquid fuels, central heating and cooling, potable water, sanitary sewer/wastewater, storm water, communications, and solid waste systems:

- Exceeded capacity of a utility
- A long-term interruption of the utility
- A violation of a permit condition
- A violation of an approved plan for that utility.

4.9.2 Proposed Action

4.9.2.1 Construction, Operation, and Maintenance of a New MWD Facility

Site Alternative 1 – Adjacent to the Existing MWD Facility

Electrical Systems. Implementation of the Proposed Action would require minimal amounts of electricity; however, construction activities would be limited to a short period (less than one-year duration). Electrical service interruptions might be experienced should aboveground or underground electrical cables need to be rerouted outside of the proposed work area. Service interruptions might also be experienced when the proposed MWD facility is connected to the Kirtland AFB electrical system.

Following the implementation of the Proposed Action, the overall electrical demand at Kirtland AFB would increase due to the added infrastructure of the proposed MWD facility. However, because the existing MWD facility would be demolished (see **Section 4.9.2.2**), the added electrical demand from the proposed MWD facility would be offset by the reduction in electrical demand from the removal of the existing MWD facility. In addition, the new MWD facility is anticipated to require less electricity than the existing MWD facility as it would use natural gas for heat and backup generators; and is anticipated to have more efficient lighting and be better insulated. Any potential increase in electrical demand from the implementation of the Proposed Action would be negligible in magnitude and within the current available capacity of the Kirtland AFB electrical system. As such, the Proposed Action would result in less than significant adverse impacts on electrical systems.

Natural Gas Systems. The proposed MWD facility would use natural gas as the fuel for building heat and as the power source for backup electrical generators. Natural gas service is not currently available to the Site Alternative 1 area; therefore, new natural gas transmission piping would need to be installed from the nearest natural gas source to Site Alternative 1, a distance of approximately 3 miles. The installation of the new natural gas transmission piping would expand the current Kirtland AFB natural gas distribution system and allow the proposed MWD facility and other facilities along the pipeline route access to natural gas service. Kirtland AFB considers natural gas to be its fuel of choice due to relatively lower costs and ease of use. Hence, the expansion of Kirtland AFB's natural gas system would be an overall beneficial impact on installation infrastructure.

Following the implementation of the Proposed Action, the overall natural gas demand at Kirtland AFB would increase because of the added demand from the proposed MWD facility. However, the increase in natural gas demand from this proposed facility would be negligible compared to the total natural gas demand for the installation. As such, the increase in natural gas demand from the Proposed Action would result in adverse impacts on natural gas systems; however, these impacts would be expected to be less than significant.

Liquid Fuel. The Proposed Action would not alter the quantities of liquid fuels (JP-8, diesel, gasoline) used at Kirtland AFB nor would it affect their handling and storage. The proposed MWD facility is not expected to require heating oil because natural gas would be used as the fuel for building heat. There would be no impacts on liquid fuel as a result of the Proposed Action.

Central Heating and Cooling Systems. The Proposed Action would not impact the central heating system of Kirtland AFB. Because Kirtland AFB is in the process of gradually shutting down the entire central heating system and because natural gas would be used as the fuel for building heat, it is expected that the proposed MWD facility would not use steam-based central heating resources. As such, no impacts on central heating and cooling systems would be expected.

Water Supply Systems. Implementation of the Proposed Action would require minimal amounts of water, primarily for dust suppression purposes. This water would be obtained from the Kirtland AFB water supply system. Water service interruptions might be experienced should underground water lines need to be rerouted outside of the proposed work area. Service interruptions might also be experienced when the proposed MWD facility is connected to the Kirtland AFB water supply system.

Following the implementation of the Proposed Action, the overall water demand at Kirtland AFB would slightly increase due to the added infrastructure of the proposed MWD facility. However, because the existing MWD facility would be demolished (see **Section 4.9.2.2**), the added water demand from the proposed MWD facility would be offset by the reduction in water demand from the removal of the existing MWD facility. Any potential increase in water demand from the implementation of the Proposed Action would be negligible in magnitude and within the current available capacity of the Kirtland AFB

water supply system. As such, the Proposed Action would result in less than significant impacts on water systems.

Sanitary Sewer and Wastewater Systems. Sanitary sewer service interruptions might be experienced when the proposed MWD facility is connected to the Kirtland AFB sanitary sewer system. Following the implementation of the Proposed Action, the amount of wastewater generated at Kirtland AFB would increase due to the added infrastructure of the proposed MWD facility. However, because the existing MWD facility would be demolished, the added wastewater generated from the proposed MWD facility would be offset by the reduction in wastewater generated from the removal of the existing MWD facility. Any potential increase in wastewater from the implementation of the Proposed Action would be negligible compared to the total volume of wastewater generated at the installation. As such, the Proposed Action would result in adverse impacts on wastewater systems; however, these impacts would be expected to be less than significant.

Storm Water Systems. Implementation of the Proposed Action would require ground disturbance as heavy equipment would clear, grade, and contour land surfaces. These activities would temporarily disrupt natural and man-made storm water drainage methods and increase the potential for storm water runoff to erode soil during construction activities. Soil erosion and sediment production would be minimized during construction periods by following an erosion and sediment control plan, and by using construction BMPs that would minimize ground surface disturbance and attempt to provide adequate temporary storm water management techniques. See **Section 4-6**, Water Resources, for additional information regarding storm water BMPs.

The construction of the proposed MWD facility as well as the associated walkways, kennels, and support buildings would add approximately 6,750 square feet of new impervious surface at the area of the Proposed Action. This increase in impervious surface would reduce the amount of surface area for storm water to permeate into the ground and increase the amount of storm water runoff. Long-term storm water management techniques, which might include the use of pipes, channels, culverts, and impoundment basins, would be implemented to reduce and control the volume of storm water runoff. The Proposed Action would result in adverse impacts on storm water systems; however, with appropriate BMPs, these impacts would be expected to be less than significant.

Communications Systems. Telephone and data transmission service interruptions might be experienced when the proposed MWD facility is connected to the Kirtland AFB communications system. Following the implementation of the Proposed Action, the overall telephone and data transmission demand at Kirtland AFB would increase due to the added infrastructure of the proposed MWD facility. However, because the existing MWD facility would be converted to a storage building, the added communication demand from the proposed MWD facility would be partially offset by the reduction in communication demand from the existing MWD facility. Any potential increase in communications service demand from the implementation of the Proposed Action would be negligible compared to the current available capacity of the Kirtland AFB communications system. As such, the Proposed Action would result in adverse impacts on communications systems; however, these impacts would be expected to be less than significant.

Solid Waste Management. The proposed construction of the MWD facility would generate approximately 13 tons of construction waste (USEPA 1998). Nonhazardous construction waste, such as asphalt, concrete, wood, and nonrecyclable metals, would be transported to the Kirtland AFB landfill for disposal. Receptacles would be provided for municipal solid waste generated by worker activity. Municipal solid waste would be transported to the Rio Rancho Landfill, because the Kirtland AFB landfill accepts only nonhazardous construction and demolition waste.

To reduce the amount of landfill waste, materials that could be recycled or reused would be diverted from landfills to the greatest extent possible. Site-generated scrap metals, wiring, clean ductwork, and structural steel would be separated and recycled offsite. Cardboard wastes would be recycled as a function of the Kirtland AFB Qualified Recycling Program. Miscellaneous salvageable metals would be transported to the Defense Reutilization and Marketing Office for recycling or reuse. Clean fill material, ground-up asphalt, and broken-up cement would be diverted from landfills and reused whenever possible.

Following the implementation of the Proposed Action, the overall amount of solid waste generated at Kirtland AFB would increase due to the addition of the proposed MWD facility. However, because the existing MWD facility would be converted to a storage building, the amount of solid waste generated from the proposed MWD facility would be partially offset by the reduction in solid waste generated from the existing MWD facility. Any potential increase in solid waste generation from the implementation of the Proposed Action would be negligible compared to the total volume of solid waste generated at Kirtland AFB and would be handled by current solid waste disposal practices. Therefore, the Proposed Action would result in adverse impacts on solid waste resources; however, these impacts would be expected to be less than significant.

Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Electrical Systems. Impacts on electrical systems would be similar to those described for Site Alternative 1.

Natural Gas Systems. Site Alternative 2 is closer to existing natural gas infrastructure than Site Alternative 1; therefore, approximately 0.5 miles of new natural gas distribution piping would be installed under this site alternative. As such, the Kirtland AFB natural gas system would still expand, resulting in beneficial impacts on infrastructure; however, it would do so by a lesser extent and cost than Site Alternative 1. Impacts on natural gas demand for this site alternative would be similar to those described for Site Alternative 1.

Liquid Fuels. Impacts on liquid fuels would be similar to those described for Site Alternative 1.

Central Heating and Cooling Systems. Impacts on central heating and cooling systems would be similar to those described for Site Alternative 1.

Water Supply Systems. Impacts on water supply systems would be similar to those described for Site Alternative 1.

Sanitary Sewer and Wastewater Systems. Impacts on sanitary sewer and wastewater systems would be similar to those described for Site Alternative 1.

Storm Water Systems. Because of the distance between Site Alternative 2 and the existing MWD obedience course, a new 22,500-square-foot MWD obedience course would need to be constructed under this site alternative. As a result, additional ground surface disturbance would be expected from Site Alternative 2 than from Site Alternative 1. Similar temporary storm water management practices as described for Site Alternative 1 would be used during construction to control erosion and sedimentation in runoff. Similar long-term storm water management techniques as described for Site Alternative 1 would be used to reduce runoff and control erosion following construction. Despite the slightly larger impact area for Site Alternative 2, with appropriate BMPs, impacts on storm water systems would be expected to be less than significant.

Communications Systems. Impacts on communications systems would be similar to those described for Site Alternative 1.

Solid Waste. Impacts on solid waste would be largely similar to those described for Site Alternative 1; however, additional quantities of solid waste would be generated during the construction of the proposed MWD obedience course required under this site alternative.

Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Electrical Systems. Impacts on electrical systems would be similar to those described for Site Alternative 1.

Natural Gas Systems. Natural gas service is available to the area of Site Alternative 3; therefore, only a minimal distance of new natural gas distribution piping would need to be installed. No expansion of the Kirtland AFB natural gas system would occur. Impacts on natural gas demand for this site alternative would be similar to those described for Site Alternative 1.

Liquid Fuels. Impacts on liquid fuels would be similar to those described for Site Alternative 1.

Central Heating and Cooling Systems. Impacts on central heating and cooling systems would be similar to those described for Site Alternative 1.

Water Supply Systems. Impacts on water supply systems would be similar to those described for Site Alternative 1.

Sanitary Sewer and Wastewater Systems. Impacts on sanitary sewer and wastewater systems would be similar to those described for Site Alternative 1.

Storm Water Systems. Impacts on storm water systems would be similar to those described for Site Alternative 2.

Communications Systems. Impacts on communications systems would be similar to those described for Site Alternative 1.

Solid Waste. Impacts on solid waste would be largely similar to those described for Site Alternative 2.

4.9.2.2 Demolition of Existing MWD Facility

Electrical Systems. Electrical transmission lines connecting the existing MWD facility to the Kirtland AFB electrical grid would be removed prior to the start of building demolition activities. Electrical interruptions might be experienced when the facility is disconnected from the Kirtland AFB electrical distribution system. Following the proposed building demolition, the overall electrical demand at Kirtland AFB would be reduced by a negligible amount due to the removal of this facility. However, this reduction in demand would be offset by the construction of the proposed MWD facility. Demolition activities at Kirtland AFB would result in impacts on electrical resources; however, these impacts would be expected to be less than significant.

Natural Gas Systems. The existing MWD facility is not connected to Kirtland AFB's natural gas system. Any existing natural gas lines within the vicinity of the demolition site would be clearly marked prior to the onset of demolition. Therefore, no impacts on natural gas systems would be expected.

Liquid Fuels. No known liquid fuels are stored at the existing MWD facility. The demolition of the existing MWD facility would not alter the quantities of most liquid fuels (JP-8, diesel, gasoline) used at Kirtland AFB nor would it affect their handling and storage. Therefore, no impacts on liquid fuels would be expected.

Central Heating and Cooling Systems. Service interruptions might be experienced when the existing MWD facility is disconnected from Kirtland AFB's central heating system, resulting in temporary adverse impacts. Long-term, beneficial impacts would be expected from the demolition of the existing MWD facility due to a reduction in the overall heating demand on Kirtland AFB. All impacts would be expected to be less than significant.

Water Supply Systems. Demolition of the existing MWD facility would require minimal amounts of water, primarily for dust suppression purposes. This water would be obtained from the Kirtland AFB water supply system. Water service interruptions might be experienced when Building 30126 is disconnected from the water supply system. The overall water demand at Kirtland AFB would be reduced by a negligible amount due to the removal of Building 30126; however, this would be offset by the construction of the proposed new MWD facility. Demolition of the existing MWD facility would result in impacts on water supply systems; however, these impacts would be expected to be less than significant.

Sanitary Sewer and Wastewater Systems. Sanitary sewer interruptions might be experienced when Building 30126 is disconnected from the Kirtland AFB sanitary sewer system; however, impacts would be expected to be less than significant.

Storm Water Systems. Implementation of the Proposed Action would require ground disturbance from foundation/pad removal and contouring of the ground surface. These activities would temporarily disrupt natural and man-made storm water drainage methods, increase sedimentation in runoff, and increase the potential for storm water runoff to erode soil during demolition activities. Soil erosion and sediment production would be minimized during demolition periods by following erosion and sediment control plans in addition to using demolition BMPs that would minimize ground surface disturbance and attempt to provide adequate temporary storm water management techniques. Demolition activities at Kirtland AFB would result in adverse impacts on storm water systems; however, these impacts would be expected to be less than significant.

Communications Systems. Telephone and data transmission service interruptions might be experienced when the existing MWD facility is disconnected from the Kirtland AFB communications system; however, impacts would be expected to be less than significant.

Solid Waste. Less than significant impacts from the generation of solid waste from demolition of Building 30126 would be expected. The proposed demolition of the existing MWD facility would generate approximately 195.3 tons of demolition waste (USEPA 1998). If Site Alternative 2 or 3 were chosen, a new MWD obedience course would be constructed closer to the site alternatives and the existing MWD obedience course would be demolished. Assuming the existing fence is composed of one of the heaviest gauge steels and measures 8 feet tall and 640 linear feet in perimeter, removal of the fence would generate approximately 1.85 tons of additional waste.

To reduce the amount of landfill waste, materials that could be recycled or reused would be diverted from landfills to the greatest extent possible. Site-generated scrap metals, wiring, clean ductwork, and structural steel would be separated and recycled offsite. Cardboard wastes would be recycled as a function of the Kirtland AFB Qualified Recycling Program. Miscellaneous salvageable metals would be transported to the Defense Reutilization and Marketing Office for recycling or reuse. Clean fill material,

ground-up asphalt, and broken-up cement would be diverted from landfills and reused whenever possible. Nonhazardous demolition waste, such as asphalt, concrete, wood, and nonrecyclable metals, would be transported to the Kirtland AFB landfill for disposal. Receptacles would be provided for municipal solid waste generated by worker activity. Municipal solid waste would be transported to the Rio Rancho Landfill, because the Kirtland AFB landfill accepts only nonhazardous construction and demolition waste.

4.9.3 No Action Alternative

The No Action Alternative would result in the continuation of the existing conditions of infrastructure resources, as discussed in **Section 3.9.2**. The implementation of the No Action Alternative would result in the continuation of inefficiencies in heating, cooling, ventilating, and electricity and an unreliable power supply. Therefore, less than significant adverse impacts on infrastructure and utilities would be expected from the No Action Alternative.

4.10 Hazardous Materials and Waste

4.10.1 Evaluation Criteria

Impacts would be considered significant if a proposed action resulted in worker, resident, or visitor exposure to hazardous materials or wastes, or if the action generated quantities of these materials beyond the capability of current management procedures. Impacts on hazardous materials management would be considered significant if the Federal action resulted in noncompliance with applicable Federal and NMED regulations, or increased the amounts generated or procured beyond current Kirtland AFB waste management procedures and capacities. Impacts on the ERP would be considered significant if the Federal action disturbed (or created) contaminated sites resulting in adverse impacts on human health or the environment.

4.10.2 Proposed Action

4.10.2.1 Construction, Operation, and Maintenance of a New MWD Facility

Site Alternative 1 – Adjacent to the Existing MWD Facility

Hazardous Materials and Petroleum Products. No impacts on hazardous materials management during construction would be expected. Contractors would be responsible for the management of hazardous materials and petroleum product usage, which would be handled in accordance with Federal, state, and USAF regulations. Contractors must report the use of hazardous materials to the 377 MSG/CEVC to be input into the Hazardous Materials Management System (HMMS). If a material that is less hazardous can be used, the 377 MSG/CEVC should make these recommendations. Use of the HMMS system would also ensure that ODSs are not available for use. Use of ODSs in such products as refrigerants, aerosols, and fire suppression systems is not permitted by the DOD without a formal request by waiver. There would be no new chemicals or toxic substances used or stored at the installation in conjunction with the Proposed Action.

The proposed MWD facility would not use any hazardous materials other than potassium chlorate and sodium chlorate oxidizers, which are used for the MWDs to find, and blank ammunition (less than 1,000 rounds). Explosives would be kept in Kirtland AFB's Munitions Storage Area offsite. Training operations would not cause an environmental release of these materials. The operation and maintenance of the MWD facility would not result in a significant increase in the type or quantity of hazardous

materials or petroleum products. Therefore, no impacts on hazardous materials and petroleum product management would be expected from operation and maintenance activities.

Hazardous and Petroleum Waste. Less than significant impacts would be expected from the generation of hazardous wastes during construction activities. It is anticipated that the quantity of hazardous wastes generated from proposed construction activities would be negligible and thus less than significant impacts on the installation's hazardous waste management program would be expected. Contractors would be responsible for the disposal of hazardous wastes in accordance with Federal and state laws and regulations, and the installation's Hazardous Waste Management Plan. BMPs, such as secondary containment, would be followed to ensure that contamination from a spill would not occur. If, however, a spill does occur, the *Hazardous Materials Emergency Planning and Response Plan* outlines the appropriate measures for spill situations (KAFB 2008b).

The operation and maintenance of the MWD facility would not result in an increase in the type or quantity of hazardous and petroleum wastes; therefore, no impacts on hazardous and petroleum waste management would be expected.

Environmental Restoration Program. The boundaries of ERP sites ST-80, LF-20, and ST-72 do not overlap with the footprint of the proposed MWD facility in Site Alternative 1. No impacts would be expected from these No Further Action ERP sites during construction activities or operation and maintenance of the new MWD facility. Because No Further Action status has been approved for ERP sites ST-80, LF-20, and ST-72, no impacts would be expected from these ERP sites during construction, operation, or maintenance of the proposed MWD facility at Site Alternative 1.

Pollution Prevention. Less than significant impacts on the Pollution Prevention Program at Kirtland AFB would be expected from implementation of the Proposed Action. An incremental increase in hazardous materials and wastes would be expected during construction under the Proposed Action. Adherence to the Pollution Prevention Program and associated plans at Kirtland AFB, particularly the *Hazardous Materials Emergency Planning and Response Plan*, would reduce adverse impacts resulting from the Proposed Action. BMPs used at construction sites would minimize impacts on the natural environment (KAFB 2008b).

The operation and maintenance of the MWD facility would not result in an increase in the type or quantity of hazardous materials. No impacts on the Pollution Prevention Program would be expected from the operation and maintenance activities.

Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Hazardous Materials and Petroleum Products. Impacts on hazardous materials and petroleum products from construction activities and the operation and maintenance of the MWD facility would be similar to that described for Site Alternative 1.

Hazardous and Petroleum Waste. Impacts on hazardous and petroleum wastes from construction activities and the operation and maintenance of the MWD facility would be similar to that described for Site Alternative 1.

Environmental Restoration Program. There are no identified ERP sites in the vicinity of proposed Site Alternative 2; therefore, no impacts on the ERP at Kirtland AFB would be expected from the construction activities, or continued operation and maintenance of the MWD facility.

Pollution Prevention. Impacts on pollution prevention from construction activities and the operation and maintenance of the MWD facility would be similar to that described for Site Alternative 1.

Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Hazardous Materials and Petroleum Products. Impacts on hazardous materials and petroleum products from construction activities and the operation and maintenance of the MWD facility would be similar to that described for Site Alternative 1.

Hazardous and Petroleum Waste. Impacts on hazardous and petroleum wastes from construction activities and the operation and maintenance of the MWD facility would be similar to that described for Site Alternative 1.

Environmental Restoration Program. The boundaries of ERP site ST-70 do not overlap with the footprint of the proposed MWD facility in Site Alternative 3. No impacts would be expected from the No Further Action ERP site during construction activities or operation and maintenance of the MWD facility.

Pollution Prevention. Impacts on pollution prevention from construction activities and the operation and maintenance of the MWD facility would be similar to those described for Site Alternative 1.

4.10.2.2 Demolition of Existing MWD Facility

Hazardous Materials and Petroleum Products. Demolition activities would require the use of petroleum products for demolition equipment. Hazardous materials (i.e., ACM, LBP, and PCBs) could also be encountered in Building 30126. It is anticipated that the quantity of products containing hazardous materials used during the demolition activities would be minimal and their use would be of short duration. There would be no new chemicals or toxic substances used or stored at the installation in conjunction with the demolition of the existing MWD facility. No significant impacts are anticipated.

No impacts on hazardous materials management during demolition would be expected. Contractors would be responsible for the management of hazardous materials and petroleum product usage, which would be handled in accordance with Federal, state, and USAF regulations. Contractors must report the use of hazardous materials to the HMMS, including pertinent information (e.g., Materials Safety Data Sheets). If a material that is less hazardous can be used, the HMMS should make these recommendations. Use of the HMMS would also ensure that ODSs are not available for use. Use of ODSs in such products as certain refrigerants, aerosols, and fire suppression systems is not permitted by the DOD without a formal request by waiver.

Hazardous and Petroleum Waste. Less than significant impacts would be expected from the generation of hazardous wastes during demolition activities. It is anticipated that the quantity of hazardous wastes generated from proposed demolition activities would be minor; therefore, less than significant impacts on the installation's hazardous waste management program would be expected. Contractors would be responsible for the disposal of hazardous wastes in accordance with Federal and state laws and regulations, as well as the installation's *Hazardous Waste Management Plan*. BMPs would be implemented to ensure that contamination from a spill would not occur. In the event of a spill, the SPCC Plan and *Hazardous Materials Emergency Planning and Response Plan* would be followed to quickly contain and clean up the spill.

Environmental Restoration Program. The boundaries of ERP sites ST-80, LF-20, and ST-72 do not overlap with the footprint of the existing MWD facility or the existing obedience course. Although the existing obedience course is in close proximity to LF-20 (approximately 60 feet east), no impacts would

be expected from this ERP site during fence and obstacle removal since LF-20 was given a No Further Action status. Because No Further Action status has been approved for ERP sites ST-80, LF-20, and ST-72, no impacts would be expected from these ERP sites during demolition of the existing MWD facility or obedience course.

Asbestos-Containing Materials. The existing MWD facility is reported to contain ACM. The existing MWD facility and associated infrastructure proposed for demolition would be surveyed prior to demolition and any identified asbestos would be separated from the remainder of the demolition materials as required and remediated in accordance with Federal (e.g., 40 CFR Subpart M—National Emission Standard For Asbestos Section 61.145), state (see **Section 3.4.2**), and USAF regulations. All ACM would be handled in accordance with all Federal, DOD, and state regulations and would be disposed of at the Keers Special Waste landfill, the City of Rio Rancho landfill, or another permitted site. Sampling, removal, and disposal of any ACM would be short-term in duration and would result in less than significant impacts.

Lead-Based Paint. As the existing MWD facility was constructed in 1954, it is assumed to contain LBP. In accordance with Kirtland AFB's *Lead-Based Paint Management Plan*, Building 30126 would be surveyed prior to demolition and any identified LBP would be separated from the remainder of the demolition materials as required and remediated in accordance with Federal, state, and USAF regulations. LBP would be handled in accordance with Federal regulations and the installation's *Lead-Based Paint Management Plan* and would be disposed of at a hazardous waste disposal facility. Sampling, removal, and disposal of any LBP would be short-term in duration and would result in less than significant impacts.

Polychlorinated Biphenyls. Building 30126 could contain light ballasts containing PCBs. The light fixtures within the existing MWD facility would be removed prior to demolition and would be handled in accordance with Federal and state regulations and the installation's *Hazardous Waste Management Plan*. Any PCBs would be disposed of at a hazardous waste disposal facility. Sampling, removal, and disposal of any light ballast would be short-term in duration and would result in less than significant impacts.

Pollution Prevention. Less than significant impacts on the Pollution Prevention Program at Kirtland AFB would be expected from the demolition of Building 30126. An incremental increase in hazardous materials and wastes would be expected during demolition under the Proposed Action. Adherence to the Pollution Prevention Program and associated plans at Kirtland AFB, particularly the *Hazardous Materials Emergency Planning and Response Plan*, would reduce adverse impacts resulting from the Proposed Action. BMPs used at the demolition site would minimize impacts on the natural environment.

4.10.3 No Action Alternative

The No Action Alternative would result in no change to the existing hazardous materials or waste management conditions discussed in **Section 3.10**. No impacts on hazardous materials or waste management would be expected as a result of the Proposed Action not being implemented.

4.11 Safety

4.11.1 Evaluation Criteria

If implementation of the Proposed Action were to increase risks associated with the safety of construction personnel, contractors, military personnel, or the local community, or hinder the ability to respond to an emergency, it would represent an adverse impact. An impact would be significant if implementation of the Proposed Action were to substantially increase risks associated with the safety of construction

personnel, contractors, military personnel, or the local community; substantially hinder the ability to respond to an emergency; or introduce a new health or safety risk for which the installation is not prepared or does not have adequate management and response plans in place.

4.11.2 Proposed Action

4.11.2.1 Construction, Operation, and Maintenance of a New MWD Facility

Site Alternative 1 – Adjacent to the Existing MWD Facility

Contractor Safety. Implementation of the Proposed Action would slightly increase the health and safety risk to contractors performing construction work at the Proposed Action site during the normal workday because the level of such activity would increase. Contractors would be required to establish and maintain health and safety programs for their employees. Implementation of the Proposed Action would result in adverse impacts on contractor safety; however, these impacts would be expected to be less than significant due to the implementation of effective health and safety programs.

MWD Safety. MWDs would remain at the existing MWD facility until construction of the proposed facility is complete. Short-term, adverse impacts on MWDs would occur as a result of disturbances related to construction activities in Site Alternative 1, which is adjacent to the existing facility. Noises associated with construction activities could temporarily increase anxiety in the MWDs and potentially distract the MWDs during training activities. However, these impacts would only occur while construction activities are occurring and would not be anticipated to result in any long-term impacts. In addition, the MWDs would likely habituate to construction disturbances after a period of time. Overall, impacts from construction disturbances would be less than significant.

The proposed MWD facility would be constructed to meet the size, sanitation, and design requirements specified in the Design Guide for MWD Facilities (DOD 2003). As such, the MWDs at Kirtland AFB would no longer be housed in kennels that are less than half of the required size. In addition, the proposed MWD facility would use a plumbing system capable of draining both storm water and dog excrement without back-ups, and the HVAC system would include humidity and dust control. Animal and insect infestations would be eliminated with the improved design of the proposed MWD facility. Each of these design improvements would help to improve the comfort, health, and safety of the MWDs of Kirtland AFB. Consequently, the MWDs would no longer be at increased risk for injury while at the MWD facility, and they and their handlers would be able to train more effectively. MWDs that are better trained would be able to perform their jobs better and ultimately be safer while on deployment. The operation of the proposed MWD facility at Kirtland AFB would result in significant beneficial impacts on MWD health and safety.

Military Personnel Safety. No impacts on military personnel health and safety would be expected during the implementation of the Proposed Action. Installation personnel would be required to vacate the area of the Proposed Action during construction activities. The Proposed Action work site would be fenced and appropriate signs posted to further reduce safety risks to installation personnel.

The use of the proposed MWD facility would improve the health and safety of military personnel at Kirtland AFB, resulting in long-term, beneficial impacts. Military personnel assigned to the proposed MWD facility would no longer be subject to inadequate space, insufficient number of toilets, and poor climate control. Potential exposures to pathogens in improperly drained dog excrement, harmful wildlife species (e.g., black widow spiders, scorpions, and rattlesnakes) within the kennels, and LBP and asbestos in building materials would be eliminated. In addition, the proposed MWD facility would allow for more

effective training of MWDs and their handlers. Better trained MWDs and MWD handlers would ultimately result in safer conditions for military personnel while on deployment.

Public Safety. No impacts on public health and safety would result from the implementation of the Proposed Action. Construction activities would not pose a safety risk to the public or to off-installation areas. The Proposed Action work site would be fenced and appropriate signs posted to further reduce safety risks to the public.

Following construction, access to the proposed MWD facility would be limited to authorized personnel. A heavy-duty, 10-foot-high, chain-link fence with straight wire (no barbed) would be constructed around the perimeter of the facility to prevent MWDs from accidentally escaping the facility. As such, the use of the proposed MWD facility at Kirtland AFB would not be expected to result in impacts on the public health and safety.

Explosives and Munitions Safety. No impacts on explosives and munitions safety would be expected during the implementation of the Proposed Action. Following the construction of the proposed MWD facility, explosives would no longer be used at the existing MWD facility because it would be converted to storage space. Explosives would instead be used at the proposed MWD facility during training exercises. The Proposed Action would not alter the number of MWDs at Kirtland AFB or change the frequency or intensity of MWD training; therefore, the quantities of explosives used during training exercises would not change. No explosives would be detonated during training exercises and none would be permanently stored at the proposed MWD facility. Based on this information, no net impacts on explosives and munitions safety would result from the implementation of the Proposed Action.

Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Contractor Safety. Impacts on contractor health and safety would be similar to those described for Site Alternative 1.

MWD Safety. No impacts on MWDs would be expected during construction activities, as the MWDs would remain at the existing MWD facility until construction of the proposed facility is complete. Long-term impacts on MWD health and safety would be similar to those described for Site Alternative 1; however, because Site Alternative 2 is on the outer edge of the cantonment area, there are more people, cars, air traffic, and military equipment visible and audible than at the existing MWD facility and Site Alternative 1. As such, there would be a slightly increased potential for adverse impacts on the health and safety of the MWDs. Site Alternative 2 has an increased potential for loud noises, which could potentially startle the MWDs and cause them to feel anxious or threatened. Additionally, the increased number of people, vehicles, and overall activity visible to the MWDs at Site Alternative 2 might be distracting. To mitigate the interactions between the MWDs and their surrounding environment, a cinderblock wall might need to be constructed around the perimeter of the MWD facility at Site Alternative 2. Construction of the cinderblock wall would obstruct the MWD's view of the adjoining area and help to dampen noise from entering the MWD facility. This would ultimately lead to healthier and safer conditions for the MWDs. Although Site Alternative 2 has an increased potential for adverse health and safety impacts on the MWDs, with appropriate planning and design efforts these adverse health and safety impacts would be less than significant and the total net impact would remain beneficial to MWD health and safety.

Military Personnel Safety. Impacts on military personnel health and safety would be similar to those described for Site Alternative 1.

Public Safety. Impacts on public health and safety would be similar to those described for Site Alternative 1; however, because Site Alternative 2 is in a more developed portion of Kirtland AFB than the existing MWD facility and Site Alternative 1, there would be a greater perception of adverse health and safety impacts on the public. Like at Site Alternative 1, the proposed MWD facility would be secured to prevent unauthorized entry to the facility. A heavy-duty, 10-foot-high, chain-link fence with straight wire (no barbed) would be constructed around the perimeter of the facility to prevent MWDs from accidentally escaping. Additionally, Site Alternative 2 might require the installation of a cinderblock wall around the perimeter of the MWD facility. This wall would obstruct visual and lessen auditory contact between the public and the MWDs, and as a result, lessen the perceived adverse impacts on public safety. Although Site Alternative 2 would have greater perceived adverse impacts on public health and safety than Site Alternative 1, with appropriate planning and design efforts the actual impacts would be negligible and similar to those expected for Site Alternative 1.

Explosives and Munitions Safety. Impacts on explosives and munitions safety would be similar to those described for Site Alternative 1.

Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Contractor Safety. Impacts on contractor health and safety would be similar to those described for Site Alternative 1.

MWD Safety. No impacts on MWDs would be expected during construction activities, as the MWDs would remain at the existing MWD facility until construction of the proposed facility is complete. Long-term impacts on MWD health and safety would be similar to those described for Site Alternative 1 and Site Alternative 2; however, because Site Alternative 3 is in the most developed location of the three site alternatives, it would have the greatest potential for adverse impacts on the health and safety of the MWDs. Similar design measures as those described for Site Alternative 2 would be implemented to mitigate potential adverse health and safety impacts on the MWDs from the surrounding environment. As such, the adverse health and safety impacts on the MWDs at Site Alternative 3 would be expected to be less than significant and the total net impacts would remain beneficial to MWD health and safety.

Military Personnel Safety. Impacts on military personnel health and safety would be similar to those described for Site Alternative 1.

Public Safety. Impacts on public health and safety would be similar to those described for Site Alternative 2.

Explosives and Munitions Safety. Impacts on explosives and munitions safety would be similar to those described for Site Alternative 1.

4.11.2.2 Demolition of Existing MWD Facility

Contractor Safety. Implementation of the Proposed Action would slightly increase the health and safety risk to contractors performing demolition work at the existing MWD facility during the normal workday because the level of such activity would increase. Contractors would be required to establish and maintain health and safety programs for their employees. Implementation of the Proposed Action would result in adverse impacts on contractor safety; however, these impacts would be expected to be less than significant due to the implementation of effective health and safety programs.

MWD Safety. No impacts on MWD safety would be expected during the demolition of the existing MWD facility, as the MWDs would be moved to the proposed new MWD facility. Temporary adverse

impacts on the health of the MWDs might occur if the new MWD facility is constructed in Site Alternative 1, as noise disturbances from nearby demolition of the existing MWD facility could disturb the MWDs and increase anxiety levels (see **Section 4.2.2.2**). However, impacts would be expected to be less than significant.

Military Personnel Safety. Less than significant adverse impacts on military personnel health and safety would be expected during demolition activities, since Building 30126 would be vacant at the time the Proposed Action was implemented. Adherence to Kirtland AFB's Asbestos Management Plan and Lead-Based Paint Management Plan by contractors during demolition activities would prevent the potential exposure of military personnel to asbestos and lead wastes. Additionally, the removal of buildings containing ACM and LBP would be beneficial to the health and safety of military personnel.

Public Safety. No impacts on public health and safety would result from the demolition of Building 30126. Demolition activities would not pose a safety risk to the public or to off-installation areas. The demolition work site for Building 30126 would be fenced and appropriate signs posted to further reduce safety risks to the public.

Explosives and Munitions Safety. No impacts on explosives and munitions safety would be expected from the demolition of Building 30126. All explosive constituents and explosive materials (e.g., potassium chlorate, sodium chlorate, and blank ammunition) would be removed from Building 30126 and the existing obedience course prior to the commencement of demolition activities.

4.11.3 No Action Alternative

Under the No Action Alternative, a new MWD facility would not be constructed and the existing MWD facility's deficiencies, as discussed in **Section 3.11.2**, would continue to jeopardize both the short- and long-term health and safety of the MWDs at Kirtland AFB. In the short term, the MWDs would be at increased risk of injury from the lack of personal space, the potential for flooding in their kennels, exposure to pathogens in improperly drained excrement, and animal/insect bites. In the long term, these deficiencies could increase stress and reduce the efficiency and effectiveness of MWD training, which could potentially affect the MWD's health and safety when deployed, resulting in significant adverse impacts on MWD safety.

4.12 Socioeconomics and Environmental Justice

4.12.1 Evaluation Criteria

Socioeconomics. This section addresses the potential for direct and indirect impacts that the Proposed Action could have on local or regional socioeconomics. Impacts on local or regional socioeconomics are evaluated according to their potential to stimulate the economy through the purchase of goods or services and increases in employment and population. Similarly, impacts are evaluated to determine if overstimulation of the economy (e.g., the construction industry's ability to sufficiently meet the demands of a project) could occur as a result of the Proposed Action.

Environmental Justice and Protection of Children. Ethnicity and poverty data are examined for the Albuquerque metropolitan area (50-mile radius around Kirtland AFB) and compared to the State of New Mexico and the United States to determine if a low-income or minority population could be disproportionately affected by the Proposed Action.

4.12.2 Proposed Action

4.12.2.1 Construction, Operation, and Maintenance of a New MWD Facility

Under the Proposed Action, the 377 ABW would construct, operate, and maintain a new MWD facility for the 377 SFS on Kirtland AFB. The total cost of construction to build the proposed MWD facility according to the most recently available Form 1391 for the Proposed Action is estimated at \$4,400,000 (KAFB 2010). Impacts associated with each site alternative are discussed as follows.

Site Alternative 1 – Adjacent to the Existing MWD Facility

Demographics. The number of workers who would be hired to construct the MWD facility at Site Alternative 1 would most likely come from the existing supply within the Albuquerque MSA. Relocation of construction workers to meet demand for the Proposed Action would not be expected as the scope of construction activities should not necessitate out-of-town workers to permanently relocate. No new staff are anticipated to be hired or transferred to Kirtland AFB for operation and maintenance of the proposed MWD facility. The number of new residents who would move to the Albuquerque MSA area as result of the Proposed Action would be negligible; therefore, less than significant impacts on demographics would be expected as a result of the Proposed Action.

Employment Characteristics. The existing construction industry within the Albuquerque MSA should adequately provide enough workers as required to construct the MWD facility. The number of construction workers necessary for the Proposed Action, estimated to be less than 1 percent of all construction workers in the Albuquerque MSA, is not large enough to outstrip the supply of the industry. Indirect beneficial impacts would result from the increase in payroll tax revenues, purchase of materials, and purchase of goods and services in the area resulting in less than significant beneficial impacts on the socioeconomic climate of the Albuquerque MSA.

Kirtland AFB. The temporary increase of construction employees at Kirtland AFB would represent a small increase in the total number of persons working on Kirtland AFB and no additional facilities (e.g., housing, transportation) would be necessary to accommodate the workforce. Changes to employment and expenditures resulting from the MWD facility would be negligible and beneficial; therefore, less than significant impacts would be expected.

Environmental Justice and Protection of Children. The Albuquerque metropolitan area (50-mile radius around Kirtland AFB) contains elevated minority and low-income populations in comparison to the United States, but similar to the State of New Mexico (see **Section 3.13.2**). Construction activities would occur adjacent to the existing MWD facility; therefore, no minority or youth populations would be disproportionately impacted by the Proposed Action. Operation of the MWD facility would provide better working conditions for MWDs and associated personnel.

MWD facilities are best sited in areas where noise from surrounding areas does not disrupt the MWDs and noise from the MWDs does not disrupt surrounding land uses (DOD 2003). If Site Alternative 1 were chosen, operation of the MWD facility would occur under the same conditions as the current facility. Additionally, the MWD facility would be constructed following the Design Guide for MWD Facilities (DOD 2003). Provisions for the safety of the general public and the safety of the MWDs and their handlers are outlined in the design guide. The operation of the facility in this location would not result in disproportionate impacts on minority and youth populations as the new MWD facility would be operating in close proximity to the existing facility and would not result in expanded MWD operations that would be near these populations.

Indirect disproportionate adverse impacts on minority, low-income, and youth populations would not be expected as result of the Proposed Action.

Site Alternative 2 – Intersection of Wyoming Boulevard and Pennsylvania Street

Demographics. Impacts on demographics for Site Alternative 2 would be similar in nature to those described for Site Alternative 1.

Employment Characteristics. Impacts on employment characteristics for Site Alternative 2 would be similar in nature to those described for Site Alternative 1.

Kirtland AFB. Impacts on Kirtland AFB for Site Alternative 2 would be similar in nature to those described for Site Alternative 1.

Environmental Justice and Protection of Children. Environmental justice and protection of children impacts for Site Alternative 2 would be similar in nature to those described for Site Alternative 1.

Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

Demographics. Impacts on demographics for Site Alternative 3 would be similar in nature to those described for Site Alternative 1.

Employment Characteristics. Impacts on employment characteristics for Site Alternative 3 would be similar in nature to those described for Site Alternative 1.

Kirtland AFB. Impacts on Kirtland AFB for Site Alternative 3 would be similar in nature to those described for Site Alternative 1.

Environmental Justice and Protection of Children. Environmental justice and protection of children impacts for Site Alternative 3 would be similar in nature to those described for Site Alternative 1. It should be noted that Site Alternative 3 is located within the cantonment area, but impacts on minority and youth populations are not expected as Site Alternative 3 would be located within a vacant lot and would adhere to the Design Guide for MWD Facilities (DOD 2003).

4.12.2.2 Demolition of Existing MWD Facility

Demographics. The number of workers who would be hired to demolish the existing MWD facility would most likely come from the existing supply within the Albuquerque MSA. Relocation of construction workers to meet demand for the Proposed Action would not be expected as the scope of demolition activities should not necessitate out-of-town workers to permanently relocate. Therefore, less than significant impacts on demographics would be expected as a result of the Proposed Action.

Employment Characteristics. The existing construction industry within the Albuquerque MSA should adequately provide the workers that would be required to demolish the existing MWD facility. The number of construction workers necessary for the Proposed Action, estimated to be less than 1 percent of all construction workers in the Albuquerque MSA, is not large enough to outstrip the supply of the industry. Indirect beneficial impacts would result from the increase in payroll tax revenues, purchase of materials, and purchase of goods and services in the area resulting in less than significant beneficial impacts on the socioeconomic climate of the Albuquerque MSA.

Kirtland AFB. The temporary increase of construction employees at Kirtland AFB would represent a small increase in the total number of persons working on Kirtland AFB and no additional facilities (e.g., housing, transportation) would be necessary to accommodate the workforce. Therefore, less than significant impacts would be expected.

Environmental Justice and Protection of Children. No minority or youth populations would be disproportionately impacted by the Proposed Action. No direct or indirect, disproportionate, adverse impacts on minority, low-income, or youth populations would be expected as result of the Proposed Action.

4.12.3 No Action Alternative

Under the No Action Alternative, the construction, operation, and maintenance of the proposed MWD facility and the demolition of the existing MWD facility would not occur. No impacts on socioeconomics would be expected as no additional jobs would be created, expenditures for goods and services to maintain the existing facilities would be minimal, and there would be no increase in tax revenue as a result of employee wages and sales receipts. Also, impacts on environmental justice would not occur as part of the No Action Alternative as the existing MWD facility would continue operating under current conditions.

4.13 Cumulative Impacts

CEQ defines cumulative impacts as the “impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time by various agencies (Federal, state, and local) or individuals. Informed decisionmaking is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future. Reasonably foreseeable future actions consist of activities that have been approved and can be evaluated with respect to their effects.

This section briefly summarizes past, current, and reasonably foreseeable future projects within the same general geographic and time scope as the Proposed Action. The geographic scope of the analysis varies by resource area. For example, the geographic scope of cumulative impacts on noise, geology and soils, and safety is very narrow and focused on the location of the resource. The geographic scope of land use, air quality, infrastructure, and socioeconomics is much broader and considers more county- or regionwide activities.

The past, current, and reasonably foreseeable projects, identified below, make up the cumulative impact scenario for the Proposed Action. The cumulative impact scenario is then added to the Proposed Action’s impacts on the individual resource areas analyzed in **Section 4** to determine the cumulative impacts of the Proposed Action. In accordance with CEQ guidance, the current effects of past actions are considered in aggregate as appropriate for each resource area without delving into the historical details of individual past actions.

4.13.1 Impact Analysis

4.13.1.1 Past Actions

Kirtland AFB has been used for military missions since the 1930s and has continuously been developed as DOD missions, organizations, needs, and strategies have evolved. Development and operation of training ranges have impacted thousands of acres with synergistic and cumulative impacts on soil, wildlife habitats, water quality, and noise. Beneficial effects, too, have resulted from the operation and management of Kirtland AFB including increased employment and income for Bernalillo County, the City of Albuquerque, and its surrounding communities; restoration and enhancement of sensitive resources such as the Coyote Springs wetland area; consumptive and nonconsumptive recreation opportunities; and increased knowledge of the history and pre-history of the region through numerous cultural resources surveys and studies.

4.13.1.2 Present and Reasonably Foreseeable Actions

Kirtland AFB is a large military installation that is continually evolving. Projects that were examined for potential cumulative impacts are included in **Table 4-4**.

4.13.2 Cumulative Impact Analysis by Resource Area

4.13.2.1 Land Use

A significant impact on land use would occur if any action is inconsistent with adopted land use plans or would substantially alter those resources required for supporting or benefiting the current use of the site and adjacent property. The Proposed Action is consistent with the installation's General Plan. This action, when considered with other potential alterations of land use, would not be expected to result in a significant cumulative adverse effect. All reasonable past, present, and foreseeable actions on Kirtland AFB are consistent with the installation General Plan.

4.13.2.2 Noise

The noise generated by the Proposed Action, when considered with other existing and proposed projects on Kirtland AFB, would not be considered a significant cumulative impact. The cumulative effect of the proposed and future project would result in only temporary increases in ambient noise levels during demolition and construction activities.

4.13.2.3 Visual Resources

Although the collective implementation of various projects at Kirtland AFB could result in cumulative impacts on visual resources at Kirtland AFB, impacts would not be significant. Cumulative impacts would be controlled by following the *Kirtland Air Force Base Architectural Compatibility Plan* (KAFB 2007b). This architectural compatibility plan attempts to ensure that future development is performed in a way that limits impacts on visual resources and is consistent with existing architectural and visual standards (AAFES 2008). Adherence to the architectural compatibility plan would prevent significant visual cumulative impacts from occurring in the future.

Table 4-4. Present and Reasonably Foreseeable Actions at Kirtland AFB

Project Name	Description
HC-130 and MC-130 Aircraft Simulator Facilities	The 58th Special Operations Wing proposes to construct new HC-130 and MC-130 simulator facilities at Kirtland AFB. The proposed construction will include one-story facilities in the southwestern section of Kirtland AFB.
Heavy Weapons Range	The 377 ABW is proposing to establish and use a heavy weapons range in the southeastern section of Kirtland AFB, approximately 0.25 miles east of the Starfire Optical Range facilities along Mount Washington Road. The proposed range will encompass the existing M60 range. It would include two firing positions and firing lines and would use the existing targets at the M60 range. Firing distance would be approximately 7,300 feet. Firing position two would be used for sniper heavy weapons (0.50 caliber) and would fire in a more southerly direction to the existing target area, approximately 3,800 feet.
Construct New Hot Cargo Pad	The 377 ABW proposes to construct, operate, and maintain a hot cargo pad at Kirtland AFB to ensure reliable support and backup for the existing hot cargo pad (Pad 5). Other components include construction of a new taxiway to the proposed hot cargo pad; replacement of the deteriorating taxiway to Pad 5; addition of new and relocation of existing anti-ram barriers, defensive fighting positions, and personal shelters surrounding the proposed hot cargo pad and Pad 5; addition of new lighting at the proposed hot cargo pad and Pad 5; and removal of existing lighting at Pad 5. The new pad will consist of 18-inch Portland cement concrete and will add additional 6-inch asphalt taxiway to the existing taxiway at Pad 5. The new pad will adjoin the existing Pad 5 to minimize enlargement of the clear zone and impacts on other critical facilities.
Construction and Demolition of Military Support Facilities	Kirtland AFB proposes to demolish and construct several military personnel support facilities in the developed area in the northwestern portion of the installation. The areas include the Visiting Officer Quarters Complex, the Main Enlisted Dormitory Campus, the Noncommissioned Officer Academy, and Dormitory Campus 2. Approximately 36 acres would be included in the construction and demolition activities. Kirtland AFB currently has a surplus of old substandard dormitory spaces that this project would help eliminate.
Army and Air Force Exchange Service (AAFES) Base Exchange Shopping Center	AAFES proposes to construct and operate a new 95,421-square-foot Shopping Center on an approximately 2.3-acre developed site between the existing Commissary (Building 20180) and existing Base Exchange (Building 20170) on Pennsylvania Street. The project also includes demolition of the 1,540-square-foot existing satellite pharmacy (Building 20167), closure of a portion (approximately 345 feet) of Pennsylvania Street, and construction of approximately 492 feet of new road to connect Texas Street with Pennsylvania Street north of the new Shopping Center. The new Shopping Center would include a new Base Exchange, pharmacy, retail laundry/dry cleaning, a beauty/barber shop, concession kiosks, five food concepts with a food court, and other similar services.

Project Name	Description
Construct New Fire Station	Kirtland AFB proposes to replace Fire Station 3 within the Manzano Base area. The proposed structure would be approximately 7,300 square feet, one-story, with three high-bay, drive-through apparatus stalls. The new structure would be located along a main road in the south-central section of Kirtland AFB. The action also includes the demolition of an approximately 4,300-square-foot fire station (Building 638) within the Manzano Base area.
498th Nuclear System Wing Facility	Kirtland AFB proposes to construct a 32,400-square-foot facility to house the newly formed 498th Nuclear Systems Wing. This facility would be a two-story, steel-framed structure with reinforced concrete foundation, floors, and reinforced masonry walls. The construction further includes tying in to utilities and communications and parking for 120 vehicles. The facility would accommodate approximately 200 personnel. The new facility location is proposed between “G” and “H” avenues west of Wyoming Blvd directly behind the Nuclear Weapons Center (Building 20325).
Air Force Nuclear Weapons Center Sustainment Center	Kirtland AFB proposes to construct a 15,946-square-foot sustainment center for the Nuclear Weapons Center. This facility would be a two-story, steel-framed structure built as a Sensitive Compartmented Information Facility with reinforced concrete foundation, floors, and reinforced masonry walls. The construction further includes tying in to utilities and communications and parking for vehicles. The facility would accommodate approximately 36 personnel. The new facility location is proposed between “G” and “H” avenues west of Wyoming Blvd directly behind the Nuclear Weapons Center (Building 20325) and south of the proposed 498th Nuclear Systems Wing facility.
Building Demolition at Kirtland AFB	The 377 ABW proposes to demolish 23 buildings on Kirtland AFB to make space available for future construction and to fulfill its mission as installation host through better site utilization. None of the buildings proposed for demolition are currently occupied or used by installation personnel. General demolition activities would include removal of foundations, floor, wall, ceiling, and roofing materials; removing electrical substations providing power to these facilities; and removing, capping and rerouting sewer, gas, water, and steam lines outside of the work areas. Equipment such as bulldozers, backhoes, front-end loaders, dump trucks, tractor-trailers, and generators would be required to support the proposed demolition activities.
Security Forces Complex	The 377 ABW proposes to construct, operate, and maintain a security forces complex at Kirtland AFB to provide adequate space and modern facilities to house all 377 security forces squadron administrative and support functions in a consolidated location. The 377 security forces squadron functions that would be transferred to the new 377 security forces complex include a base operations center with command and control facility, administration and office space, training rooms, auditorium or assembly room, guard mount, hardened armory for weapons and ammunition storage, confinement facilities, law enforcement, logistics warehouse, general storage, vehicle garage with maintenance area, and associated communications functions. One existing building within the proposed footprint of the 377 security forces complex would be demolished.

Project Name	Description
21st Explosive Ordinance Division Expansion	The 21st Explosive Ordinance Division proposes to construction a facility expansion and site improvements for the 21st Explosive Ordinance Division Weapons of Mass Destruction Company Complex at Kirtland AFB. The 21st Explosive Ordinance Division currently operates from a 90-acre property leased by the Army within Kirtland AFB. The current site has seven structures, six of which are substandard and do not have adequate fire protection. The 21st Explosive Ordinance Division proposes to expand this site to a total of 280 acres, add three permanent structures, demolish five of the six substandard structures, add two temporary storage containers, tie in to nearby utilities, construct water tanks for fire suppression, and construct several concrete pads for training tasks.
Spacecraft Component Integration Lab	Proposed lease action to convert underutilized space, including a former military family housing area and a recreational use area, to use for office, commercial, and senior continuum care space at Kirtland AFB.

4.13.2.4 Air Quality

The Proposed Action would result in low levels of air emissions below *de minimus* thresholds and would not be regionally significant. The Proposed Action would generate emissions below 10 percent of the emissions inventory for the AMRGI AQCR and the majority of emissions would be short-term. Therefore, the Proposed Action would not contribute significantly to adverse cumulative impacts on air quality at Kirtland AFB or regionally.

4.13.2.5 Geology and Soils

The Proposed Action, when combined with other reasonably foreseeable projects, would not result in significant cumulative impacts on geology and soils. The Proposed Action and other local actions would not reduce prime farmland soils or agricultural production. BMPs outlined in the SWPPP would be implemented to control erosion during demolition and construction activities, which would minimize impacts.

4.13.2.6 Water Resources

The cumulative impacts of the Proposed Action, when considered with potential disturbances on water resources from future actions, would not be expected to have a significant cumulative impact on water resources. Implementation of BMPs would minimize potential for adverse impacts on water resources associated with the Proposed Action and future actions.

4.13.2.7 Biological Resources

Implementation of the Proposed Action and other reasonably foreseeable projects would not result in a significant cumulative impact on biological resources. Because the Proposed Action would occur in a previously disturbed area that does not contain much vegetation or important biological habitats, it would not be expected to significantly impact vegetation or wildlife habitats. Although growth and development can be expected to continue outside of Kirtland AFB and within the surrounding natural areas, significant cumulative adverse impacts on these resources would not be expected when added to the impacts from activities associated with the Proposed Action. Overall, cumulative impacts on the biological resources of the area would be less than significant.

4.13.2.8 Cultural Resources

The cumulative impact of the Proposed Action and other reasonably foreseeable projects, when compared to the condition of the structures and the potential disturbances to cultural resources, would be considered less than significant. There are no known cultural resources within the footprint of the proposed MWD facility. The implementation of the Proposed Action is not expected to have any significant impact on cultural resources.

4.13.2.9 Infrastructure

Cumulative impacts on infrastructure have the potential to cause adverse impacts on electrical, natural gas, liquid fuel, central heating, water supply, wastewater, storm water, communications, and solid waste management services. The *Kirtland Air Force Base, New Mexico General Plan 2002* (KAFB 2002) addresses the capacity and the need to upgrade all elements of the infrastructure to support additional projects at Kirtland AFB. An upgrade of any infrastructure component to support future construction at Kirtland AFB would largely result in beneficial impacts for the installation.

4.13.2.10 Hazardous Materials and Waste

Implementation of the Proposed Action and other reasonably foreseeable projects would not be expected to result in a significant cumulative impact on hazardous materials and waste. The Proposed Action would result in an increase in the generation of hazardous materials and wastes; however, all materials would be handled and disposed of appropriately. Future projects would incorporate measures to limit or control hazardous materials and waste into their design and operation plans. Therefore, the impacts from the Proposed Action, when combined with other ongoing and proposed projects on Kirtland AFB, would not be considered a significant cumulative effect.

4.13.2.11 Safety

No cumulative impacts on health and safety would be expected. The implementation of effective health and safety plans, which follow Federal, state, and local OSHA policies, at the project site during construction and during facility operation would reduce or eliminate cumulative health and safety impacts on contractors, military personnel, and the general public.

4.13.2.12 Socioeconomics and Environmental Justice

Implementation of the Proposed Action would result in beneficial impacts on the region's economy. No impacts on residential areas, population, or minority or low-income families off the installation would occur. These effects, when combined with the other projects currently proposed or ongoing at Kirtland AFB, would not be considered a significant cumulative impact.

4.13.3 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

Energy. The use of nonrenewable resources is an unavoidable occurrence, although not considered significant. The Proposed Action would require use of fossil fuels, a nonrenewable natural resource, during construction (oil, fuel) and operation (natural gas) of the MWD facility. Energy supplies, although relatively small, would be committed to the Proposed Action.

Geology and Soils. Construction activities would result in temporary soil disturbance; however, implementation of BMPs and erosion-control measures would limit the environmental consequences. Although these impacts would be unavoidable, the impact on soils would not be expected to be significant.

Hazardous Materials and Waste. The generation of hazardous materials and wastes during demolition and construction activities would be unavoidable; however, these wastes would be handled in accordance with Federal, state, and USAF policies and would not be expected to result in a significant impact.

4.13.4 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, and Local Land Use Plans, Policies, and Controls

The Proposed Action would occur entirely within Kirtland AFB. Construction, operation, and maintenance activities would not be incompatible with any current land uses on Kirtland AFB. The Proposed Action would not conflict with any applicable off-installation land use ordinances. The Proposed Action would follow all applicable permitting, building, and safety requirements.

4.13.5 Relationship Between Short-term Uses and Long-term Productivity

Short-term uses of the biophysical components of the human environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than 5 years. Long-term uses of the human environment include those impacts occurring over a period of more than 5 years, including permanent resource loss.

Implementation of the Proposed Action would not require short-term resource uses that would result in long-term compromises of productivity. The Proposed Action would not result in intensification of land use at Kirtland AFB and the surrounding area. Implementation of the Proposed Action would not represent a significant loss of open space. Therefore, it is anticipated that the Proposed Action would not result in any cumulative land use or aesthetic impacts.

4.13.6 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the impacts that use of these resources will have on future generations. Irreversible impacts primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable timeframe (e.g., energy and minerals). The irreversible and irretrievable commitments of resources that would result from implementation of the Proposed Action involve the consumption of material resources used for construction, energy resources, land, and human labor resources. The use of these resources is considered to be permanent.

Material Resources. Material resources used for the Proposed Action include building materials, concrete and asphalt, and various material supplies. Most of the materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources. Energy resources used for the Proposed Action would be irretrievably lost. This includes petroleum-based products (such as gasoline, diesel, and natural gas) and electricity. During construction activities, gasoline and diesel would be used for the operation of construction vehicles. During operation, natural gas would be used for heating the MWD facility. Electricity would also be used during operation and maintenance of the MWD facility. Consumption of these energy resources would

not place a significant demand on their availability in the region; therefore, less than significant impacts would be expected.

Biological Resources. The Proposed Action would result in minor loss of vegetation and wildlife habitat. Because the project area has been previously disturbed, the loss would be minimal and not considered significant.

Human Resources. The use of human resources for construction, operation, and maintenance activities is considered an irretrievable loss only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities and is considered beneficial.

5. List of Preparers

This EA has been prepared under the direction of the 377 ABW at Kirtland AFB. The individual contractors that contributed to the preparation of this document are listed below.

Alvin Banguilan

HDR|e²M
M.A. Anthropology
B.S. Anthropology
Years of Experience: 18

Louise Baxter

HDR|e²M
M.P.A. Public Administration
B.S. Political Science
Years of Experience: 19

Tom Blonkowski

HDR|e²M
B.A. Environmental Economics
Years of Experience: 1

Shannon Cauley, USACE CWD, CPSS

HDR|e²M
B.S. Geology
Graduate Studies Natural Resources
Graduate Studies Geology
USACE Certified Wetland Delineator
Certified Professional Soil Scientist
Years of Experience: 25

Paul D'Ornellas

HDR|e²M
B.A. Chemistry
Years of Experience: 1

Timothy Didlake

HDR|e²M
B.S. Earth Sciences
Years of Experience: 2

Elaine Dubin

HDR|e²M
B.S. Earth Science
Years of Experience: 3

Sylvia Fontes, CIH

HDR|e²M
M.S. Occupational Health
B.S. Biochemistry
Years of Experience: 24

Stuart Gottlieb

HDR|e²M
B.A. Geography
Years of Experience: 7

Megan Griffin

HDR|e²M
M.S. Biology
B.S. Environmental Science
Years of Experience: 4

Leigh Hagan

HDR|e²M
MESM Environmental Science and
Management
B.S. Biology
Years of Experience: 5

Michael Jennings

HDR|e²M
B.A. Archaeology
Years of Experience: 10

Shad Manning

HDR|e²M
M.S. Environmental Science
B.A. Paleobiology
B.A. Anthropology
Years of Experience: 4

Jeffrey McCann

HDR|e²M
B.G.S. Geological Sciences
Years of Experience: 29

Cheryl Myers

HDR|e²M
A.A.S. Nursing
Years of Experience: 19

Rebecca Oldham

HDR|e²M
B.S. English
Years of Experience: 18

Tanya Perry

HDR|e²M

B.S. Environmental Science

B.A. Communications

Years of Experience: 9

Terri Rector

B.S. Chemical Engineering

Years of Experience: 10

Patrick Solomon

HDR|e²M

M.S. Geography

B.A. Geography

Years of Experience: 15

Adam Teepe

HDR|e²M

MESM Environmental Science and
Management

B.S. Environmental Geology

Years of Experience: 6

Jeffrey Weiler

HDR|e²M

M.S. Resource Economics/Environmental
Management

B.A. Political Science

Years of Experience: 34

Audrey Wessel

HDR|e²M

M.S. Environmental Science and Policy

B.S. Wildlife Science

Years of Experience: 4

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APPENDIX A

APPLICABLE LAWS, REGULATIONS, POLICIES, AND PLANNING CRITERIA

Appendix A

Applicable Laws, Regulations, Policies, and Planning Criteria

When considering the affected environment, the various physical, biological, economic, and social environmental factors must be considered. In addition to the National Environmental Policy Act (NEPA), there are other environmental laws and Executive Orders (EOs) to be considered when preparing environmental analyses. These laws are summarized below.

NOTE: This is not a complete list of all applicable laws, regulations, policies, and planning criteria potentially applicable to documents, however, it does provide a general summary for use as a reference.

Airspace Management

Airspace management procedures assist in preventing potential conflicts or accidents associated with aircraft using designated airspace in the United States, including restricted military airspace. Airspace management involves the coordination, integration, and regulation of the use of airspace. The Federal Aviation Administration (FAA) has overall responsibility for managing airspace through a system of flight rules and regulations, airspace management actions, and air traffic control (ATC) procedures. All military and civilian aircraft are subject to Federal Aviation Regulations (FARs). The FAA's *Aeronautical Information Manual* defines the operational requirements for each of the various types or classes of military and civilian airspace.

Some military services have specific guidance for airspace management. For example, airspace management in the U.S. Air Force (USAF) is guided by Air Force Instruction (AFI) 13-201, *Air Force Airspace Management*. This AFI provides guidance and procedures for developing and processing special use airspace (SUA). It covers aeronautical matters governing the efficient planning, acquisition, use, and management of airspace required to support USAF flight operations. It applies to activities that have operational or administrative responsibility for using airspace, establishes practices to decrease disturbances from flight operations that might cause adverse public reaction, and provides flying unit commanders with general guidance for dealing with local problems. The U.S. Army, per Army Regulation (AR) 95-2, *Airspace, Airfields/Heliport, Flight Activities, Air Traffic Control and Navigational Aids*, provides similar guidance and procedures for U.S. Army airspace operations.

Noise

Federal and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social impacts associated with noise. The U.S. Department of Housing and Urban Development (HUD), in coordination with the Department of Defense (DOD) and the FAA, has established criteria for acceptable noise levels for aircraft operations relative to various types of land use.

The U.S. Army, through AR 200-1, *Environmental Protection and Enhancement*, implements Federal laws concerning environmental noise from U.S. Army activities. The USAF's Air Installation Compatible Use Zone (AICUZ) Program, (AFI 32-7063), provides guidance to air bases and local communities in planning land uses compatible with airfield operations. The AICUZ program describes existing aircraft noise and flight safety zones on and near USAF installations.

Land Use

The term “land use” refers to real property classifications that indicate either natural conditions or the types of human activities occurring on a defined parcel of land. In many cases, land use descriptions are codified in local zoning laws. However, there is no nationally recognized convention or uniform terminology for describing land use categories.

Land use planning in the USAF is guided by *Land Use Planning Bulletin, Base Comprehensive Planning* (HQ USAF/LEEVX, August 1, 1986). This document provides for the use of 12 basic land use types found on a USAF installation. In addition, land use guidelines established by the HUD and based on findings of the Federal Interagency Committee on Noise (FICON) are used to recommend acceptable levels of noise exposure for land use. The U.S. Army uses the 12 land use types for installation land use planning, and these land use types roughly parallel those employed by municipalities in the civilian sector.

Air Quality

The Clean Air Act (CAA) of 1970, and Amendments of 1977 and 1990, recognizes that increases in air pollution result in danger to public health and welfare. To protect and enhance the quality of the Nation’s air resources, the CAA authorizes the U.S. Environmental Protection Agency (USEPA) to set six National Ambient Air Quality Standards (NAAQS) which regulate carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter pollution emissions. The CAA seeks to reduce or eliminate the creation of pollutants at their source, and designates this responsibility to state and local governments. States are directed to utilize financial and technical assistance and leadership from the Federal government to develop implementation plans to achieve NAAQS. Geographic areas are officially designated by the USEPA as being in attainment or nonattainment for pollutants in relation to their compliance with NAAQS. Geographic regions established for air quality planning purposes are designated as Air Quality Control Regions (AQCRs). Pollutant concentration levels are measured at designated monitoring stations within the AQCR. An area with insufficient monitoring data is designated as unclassified. Section 309 of the CAA authorizes USEPA to review and comment on impact statements prepared by other agencies.

An agency should consider what effect an action might have on NAAQS due to short-term increases in air pollution during construction and long-term increases resulting from changes in traffic patterns. For actions in attainment areas, a Federal agency could also be subject to USEPA’s Prevention of Significant Deterioration (PSD) regulations. These regulations apply to new major stationary sources and modifications to such sources. Although few agency facilities will actually emit pollutants, increases in pollution can result from a change in traffic patterns or volume. Section 118 of the CAA waives Federal immunity from complying with the CAA and states all Federal agencies will comply with all Federal- and state-approved requirements.

The General Conformity Rule requires that any Federal action meet the requirements of a State Implementation Plan (SIP) or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

The General Conformity Rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to Federal actions that are considered “regionally significant” or where the total emissions from the action meet or exceed the *de minimis* thresholds presented in 40 CFR 93.153. An action is regionally significant when the total nonattainment

pollutant emissions exceed 10 percent of the AQCR's total emissions inventory for that nonattainment pollutant. If a Federal action does not meet or exceed the *de minimis* thresholds and is not considered regionally significant, then a full Conformity Determination is not required.

Health and Safety

Human health and safety relates to workers' health and safety during demolition or construction of facilities, or applies to work conditions during operations of a facility that could expose workers to conditions that pose a health or safety risk. The Federal Occupational Safety and Health Administration (OSHA) issues standards to protect persons from such risks, and the DOD and state and local jurisdictions issue guidance to comply with these OSHA standards. Safety also can refer to safe operations of aircraft or other equipment.

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, implements Air Force Policy Directive (AFPD) 91-3, *Occupational Safety and Health*, by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with the USAF Mishap Prevention Program, these standards ensure all USAF workplaces meet Federal safety and health requirements.

AFI 91-202, *USAF Mishap Prevention Program*, implements AFPD 91-2, *Safety Programs*. It establishes mishap prevention program requirements (including the Bird/Wildlife Aircraft Strike Hazard [BASH] Program), assigns responsibilities for program elements, and contains program management information.

U.S. Army regulations in AR 385-10, *Army Safety Program*, prescribe policy, responsibilities, and procedures to protect and preserve U.S. Army personnel and property from accidental loss or injury. AR 40-5, *Preventive Medicine*, provides for the promotion of health and the prevention of disease and injury.

Geological Resources

Recognizing that millions of acres per year of prime farmland are lost to development, Congress passed the Farmland Protection Policy Act to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland (7 Code of Federal Regulations [CFR] Part 658). Prime farmland is described as soils that have a combination of soil and landscape properties that make them highly suitable for cropland, such as high inherent fertility, good water-holding capacity, and deep or thick effective rooting zones, and that are not subject to periodic flooding. Under the Farmland Protection Policy Act, agencies are encouraged to conserve prime or unique farmlands when alternatives are practicable. Some activities that are not subject to the Farmland Protection Policy Act include Federal permitting and licensing, projects on land already in urban development or used for water storage, construction for national defense purposes, or construction of new minor secondary structures such as a garage or storage shed.

Water Resources

The Clean Water Act (CWA) of 1977 is an amendment to the Federal Water Pollution Control Act of 1972, is administered by USEPA, and sets the basic structure for regulating discharges of pollutants into U.S. waters. The CWA requires USEPA to establish water quality standards for specified contaminants in surface waters and forbids the discharge of pollutants from a point source into navigable waters without a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits are issued by USEPA or the appropriate state if it has assumed responsibility. Section 404 of the CWA establishes a

Federal program to regulate the discharge of dredge and fill material into waters of the United States. Section 404 permits are issued by the U.S. Army Corps of Engineers (USACE). Waters of the United States include interstate and intrastate lakes, rivers, streams, and wetlands that are used for commerce, recreation, industry, sources of fish, and other purposes. The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Each agency should consider the impact on water quality from actions such as the discharge of dredge or fill material into U.S. waters from construction, or the discharge of pollutants as a result of facility occupation.

Section 303(d) of the CWA requires states and USEPA to identify waters not meeting state water quality standards and to develop Total Maximum Daily Loads (TMDLs). A TMDL is the maximum amount of a pollutant that a waterbody can receive and still be in compliance with state water quality standards. After determining TMDLs for impaired waters, states are required to identify all point and nonpoint sources of pollution in a watershed that are contributing to the impairment and to develop an implementation plan that will allocate reductions to each source to meet the state standards. The TMDL program is currently the Nation's most comprehensive attempt to restore and improve water quality. The TMDL program does not explicitly require the protection of riparian areas. However, implementation of the TMDL plans typically calls for restoration of riparian areas as one of the required management measures for achieving reductions in nonpoint source pollutant loadings.

The USEPA issued a Final Rule for the CWA concerning technology-based Effluent Limitations Guidelines and New Source Performance Standards for the Construction and Development point source category. All NPDES storm water permits issued by the USEPA or states must incorporate requirements established in the Final Rule. As of February 1, 2010, all new construction sites are required to meet the non-numeric effluent limitations and design, install, and maintain effective erosion and sedimentation controls. In addition, construction site owners and operators that disturb 1 or more acres of land are required to use best management practices (BMPs) to ensure that soil disturbed during construction activities does not pollute nearby water bodies. Effective August 1, 2011, construction activities disturbing 20 or more acres must comply with the numeric effluent limitation for turbidity in addition to the non-numeric effluent limitations. The maximum daily turbidity limitation is 280 nephelometric turbidity units (ntu). On February 2, 2014, construction site owners and operators that disturb 10 or more acres of land are required to monitor discharges to ensure compliance with effluent limitations as specified by the permitting authority. Construction site owners are encouraged to phase ground-disturbing activities to limit the applicability of the monitoring requirements and the turbidity limitation. The USEPA's limitations are based on its assessment of what specific technologies can reliably achieve. Permittees can select management practices or technologies that are best suited for site-specific conditions.

The Coastal Zone Management Act (CZMA) of 1972 declares a national policy to preserve, protect, and develop, and, where possible, restore or enhance the resources of the Nation's coastal zone. The coastal zone refers to the coastal waters and the adjacent shorelines, including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches, and includes the Great Lakes. The CZMA encourages states to exercise their full authority over the coastal zone through the development of land and water use programs in cooperation with Federal and local governments. States may apply for grants to help develop and implement management programs to achieve wise use of the land and water resources of the coastal zone. Development projects affecting land or water use or natural resources of a coastal zone must ensure the project is, to the maximum extent practicable, consistent with the state's coastal zone management program.

The Safe Drinking Water Act (SDWA) of 1974 establishes a Federal program to monitor and increase the safety of all commercially and publicly supplied drinking water. Congress amended the SDWA in 1986, mandating dramatic changes in nationwide safeguards for drinking water and establishing new Federal

enforcement responsibility on the part of USEPA. The 1986 amendments to the SDWA require USEPA to establish Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and Best Available Technology (BAT) treatment techniques for organic, inorganic, radioactive, and microbial contaminants; and turbidity. MCLGs are maximum concentrations below which no negative human health impacts are known to exist. The 1996 amendments set current Federal MCLs, MCLGs, and BATs for organic, inorganic, microbiological, and radiological contaminants in public drinking water supplies.

The Wild and Scenic Rivers Act of 1968 provides for a wild and scenic river system by recognizing the remarkable values of specific rivers of the Nation. These selected rivers and their immediate environment are preserved in a free-flowing condition, without dams or other construction. The policy not only protects the water quality of the selected rivers but also provides for the enjoyment of present and future generations. Any river in a free-flowing condition is eligible for inclusion, and can be authorized as such by an Act of Congress, an act of state legislature, or by the Secretary of the Interior upon the recommendation of the governor of the state(s) through which the river flows.

EO 11988, *Floodplain Management* (May 24, 1977), directs agencies to consider alternatives to avoid adverse impacts and incompatible development in floodplains. An agency may locate a facility in a floodplain if the head of the agency finds there is no practicable alternative. If it is found there is no practicable alternative, the agency must minimize potential harm to the floodplain, and circulate a notice explaining why the action is to be located in the floodplain prior to taking action. Finally, new construction in a floodplain must apply accepted floodproofing and flood protection to include elevating structures above the base flood level rather than filling in land.

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (October 5, 2009), directed the USEPA to issue guidance on Section 438 of the Energy Independence and Security Act (EISA). The EISA establishes into law new storm water design requirements for Federal construction projects that disturb a footprint of greater than 5,000 square feet of land. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Predevelopment hydrology would be calculated and site design would incorporate storm water retention and reuse technologies to the maximum extent technically feasible. Post-construction analyses will be conducted to evaluate the effectiveness of the as-built storm water reduction features. These regulations are applicable to DOD Unified Facilities Criteria. Additional guidance is provided in the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*.

Biological Resources

The Endangered Species Act (ESA) of 1973 establishes a Federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially endangered or threatened, and the U.S. Fish and Wildlife Service (USFWS) maintains the list. A list of Federal endangered species can be obtained from the Endangered Species Division, USFWS (703-358-2171). States might also have their own lists of threatened and endangered species which can be obtained by calling the appropriate State Fish and Wildlife office. Some species also have laws specifically for their protection (e.g., Bald Eagle Protection Act).

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties and conventions between the United States, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess; offer to or sell, barter, purchase, or deliver; or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. The MBTA also makes it unlawful to ship, transport, or carry from one state, territory, or district to another; or through a foreign country, any bird, part, nest, or egg that was captured, killed, taken, shipped, transported, or carried contrary to the laws from where it was obtained; and import from Canada any bird, part, nest, or egg obtained contrary to the laws of the province from which it was obtained. The U.S. Department of the Interior has authority to arrest, with or without a warrant, a person violating the MBTA.

EO 11514, *Protection and Enhancement of Environmental Quality* (March 5, 1970), states that the President, with assistance from the Council on Environmental Quality (CEQ), will lead a national effort to provide leadership in protecting and enhancing the environment for the purpose of sustaining and enriching human life. Federal agencies are directed to meet national environmental goals through their policies, programs, and plans. Agencies should also continually monitor and evaluate their activities to protect and enhance the quality of the environment. Consistent with NEPA, agencies are directed to share information about existing or potential environmental problems with all interested parties, including the public, in order to obtain their views.

EO 11990, *Protection of Wetlands* (May 24, 1977), directs agencies to consider alternatives to avoid adverse impacts and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland. Agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands.

EO 13186, *Conservation of Migratory Birds* (January 10, 2001), creates a more comprehensive strategy for the conservation of migratory birds by the Federal government. EO 13186 provides a specific framework for the Federal government's compliance with its treaty obligations to Canada, Mexico, Russia, and Japan. EO 13186 provides broad guidelines on conservation responsibilities and requires the development of more detailed guidance in a Memorandum of Understanding (MOU). EO 13186 will be coordinated and implemented by the USFWS. The MOU will outline how Federal agencies will promote conservation of migratory birds. EO 13186 requires the support of various conservation planning efforts already in progress; incorporation of bird conservation considerations into agency planning, including NEPA analyses; and reporting annually on the level of take of migratory birds.

Cultural Resources

The American Indian Religious Freedom Act of 1978 and Amendments of 1994 recognize that freedom of religion for all people is an inherent right, and traditional American Indian religions are an indispensable and irreplaceable part of Indian life. It also recognized the lack of Federal policy on this issue and made it the policy of the United States to protect and preserve the inherent right of religious freedom for Native Americans. The 1994 Amendments provide clear legal protection for the religious use of peyote cactus as a religious sacrament. Federal agencies are responsible for evaluating their actions and policies to determine if changes should be made to protect and preserve the religious cultural rights and practices of Native Americans. These evaluations must be made in consultation with native traditional religious leaders.

The Archaeological Resource Protection Act (ARPA) of 1979 protects archaeological resources on public and American Indian lands. It provides felony-level penalties for the unauthorized excavation, removal, damage, alteration, or defacement of any archaeological resource, defined as material remains of past human life or activities which are at least 100 years old. Before archaeological resources are excavated or removed from public lands, the Federal land manager must issue a permit detailing the time, scope, location, and specific purpose of the proposed work. ARPA also fosters the exchange of information about archaeological resources between governmental agencies, the professional archaeological community, and private individuals. ARPA is implemented by regulations found in 43 CFR Part 7.

The National Historic Preservation Act (NHPA) of 1966 sets forth national policy to identify and preserve properties of state, local, and national significance. The NHPA establishes the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), and the National Register of Historic Places (NRHP). The ACHP advises the President, Congress, and Federal agencies on historic preservation issues. Section 106 of the NHPA directs Federal agencies to take into account impacts of their undertakings (actions and authorizations) on properties included in or eligible for the NRHP. Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties. Section 106 of the act is implemented by regulations of the ACHP, 36 CFR Part 800. Agencies should coordinate studies and documents prepared under Section 106 with NEPA where appropriate. However, NEPA and NHPA are separate statutes and compliance with one does not constitute compliance with the other. For example, actions which qualify for a categorical exclusion under NEPA might still require Section 106 review under NHPA. It is the responsibility of the agency official to identify properties in the area of potential effects, and whether they are included or eligible for inclusion in the NRHP. Section 110 of the NHPA requires Federal agencies to identify, evaluate, and nominate historic property under agency control to the NRHP.

The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 establishes rights of American Indian tribes to claim ownership of certain “cultural items,” defined as Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony, held or controlled by Federal agencies. Cultural items discovered on Federal or tribal lands are, in order of primacy, the property of lineal descendants, if these can be determined, and then the tribe owning the land where the items were discovered or the tribe with the closest cultural affiliation with the items. Discoveries of cultural items on Federal or tribal land must be reported to the appropriate American Indian tribe and the Federal agency with jurisdiction over the land. If the discovery is made as a result of a land use, activity in the area must stop and the items must be protected pending the outcome of consultation with the affiliated tribe.

EO 11593, *Protection and Enhancement of the Cultural Environment* (May 13, 1971), directs the Federal government to provide leadership in the preservation, restoration, and maintenance of the historic and cultural environment. Federal agencies are required to locate and evaluate all Federal sites under their jurisdiction or control which might qualify for listing on the NRHP. Agencies must allow the ACHP to comment on the alteration, demolition, sale, or transfer of property which is likely to meet the criteria for listing as determined by the Secretary of the Interior in consultation with the SHPO. Agencies must also initiate procedures to maintain federally owned sites listed on the NRHP.

EO 13007, *Indian Sacred Sites* (May 24, 1996), provides that agencies managing Federal lands, to the extent practicable, permitted by law, and not inconsistent with agency functions, shall accommodate American Indian religious practitioners’ access to and ceremonial use of American Indian sacred sites, shall avoid adversely affecting the physical integrity of such sites, and shall maintain the confidentiality of such sites. Federal agencies are responsible for informing tribes of proposed actions that could restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites.

EO 13175, *Consultation and Coordination with Indian Tribal Governments* (November 6, 2000), was issued to provide for regular and meaningful consultation and collaboration with Native American tribal officials in the development of Federal policies that have tribal implications, and to strengthen the United States government-to-government relationships with Native American tribes. EO 13175 recognizes the following fundamental principles: Native American tribes exercise inherent sovereignty over their lands and members, the United States government has a unique trust relationship with Native American tribes and deals with them on a government-to-government basis, and Native American tribes have the right to self-government and self-determination.

EO 13287, *Preserve America* (March 3, 2003), orders Federal agencies to take a leadership role in protection, enhancement, and contemporary use of historic properties owned by the Federal government, and promote intergovernmental cooperation and partnerships for preservation and use of historic properties. EO 13287 established new accountability for agencies with respect to inventories and stewardship.

Socioeconomics and Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), directs Federal agencies to make achieving environmental justice part of their mission. Agencies must identify and address the adverse human health or environmental impacts that its activities have on minority and low-income populations, and develop agencywide environmental justice strategies. The strategy must list “programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations, ensure greater public participation, improve research and data collection relating to the health of and environment of minority populations and low-income populations, and identify differential patterns of consumption of natural resources among minority populations and low-income populations.” A copy of the strategy and progress reports must be provided to the Federal Working Group on Environmental Justice. Responsibility for compliance with EO 12898 is with each Federal agency.

Hazardous Materials and Waste

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 authorizes USEPA to respond to spills and other releases of hazardous substances to the environment, and authorizes the National Oil and Hazardous Substances Pollution Contingency Plan. CERCLA also provides a Federal “Superfund” to respond to emergencies immediately. Although the “Superfund” provides funds for cleanup of sites where potentially responsible parties cannot be identified, USEPA is authorized to recover funds through damages collected from responsible parties. This funding process places the economic burden for cleanup on polluters.

The Pollution Prevention Act (PPA) of 1990 encourages manufacturers to avoid the generation of pollution by modifying equipment and processes; redesigning products; substituting raw materials; and making improvements in management techniques, training, and inventory control. Consistent with pollution prevention principles, EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (January 24, 2007 [revoking EO 13148]), sets a goal for all Federal agencies to promote environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products; and use of paper of at least 30 percent post-consumer fiber content. In addition, EO 13423 sets a goal that requires Federal agencies to ensure that they reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of; increase diversion of solid waste, as appropriate; and maintain cost-effective waste prevention and

recycling programs at their facilities. Additionally, in *Federal Register* Volume 58 Number 18 (January 29, 1993), CEQ provides guidance to Federal agencies on how to “incorporate pollution prevention principles, techniques, and mechanisms into their planning and decisionmaking processes and to evaluate and report those efforts, as appropriate, in documents pursuant to NEPA.”

The Resource Conservation and Recovery Act (RCRA) of 1976 is an amendment to the Solid Waste Disposal Act. RCRA authorizes USEPA to provide for “cradle-to-grave” management of hazardous waste and sets a framework for the management of nonhazardous municipal solid waste. Under RCRA, hazardous waste is controlled from generation to disposal through tracking and permitting systems, and restrictions and controls on the placement of waste on or into the land. Under RCRA, a waste is defined as hazardous if it is ignitable, corrosive, reactive, toxic, or listed by USEPA as being hazardous. With the Hazardous and Solid Waste Amendments (HSWA) of 1984, Congress targeted stricter standards for waste disposal and encouraged pollution prevention by prohibiting the land disposal of particular wastes. The HSWA amendments strengthen control of both hazardous and nonhazardous waste and emphasize the prevention of pollution of groundwater.

The Superfund Amendments and Reauthorization Act (SARA) of 1986 mandates strong clean-up standards and authorizes USEPA to use a variety of incentives to encourage settlements. Title III of SARA authorizes the Emergency Planning and Community Right to Know Act (EPCRA), which requires facility operators with “hazardous substances” or “extremely hazardous substances” to prepare comprehensive emergency plans and to report accidental releases. If a Federal agency acquires a contaminated site, it can be held liable for cleanup as the property owner/operator. A Federal agency can also incur liability if it leases a property, as the courts have found lessees liable as “owners.” However, if the agency exercises due diligence by conducting a Phase I Environmental Site Assessment, it can claim the “innocent purchaser” defense under CERCLA. According to Title 42 United States Code (U.S.C.) 9601(35), the current owner/operator must show it undertook “all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice” before buying the property to use this defense.

The Toxic Substance Control Act (TSCA) of 1976 consists of four titles. Title I established requirements and authorities to identify and control toxic chemical hazards to human health and the environment. TSCA authorized USEPA to gather information on chemical risks, require companies to test chemicals for toxic effects, and regulate chemicals with unreasonable risk. TSCA also singled out polychlorinated biphenyls (PCBs) for regulation, and, as a result, PCBs are being phased out. PCBs are persistent when released into the environment and accumulate in the tissues of living organisms. They have been shown to cause adverse health impacts on laboratory animals and could cause adverse health impacts in humans. TSCA and its regulations govern the manufacture, processing, distribution, use, marking, storage, disposal, clean-up, and release reporting requirements for numerous chemicals like PCBs. TSCA Title II provides statutory framework for “Asbestos Hazard Emergency Response,” which applies only to schools. TSCA Title III, “Indoor Radon Abatement,” states indoor air in buildings of the United States should be as free of radon as the outside ambient air. Federal agencies are required to conduct studies on the extent of radon contamination in buildings they own. TSCA Title IV, “Lead Exposure Reduction,” directs Federal agencies to “conduct a comprehensive program to promote safe, effective, and affordable monitoring, detection, and abatement of lead-based paint and other lead exposure hazards.” Further, any Federal agency having jurisdiction over a property or facility must comply with all Federal, state, interstate, and local requirements concerning lead-based paint.

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APPENDIX B

INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING (IICEP) MATERIALS

Appendix B

Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) Materials

The 377th Air Base Wing (377 ABW) solicited comments on the Draft Environmental Assessment (EA) by distributing letters (examples follow) to potentially interested Federal, state, and local agencies; Native American tribes; and other stakeholder groups or individuals, and by publishing a Notice of Availability (NOA) in The Albuquerque Journal that provided notification that the Draft EA was available for review. Three government agency comments were received from the Albuquerque Environmental Health Department (AEHD) Air Quality Division (AQD), the New Mexico Department of Game and Fish, and the New Mexico Environment Department. The distribution lists of potentially interested parties, examples of the IICEP notification letters, the NOA, and the three comments received follow in this appendix. The following is a list of potentially interested parties:

Federal, State, and Local Agencies

Mr. Robert Campellone
U.S. Fish and Wildlife Service
Division of Planning
P.O. Box 1306
Albuquerque, NM 87103

Ms. Mary Lou Leonard
City of Albuquerque
Acting Environmental Health Department
Director
P.O. Box 1293
Albuquerque, NM 87103

Ms. Julie Alcon
U.S. Army Corps of Engineers
Chief of Environmental Resources Section
4101 Jefferson Plaza NE
Albuquerque, NM 87109

Ms. Jackie Andrew
Southwestern Region NEPA Coordinator
U.S. Forest Service
333 Broadway Boulevard SE
Albuquerque, NM 87102

Ms. Georgia Cleverly
New Mexico Environment Department
Office of Planning and Performance
P.O. Box 5469
Santa Fe, NM 87502

Ms. Terra Monasco
New Mexico Game and Fish
Assistant Chief of Conservation Services
Division
P.O. Box 25112
Santa Fe, NM 87504

Example IICEP Letter to Federal, State, and Local Agencies



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFMC)

NOV 1 2016

Colonel Robert L. Maness
377 ABW/CC
2000 Wyoming Blvd SE Suite E-3
Kirtland AFB NM 87117-5000

Ms. Mary Lou Leonard
Acting Environmental Health Department Director
City of Albuquerque
PO Box 1293
Albuquerque NM 87103

RE: Construction, Operation, and Maintenance of a Military Working Dog Facility at Kirtland Air Force Base, New Mexico

Dear Ms. Leonard

The 377th Air Base Wing (377 ABW) Kirtland Air Force Base (KAFB) has prepared a Draft Environmental Assessment (EA) addressing the construction, operation, and maintenance of a Military Working Dog (MWD) facility at KAFB. The 377 ABW proposes to construct a MWD facility for the 377th Security Forces Squadron (377 SFS) on KAFB to provide adequate and up-to-date housing facilities for MWDs to meet current size and sanitation standards for MWD facilities. The existing MWD facility on KAFB would be converted to a storage building of nonhazardous materials. The environmental impact analysis process for this proposal is being conducted in accordance with Council on Environmental Quality regulations pursuant to the requirements of the National Environmental Policy Act of 1969.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, I request your participation by reviewing the Draft EA and solicit your comments concerning the proposal and any potential environmental concerns you may have. Copies of the Draft EA and the proposed Finding of No Significant Impact are available at <http://www.kirtland.af.mil> under the environmental issues tab. Please provide written comments on the Draft EA or other information regarding the action at your earliest convenience but no later than 30 days from the receipt of this letter. Appendix B of the Draft EA contains a listing of those Federal, state, and local agencies that have been contacted. If there are any additional agencies that you feel should review and comment on the proposed activities, please include them in your distribution of this letter.

Please address questions or comments on this proposed action to the NEPA Program Manager, 377 MSG/CEANQ, 2050 Wyoming Boulevard SE, Suite 125, Kirtland AFB, NM 87117, or via email to nepa@kirtland.af.mil.

Sincerely


ROBERT L. MANESS, Colonel, USAF
Commander

Native American Tribes

Isleta Pueblo
Governor Robert Benavidez
P.O. Box 1270
Isleta Pueblo, NM 87022

Pueblo of Zuni
Governor Norman Cooneyate
P.O. Box 339
Zuni, NM 87327

White Mountain Apache
Ronnie Lupe, Chairman
Tribal Council
P.O. Box 700
Whiteriver, AZ 85941

Ysleta del Sur Pueblo
Governor Frank Paiz
119 S Old Pueblo Road
P.O. Box 17579 – Ysleta Station
El Paso, TX 79917

Michael Burgess, Tribal Chairman
Comanche Indian Tribe
P.O. Box 908
Lawton, OK 73507

Jicarilla Apache Nation
President Levi Pesata
P.O. Box 507
Dulce, NM 87528

Mescalero Apache Tribe
President Carleton Naiche-Palmer
P.O. Box 227
Mescalero, NM 88340

Pueblo of Nambe
Governor Ernest Mirabal
Route 1, Box 117-BB
Santa Fe, NM 87506

Navajo Nation
President Joe Shirley, Jr.
P.O. Box 9000
Window Rock, AZ 86515

Ohkay Owingeh
Governor Marcelino Aguino
P.O. Box 1099
San Juan Pueblo, NM 87566

Pueblo of Acoma
Governor Chandler Sanchez
P.O. Box 309
Acoma, NM 87034

Pueblo of Cochiti
Governor John F. Pecos
P.O. Box 70
Cochiti Pueblo, NM 87072

Pueblo of Jemez
Governor David Toledo
P.O. Box 100
Jemez Pueblo, NM 87024

Pueblo of Laguna
Governor John Antonio, Sr.
P.O. Box 194
Laguna Pueblo, NM 87026

Pueblo of Picuris
Governor Gerald Nailor
P.O. Box 127
Penasco, NM 87553

Pueblo of Pojoaque
Governor George Rivera
78 Cities of Gold Road
Santa Fe, NM 87506

Pueblo of San Felipe
Governor Anthony Ortiz
P.O. Box 4339
San Felipe Pueblo, NM 87001

Pueblo of San Ildefonso
Governor Leon T. Roybal
Route 5, Box 315 –A
Santa Fe, NM 87506

Pueblo of Sandia
Governor Joe M. Lujan
481 Sandia Loop
Bernalillo, NM 87004

Pueblo of Santa Ana
Governor Bruce Sanchez
2 Dove Road
Santa Ana Pueblo, NM 87004

Pueblo of Santa Clara
Governor Walter Dasheno
P.O. Box 580
Española, NM 87532

Pueblo of Santo Domingo
Governor Everett F. Chavez
P.O. Box 99
Santo Domingo Pueblo, NM 87052

Pueblo of Taos
Governor Ruben A. Romero
P.O. Box 1846
Taos, NM 87571

Governor Mark Mitchell
Route 42, Box 360-T
Santa Fe, NM 87506

Pueblo of Zia
Governor Ivan Pino
135 Capitol Square Drive
Zia Pueblo, NM 87053-6013

Hopi Tribal Council
P.O. Box 123
Kykotsmovi, AZ 86039

Example IICEP Letter to Native American Tribes



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFMC)

Colonel Michael S. Duvall
377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB NM 87117-5000

Pueblo of Isleta
Governor Robert Benavidez
P.O. Box 1270
Isleta Pueblo NM 87022

Dear Governor Benavidez

To improve our government-to-government relationship with your tribe, we would like to develop a program with you to review current and future activities associated with the mission of Kirtland Air Force Base (Kirtland AFB). Our broad mission is to ensure safe, secure and reliable weapons systems to support the national command structure and the Air Force warfighter. Our responsibilities are to advocate the Air Force's weapon system and support programs. In order to achieve this mission Kirtland AFB is constantly changing and growing.

We have seven projects currently under planning and potentially of interest to your tribe. A list of these projects is attached. If you have potential interest or concerns related to these projects, please contact Ms. Valerie Renner at telephone number (505) 846-8840.

As a follow-up to this letter, Ms. Renner will be calling you to further discuss Kirtland AFB's intent to improve our consultation process and to determine if you wish to discuss any of the projects identified on the attached list. If you would like to personally meet with me to discuss these or other topics, please advise Ms. Renner and she will facilitate a meeting. Thank you for your time in consideration of our requests.

Sincerely

MICHAEL S. DUVALL, Colonel, USAF
Commander

Attachment:

1. Description of Proposed Actions at Kirtland AFB

HC/MC-130 Aircraft Recapitalization:

The 58th Special Operations Wing (58th SOW) proposes to get 12 new C-130 airplanes to replace 8 older ones they currently fly. No change in the mission of the 58th SOW will occur. The number of people that will come here to train will increase slightly.

Heavy Weapons Range:

The 377th Air Base Wing is proposing to establish and use a heavy weapons range in the southeast section of Kirtland AFB approximately 0.25 miles east of the Starfire Optical Range facilities along Mount Washington Road. The proposed range will encompass the existing M60 range. It would include two firing positions and firing lines and would use the existing targets at the M60 range. Firing distance would be approximately 7,300 feet. Firing position two would be used for sniper heavy weapons (.50 caliber) and would fire in a more southerly direction to the existing target area, approximately 3,800 feet.

Construct New Hot Cargo Pad:

Kirtland AFB has only one hot cargo pad that aircraft park on to load and unload supplies that are continuously flown in and out of Kirtland AFB. The new pad will consist of a cement concrete containing additives to reduce the effects of alkali-silica reactivity. The new pad will adjoin the existing. This project will include a new 6" asphalt taxiway and replace the deteriorated asphalt taxiway to Pad 5. The new pad will adjoin the existing Pad 5 to minimize enlargement of the clear zone and effects on other critical facilities.

Dormitory Master Plan:

This project proposes to construct three new permanent party dormitories to replace old substandard dormitories built in 1950. Kirtland AFB currently has a surplus of old substandard dormitory space this project will help eliminate. The proposed dormitories will be energy-efficient and more economical to maintain.

Construct New Shopping Center:

The Army and Air Force Exchange Service (AAFES) proposes to construct and operate a new Shopping Center at Kirtland AFB. This proposed project will include demolishing of existing facilities, closure of Pennsylvania Avenue, and the construction of a new road behind the new shopping center.

Construct Several New Facilities:

Kirtland AFB proposes to construct six new facilities that will support the fire department (two new fire stations), the newly formed 498th Nuclear System Wing, the newly formed Air Force Nuclear Weapons Center Sustainment Center, the Military Working Dog Facility, and a new Fitness Center. All of these proposed actions will be described in detail in separate Environmental Assessments for review.

Excavation of Five Archaeology Sites:

Kirtland AFB Cultural Resource Manager is developing a research design to excavate five archaeological sites (LA 155815, LA 156001, LA 107494, LA 53671, and LA 153888). Two of the sites (LA 155815 and LA 156001) are next to each other just south of Tijeras Arroyo. They have been exposed due to past flooding of the arroyo and are now eroding from wind and natural elements. The sites are dated as Classic Pueblo from AD 1625 – 1700. This is in the beginning stages of design and the exact procedure has not been determined.

LA 107494 had been damaged by a bulldozer and the cuts have exposed several features. It is a large habitation area with several structures dating from Late Developmental to Coalition (1050 – 1600 AD) time periods. The site is slowly being destroyed by this erosion. Therefore, we recommend stabilizing the site.

LA 53671 is a potentially extensive pithouse village dating to the Late Developmental to Early Classic period (AD 1050 – 1325). This site appears to have been damaged by a large bulldozer. We are estimating this happened during the construction of Coyote Springs Road. Several large trenches exist throughout the site and erosion of the site has been exacerbated by the trenches. The site is slowly being destroyed by this erosion. Therefore, we recommend stabilizing the site.

LA 153888 is a large biface cache. This site is also being damaged by erosion that is caused by a road that was put in near the site. We recommend stabilizing the site.

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GOVERNOR
Bill Richardson



DIRECTOR AND SECRETARY
TO THE COMMISSION
Tod Stevenson

Robert S. Jenks, Deputy Director

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way
Post Office Box 25112
Santa Fe, NM 87504
Phone: (505) 476-8008
Fax: (505) 476-8124

Visit our website at www.wildlife.state.nm.us
For information call: 505/476-8000
To order free publications call: 1-800-862-9310

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KENT A. SALAZAR, Commissioner
Albuquerque, NM

M.H. "DUTCH" SALMON, Commissioner
Silver City, NM

THOMAS "DICK" SALOPEK, Commissioner
Las Cruces, NM

November 23, 2010

NEPA Program Manager
377 MSG/CEANQ
2050 Wyoming Blvd. SE, Suite 125
Kirtland AFB, NM 87117

Re: Military Dog Working Facility Draft Environmental Impact Statement; NMGF No. 13863

Dear Sirs,

The Department of Game and Fish has reviewed the above-referenced document and does not anticipate significant impacts to wildlife or sensitive habitats. For more information on listed and other species of concern, contact the following sources:

1. BISON-M Species Accounts, Searches, and County lists: <http://www.bison-m.org>
2. Habitat Handbook Project Guidelines:
http://wildlife.state.nm.us/conservation/habitat_handbook/index.htm
3. For custom, site-specific database searches on plants and wildlife. Go to Data then to Free On-Line Data and follow the directions go to: <http://nmmhp.unm.edu>
4. New Mexico State Forestry Division (505-827-5830) or <http://nmrareplants.unm.edu/index.html> for state-listed plants
5. For the most current listing of federally listed species **always** check the U.S. Fish and Wildlife Service at (505-346-2525) or <http://www.fws.gov/ifu2es/NewMexico/index.cfm>

Thank you for the opportunity to review and comment on your project. If you have any questions, please contact Mark Watson, Habitat Specialist, at (505) 476-8115 or mark.watson@state.nm.us

Sincerely,

Eliza Gilbert
Permits/Biological Information Specialist/ZBS Recovery
Technical Guidance Section- Conservation Services Divisions

xc: Wally Murphy, Ecological Services Field Supervisor, USFWS

CITY OF ALBUQUERQUE



December 3, 2010

Program Manager, KAFB
National Environmental Policy Act
377 MSG/CEANQ
2050 Wyoming Blvd. SE
Kirtland AFB, NM 87117-5270

Certified Mail No. 7007 1490 0003 5645 3107

Re: Military Working Dog Facility

KAFB NEPA Program Manager:

Thank you for providing the Air Quality Division (Division) the opportunity to review the KAFB preliminary EA (EA) for the construction and operation of the Military Working Dog Facility. Based on review of the preliminary EA, dated November 2010, the Division has concluded that activities associated with this type of operation appear to require notification and Source Registration/Permit application submittals to the Division. KAFB must ensure that all appropriate notifications and applications are submitted as required by 20.11 NMAC.

The EA states that building reconstruction/demolition may occur as a result of this project. Inspection, notification requirements and asbestos removal will need to be done in accordance with 20.11.20.22 NMAC – Demolition and Renovation Activities; Fugitive Dust Control Construction Permit and Asbestos Notification Requirements and Title 40 CFR Subpart M—National Emission Standard for Asbestos §61.145 – Standard for demolition and renovation.

The EA reports that the planned construction will result in surface disturbance. Surface disturbance of $\frac{3}{4}$ of an acre or more will require a Fugitive Dust Permit. Buildings to be demolished that exceed 75,000 ft³ will require a Fugitive Dust Permit. If a Fugitive Dust Permit is required, surface disturbance/demolition shall not occur before Division staff sign and issue a fugitive dust permit. Fugitive dust emissions resulting from this project must be mitigated and controlled as cited in 20.11.20 NMAC.

KAFB shall ensure that the appropriate Source Registration, 20.11.40 NMAC, and Authority to Construct, 20.11.41 NMAC, applications have been submitted and the appropriate Certificate/Permit have been issued by the Division. Construction and operation of these sources shall be done in accordance with 20.11.40 NMAC and 20.11.41 NMAC as applicable. Those engines, not defined as a “Nonroad engine” under Title 40 CFR Part 89 or 90, and applicable to 20.11.41 NMAC, shall obtain a permit pursuant to Part 41. If applicable to 20.11.40 NMAC, the owner/operator shall obtain a Certificate of Registration pursuant to Part 40.

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Albuquerque - Making History 1706-2006

CITY OF ALBUQUERQUE



Program Manager
December 3, 2010
Page 2

Thank you for the time and the opportunity to review the EA Draft Report. Please do not hesitate to contact me with any questions or concerns you may have (dreyes@cabq.gov or 505-768-1958).

Sincerely,

Damon R. Reyes
Enforcement Section Supervisor
Air Quality Division
Environmental Health Department
City of Albuquerque

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Xc: Mary Lou Leonard, Director, Environmental Health Department
Isreal Tavarez, Environmental Engineering Manager, Air Quality Permitting Section
William Gallegos, Environmental Health Manager, Environmental Service Department

Albuquerque - Making History 1706-2006



BILL RICHARDSON
Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Office of the Secretary

Harold Runnels Building
1190 Saint Francis Drive (87505)
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2855 Fax (505) 827-2836
www.nmenv.state.nm.us



RON CURRY
Secretary
Sarah Cottrell
Deputy Secretary

December 20, 2010

Colonel Robert L. Maness
377 ABW/CC
2200 Wyoming Blvd SE Suite E-3
Kirtland AFB NM 87117-5000

RE: Revised Response for Proposed U.S. Air Force Military Working Dog (MWD) Facility Construction Kirtland Air Force Base, Albuquerque

Dear Colonel Maness:

A response to the letter regarding the above named project was sent to you on December 8, 2010. The response that you received was incorrect and I apologize. Comments for the above named project are as follows.

Surface Water Quality Bureau

The Surface Water Quality Bureau (SWQB) has reviewed the above referenced document. All concerns SWQB would have about this project were addressed in the referenced document. SWQB has no comments to make at this time

Petroleum Storage Tanks Bureau

Additional information is needed to properly process 3344ER. No location information was provided with this EIR. As a result, it is not possible to determine whether or not any storage tank facilities are within the area affected by this project.

Again, I apologize for sending an initial incorrect response and hope this information is helpful to you.

Sincerely,

Georgia Cleverley
Environmental Impact Review Coordinator
NMED File #3344 (revised)

Table B-1. Responses to Comments Received on the Draft Environmental Assessment

Section	Commenter	Comment Summary	Response
Air Quality	Albuquerque Environmental Health Department (AEHD) Air Quality Division (AQD)	<p>The AEHD-AQD reviewed the EA and noted that surface disturbances of 0.75 acres or more and demolition of buildings 75,000 square feet or more require a Fugitive Dust Permit. The AEHD-AQD also notes pertinent asbestos regulations for the Proposed Action.</p> <p>The AEHD-AQD also noted that Kirtland AFB shall ensure that the appropriate Source Registration (20.11.40 NMAC) and Authority to Construct (20.11.41 NMAC) applications have been submitted and the appropriate certificates/permits have been issued by the AQD for stationary sources (i.e., generators) under the Proposed Action.</p>	<p>As stated in Sections 1.3.1 and 3.4.2 of this EA, Kirtland AFB will obtain a Fugitive Dust Construction Permit, where applicable, and all other necessary air quality permits prior to the start of construction. Section 4.4.2.1 of the Final EA has been updated for clarification that Fugitive Dust Permits would be required for construction activities (Site Alternatives 2 and 3).</p> <p>Section 4.4.2.1 of the Final EA has also been updated for clarification that Kirtland AFB would submit the appropriate Authority to Construct (20.11.41 NMAC) applications for the emergency generator associated with the proposed MWD facility.</p>

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APPENDIX C

SITE PHOTOGRAPHS



C1. Existing MWD Facility, Building 30126



C2. Existing MWD Facility, Building 30126



C3. Existing Obedience Course Adjacent to Existing MWD Facility



C4. Existing Conditions of Site Alternative 1–Adjacent to Existing MWD Facility



C5. Existing Conditions of Site Alternative 2– Intersection of Wyoming Boulevard and Pennsylvania Street



C6. Existing Conditions of the Boy Scouts Building Southwest of Site Alternative 2



C7. Existing Conditions of Site Alternative 3 – Intersection of M Avenue and Pennsylvania Street

APPENDIX D

AIR QUALITY SUPPORTING DOCUMENTATION

Summary	Summarizes total emissions by proposed site.
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Haul Truck On-Road	Estimates emissions from haul trucks removing materials from the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
Emergency Generator	Estimates emissions from the operation of emergency generators.
AQCR Tier Report	Summarizes total emissions for the Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region Tier report for 2002, to be used to compare the project to regional emissions.

Air Quality Emissions from Proposed Action

	NO_x (ton)	VOC (ton)	CO (ton)	SO₂ (ton)	PM₁₀ (ton)	PM_{2.5} (ton)	CO₂ (ton)
Proposed Project at Site 1 Construction Combustion	4.875	0.459	2.146	0.379	0.349	0.339	552.790
Construction Fugitive Dust	-	-	-	-	1.139	0.228	-
Haul Truck On-Road	0.001	0.001	0.003	0.0001	0.001	0.0003	0.232
Construction Commuter	0.882	1.174	12.620	0.037	0.476	0.130	183.281
TOTAL	5.76	1.63	14.8	0.42	1.97	0.697	736.3

Note: Total PM_{10/2.5} fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO₂ emissions converted to metric tons = **667.826 metric tons**

	NO_x (ton)	VOC (ton)	CO (ton)	SO₂ (ton)	PM₁₀ (ton)	PM_{2.5} (ton)	CO₂ (ton)
Proposed Project at Site 2 Construction Combustion	4.875	0.505	2.146	0.379	0.349	0.339	552.790
Construction Fugitive Dust	-	-	-	-	1.549	0.310	-
Haul Truck On-Road	0.001	0.001	0.003	0.0001	0.001	0.0003	0.232
Construction Commuter	0.882	1.174	12.620	0.037	0.476	0.130	183.281
TOTAL	5.76	1.68	14.8	0.42	2.38	0.779	736.3

Note: Total PM_{10/2.5} fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO₂ emissions converted to metric tons = **667.826 metric tons**

	NO_x (ton)	VOC (ton)	CO (ton)	SO₂ (ton)	PM₁₀ (ton)	PM_{2.5} (ton)	CO₂ (ton)
Proposed Project at Site 3 Construction Combustion	4.875	0.505	2.146	0.379	0.349	0.339	552.790
Construction Fugitive Dust	-	-	-	-	1.549	0.310	-
Haul Truck On-Road	0.001	0.001	0.003	0.000	0.001	0.000	0.232
Construction Commuter	0.882	1.174	12.620	0.037	0.476	0.130	183.281
TOTAL	5.76	1.68	14.8	0.42	2.38	0.779	736.3

Note: Total PM_{10/2.5} fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO₂ emissions converted to metric tons = **667.826 metric tons**

Since future year budgets were not readily available, actual 2002 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region 152

Year	Point and Area Sources Combined					
	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)
2002	36,778	31,651	245,346	2,619	137,376	16,676

Source: USEPA-AirData NET Tier Report (<http://www.epa.gov/air/data/geosel.html>).

Determination Significance (Significance Threshold = 10%)

Proposed Project at Site 1

	Point and Area Sources Combined					
	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)
Regional Emissions	36,778	31,651	245,346	2,619	137,376	16,676
Project Emissions	5.76	1.63	14.77	0.42	1.97	0.70
<i>Proposed Project at Site 1 %</i>	0.0157%	0.0052%	0.0060%	0.0159%	0.0014%	0.0042%

Proposed Project at Site 2

	Point and Area Sources Combined					
	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)
Regional Emissions	36,778	31,651	245,346	2,619	137,376	16,676
Project Emissions	5.76	1.68	14.77	0.42	2.38	0.78
<i>Proposed Project at Site 2 %</i>	0.0157%	0.0053%	0.0060%	0.0159%	0.0017%	0.0047%

Proposed Project at Site 3

	Point and Area Sources Combined					
	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)
Regional Emissions	36,778	31,651	245,346	2,619	137,376	16,676
Project Emissions	5.76	1.68	14.77	0.42	2.38	0.78
<i>Proposed Project at Site 3 %</i>	0.0157%	0.0053%	0.0060%	0.0159%	0.0017%	0.0047%

Site 1 Project Combustion

Combustion Emissions

Combustion Emissions of VOC, NO_x, SO₂, CO, PM_{2.5}, PM₁₀, and CO₂ due to Construction

General Construction Activities

	Area Disturbed
Construction staging area	5,625 ft ²
Construction of kennel building	5,000 ft ²
Construction of covered walkway	130 ft ²
Construction of administrative/support building	2,870 ft ²
Newly constructed parking area	11,000 ft ²

Assume a 75' x 75' area will be used.

General Demolition Activities

Demolition of Building 30126	2,520 ft ²
------------------------------	-----------------------

Total General Construction Area:	24,625 ft ²
	0.6 acres
Total General Demolition Area:	2,520 ft ²
	0.1 acres
Total Disturbed Area:	27,145 ft ²
	0.6 acres
Construction Duration:	12 months
Annual Construction Activity:	240 days/yr

Assume 12 months, 4 weeks per month, 5 days per week.

Site 1 Project Combustion

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0

Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.

Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	0.83	2.55	2.47	4941.53

Paving

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	0.91	2.78	2.69	5623.96

Demolition

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	0.64	1.92	1.87	3703.07

Building Construction

Equipment ^d	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page

Site 1 Project Combustion

Architectural Coatings

Equipment	No. Reqd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

- a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.
- b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.
- c) The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO₂ emissions by more than a factor of two.
- d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

Site 1 Project Combustion

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO _x	VOC	CO	SO ₂ **	PM ₁₀	PM _{2.5}	CO ₂
Grading Equipment	1	41.641	2.577	15.710	0.833	2.546	2.469	4941.526
Paving Equipment	1	45.367	2.606	18.578	0.907	2.776	2.693	5623.957
Demolition Equipment	1	31.808	1.886	12.584	0.636	1.923	1.865	3703.074
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			7.290					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NO_x = (Total Grading NO_x per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft ²)	Total Area (acres)	Total Days
Grading:	27,145	0.62	1
Paving:	11,000	0.25	2
Demolition:	2,520	0.06	3
Building Construction:	24,625	0.57	240
Architectural Coating	8,000	0.18	20

(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
Grading Equipment	41.64	2.58	15.71	0.83	2.55	2.47	4,942
Paving	90.73	5.21	37.16	1.81	5.55	5.39	11,248
Demolition	92.01	5.45	36.40	1.84	5.56	5.40	10,711
Building Construction	9,455.12	751.15	4,171.75	747.92	678.97	658.60	1,071,483
Architectural Coatings	71.48	153.26	31.31	5.02	6.19	6.00	7,195
Total Emissions (lbs):	9,750.98	917.65	4,292.33	757.43	698.82	677.85	1,105,579

Results: Total Project Annual Emission Rates

	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
Total Project Emissions (lbs)	9,750.98	917.65	4,292.33	757.43	698.82	677.85	1,105,579
Total Project Emissions (tons)	4.88	0.46	2.15	0.38	0.35	0.34	552.79

Site 2 & 3 Project Combustion

Combustion Emissions

Combustion Emissions of VOC, NO_x, SO₂, CO, PM_{2.5}, PM₁₀, and CO₂ due to Construction

General Construction Activities

	Area Disturbed
Construction Staging Area	5,625 ft ²
Construction of kennel building	5,000 ft ²
Construction of covered walkway	130 ft ²
Construction of administrative/support building	2,870 ft ²
Newly constructed parking area	11,000 ft ²
Construction of obedience course	22,500 ft ²

Assume a 75' x 75' area will be used.

General Demolition Activities

Demolition of Building 30126	2,520 ft ²
------------------------------	-----------------------

Total General Construction Area:	47,125 ft ²
	1.1 acres
Total General Demolition Area:	2,520 ft ²
	0.1 acres
Total Disturbed Area:	49,645 ft ²
	1.1 acres
Construction Duration:	12 months
Annual Construction Activity:	240 days/yr

Assume 12 months, 4 weeks per month, 5 days per week.

Site 2 & 3 Project Combustion

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0

Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.

Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	0.83	2.55	2.47	4941.53

Paving

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	0.91	2.78	2.69	5623.96

Demolition

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	0.64	1.92	1.87	3703.07

Building Construction

Equipment ^d	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c (lb/day)	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page

Site 2 & 3 Project Combustion

Architectural Coatings

Equipment	No. Reqd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)	PM _{2.5} (lb/day)	CO ₂ (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

- a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.
- b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.
- c) The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO₂ emissions by more than a factor of two.
- d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

Site 2 & 3 Project Combustion

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO _x	VOC	CO	SO ₂ **	PM ₁₀	PM _{2.5}	CO ₂
Grading Equipment	1	41.641	2.577	15.710	0.833	2.546	2.469	4941.526
Paving Equipment	1	45.367	2.606	18.578	0.907	2.776	2.693	5623.957
Demolition Equipment	1	31.808	1.886	12.584	0.636	1.923	1.865	3703.074
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			11.956					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NO_x = (Total Grading NO_x per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft ²)	Total Area (acres)	Total Days
Grading:	49,645	1.14	1
Paving:	11,000	0.25	2
Demolition:	2,520	0.06	3
Building Construction:	47,125	1.08	240
Architectural Coating	21,520	0.49	20

(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative.

The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition.

The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
Grading Equipment	41.64	2.58	15.71	0.83	2.55	2.47	4,942
Paving	90.73	5.21	37.16	1.81	5.55	5.39	11,248
Demolition	92.01	5.45	36.40	1.84	5.56	5.40	10,711
Building Construction	9,455.12	751.15	4,171.75	747.92	678.97	658.60	1,071,483
Architectural Coatings	71.48	246.58	31.31	5.02	6.19	6.00	7,195
Total Emissions (lbs):	9,750.98	1,010.98	4,292.33	757.43	698.82	677.85	1,105,579

Results: Total Project Annual Emission Rates

	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
Total Project Emissions (lbs)	9,750.98	1,010.98	4,292.33	757.43	698.82	677.85	1,105,579
Total Project Emissions (tons)	4.88	0.51	2.15	0.38	0.35	0.34	552.79

Site 1 Project Fugitive

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
General Construction Activities	0.19	ton PM ₁₀ /acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM ₁₀ /acre-month	MRI 1996; EPA 2001; EPA 2006

PM_{2.5} Emissions

PM _{2.5} Multiplier	0.10	(10% of PM ₁₀ emissions assumed to be PM _{2.5})	EPA 2001; EPA 2006
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Control Efficiency

	0.50	(assume 50% control efficiency for PM ₁₀ and PM _{2.5} emissions)	EPA 2001; EPA 2006
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Project Assumptions

Demolition and New Road Construction (0.42 ton PM₁₀/acre-month)

Duration of Construction Project	12 months
Area	0.3 acres

Construction Activities (0.19 ton PM₁₀/acre-month)

Duration of Construction Project	12 months
Area	0.3 acres

	Project Emissions (tons/year)			
	PM ₁₀ uncontrolled	PM ₁₀ controlled	PM _{2.5} uncontrolled	PM _{2.5} controlled
Demolition and New Road Construction	1.56	0.78	0.16	0.08
Construction Activities	0.71	0.36	0.07	0.04
Total	2.28	1.14	0.23	0.11

Site 1 Project Fugitive

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM₁₀/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM₁₀/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM₁₀/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM₁₀/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM₁₀/acre-month) and 75% of the average emission factor (0.11 ton PM₁₀/acre-month). The 0.19 ton PM₁₀/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM₁₀/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM₁₀ and PM_{2.5} in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM₁₀/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM₁₀/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM₁₀/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

PM_{2.5} Multiplier

0.10

PM_{2.5} emissions are estimated by applying a particle size multiplier of 0.10 to PM₁₀ emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM₁₀ and PM_{2.5}

0.50

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM₁₀ and PM_{2.5} in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999*. EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants*. Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1)*. Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Site 2 & 3 Project Fugitive

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
General Construction Activities	0.19	ton PM ₁₀ /acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM ₁₀ /acre-month	MRI 1996; EPA 2001; EPA 2006

PM_{2.5} Emissions

PM _{2.5} Multiplier	0.10	(10% of PM ₁₀ emissions assumed to be PM _{2.5})	EPA 2001; EPA 2006
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Control Efficiency

	0.50	(assume 50% control efficiency for PM ₁₀ and PM _{2.5} emissions)	EPA 2001; EPA 2006
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Project Assumptions

Demolition and New Road Construction (0.42 ton PM₁₀/acre-month)

Duration of Construction Project	12 months
Area	0.3 acres

Construction Activities (0.19 ton PM₁₀/acre-month)

Duration of Construction Project	12 months
Area	0.7 acres

	Project Emissions (tons/year)			
	PM ₁₀ uncontrolled	PM ₁₀ controlled	PM _{2.5} uncontrolled	PM _{2.5} controlled
Demolition and New Road Construction	1.56	0.78	0.16	0.08
Construction Activities	1.53	0.77	0.15	0.08
Total	3.10	1.55	0.31	0.15

Site 1 Project Grading

Grading Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 0.6 acres/yr (from Combustion Worksheet)
 Qty Equipment: 3.0 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project- specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	0.62	0.08
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	0.62	0.30
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	0.31	0.31
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	0.31	0.13
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	0.62	0.22
TOTAL								1.04

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 1.04
 Qty Equipment: 3.00
 Grading days/yr: 0.35

Site 2 & 3 Project Grading

Grading Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 1.1 acres/yr (from Combustion Worksheet)
 Qty Equipment: 3.0 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	1.14	0.14
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	1.14	0.56
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	0.57	0.57
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	0.57	0.24
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	1.14	0.40
TOTAL								1.91

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 1.91
 Qty Equipment: 3.00
 Grading days/yr: 0.64

All Sites Haul Truck On-Road

Haul Truck Emissions

Emissions from hauling construction and demolition debris are estimated in this spreadsheet.

Emission Estimation Method References: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

US EPA Estimating 2003 Building-Related Construction and Demolition Materials Amounts (March 2009).

Assumptions:

Haul trucks carry 20 cubic yards of material per trip.

The average distance from the project site to the base landfill is 10 miles, and from the project site to the offsite Cerro Colorado Landfill is 30 miles.

Assume 85% of demolition waste would go to the base landfill and 15% would be transported offsite. Therefore a haul truck will have a weighted average of 26 miles round trip.

Estimated number of trips required by haul trucks = total amount of material demolished on installation/20 cubic yards per truck

Typical non-residential demolition materials generation per unit area:	158 lb/ft ²	EPA 2009
Total demolition waste removed:	2,520 ft ²	From Project Combustion
Total demolition waste:	398,160 lbs	Density of demolition waste * project area
Density of demolition waste:	150 lbs/ft ³	Density of concrete (EPA 2009)
Total volume of demolition waste:	98 cubic yards	
Number of trucks required to haul demolition waste:	5	Heavy duty diesel haul trucks (20 CY)
Miles per round trip:	26 miles	Weighted average

Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
HDDV	6.500	4.7000	19.10	0.512	7.7	2.01	1646

Notes:

Emission factors for all pollutants except CO₂ are from USAF IERA 2003.

Emission factors for PM, PM₁₀, SO_x are from HDDV in Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO_x are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

Diesel fuel produces 22.384 pounds of CO₂ per gallon.

It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)

CO₂ emission factor = 22.384 lbs CO₂/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb

HDDV Haul Truck Emissions

	NO _x	VOC	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂
lbs	1.83	1.32	5.38	0.14	2.18	0.57	463.66
tons	0.001	0.001	0.003	0.0001	0.001	0.0003	0.23

Example Calculation: NO_x emissions (lbs) = 26 miles per round trip * 494 trips * NO_x emission factor (g/mile) * lb/453.6 g

All Sites Construction Commuter Emissions

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

Assumptions:

Passenger vehicle emission factors for scenario year 2010 are used.

Assume up to 30 workers would be required at the site.

Passenger vehicle model year 2000 is used.

The average roundtrip commute for a construction worker = 50 miles
 Number of construction days = 240 days
 Number of construction workers (daily) = 30 people
 Riders per vehicle = 1 person
 Number of vehicles (daily) = 30 vehicles

Average On-Road Vehicle Emission Factors (grams/mile)

Vehicle Type Category	NO _x	VOC	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂
LDGV	2.1	2.9	33.1	0.072	0.71	0.20	391.97
LDGT1	2.2	3.2	35.2	0.096	1.08	0.29	526.04
LDGT2	2.5	3.5	38.6	0.098	2.58	0.66	535.24
HDGV	2.9	3.5	41.1	0.154	5.51	1.42	843.56
LDDV	1.2	0.6	1.7	0.116	0.80	0.28	373.70
LDDT	1.5	1.1	2.9	0.157	1.59	0.48	505.90
HDDV	6.5	4.7	19.1	0.512	7.73	2.01	1645.60
MC	0.6	6.5	41.0	0.032	0.08	0.03	177.48

Notes:

Emission factors for all pollutants except CO₂ are from USAF IERA 2003.

Emission factors for PM, PM₁₀, SO_x are from Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO_x are from Tables 4-2 through 4-49 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

It is assumed that the average vehicle will produce 19.564 pounds of CO₂ per gallon of gas used and 22.384 pounds of CO₂ per gallon of diesel used (<http://www.eia.doe.gov/oiarf/1605/coefficients.html>).

Using the default fuel economy for the vehicle type categories in USAF IERA Table 4-51, the CO₂ emission factor was estimated.

Example: HDDV CO₂ emission factor = 22.384 lbs CO₂/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb = 1645.60 g/mile

On-Road Vehicle Emissions (Annual)

Vehicle Type Category	NO _x	VOC	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂
LDGV	1148.33	1585.79	18099.92	39.37	388.25	109.37	214339.87
LDGT1	199.05	289.52	3184.76	8.69	97.71	26.24	47593.75
LDGT2	168.65	236.11	2603.97	6.61	174.05	44.52	36107.26
HDGV	34.52	41.67	489.29	1.83	65.60	16.90	10042.36
LDDV	37.14	18.57	52.62	3.59	24.76	8.67	11566.85
LDDT	22.62	16.59	43.73	2.37	23.98	7.24	7628.63
HDDV	149.60	108.17	439.60	11.78	177.91	46.26	37875.03
MC	4.76	51.59	325.40	0.25	0.63	0.24	1408.61
Total (lbs)	1764.68	2348.02	25239.29	74.50	952.89	259.44	366562.36
Total (tons)	0.88	1.17	12.62	0.04	0.48	0.13	183.28

Example Calculation: NO_x emissions (lbs) = 48 vehicles * percent of vehicle mix /100 * NO_x emission factor (g/mile) * 50 miles/day * number of construction days * lb/453.6 g

Default Fuel Economies for On-Road Vehicles

Vehicle Type Category	Default Fuel Economy (mpg)
LDGV	22.64
LDGT1	16.87
LDGT2	16.58
HDGV	10.52
LDDV	27.17
LDDT	20.07
HDDV	6.17
MC	50.00

Notes:

Values from Table 4-51 (USAF IERA 2003).

Average On-Road Vehicle Mix

Vehicle Type Category	Average On-Road Vehicle Mix (%)
LDGV	68.9
LDGT1	11.4
LDGT2	8.5
HDGV	1.5
LDDV	3.9
LDDT	1.9
HDDV	2.9
MC	1

Notes:

Vehicle mix is from Table 6-1 (USAF IERA 2003).

All Sites Emergency Generator Emissions

Emissions from the operation of the 150-kVA emergency generator used for backup power supply for the proposed MWD facility are estimated in this spreadsheet.

Generator kva	Convert to kW	Conversion from kW to Btu/hr	Engine Btu/hr (Assume 70% efficiency converting mechanical to electrical power)	Engine MMBtu/hr
150	120	3413	585,086	0.59

Natural Gas Reciprocating Engine Emission Factors from AP-42, Section 3.2	NOx	CO	VOC	PM-10	PM-2.5	SO ₂	CO ₂
	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu
2-stroke lean burn engine	3.17	3.86E-01	1.20E-01	3.84E-02	3.84E-02	5.88E-04	110
4-stroke lean burn engine	4.08	3.17E-01	1.18E-01	7.71E-05	7.71E-05	5.88E-04	110
4-stroke rich burn engine	2.21	3.51	2.96E-02	9.50E-03	9.50E-03	5.88E-04	110
Maximum Emission Factor	4.08	3.51	0.12	0.0384	0.0384	0.000588	110

Assume max. 500 hrs/yr operation

NOx	CO	VOC	PM-10	PM-2.5	SO ₂	CO ₂
(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)
1,193.57	1,026.83	35.11	11.23	11.23	0.17	32,179.71

NOx	CO	VOC	PM-10	PM-2.5	SO ₂	CO ₂
(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
0.60	0.51	0.02	0.01	0.01	8.60E-05	16.09

Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region 152

Row #	State	County	Point Source Emissions					Area Source Emissions (Non-Point and Mobile Sources)						
			CO	NOx	PM10	PM2.5	SO2	VOC	CO	NOx	PM10	PM2.5	SO2	VOC
1	NM	Bernalillo Co	1,179	1,199	177	119	43.6	310	184,071	23,731	61,715	8,064	1,524	24,000
2	NM	Sandoval Co	346	186	94.5	92.6	0.40	62.4	39,031	4,519	36,517	4,274	603	4,517
3	NM	Valencia Co	153	296	1.24	1.07	0	27.1	20,566	6,847	38,871	4,125	448	2,734
Grand Total			1,678	1,681	273	213	44	400	243,668	35,097	137,103	16,463	2,575	31,251

SOURCE:

<http://www.epa.gov/air/data/geosel.html>

USEPA - AirData NET Tier Report

*Net Air pollution sources (area and point) in tons per year (2002)

Site visited on 19 Oct 2009.

Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region 152 (40 CFR 81.83)

	CO	NOx	PM10	PM2.5	SO2	VOC
Bernalillo	185,250	24,930	61,892	8,183	1,568	24,310
Total	245,346	36,778	137,376	16,676	2,619	31,651