

Draft Environmental Assessment

MD Anderson Cancer Center

Smithville Research Center Wildfire  
Mitigation Project Update

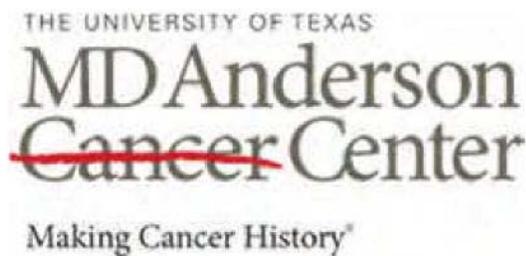
HMGP-DR-1791-TX Project #291

Bastrop County, Texas

*July 2015*

*Prepared for*

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## Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
CAA	Clean Air Act
CBRA	Coastal Barrier Resources Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
dB	decibel
DNL	Day-Night Average Sound Level
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMST	Ecological Mapping System of Texas
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMU	fuel management unit
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
GLO	General Land Office
HMGP	Hazard Mitigation Grant Program
HVAC	Heating, Ventilation, and Air Conditioning
MBTA	Migratory Bird Treaty Act
MDACC	MD Anderson Cancer Center
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA/NMFS	National Oceanic and Atmospheric Administration/National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OSHA	Occupational Safety and Health Administration
PEM	palustrine emergent wetland
PL	Public Law
SHPO	State Historic Preservation Office
SWPPP	Storm Water Pollution Prevention Plan
TCEQ	Texas Commission on Environmental Quality
TDEM	Texas Division of Emergency Management
THC	Texas Historical Commission
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TXNDD	Texas Natural Diversity Database
USACE	United States Army Corps of Engineers
USCB	United States Census Bureau

USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UT	University of Texas

## **1.0 Introduction**

The University of Texas (UT) MD Anderson Cancer Center (MDACC) has applied for funds from the Federal Emergency Management Agency (FEMA), through the Texas Division of Emergency Management (TDEM), to conduct wildfire mitigation at the Smithville Research Center in Bastrop County, Texas. FEMA approved to fund the project through the Hazard Mitigation Grant Program (HMGP) under the 2008 presidential disaster declaration (DR-1791-TX Project #291) for Hurricane Ike. The scope of the proposed mitigation project was to protect the Smithville Research Center from wildfire damage through the development of defense zones along the property perimeter and building hardening measures.

In accordance with 44 Code of Federal Regulations (CFR) Part 10, an Environmental Assessment (EA) was prepared in 2012 to meet the requirements of Section 102 of the National Environmental Policy Act of 1969 (NEPA), the President's Council on Environmental Quality (CEQ) regulations to implement NEPA (40 CFR Parts 1500-1508), and FEMA's regulations implementing NEPA (44 CFR Part 10). FEMA used the findings in that EA to prepare a Finding of No Significant Impact (FONSI).

In 2014, a Fuel Reduction Model was completed as part of the wildfire mitigation design for the MDACC Smithville campus. Based on the results of this extensive effort, MDACC requested a change in the approved scope of work for the project. The revised scope is detailed in Section 3.1.2 of this EA. In general, the revised scope extends the acreage for vegetation removal to approximately 65 acres on the MDACC campus; removes the sprinkler system component; and maintains the structure hardening component of the original scope.

FEMA is required to consider potential environmental impacts from the revised mitigation measures. Therefore, FEMA requested that MDACC prepare an updated EA for the wildfire mitigation at MDACC Smithville campus (the campus). The focus of this EA is to analyze the potential environmental impacts of the revised scope of work at the campus and is a stand-alone EA that supersedes the EA issued in 2012.

### **1.1 Project Location**

The Smithville Research Center is a unique component of MDACC, with the mission to investigate the molecular biology of cancer and to develop means for cancer prevention and detection. MDACC is located in the Lost Pines region of Bastrop County near Smithville, Texas, as presented on Figure 1-1 and Figure 1-2 (**Appendix A**). The project area is located on Park Road 1C, approximately 1.5 miles north of Texas Highway 71 and 4 miles northwest of Smithville, Bastrop County, Texas. The MDACC campus is comprised of 10 buildings including laboratories, research facilities, a physical plant, and office buildings. The entire

campus encompasses approximately 700 acres of land., For purposes of evaluating potential impacts of the proposed project, the project area was redefined to include the developed area and some of the surrounding undeveloped forested areas (approximately 65 acres) within the MDACC property.

## **2.0 Purpose and Need**

Through its Hazard Mitigation Grant Program (HMGP), FEMA provides grants to states and local governments to implement long-term hazard mitigation measures. The purpose of HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

The purpose of this project is to reduce the Smithville Research Center's vulnerability to wildfires while adhering to State and Federal regulations. The goal is to mitigate the risk of a surface or crown fire impacting the campus. The need for the proposed wildfire mitigation project can be assessed through the following:

- Historical wildfire evidence;
- Presence of wildfire fuel; and
- Function and value of the campus.

### **2.1 Historical Wildfire Evidence**

In 2009, the Texas Parks and Wildlife Department (TPWD) completed the *Wildfire Hazard Mitigation and Forest Management Recommendations University of Texas M.D. Anderson Cancer Center, Bastrop County*. The report evaluated the types of wildland fuel in certain areas of Bastrop County (Figure 2-1). The report presented the following historical wildfire data and also included the evaluation on wildland fuels.

The native pine-oak forest located on the MDACC property and the surrounding area is a fire-dependent ecosystem. Historically, these forests evolved with periodic fires ignited by lightning strikes and Native Americans, who may have used fire for agricultural and hunting/gathering purposes. Research has shown that major fires occurred within this habitat every 15 to 30 years and low intensity fires occurred more frequently. Over time these ecosystems developed adaptations to periodic fires and are now dependent upon fire to create the specific habitat structure or food source necessary for survival. Without wildfires, the Lost Pines region is subject to changes as forest health declines, while the buildup of wildland fuel increases the risk of a serious wildfire.

The Lost Pines region is very susceptible to wildfires, which threaten homes, natural resources, and other critical infrastructure. A summary of historical events beginning in 1999 are described below.

- 1999 - A lightning strike ignited a wildfire on MDACC property that required air and ground resources. The fire was contained to about 3 acres (TPWD, 2009).
- 2008 - Bastrop State Park experienced six wildfires (natural and human-related) on or adjacent to their property, causing about 100 acres of damage (TPWD, 2009).
- 2009 - Bastrop County's Wilderness Ridge Fire, ignited by a downed power line, resulted in significant natural resource damage on 1,451 acres (TPWD, 2009).
- 2011 – Strong winds, low humidity, and critically dry vegetation caused a devastating wildfire season in 2011 (TFS, 2011a, 2011b).

Although occasional wildfires are natural and necessary for the sustainability of the ecosystem, they are potentially damaging and dangerous for the facility, its inhabitants, and its activities.

## **2.2 Presence of Wildfire Fuel**

In 2008, TPWD contracted a third party to conduct a vegetation classification and wildland fuels survey for Buescher State Park and MDACC. TPWD is working to develop wildland fire management plans for all of their properties. The completed survey of the Smithville Research Center resulted in the delineation of various vegetation associations and their corresponding wildland fuel models. These delineations, illustrated on Figure 2-1, helped in the wildland fire management planning and aided in the expected fire behavior during wildfire or prescribed fire events for this wildfire mitigation project. With the absence of fire, wildland fuels tend to accumulate and increase the risk for a catastrophic wildfire (TPWD, 2009).

The five vegetative associations described in the TPWD 2009 report were confirmed during site reconnaissance on the MDACC property in the months of February and March 2015. Tree species including blackjack oak, post oak, loblolly pine, ash juniper, roughleaf hackberry, and American elm were documented. The shrub canopy layer within the forest was comprised of yaupon holly, possum haw, and juvenile trees. Large amounts of deadwood were scattered throughout the forested area.

The MDACC property is surrounded by primarily a pine-oak forest, which is rated as a moderate fuel load. This vegetative association indicates a significant need for increased protection against wildfires.

### **2.2.1 Previous Wildfire Mitigation Projects**

Previous wildfire mitigation projects at the facility have cleared several areas categorized as “Zones” around the facility of underbrush and wildland fuel (identified as Zone 2 in pink on Figure 2-2). These areas have been cleared to grass approximately 150-feet around the perimeter

of the development generally following the recently constructed Circle Loop Road in the eastern portion of the development. Outside of these cleared areas in certain locations, the forest has also been cleared of underbrush. Additional underbrush clearing has been previously completed near the northwest entrance to the campus. Table 2-1 presents the approximate estimates of the acreage of the existing wildfire mitigation zones.

**Table 2-1: Estimated Existing Defense Zone Areas**

<b>Zone</b>	<b>Zone Description</b>	<b>Acres*</b>
Zone 1 (Yellow)	Existing Managed Landscape	28.1
Zone 2 (Pink)	Managed Underbrush Removal	19.0

Note: \* Areas are estimates that are based on field reviews and GIS queries.

Although previous wildfire defense zones have been established around the facility, additional wildfire defense zones need to be established or enhanced for a significant portion of the facility to provide a complete wildfire barrier around the campus. The areas lacking vegetative management are located in three general areas: (1) south of Lab 1 and Lab 2; (2) behind the Griffin Building, Lab 3 and the Physical Plant and extend southeast; and (3) on either side of the southern entrance on Circle Loop Road. The dense forest located in these areas was photographed (see **Appendix B**). If the wildfire were to begin north of the campus and move southward, there are no defense mechanisms currently in place to prevent or protect against the wildfire.

### **2.3 Function and Value of Smithville Research Center Campus**

The Smithville Research Center was established in 1971 as an educational and research facility focused on determining how environmental factors contribute to cancer formation. MDACC acquired 717 acres of land near Smithville from TPWD and in 1977 construction of the original buildings was completed. From the outset, the multi-disciplinary teams assembled at Smithville Research Center in the Department of Molecular Carcinogenesis have brought unique focus to complex problems, and the research program has grown rapidly in size, scope and reputation.

Since its inception, the campus has benefited from increased investment in infrastructure and facilities to keep pace with the growth of its research programs. Smithville Research Center was designated as a Nationally Recognized Environmental Center in 1996. In the last five years, \$26.7 million in new facilities and improvements were added to the campus, which included a new 23,000 square foot research laboratory building, Lab 4.

The research program of the Department of Molecular Carcinogenesis is focused on defining normal pathways that control cell differentiation, cell division, cell growth and cell survival in order to define the factors that lead to cancer formation and progression, as well as prevention strategies.

## **3.0 Alternatives**

This section describes the alternatives that were considered in addressing the purpose and need stated in Section 2. Two alternatives are evaluated in this EA: No Action Alternative and Proposed Action Alternative. An additional alternative was assessed, which considered hardening all buildings on campus, but it was dismissed in the evaluation process based on the associated costs and incomplete mitigation measures.

### **3.1 Alternatives Evaluated**

#### **3.1.1 No Action Alternative**

Under the No Action Alternative, MDACC would not take any additional steps to reduce the risk of wildfire at the Smithville Research Center. The existing fire hazard to the campus, staff, and assets surrounding the project area would remain under the No Action Alternative. Thus, loss of native flora and fauna along with their associated habitats would occur in the event of a wildfire.

#### **3.1.2 Proposed Action Alternative**

Under the Proposed Action Alternative, MDACC would enhance and establish FMUs around the perimeter of the campus and protect and harden critical buildings and facility infrastructures. These proposed actions are further detailed below.

#### ***Fire Management Units***

The creation of FMUs was derived from the 2014 forest fuel reduction assessment (URS, 2014) and the 2009 Wildfire Hazard Mitigation and Forest Management Recommendations (TPWD, 2009). FMUs are classified by the dominant vegetation species present and the overall fuel reduction prescribed. The main principle behind these forestry recommendations was potential fuels reduction of the surrounding wildland environment. The objective is to convert any crown fire potential into surface fire potential, which has relatively lower heat intensity and shorter flame length. The lower heat intensity and shorter flame length provided by the FMUs will reduce the radiant heat exposure when close to combustible structures. Thus, this strategy limits the ignition sources for the MDACC buildings.

The future condition goal is to facilitate a minimum of 70 percent canopy closure throughout the project area, however much of the area currently has less than 70 percent canopy closure. In some places, there is not 70 percent canopy cover and/or small pockets where the overstory is not as dense or is not mature. In these cases, healthy pine and oak trees, no matter what the size, would be favored and not cut so that the future canopy would be protected. Suppressed and unhealthy oaks and pines that are interfering with the success of healthy oak and pine might be cut.

These FMUs are presented in Figure 3-1 and Figure 3-2 and Table 3-1 presents the approximate estimates of the acreage associated with each of the proposed FMUs. Creation of these defense zones would include the removal of most dead, decaying, and woody material as well as most yaupon holly (*Ilex vomitoria*), due to its flammable characteristics. The FMUs are classified by the dominant vegetation species present and the overall fuel reduction prescribed. FMU 1 is 18.4 acres, consists of post oak/blackjack oak woodlands and loblolly pine ravines, and has a dense fuel load and dense canopy cover. FMU 2 is 29.6 acres, consists of post oak/blackjack oak woodlands and loblolly pines, and has a moderate fuel load. The canopy cover in FMU 2 is heavy, but is not as dense as in FMU 1.

FMU 3 is 13.5 acres and is an interior area of the campus where vegetation and canopy cover is sparse. This area was previously treated and since that time many large trees have blown down and are creating a heavy surface fuel load. In some cases larger trees may be cut and removed if they are determined to be dead by a certified arborist and if they add to the fuel load in the defense zones. Dead and downed logs will be removed to the temporary debris staging area or would be mulched and spread on site. FMU 4 is a small 3 acre area near the entry to the campus that consists of post oak/blackjack oak woodlands with dense canopy cover. More specifically, in FMUs 1, 2 and 4, small-diameter under- and mid-story woody vegetation (primarily yaupon and cedar) will be removed to eliminate ladder fuels.

**Table 3-1: Fuels Reduction Management Units**

<b>Fuel Management Unit</b>	<b>Fuel Break Description</b>	<b>Area (ac)</b>	<b>Ownership</b>
1	Loblolly drainage- heavy load	18.4	MDACC
2	Loblolly / Oak mix moderate	29.6	MDACC
3	Sanitation cut	13.5	MDACC
4	Oak re-entry	3	MDACC
<b>Total</b>		<b>64.5</b>	

All vegetation removal would be above ground surface. Equipment for vegetation clearing may include mowing machinery, handsaws, bobcats, grinders, and hauling trucks. Every effort will be made to hand cut when possible to minimize ground disturbance. Fuels reduction activities will only be conducted from July 1 to December 31, outside of the Houston toad breeding season and emergence period.

Suppressed trees include those that meet one or more the following criteria: infested by insects; infected with diseases such as cankers; dead (unless kept as wildlife snag); V-shaped, co-dominant stem in lower 2/3 of tree; crook, sweep or lean; greater than 20 percent dead or broken top; greater

than 30 percent of the trunk is missing bark; or less than 50 percent of the tree has a live crown. The treatment will focus on removal of underbrush and ladder fuels. The focus is also on keeping large living canopy trees and smaller pines and oaks when the existing canopy is not dense. Small living pines and oaks would be selectively removed only when necessary to achieve the stated purpose and need of hazardous fuels reduction. If the tree does not contribute to wildfire hazard, and if it is not suppressed, it will not be removed.

Eastern red cedar, the majority of which are less than 4 inches in diameter at breast height (dbh) will be removed. Some eastern red cedar, especially larger trees that provide canopy cover, may be left in place to maintain 70 percent canopy coverage. Trees will be pruned up to a maximum of 8 feet off the ground. Trees will be pruned using only a pole pruner and/or appropriate chainsaw with 12", 14", or 16" guide bars. Dead standing and fallen trees may be removed from the site, may be chipped in place, or may be left in place for wildlife habitat. No root balls or stumps will be removed, mechanically excavated, or pushed. All stumps will be cut to a height no greater (on average) than 4" above the ground measured on the uphill side.

When absolutely necessary for fuels reduction purposes, some small diameter living oaks and pines will be selectively removed in FMUs 1, 2, and 4. Suppressed and unhealthy oak trees and pine trees will be removed in favor of removal of healthy trees whenever possible.

In the loblolly pine ravines (FMUs 1 and 2), live pine trees will not be removed except within FMU 1 north of the Griffin Building. Within this area, pine trees less than 6 inches dbh will be selectively removed to achieve fuels reduction while retaining at least 70 percent canopy cover. In this section of FMU 1, the density of pine trees is greater than desired for a healthy forest or for wildfire mitigation. Suppressed and unhealthy pines will be removed in favor of healthy pines. All work within ravines will be accomplished by hand clearing. No mechanized equipment will be used within or directly adjacent to these ravines.

All vegetation clearing will be accomplished with hydraulic mulching machines, wheeled vehicles, or hand clearing. No bulldozers or tracked vehicles will be permitted for this treatment. Certain areas, including those less than 30 feet from a structure or within 200 feet from potential Houston toad breeding sites (i.e. riparian areas, ravines, ephemeral wet weather ponds, creeks, streams, drainages, ponds, stock tanks, wetlands, seeps, and springs) will be treated by hand and mechanical equipment will not be used unless authorized by the Houston toad monitor that is on site. Spreading of mulch will further reduce any potential erosion created by ground disturbance. Also, if the project area experiences 2-inches of rain or more over a 48-hour period, vegetation management work must cease for 24 hours beginning from the last rains. This will help reduce rutting and ground disturbance. Any large tire ruts will be smoothed so as not to create an undesirable breeding pond.

Ladder fuels, dead and downed trees, and small diameter living trees will either be mulched and spread on site with a hydraulic mulching machine, or vegetative debris will be hauled to a

temporary debris staging area on the campus to be ground on-site for haul away (Figure 3-3). The temporary staging area will be located on an open field within FMU 3 and is approximately 1 acre. The area will be fenced off with plastic sheeting prior to operation to ensure that no Houston toads are present and that no Houston toads enter the debris staging area throughout the duration of the project. The haul routes to and from the treatment areas are shown on the enclosed maps and generally will utilize existing roads and trails. Any mowing equipment used for clearing grass, forbs, and small-diameter woody vegetation will be set at a height of at least 5 inches above the ground to minimize the potential for striking toads.

Applying fuel reduction treatments is a dynamic process where decisions are made real-time based on what is present in the field, which is not uniform. A qualified forester will be on site to initiate the fuel reduction task in accordance with the treatment prescription and will periodically monitor the progress and the compliance of the fuel reduction specifications.

Vegetative material would either be staged on caliche surfaces and would be moved to its final disposal site within 24 hours; staged on asphalt surfaces and moved to its final disposal site within 72 hours; staged on undisturbed ground within an embedded enclosure which will be checked daily; or mulched and spread on site no more than 2 inches deep in average. All cut debris would be chipped onsite or hauled at the end of the work day to one of the temporary staging areas or to its final disposal site. Equipment staging areas for this action would also consist of private streets, parking lots, and other areas where the ground surface has already been disturbed; thus no additional vegetation clearing would be necessary for equipment staging.

### ***Structure Hardening***

In addition to fuels reduction, MDACC may use any remaining funds to harden critical buildings and research laboratories on the campus so they can better withstand impacts from wildfire. Critical buildings, including the Griffin Building (aka SRG), the physical plant (SMS), and the conference center (SRC; Figure 1-2) will be hardened in order to better withstand impacts from wildfire. Priority will be given to hardening the Griffin Building. The physical plant is classified as a critical building because in the event of a wildfire, this building will supply the power to the Griffin Building during the fire. The conference center is classified as a critical building because it houses the control unit for the power plant. Therefore, the controls for the consistent supply of power to the Griffin Building would require the hardening of these three buildings. The hardening measures will include mechanical additions and modifications to HVAC systems to allow for 100 percent recirculation of return air to avoid smoke infiltration. Fire resistant roofs, doors, and windows may also be installed at these buildings.

### **3.2 Alternatives Considered and Dismissed**

MDACC also considered hardening all buildings and structures located within the campus. Structural hardening measures considered included: replacing roofing material with non-combustible materials, reinforcing external walls with non-combustible materials, reinstalling

windows with tempered glass, installing automatic dampers at air intakes, and replacing existing doors with fire-proof doors. This alternative was eliminated from further consideration because the cost to harden all of the buildings on campus would be cost prohibitive and would exceed the value of the hazard mitigation grant.

## 4.0 Affected Environment and Potential Impact

This section is organized by individual resources. It includes a description of the existing conditions at the project area, which is located in Bastrop County, and provides an analysis of potential environmental consequences for each alternative. Where potential impacts exist, conditions or mitigation measures to offset these impacts are detailed. A summary table is provided in Section 4.6 (Table 4-8).

### 4.1 Physical Resources

#### 4.1.1 Geology and Soils

Bastrop County exists within the Gulf Coastal Plains physiographic province of Texas. The province has limited topographic relief, with elevations in Bastrop County ranging from 400 feet above mean sea level (MSL) to approximately 600 feet MSL (Marks, 2010; Figure 4-1, 4-2). Several geologic formations are seen as outcrops within the Plains Area and are generally composed of varying proportions of sand, silt, clay and gravel. The sand formations provide friable, deep sandy soils that contribute to the Houston toad habitat (Loomis Austin, 2007).

A seismic disturbance is any earth movement (natural or man-made) that is caused by a momentary disturbance of the elastic equilibrium of a portion of the earth. The U.S. Geological Survey (USGS) and State of Ohio have developed national/state maps of earthquakes and earthquake shaking hazards to quantify seismic hazards in a region (USGS Open-File Report 97-131). The maps show contour values that represent earthquake ground motion in terms of peak acceleration, defined as percent of gravity, that have a common given probability of being exceeded in a defined number of years. These maps are employed to assess the probabilistic seismicity and provide information used to create and update design provisions for building codes in the U.S. The higher the seismic hazard value is, the greater the potential hazard (USGS, 2010). Information regarding recent history of the three closest earthquakes experienced near the Project area was obtained from the USGS Mineral Resources On-Line Spatial Data and is summarized below in Table 4-1.

**Table 4-1: Recent History of Earthquakes near the Project Area**

<b>Distance From Project Area</b>	<b>Magnitude</b>	<b>Date</b>
Approximately 40 miles east of the project area	2.3	4/7/1992
Approximately 44 miles southeast of project area	2.7	1/4/1995
Approximately 54 miles northeast of the project area	2.7	9/15/2007

The MDACC campus is situated mostly on Crockett fine sandy loam soil with small portions of the campus on Edge gravelly fine sandy loam and Edge fine sandy loam (NRCS, 2012a; Figure 4-3). The project area is composed of three soils which are briefly described in the Table 4-2.

The soils within the project area are not classified as hydric soils or prime farmland (NRCS, 2012b).

**Table 4-2: Soils within the Project Area**

Soil	% Slope	Description	Hydric	Prime Farmland
Crockett fine sandy loam	1 to 3	Found on ridge tops in prairies, moderately well drained, no flooding.	No	No
Edge gravelly fine sandy loam	0 to 1	Found on old, high terraces, moderately well drained, no flooding.	No	No
Edge fine sandy loam	3 to 8	Found on backslopes and side slopes, well drained, no flooding.	No	No

Sources: NRCS, 2012a, 2012b USACE, 2002

The Farmland Protection Policy Act (7 USC 4201, *et seq*) and its regulations (7 CFR Part 658) establish criteria for identifying and considering the effects of federal programs on the conversion of farmland to non-agricultural uses. Prime farmland soils are not located within the project area of the Smithville Research Center (NRCS, 2012b).

***Potential Impacts***

No Action Alternative – Under the No Action Alternative, no construction would occur and there would be no impacts to geology, soils, or seismicity.

Proposed Action Alternative – Under the Proposed Action Alternative, construction activities associated with the structure hardening component would not be deep enough to impact underlying geologic resources or seismicity. Although the use of equipment, such as mowing machinery, handsaws, bobcats, grinders, and hauling trucks may be utilized for vegetative clearing, proposed vegetation removal would primarily be completed by hand-clearing, whenever practical, and would remain above ground with care given to erosion control methods, including preserving intact root structures. Per avoidance and minimization measures outlined by FEMA and USFWS, presented in Section 4.3, mowing equipment will be set a height of at least 5 inches. The use of erosion control and best management practices (BMPs) would not result in adverse impacts to the geology and soils in the project area. The proposed project would have a minimal short-term impact on native soils.

The applicant would be required to prepare a Storm Water Pollution Prevention Plan (SWPPP) prior to construction. Implementation of appropriate BMPs, as described in the SWPPP, would

help minimize site runoff. BMPs would include the installation of silt fences and the re-vegetation of disturbed soils to minimize erosion. Waste materials will be managed and disposed of in accordance with applicable local, State, and Federal regulations. If contaminated materials are discovered during the construction activities, work will cease until the appropriate procedures and permits can be implemented.

#### **4.1.2 Air Quality**

Under the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for air quality contaminants considered harmful to public health and the environment. The NAAQS is based on the three year average, or design value, of the fourth highest daily maximum 8-hour average ozone concentrations measured annually at each regulatory monitor (Texas Commission on Environmental Quality [TCEQ], 2013). Attainment means the air quality meets the standards set by the NAAQS. Bastrop County is one of the counties categorized in the Austin-Round Rock area and is currently in a designated attainment area based on the 1997 NAAQS for ozone (TCEQ, 2014a).

#### ***Potential Impacts***

No Action Alternative – Under the No Action Alternative, there would be no construction and no effect on air quality.

Proposed Action Alternative – Under the Proposed Action Alternative, minor, short-term impacts to air quality would occur during construction. Proposed vegetation removal for the creation of defense zones would be using hand-clearing, whenever practical, although the use of equipment, such as mowing machinery, handsaws, bobcats, grinders, and hauling trucks may be utilized for vegetative clearing.

Emissions from fuel-burning internal combustion engines (e.g., heavy equipment and earthmoving machinery) could temporarily increase the levels of some of the criteria pollutants, including CO, NO<sub>2</sub>, O<sub>3</sub>, PM<sub>10</sub>, and non-criteria pollutants such as volatile organic compounds. To reduce the emission of criteria pollutants, fuel-burning equipment running times would be kept to a minimum and engines would be properly maintained.

Dust abatement procedures could minimize dust emission onsite and mitigate potentially damaging impacts. These mitigation procedures will likely include the regular spraying of water on loose dirt in the construction site in order to minimize the volume of fugitive dust particles.

## **4.2 Water Resources**

### **4.2.1 Surface Water**

Under the Clean Water Act (CWA), the EPA established the basic framework for regulating discharges of pollutants into the Waters of the United States.

The campus is situated two miles upstream from the Buescher Lake in the sub-watershed of Hunt Branch. Hunt Branch begins east of the campus and generally flows south into Buescher Lake. Surface water at the campus drains to the east towards Hunt Branch and to the west towards Dry Branch respectively. On the east side of the campus, water flows east through forested land for approximately 0.25 miles before draining into Hunt Branch. There are three man-made ponds within the MDACC property (Figure 4-4). Two of the three storm water detention ponds are located just west of Laboratory 4. The third pond is located east of Laboratory 4, outside of Circle Loop Road.

Four drainage features (DD) were delineated and photographed (Figure 4-4). DD1 and DD3 were field identified as perennial based on hydrological conditions, high ordinary high water mark indicators, and present erosion (Figure 4-4). Two relatively large washes flow into DD1 providing high volumes of surface water runoff. Pond 3 located east of Circle Loop Road continually flows through an outfall pipe into DD3, which provides a surface water connection.

DD2 and DD4 were field identified as ephemeral drainages based on their low ordinary high water mark indicators and minimal hydrologic conditions. These drainages would not likely hold water during the majority of the year. Photographed surface water depths identified during the site reconnaissance (**Appendix D**) within these drainages were considered to be atypical due to recent rainfall at the project location each morning that was surveyed.

### ***Potential Impacts***

No Action Alternative – Under the No Action Alternative, no construction would occur and there would be no impacts to surface waters.

Proposed Action Alternative – Under the Proposed Action Alternative, minor short-term impacts to offsite surface waters may occur due to stormwater runoff transporting sediments from soils disturbed during vegetation removal. To reduce impacts to offsite surface waters, the applicant would implement appropriate BMPs, such as installing silt fences and re-vegetating bare soils with site-specific native species. The applicant would also be required to prepare a SWPPP prior to construction.

### **4.2.2 Groundwater**

Groundwater in Bastrop County is supplied by one aquifer. The Carrizo-Wilcox Aquifer forms the major aquifer in western and central Bastrop and Lee Counties. This aquifer contains both water-table and artesian zones and consists of two connected formations, the Wilcox Group and the overlying Carrizo formation. The thickness of the artesian zone ranges from 200 feet to 3,000 feet. Although the aquifer can extend for 3,000 feet, the freshwater saturated thickness of the sands averages 670 feet. The outcrop (recharge zone) region dominates most of the western

part of the county and the deeper (downdip) portion runs through the central part of the county (Ashworth and Hopkins, 1995).

### ***Potential Impacts***

No Action Alternative – Under the No Action Alternative, no construction would occur and there would be no impacts to groundwater.

Proposed Action Alternative – Under the Proposed Action Alternative, no impacts to groundwater are anticipated due to the depth of the aquifer. Vegetation clearing activities are not anticipated to reach a sufficient depth to directly impact groundwater.

### **4.2.3 Waters of the U.S.**

The U.S. Army Corps of Engineers (USACE) regulates the discharge of dredged or fill material into Waters of the United States, including wetlands, pursuant to Section 404 of the CWA. Additionally, Executive Order (EO) 11990 (Protection of Wetlands) requires Federal agencies to avoid, to the extent possible, adverse impacts to wetlands.

The USFWS National Wetland Inventory (NWI) map of the area indicated there are no wetlands within the proposed project area (USFWS, 2015a). A site visit was conducted by wetland biologists on March 12-13, 2015 throughout the project area. One palustrine emergent wetland (PEM) was observed within the project area in FMU 3 and five drainage features. All of the drainages connect directly to Hunt Branch. This (0.01 acre) wetland drains to an earthen ditch encircling FMU3 and flows into Pond 3. The wetland was dominated by sand spikerush (*Eleocharis montevidensis*) and common rush (*Juncus effusus*), which are considered hydrophytic vegetation. Hydrological indicators included surface water, high water table, saturation, algal mats, and geomorphic position. The soil pit exhibited a depleted matrix with fairly high redox concentrations.

### ***Potential Impacts***

No Action Alternative – Under the No Action Alternative, proposed construction would not occur and there would be no impacts to wetlands or other Waters of the United States.

Proposed Action Alternative – Under the Proposed Action Alternative, no permanent impacts to Waters of the United States, including wetlands or other water features, would occur. All identified wetlands would be completely avoided; therefore, there would be no direct impacts to wetlands or other waters. Appropriate BMPs, including the installation of silt fences and the re-vegetation of disturbed soils, would be implemented to minimize soil erosion and reduce off-site sediment transport to offsite waters.

#### 4.2.4 Floodplains

EO 11988 (Floodplain Management) requires Federal agencies to avoid direct or indirect support of development within the 100-year floodplain whenever there is a practicable alternative. FEMA uses Flood Insurance Rate Maps (FIRMs) to identify the 100-year floodplain for the National Flood Insurance Program. Consistent with EO 11988, FIRMs were examined during the preparation of this EA Update. According to the FIRM, the majority of the proposed project area is located within Flood Zone X, which is outside of the 100-year floodplain (FEMA 2006; Community Panel Number 48021C0395E, Revised January 19, 2006). The project FIRM is presented on Figure 4-3. Approximately 0.16 acre of the project area will be located within the 100-year floodplain.

#### *Potential Impacts*

No Action Alternative – Under the No Action Alternative, construction of defense zones would not occur and there would be no impacts to floodplains.

Proposed Action Alternative – Under the Proposed Action Alternative, 0.16 acre of the project activities would take place inside the 100-year floodplain. Because there will be no construction or filling of the floodplain, no significant impacts to the floodplain are anticipated. As required by EO 11988, FEMA has completed the eight step-decision making process for actions proposed in the regulatory floodplain. That process is documented in **Appendix C**. For the small portion of the project that is located within the floodplain, MDACC must coordinate with the local floodplain administrator to obtain any required permits for the proposed work.

#### 4.3 Biological Resources

According to the Ecological Mapping System of Texas (EMST) data, five vegetation types occur within the project area. These include Barren, Bastrop Lost Pines: Loblolly Pine Forest, Bastrop Lost Pines: Loblolly Pine/Oak Forest, Post Oak Savanna: Post Oak Motte and Woodland, and Urban Low Intensity (Elliott et al., 2014). Barren areas are described as having little or no vegetation cover during the time of image data collection. This vegetation type can include rural roads, buildings, and areas cleared for development. Bastrop Lost Pines: Loblolly Pine Forest typically includes an overstory dominated by loblolly pine (*Pinus taeda*). Post oak (*Quercus stellata*) and blackjack oak (*Quercus marilandica*) may also be important overstory species with some portions dominated by eastern redcedar (*Juniperus virginiana*). The understory component frequently consists of farkleberry (*Vaccinium arboreum*). Bastrop Lost Pines: Loblolly Pine/Oak Forest canopy trees are typically loblolly pine, post oak, blackjack oak, cedar elm (*Ulmus crassifolia*), and sugar hackberry (*Celtis laevigata*). Similar to the previous vegetation type, portions may be dominated by eastern redcedar and farkleberry is a common understory component. The Post Oak Savanna: Post Oak Motte and Woodland

dominant tree species is post oak. Other important species may include cedar elm, blackjack oak, sugar hackberry, water oak (*Quercus nigra*), southern red oak (*Quercus rubra*), black hickory (*Carya texana*), and plateau live oak (*Quercus virginiana*). Mesquite (*Prosopis glandulosa*), common persimmon (*Diospyros virginiana*), yaupon (*Ilex vomitoria*), possumhaw (*Viburnum nudum*), winged elm (*Ulmus alata*), gum bumelia (*Sideroxylon lanuginosum*), American beautyberry (*Callicarpa americana*), and eastern redcedar may all be present in the shrub layer. The last EMST type, Urban Low Intensity, is described as containing built-up areas that contain some impervious cover (Elliott et al., 2014). These areas are habitat for wildlife and provide food and shelter components.

Regarding wildlife with the potential to occur within the project area, several federal laws and regulations should be considered. The Migratory Bird Treaty Act of 1918 (MBTA) and its subsequent amendments (16 U.S.C. 703-712) give the federal legislative authority for protection of migratory bird species. Regulations supporting this act are codified and regularly updated in Part 10 and 21 of Title 50 of the Code of Federal Regulations. The MBTA makes it unlawful, unless permitted by regulations, to take, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg. Take is defined as to “pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt” to engage in any such action.

The Bald and Golden Eagle Protection Act (BGEPA) of 1940, as amended (16 U.S.C. §668(a); 50 CFR 22), provides protection for the Bald Eagle and Golden Eagle by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any Bald or Golden Eagle, alive or dead, including any part, nest or egg, unless allowed by permit in accordance with the BGEPA’s policies and regulations.

The Endangered Species Act (ESA) of 1973 was enacted to protect and recover threatened and endangered plants and animals and the habitats in which they are found. Section 7 of the ESA requires Federal agencies, in consultation with the USFWS and/or the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA/NMFS), to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The ESA also prohibits any action that causes an unauthorized "taking" of any listed species. Take is defined similarly as in the MBTA.

The Lacey Act of 1900 protects Bald Eagles by making it a federal offense to take, possess, transport, sell, import, or export their nests, eggs, and parts that are taken in violation of any state, tribal, or U.S. law.

#### **4.3.1 Texas Natural Diversity Database**

Information was received from the TPWD Texas Natural Diversity Database (TXNDD) concerning the occurrence and location of reported state- and federally-listed plant species in the project area (TPWD, 2015). The elemental occurrence data and map depicting elemental

occurrences within a 1.5 mile buffer of the project area have been included in **Appendix D**. The TXNDD results include one element of occurrence within the project area for the Houston toad (EO ID 344; in 2003), and one elemental occurrence for the Navasota ladies'-tresses (EO ID 8806; in 2004), 1.5 miles north of the project area. Other elemental occurrences within the 1.5 mile buffer are for rare species not protected by federal laws, and are not further discussed. As noted by TPWD, elemental occurrence results, based on the stated limitations of the TXNDD, do not mean there is an absence of other endangered, threatened or rare species and should not be used for presence/absence determinations.

#### **4.3.2 Federally Listed Species**

The USFWS (2015b) maintains lists of threatened and endangered species known to occur in each county of the United States. Table 4-3 presents the federally listed species and their likelihood of occurrence in the project area based on species' habitat requirements and natural history described in its recovery plan or 5-year review if available.

**Table 4-3: Federally Listed Species with Potential to Occur in Project Area**

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
<i>Spiranthes parksii</i>	Navasota ladies'-tresses	E	The species is an edaphic endemic dependent on ephemeral seeps with sandy soils, and found mainly in small clearings within post oak savanna in central east Texas.	<b>Potential to occur.</b> The project area contains post oak motte and woodlands. As described in the soils description, these areas also have well-drained sandy, loamy soils with an underlying claypan. However, none were observed within the project area during the 2015 site visit.
<i>Bufo houstonensis</i>	Houston toad	E	The species prefers a mature, healthy forest with an open understory and breeding areas (ephemeral wet-weather ponds and other water features).	<b>Potential to occur.</b> The project area lies within critical habitat for the species and has suitable potential habitat. However, none were observed within the project area during the 2015 site visit.
<i>Charadrius melodus</i>	Piping Plover	T	The species is a migrant through inland Texas and winters along the coast. Not much is known about inland stopover sites, but it is believed the species stops opportunistically.	<b>Not likely to occur.</b> Due to a lack of descriptions for migratory stopover sites, it cannot be ruled out that the species has the potential to occur. However, this potential is limited to migration. No nesting or overwintering habitat occurs.
<i>Grus americana</i>	Whooping Crane	E	Migrate to Texas during winter to croplands for feeding and palustrine wetlands and riverine habitat for roosting.	<b>Not likely to occur.</b> The project area does not include wetlands or croplands.

E-Federally Endangered, T-Federally Threatened  
Sources: USFWS, 1984; 2009a; 2009b; 2012b; 2012c

As noted in Table 4-3, two federally endangered species have the potential to occur in the project area: Navasota ladies'-tresses (*Spiranthes parksii*) and Houston toad (*Bufo houstonensis*). In addition, the Smithville Research Center is located in designated critical habitat for the Houston toad (USFWS, 2014). Descriptions of these species are provided below.

#### 4.3.2.1 Species Descriptions

##### *Navasota ladies'-tresses*

The Navasota ladies'-tresses is known to occur in association with the post oak savanna vegetation type (USFWS, 1984). This species is endemic to Bastrop, Brazos, Burleson, Fayette, Freestone, Grimes, Jasper, Leon, Limestone, Madison, Milam, Robertson, and Washington Counties (Poole, Carr, Price, & Singhurst, 2007). It is a perennial that grows to approximately 15-33 cm tall with erect, unbranched stems. The leaves are basal, linear-lanceolate to somewhat broader. Flowers are creamy white, arranged in a single, vertically spiraled row. Fruit is a capsule with partly or wholly polyembryonic seeds. It occurs only in openings in post oak woodlands on sandy loams along upland drainages or intermittent streams, often in areas with a perched water table associated with underlying claypan. It flowers from late October through November or early December (Poole, Carr, Price, & Singhurst, 2007). As previously stated, according to the TXNDD, there was one elemental occurrence for this species 1.5 miles north of the project area in 2004 (TPWD, 2015). Due to the proximity of the previously confirmed elemental occurrence and presence of post oak woodlands on sandy loams along upland drainages, there is potential for this species to occur within the project area. No Navasota ladies'-tresses were observed during the site reconnaissance.

##### *Houston Toad*

The Houston toad is a federal and state-listed endangered species. It typically averages 2-3.5 inches long and has a light mid-dorsal stripe, pale underside often with small, dark spots, and varies in overall coloration from light brown to gray or purplish gray occasionally displaying green patches. It is typically inactive during the coldest months and when it is hot and dry (USFWS, 2011b). The Houston toad has varying habitat requirements for its different life stages. Three recognized habitat types exist including breeding, occupied, and dispersal. While each habitat type has varying definitions, a unifying component of all three is the presence of a canopy cover component associated with mature forests. In addition, breeding habitat requires suitable soils, defined as deep, sandy soils, and a lentic water source capable of sustaining reproductive and larval life stages. Occupied habitat encompasses the adjacent uplands up to 1.6 km from breeding habitats with suitable soils that support adults year round. Dispersal habitat consists of upland areas, water sources, and drainages within and surrounding occupied habitat which do not need to contain suitable soils (Forstner, 2010).

Bastrop County has been surveyed for the Houston toad consistently every year since the 1970s by both university researchers and biologists working for TPWD and USFWS. According to the USFWS Houston Toad 5-Year Review, the number of Houston toads in Bastrop County in 2003 was estimated to be between 100 and 200 individuals. The 2011

Houston toad breeding/survey season ended May 2011 with only six Houston toads detected in Bastrop State Park, two Houston toads detected on the Griffith League Ranch, one Houston toad detected south of the Texas State Highway 290 corridor, and one Houston toad detected in each of the three counties; Austin, Lavaca, and Burleson (USFWS, 2011b). No reproductive events were observed during the 2011 breeding season, despite extensive survey attempts (Forstner and Dixon, 2011). However, reproductive events were recorded in 2012, 2013, 2014 (pers. comm. M. Forstner).

***Houston Toad Surveys***

MDACC sponsored a series of field investigations by a USFWS permitted biologist for the Houston toad for approximately 700 acres of MDACC property. The surveys were completed in 2007, 2008 and 2009 and were conducted to determine the presence/absence for the Houston toad. The surveys were conducted by SWCA Environmental Consultants (SWCA) and were completed during the Houston toad breeding season between February 1 and April 30. The 700-acres were divided into three transects that were physically walked during each survey period. The results of the three years’ surveys are described below in Table 4-4. No Houston toads were observed during these surveys.

**Table 4-4: Summary of Houston Toad Surveys**

Survey Year	Summary of Survey Results
2007	SWCA surveyed the Smithville Research Center property for seven nights during the 2007 Houston toad breeding season. In addition, SWCA visited three known breeding sites (off-site) throughout the surveys for use as Houston toad reference ponds. Houston toads were observed at the three reference sites on four out of seven visits. No Houston toads, however, were observed within the MD Anderson survey area during any of the seven visits.
2008	SWCA surveyed the Smithville Research Center property for six nights during the 2008 Houston toad breeding season. In addition, SWCA visited two known breeding sites (off-site) throughout the surveys for use as Houston toad reference ponds. Houston toads were observed at one site (Bastrop State Park Lake) on four out of six visits. No Houston toads were observed within the MD Anderson survey area during any of the six visits.
2009	SWCA surveyed the Smithville Research Center property for five nights during the 2009 Houston toad breeding season. SWCA visited two known breeding sites in Bastrop State Park and Buescher State Park and multiple pond locations throughout Bastrop County prior to each survey for use as Houston toad reference ponds. No Houston toads were observed within the MD Anderson survey area, Bastrop State Park or Buescher State Park during any of the five visits.

Sources: SWCA, 2007; SWCA, 2008; SWCA, 2009

Additional site reconnaissance was conducted by a USFWS Houston toad permitted biologist from URS on February 2 and 3, 2015. The purpose of this reconnaissance was to evaluate the presence of potential Houston toad habitat within the project area. The soils present within the project area contain fine sandy loam or gravelly fine sandy loam surfaces, as presented in the Section 4.1.1. These soils are not conducive for Houston toad breeding or occupied habitat;

however, the project area occurs adjacent to breeding and occupied habitat and contains canopy cover associated with mature forest. Therefore, it is considered to contain potential dispersal habitat.

In addition, four drainages were observed flowing into an intermittent stream, Hunt Branch. These drainages contained the required canopy cover component for Houston toad habitat; therefore, they were delineated within the project area as dispersal habitat corridors (Figure 4-5). Corridors such as these have been shown to be vital to Houston toad conservation and require additional protection (Forstner, 2010).

During the site visit in 2015, no egg strands were observed within submerged shoreline vegetation. Additionally, Houston toads were not observed utilizing any ponds on the MD Anderson property or survey area in 2007, 2008, or in 2009. However, the potential exists for the toad to utilize the project area as dispersal habitat.

### ***Bald Eagles and Migratory Birds***

While no longer listed as a threatened species, the bald eagle (*Haliaeetus leucocephalus*) is protected under BGEPA, MBTA, and the Lacey Act of 1900. Bald Eagles have been sighted in Bastrop County and have the potential to inhabit the project area as it provides desirable large trees. Birds expected to use the project area include crows, finches, sparrows, wrens, hawks, flycatchers, doves, cardinals, mockingbirds, and woodpeckers. The Bastrop Lost Pines ecoregion is also the southwestern most range of the pileated woodpecker (*Dryocopus pileatus*) and pine warbler (*Dendroica pinus*), and the western extension of the range of several other warblers. Some migratory birds were seen and heard, but no bald eagles were observed during the 2015 site reconnaissance.

### ***Potential Impacts***

No Action Alternative – Under the No Action Alternative, there would be no impacts to biological resources, including federal and state-protected species.

Proposed Action Alternative – Under the Proposed Action Alternative, vegetation removal would be conducted on approximately 65 acres of forested land, as defined in the alternative description.

There were no elemental occurrences identified for Bald Eagles within the immediate vicinity of the proposed project area, and there were no sightings of individuals or nests within the project area during the 2015 surveys. If the project activities occur adjacent to any Bald or Golden Eagle nest, both occupied and unoccupied, the applicant must contact FEMA and consult with the USFWS before work begins. If the project activities should occur during migratory bird breeding season (March through August) a qualified biological monitor will be deployed to survey the vegetation for nests prior to conducting work. The appropriate timing of

surveys in advance of work activities will be determined by the biological monitor. If an occupied migratory bird nest is found, work within a buffer zone around the nest will be postponed until the nest is vacated and juveniles have fledged. The biological monitor will determine an appropriate buffering radius based on species present, real-time site conditions, and proposed vegetation management methodology and equipment. For work near an occupied nest, the biological monitor would prepare a report documenting the migratory species present and the rationale for the buffer radius determination, and submit that report to FEMA for inclusion in project files. FEMA is making a “no effect” determination for Navasota ladies’-tresses (*Spiranthes parksii*) piping plover (*Charadrius melodus*) and the whooping crane (*Grus americana*). In a letter dated January 29, 2015, FEMA initiated informal consultation with USFWS under Section 7 of the ESA for the Houston toad since there is a potential for the toad to be present within the project area. FEMA determined that the proposed project may affect, but is not likely to adversely affect the Houston toad given the implementation of various avoidance and mitigation measures (Appendix F). FEMA also determined that the proposed project will not adversely modify critical habitat. USFWS concurred with FEMA’s determinations in a letter dated May 28, 2015.

#### **4.4 Cultural Resources**

The National Historic Preservation Act (NHPA) of 1966, (Public Law [P.L.] 89-665; 16 USC 470 *et seq.*) as amended, outlines Federal policy to protect historic properties and promote historic preservation in cooperation with States, Tribal Governments, local governments, and other consulting parties. The NHPA established the National Register of Historic Places (NRHP) and designated the State Historic Preservation Office (SHPO) as the entity responsible for administering State-level programs. The NHPA also created the Advisory Council on Historic Preservation (ACHP), the Federal agency responsible for overseeing the Section 106 process and providing commentary on Federal activities, programs, and policies that affect historic properties.

Section 106 of the NHPA and its implementing regulations (36 CFR 800) outline the procedures for Federal agencies to follow to take into account the effect of their actions on historic properties. The Section 106 process applies to any Federal undertaking that has the potential to affect historic properties, defined in the NHPA as those properties (archaeological sites, standing structures, or other historic resources) that are listed in or eligible for listing in the NRHP. Although buildings and archaeological sites are most readily recognizable as historic properties, a diverse range of resources are listed in the NRHP, including roads, landscapes, and vehicles. Under Section 106, Federal agencies are responsible for identifying historic properties within the Area of Potential Effects (APE) for an undertaking, assessing the effects of the undertaking on those historic properties. If cultural resources are present, appropriate agencies will be contacted. Under the NHPA, MDACC is responsible for considering ways to

avoid, minimize, and mitigate any adverse effects of its undertaking on historic properties through agency coordination. This is the primary regulatory framework that is used in the NEPA process to determine impacts on cultural resources.

### ***Potential Impacts***

No Action Alternative – Under the No Action Alternative, no construction would occur and no historic properties would be affected.

Proposed Action Alternative – The APE for the proposed project includes the 65 acre hazardous fuels treatment area, haul routes, and the temporary vegetation staging and grinding site. Some of the forested land is maintained and some is previously undisturbed. Buildings that may be hardened under the Proposed Action Alternative were constructed as early as 1977 and are not considered cultural resources. Archival research conducted via the Texas Historical Commission’s (THC) Texas Archeological Sites Atlas web site indicated that no previously recorded historical or archeological sites have been identified within or in the immediate vicinity of the APE. Figure 4-6 identifies sites included in the state database in the vicinity of the project location.

In a December 22, 2014 letter, FEMA consulted with the SHPO under Section 106 of the NHPA and made a determination of “no historic properties affected” as a result of the proposed action. SHPO concurred with FEMA’s determination on January 15, 2015. Correspondence is included in **Appendix E**. Based on archival research, building construction dates, and correspondence with the SHPO, FEMA has made the determination that the proposed project will have no impact on archeological or cultural resources.

In the event that archeological deposits, including any Native American pottery, stone tools, bones, or human remains, are uncovered, the project shall be halted. All work will stop immediately in the vicinity of the discovery and all reasonable measures will be taken to avoid or minimize harm to the finds. All archeological findings will be secured by MDACC, and access to the sensitive area will be restricted by MDACC. MDACC will inform FEMA immediately, and FEMA will consult with the SHPO. Work in sensitive areas shall not resume until consultation is completed and until FEMA determines that the appropriate measures have been taken to ensure complete project compliance with the NHPA and its implementing regulations.

## **4.5 Socioeconomic Resources**

### **4.5.1 Socioeconomic**

Table 4-5 presents regional population trends in the State of Texas, Bastrop County, and census tract 9506, which is where the project is located. Overall, population within these geographic locations has increased over the 13-year period of 2000- 2013. Whereas Texas experienced a 5.4

percent increase in population from 2010 to 2013, Bastrop County experienced a slower increase in population at 2.2 percent. Census tract 9506 experienced growth in period of 16.3 percent from 2000 to 2010; however the population within this tract decreased 5.8 percent from 2010 to 2013.

**Table 4-5: Regional Population Trends from 2000-2013**

Location	Population			Percent Change 2000-2010	Percent Change 2010-2013
	2000	2010	2013		
Texas	20,851,820	25,145,561	26,448,193	20.6%	5.4%
Bastrop County	57,733	74,403	75,825	28.8%	2.2%
Census Tract 9506	4,459	5,184	4,881	16.3%	-5.8%

Source: USCB, 2000, 2010, and 2013a

Median household income and percent of the population below poverty level are indicators of economic conditions. This data is presented in Table 4-6.

**Table 4-6: Poverty Status and Median Household Income**

Category	2009-2013 American Community Survey		
	Texas	Bastrop County	Census Tract 9506
Median Household Income	\$51,900	\$51,750	\$44,764
% Families Below Poverty Level	13.70%	12.0%	11.7%
% People Below Poverty Level	17.60%	16.50%	14.7%

Source: USCB, 2013b

As shown in Table 4-6, the median household income for the census tract is lower than the median household income of Bastrop County; although median household incomes were both above the 2012 poverty guideline for a four person family (\$23,050) as defined by the U.S. Department of Health and Human Services (USHHS, 2012).

***Potential Impacts***

No Action Alternative – Under the No Action Alternative, no impacts to socioeconomic resources would occur.

Proposed Action Alternative – Under the Proposed Action Alternative, no adverse socioeconomic impacts are anticipated. The population, according to the 2010 Census, for the census block 1098 in the immediate project area is zero; therefore no impacts to nearby populations are anticipated. Additionally, the proposed alternative is to be implemented on only MDACC property within the developed area of the Smithville Research Center. The

project is not expected to have a great impact on the economy of the surrounding community and the major goal of the project is to protect the valuable research housed at the facility.

#### **4.5.2 Environmental Justice**

EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) mandates that Federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations.

Socioeconomic and demographic data for the project area were reviewed to determine if a disproportionate number of minority or low-income persons have the potential to be adversely affected by the proposed project. The following information, Table 4-7, was gathered from the 2009-2013 American Community Survey for evaluation.

As shown in Table 4-7, by 2013 the racial minority composition of 43.3 percent and 55.2 percent were reported for Texas and Bastrop County, respectively. At the project level, the 2013 racial minority composition of 28.1 percent was reported within Census tract 9506, of which 24.2 percent of the population is Hispanic or Latino.

Site observations indicate that the demographics of the residential communities adjacent to the proposed project area are consistent with that found throughout the area.

#### ***Potential Impacts***

No Action Alternative – Under the No Action Alternative, no activities would occur and there would be no disproportionate impacts on minority or low-income populations.

Proposed Action Alternative –The Proposed Action Alternative would be implemented within the developed MDACC campus, and would not result in the acquisition of additional land or displacement of any population or businesses. There would be no disproportionately high or adverse impact on minority or low-income portions of the population. The project would result in beneficial impacts to populations in and near the project area as the intent is to reduce wildfire risk.

**Table 4-7: Total Population, Race, and Ethnicity-2009-2013**

Category	Texas		Bastrop County		Census Tract 9506	
	Number	Percent	Number	Percent	Number	Percent
Total Population	25,639,373		74,730		4,881	
<b>Race and Ethnic Origin</b>	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
White Alone	11,488,269	44.8%	42,345	56.7%	3,504	71.8%
Black or African American Alone	2,956,545	11.5%	5,704	7.6%	45	0.9%
American Indian and Alaskan Native Alone	66,100	0.3%	258	0.3%	72	1.5%
Asian Alone	1,005,797	3.9%	584	0.8%	0	0.0%
Native Hawaiian and Other Pacific Islander Alone	18,011	0.1%	0	0.0%	0	0.0%
Some Other Race	34,413	0.1%	134	0.2%	16	0.3%
Two or More Races	352,511	1.4%	907	1.2%	61	1.2%
Hispanic or Latino	9,717,727	37.9%	24,804	33.2%	1,183	24.2%
Total Racial Minority <sup>1</sup>	14,151,104	55.2%	32,391	43.3%	1,377	28.1%

Source: USCB, 2013b

Notes:

1. Racial Minority = Black or African American alone, American Indian and Alaskan Native alone, Asian alone, Native Hawaiian and Other Pacific Islander alone, Some Other Race alone, Two or More Races, and Hispanic or Latino.

### 4.5.3 Hazardous Materials

A preliminary investigation was conducted to determine the impact of the proposed project on potential hazardous materials sites within the project area. The purpose of this preliminary investigation was to identify sites that may have a potential adverse effect on the local environment posed by hazardous materials or petroleum contamination if disturbed by earthmoving activities during construction of the project. Because of the potentially high cost and complicated procedures required to mitigate impacts when constructing over or through potentially contaminated sites, avoidance of these areas is often the most prudent and feasible course of action.

A review of available records maintained by the EPA and the TCEQ was conducted by searching online databases maintained by these two regulatory agencies (EPA, 2015; TCEQ, 2014b, 2012). The purpose of the records review was to assess the potential for hazardous

substance contamination within the proposed project area and the potential impacts that could result from project-related construction activities on these properties. Several regulated facilities were identified within the campus. No facilities within 0.5-mile of the campus were identified as having confirmed petroleum releases.

### ***Potential Impacts***

No Action Alternative – Under the No Action Alternative, no construction would occur and there would be no impacts to hazardous materials or waste.

Proposed Action Alternative – Under the Proposed Action Alternative, no hazardous materials or waste impacts are anticipated. Any hazardous materials discovered, generated, or used during construction would be handled and disposed of in accordance with applicable local, State, and Federal regulations.

### **4.5.4 Noise**

Noise is generally defined as unwanted sound. Sound is most commonly measured in decibels (dB) on the A-weighted scale, which is the scale most similar to the range of sounds that the human ear can hear. The Day-Night Average Sound Level (DNL) is an average measure of sound. The DNL descriptor is accepted by Federal agencies as a standard for estimating sound impacts and establishing guidelines for compatible land uses. EPA guidelines, and those of many other Federal agencies, state that outdoor sound levels in excess of 55 dB DNL are “normally unacceptable” for noise-sensitive land uses such as residences, schools, or hospitals (EPA, 1974).

The Smithville Research Center is not located near sensitive noise receptors (nursing homes, hospitals, etc.) and is generally surrounded by undeveloped land.

### ***Potential Impacts***

No Action Alternative – Under the No Action Alternative, no construction would occur and there would be no impacts to noise levels.

Proposed Action Alternative – Under the Proposed Action Alternative, minor short-term increases in noise levels are anticipated during the construction period. To mitigate noise impacts to nearby noise-sensitive receptors, construction activities would take place during normal business hours. Equipment and machinery utilized at the proposed project area would meet all local, State, and Federal noise regulations.

### **4.5.5 Transportation**

The project area is located in Bastrop County near Buescher State Park. Access to the secure campus is provided by Park Road 1C via State Highway 71. The roadway network is

illustrated in Figure 1-1. Because of the campus' remoteness, traffic operations currently operate adequately.

### ***Potential Impacts***

No Action Alternative – Under the No Action Alternative, there would be no construction and no impacts to transportation would occur.

Proposed Action Alternative – Under the Proposed Action Alternative, there would be no significant long-term impact to the existing roadway network. There would be a minor temporary increase in construction traffic on roadways leading into the campus, as well as within the campus although the increase is not anticipated to impact traffic conditions. Although road closures are not anticipated, appropriate signage would be posted on affected roadways and construction vehicles and equipment would be stored on campus during project construction to mitigate against any potential delays.

The proposed alternative would require annual maintenance of clearing the underbrush in the defense zones, although no impacts to traffic operations are anticipated. The annual maintenance period is anticipated to be brief and during maintenance construction vehicles and equipment will be stored on campus to minimize the impacts to the surrounding roadway network.

### **4.5.6 Public Health and Safety**

EO 13045 (Protection of Children) requires Federal agencies to make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children. Safety and security issues considered in this EA include the health and safety of area residents, the public-at-large, and the protection of personnel involved in the activities related to the construction of the proposed project.

### ***Potential Impacts***

No Action Alternative – Under the No Action Alternative, no construction activities would occur and there would be no impacts to public health and safety. Although no construction related safety issues are a concern, this alternative does not provide any additional wildfire protection to the campus.

Proposed Action Alternative – Under the Proposed Action Alternative, construction activities could present safety risks to those performing the activities; however, no impacts to public health and safety are anticipated. The proposed activities will provide protection against wildfires to the campus, while enhancing the safety.

To minimize risks, all construction activities would be performed by qualified personnel trained in the proper use of equipment, including all appropriate safety precautions. Additionally, all activities would be conducted in a safe manner in accordance with the standards specified in the Occupational Safety and Health Administration (OSHA)

regulations. The appropriate signage and barriers would be in place prior to construction activities to alert pedestrians and motorists of project activities. The construction contractor will be responsible for adhering to the Texas One-Call Law.

#### 4.6 Summary

The following table summarizes the potential impacts of the Proposed Action Alternative and conditions or mitigation measures to offset those impacts.

**Table 4-8: Summary of Impacts**

Affected Environment	Impacts	Mitigation
Geology, Soils, and Seismicity	No impacts to geology or seismicity are anticipated. Minor, short-term impacts to soils. No impacts to prime and unique farmlands would occur.	SWPPP must be obtained prior to construction. The construction contractor would be required to implement appropriate BMPs, including installation of silt fences and re-vegetation of disturbed soils to minimize erosion. Waste materials will be managed and disposed of in accordance with applicable local, State, and Federal regulations. If contaminated materials are discovered during the construction activities, work will cease until appropriate procedures and permits can be implemented.
Air Quality	Minor, short-term impacts to air quality would occur during the construction period.	Construction contractors would be required to water down construction areas when necessary to minimize dust emissions, fuel-burning equipment running times would be kept to a minimum, and engines would be properly maintained.
Surface Water	Minor, short-term impacts to offsite surface waters may occur due to stormwater runoff transporting sediments from soils disturbed during vegetation.	The applicant would be required to obtain a SWPPP for the project. Appropriate BMPs, including installing silt fences and re-vegetating bare soils with site-specific native species, would minimize runoff.
Groundwater	No impacts to groundwater are anticipated.	None
Waters of the U.S.	No impacts to wetlands or other Waters of the United States are anticipated.	Appropriate BMPs would be implemented to minimize soil erosion and reduce sediment transport to offsite surface waters and wetland areas.

Affected Environment	Impacts	Mitigation
Floodplains	No significant impacts to the floodplain are anticipated.	None
Biological Resources	<p>FEMA has made a “no effect” determination for Navasota ladies’-tresses (<i>Spiranthes parksii</i>) and the whooping crane (<i>Grus americana</i>). FEMA determined that the proposed action may affect, but will not likely adversely affect the Houston toad. USFWS concurrence with this determination was received May 28, 2015. Impacts to bald eagles and migratory bird species are not anticipated.</p>	<p>MDACC must implement the agreed upon avoidance and minimization measures outlined in the consultation between FEMA and USFWS, included in Appendix E.</p> <p>If project activities occur adjacent to any bald or golden eagle nest, MDACC will contact FEMA and consult with the USFWS before work begins.</p> <p>If the project activities should occur during migratory bird breeding season (March through August) a qualified biological monitor will be deployed to survey the vegetation for nests prior to conducting work. The appropriate timing of surveys in advance of work activities will be determined by the biological monitor. If an occupied migratory bird nest is found, work within a buffer zone around the nest will be postponed until the nest is vacated and juveniles have fledged. The biological monitor will determine an appropriate buffering radius based on species present, real-time site conditions, and proposed vegetation management methodology and equipment. For work near an occupied nest, the biological monitor would prepare a report documenting the migratory species present and the rationale for the buffer radius determination, and submit that report to FEMA for inclusion in project files</p>
Cultural Resources	No impacts to cultural resources are anticipated.	<p>In the event that archeological deposits, including any Native American pottery, stone tools, bones, or human remains, are uncovered, the project shall be halted. All work will stop immediately in the vicinity of the discovery and all reasonable measures will be taken to avoid or minimize harm to the finds. All archeological findings will be secured by MDACC, and access to the sensitive area will be restricted by MDACC. MDACC will inform FEMA immediately, and</p>

Affected Environment	Impacts	Mitigation
		FEMA will consult with the SHPO. Work in sensitive areas shall not resume until consultation is completed and until FEMA determines that the appropriate measures have been taken to ensure complete project compliance with the NHPA and its implementing regulations.
Socioeconomics	No adverse socioeconomic impacts are anticipated.	None
Environmental Justice	No disproportionately high or adverse effect on minority or low-income populations is anticipated.	None
Hazardous Materials	No hazardous materials or waste impacts are anticipated.	Any hazardous materials discovered, generated, or used during construction would be disposed of and handled in accordance with applicable local, State, and Federal regulations.
Noise	Minor short-term impacts to noise levels would occur at the proposed project area during the construction period.	Construction would take place during normal business hours and equipment would meet all local, State, and Federal noise regulations.
Transportation	A short-term, minor increase in the volume of construction traffic on adjacent roadways could cause slower traffic flow during construction activities.	Construction vehicles and equipment would be stored on-site during project construction and appropriate signage would be posted on affected roadways. The appropriate signage and barriers should be in place prior to construction activities to alert pedestrians and motorists of project activities.
Public Health and Safety	No impacts to public health and safety are anticipated.	All construction activities would be performed by qualified personnel and in accordance with the standards specified in OSHA regulations; appropriate signage and barriers would be in place prior to construction activities to alert pedestrians and motorists of project activities. The construction contractor will be responsible for adhering to the Texas One-Call Law.

## 5.0 Cumulative Impacts

According to CEQ regulations, cumulative impacts represent the “impact on the environment which results 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).” In accordance with NEPA and to the extent reasonable and practical, this EA considered the combined effect of Proposed Action Alternative and other actions occurring or proposed in the immediate vicinity of the proposed project area.

No significant cumulative impacts are foreseen from implementation of the proposed action and other past, present, and future actions. Because the proposed action would have no impact or minimal impact on water resources, wetlands, floodplains, most wildlife, vegetation communities, cultural resources, environmental justice, public services and utilities, hazardous materials, or public health and safety, the proposed action would not contribute to significant cumulative impacts on these resources.

Operation of heavy equipment during fuels reduction would temporarily disturb soils. However, with the implementation of BMPs to protect soils, a significant adverse cumulative impact on soils would not be expected.

The proposed vegetation modification could have an adverse effect on the Houston toad; however, with implementation of avoidance and minimization measures, impacts would not be significant.

In addition to the work being conducted at MDACC, TPWD may also be conducting fuels reduction work on approximately 58 acres along the western border of the Smithville campus. The treatment area would be located within Buescher State Park.

Bastrop County also has several planned hazardous fuels reduction projects to the north of the City of Bastrop (North Lost Pines) and to the south of the City of Bastrop in the Tahitian Village area. The City of Bastrop has a fuels reduction planned in the Piney Ridge neighborhood. These projects are similar in nature to the proposed action and, in combination with the proposed project, they could result in a cumulative impact to the Houston toad. Avoidance and minimization measures to protect the Houston toad, which were approved by the USFWS, would also be implemented by the County and the City in order to minimize impacts to the species. Work in Buescher State Park would be overseen by the TPWD, an agency that is familiar with the Houston toad and that manages its protection at the state level. Therefore, no cumulative impacts to the Houston toad are expected as a result of the implementation of these projects. The 2011 Bastrop Complex fire resulted in significant habitat destruction and

fragmented habitat for the Houston toad. The proposed and planned hazardous fuels reduction projects could result in beneficial cumulative impacts on the Houston toad by reducing the risk of a major wildfire, which could destroy habitat for the Houston toad.

The proposed action and the similar projects located in and near the City of Bastrop are located a sufficient distance away from each other that these projects would not result in temporary, cumulative impacts related to noise, traffic, or air quality. The timing and scope of work details for the potential TPWD work in Buescher State Park are unknown. While this project is in close proximity to the proposed action, it is unlikely that it would take place at the same time as the proposed action. If so, the impacts to noise, traffic, and air quality are still not anticipated to be significant.

Climate change is by its nature a cumulative impact. Carbon dioxide emissions and loss of carbon fixing vegetative material from the proposed action and similar activities in and near the City of Bastrop and near MDACC campus would make a very small contribution to climate change.

## **6.0 Public Participation**

FEMA is the lead Federal agency for conducting the NEPA compliance process for the proposed mitigation actions at the Smithville Research Center in Bastrop County. It is the goal of the lead agency to expedite the preparation and review of the NEPA documents and to be responsive to the needs of the community and the purpose and need of the proposed action while meeting the intent of NEPA and complying with all NEPA provisions.

Interagency reviews have been conducted in the form of agency consultation letters and the responses received from the agencies (**Appendix E**). Agencies consulted are listed in Section 7.0.

A Notice of Availability of the Draft EA will be published in the local newspaper and on FEMA's website (<http://www.fema.gov/media-library/assets/documents>) requesting public comments. Additionally, the Draft EA will be made available for review for a period of 30 days at the Smithville Public Library, 1000 Southeast Martin Luther King Boulevard, Smithville, TX 78957. FEMA will consider and respond to all public comments in the Final EA. If no substantive comments are received, the Draft EA will become final and a Finding of No Significant Impact (FONSI) will be issued for the project.

## 7.0 Agency Coordination

The objective of early and frequent coordination with federal, state, and local agencies is to generate the best possible alternative for the project and to address issues or concerns of the agencies throughout the study. Agency coordination was conducted through written correspondence.

The correspondence packet included a letter, a project description, and a project area map that illustrated the project location. The letter requested agency expertise in the early identification of possible adverse economic, social or environmental effects or concerns posed by the project and solicited comments regarding the project. A copy of the correspondence packet and a copy of agency response letters are included in **Appendix E**. Table 7-1 summarizes the agency responses.

**Table 7-1: Summary of Agency Responses**

<b>Consulting Agency</b>	<b>Comment Summary</b>	<b>Submittal Date</b>	<b>Agency Response Date</b>
Texas General Land Office	Project is outside of Texas Coastal Management Program boundary.		3/7/2012
Texas Historical Commission	No historic properties affected; project may proceed.	12/22/2014	1/21/2015
U.S. Fish and Wildlife Service	Directed to county level listing of federally listed threatened and endangered species. Entered into Section 7 informal consultation on one federally listed species. Concurrence was reached on May 28, 2015.	1/29/2015	5/28/2015

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