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U.S. DEPARTMENT OF ENERGY



ENVIRONMENTAL ASSESSMENT FOR THE HIGH EXPLOSIVE SCIENCE AND ENGINEERING FACILITY



PANTEX PLANT * AMARILLO, TEXAS * 2015

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ACRONYMS

AAI	Actions in the Area of Influence
ADA	Americans with Disabilities Act
AGL	Application Guide for Laboratories
B&W	Babcock & Wilcox
CFR	Code of Federal Regulations
CNS	Consolidated Nuclear Security, LLC
CoE	Code of Excellence
D&D	Deactivation and Decommissioning
dBa	decibels A-weighted
DOD	Department of Defense
DOE	Department of Energy
EA	Environmental Assessment
EISA	Energy Independence and Security Act
EO	Executive Order
EPA	Environmental Protection Agency
EPC	Environmental Performance Criteria
ESL	Effect Screening Levels
FHA	Fire Hazard Analysis
FM	Farm-to-Market Roads
ft ²	Square feet
GHG	Greenhouse Gases
GOV	Government-owned vehicle
HE	High Explosive
HE S&E	High Explosive Science and Engineering
HPFL	High Pressure Fire Loop
LA	Limited Area
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
M&O	Managing & Operating Contractor
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NNSA	National Nuclear Security Administration
NPO	NNSA Production Office
NPR	Nuclear Posture Review
POV	Privately-owned vehicle
SA	Supplement Analysis
SHP	Southern High Plains
SHPO	State Historic Preservation Office
SNM	Special Nuclear Material
SPEIS	Supplemental Programmatic Environmental Impact Statement
SPO	Sustainable Performance Office
SWEIS	Site-Wide Environmental Impact Statement
SWMU	Solid Waste Management Unit
TD&DL	Technology Development & Deployment Laboratory
UFC	Unified Facilities Criteria
USGBC	U.S. Green Building Council

1.0 INTRODUCTION

The National Environmental Policy Act (NEPA) requires Federal agency officials to consider the environmental consequences of their proposed actions before decisions are made. In complying with NEPA, the Department of Energy's (DOE's) National Nuclear Security Administration (NNSA) follows the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] 1500-1508) and DOE's NEPA-implementing procedures (10 CFR 1021). The purpose of an environmental assessment (EA) is to provide federal decision makers sufficient evidence and analysis to determine whether to prepare an environmental impact statement or issue a Finding of No Significant Impact.

2.0 BACKGROUND

The DOE/NNSA must maintain a long-term, efficient, and effective operation of the Pantex Plant (Figure 1 on page 6). The NNSA mission at the Pantex Plant is to:

- Develop, test, and fabricate chemical and HEs (HE), HE components, and non-HE material qualification technologies
- Provide staging and surveillance of weapons and weapon components
- Evaluate, retrofit, and repair nuclear weapons
- Dismantle weapons retired from the stockpile
- Sanitize components from dismantled weapons

The High Explosive Science and Engineering (HE S&E) mission supports the NNSA and the Supplemental Programmatic Environmental Impact Statement (SPEIS) goals and objectives to ensure that the NNSA can provide a modernized capability-based infrastructure at the Pantex Plant and provide support for the High Explosive Center of Excellence (HE CoE) into the future.

The HE S&E mission is also consistent with the goals of the 2010 Nuclear Posture Review (NPR), the NNSA core mission, and the stated mission of the Pantex Plant. A key tenet of the 2010 NPR is "Modernization of the infrastructure, including major capital projects, needed to ensure safe, secure, sustainable and cost-effective operations in support of scientific and manufacturing activities."

2.1 PURPOSE AND NEED FOR THE PROJECT

2.1.1 Proposed Action

The proposed action would be to design, construct, and operate a HE S&E facility that would support the NNSA mission. This would include developing and sustaining high quality scientific staff and supporting computational and experimental capabilities as well as developing additional evaluation and diagnostic tools for the evaluation of technology development.

The existing facilities used for HE S&E represent a significant maintenance burden and soon would no longer meet the Pantex site mission needs. Operations that are presently located in 15 separate facilities, most of which are nearly 60 years old, would be consolidated into three common facilities where operations would be streamlined, technology sharing made possible, and technical communications improved. The HE S&E facility would serve as the scientific and engineering hub supporting all HE CoE activities and technology development activities at Pantex.

2.2 PROJECT DESCRIPTION

When completed, the HE S&E facility would support all HE CoE activities and Special Nuclear Material (SNM) technology development activities at Pantex. Only HE would be present in the facility (no SNM would be present in the facility). Operations that are presently located in 15 separate facilities with seven connecting ramps, measuring approximately 81,552 square feet (ft²), would be consolidated into a common facility where operations would be streamlined, technology sharing made possible, and technical communications improved.

Due to the DOE's requirement for new square footage to be offset by demolished square footage, many existing outdated facilities would have to be demolished. The demolition of these facilities would not be addressed in this EA. Additional NEPA analyses would be completed prior to demolitions.

The proposed facility consists of approximately 72,000 ft² and generally includes construction of three structures and support areas:

- HE Material Laboratories
- HE Material Staging Area
- Technology Development and Deployment Laboratories (TD&DL)
- Administration and Office Area
- All-weather ramps and truck access areas

The preferred alternative would be a campus approach for the new facility, consisting of separate buildings and physical separation for the HE laboratories, HE material staging magazine, and non-HE laboratories combined with the office and administrative area. The principal advantage of the campus approach would be that, although the HE areas require structural concrete for explosion safety, physical separation of the HE and non-HE areas allows for conventional construction of the non-HE areas (Figure 2 on page 7).

The new facility would be located on the southwest corner of Zone 11 across the road and south of Buildings 11-51A and 11-51 and also be located within 500 ft. of monitoring wells. This location was chosen to minimize interferences with other Pantex operations and allow construction using a green-field approach.

The design of the HE S&E Facility will comply with the Leadership in Energy and Environmental Design (LEED) requirements. The object of the program is to embrace the "reduce, reuse, recycle" attitude for building construction and to reduce the energy and water use for buildings. The process will confirm the registration and certify the project with US Green Building Council (USGBC) under LEED. During design, a LEED New Construction and Major Renovations Project Checklist, and Sustainable Design Report will be updated showing the minimum points necessary for Gold certification.

The HE S&E Facility design will meet requirements that would provide electric charging stations for the facilities' GOV to help meet SSc-4.3 Alternative Transportation-Low-Emitting and Fuel-Efficient Vehicles. In addition, solar water heaters will be installed in accordance with the Energy Independence and Security Act (EISA) 2007 Section 523, "if lifecycle cost-effective, as compared to other reasonably available technologies, not less than 30 percent of the hot water demand for each new Federal building or Federal building undergoing a major renovation be met through the installation and use of solar hot water heaters."

Laboratories for the 21st Century (Labs21) Program (<http://www.labs21century.gov/>) is a joint program of the US Environmental Protection Agency (EPA) and the DOE geared toward architects and engineers

who are familiar with laboratory buildings. Labs21 Program developed the environmental performance criteria (EPC) in response to a desire by laboratory designers to have a rating system similar to LEED but more tailored to the unique characteristics of laboratory facilities. The EPC modifies some of the LEED credit requirements and adds several new credits and prerequisites in areas not addressed by LEED. This program encourages the design, construction, and operation of safe, sustainable, high-performance laboratories. Labs21 does not provide third-party certification.

The Labs21 program developed a tool kit of resources to support the design, construction, and operation of high-performance laboratories. The tools include design guides, case studies, a performance rating system, a video, and other products that are planned or under development. In conjunction with the tool kit, the designer can use the USGBC 2003 Draft LEED Application Guide for Laboratories (LEED-AGL). It uses the EPC as a starting point and incorporates most of the EPC requirements. Labs21 and LEED-AGL should be used by the designer to aid in complying with the sustainability requirements of the DOE Sustainability Performance Office (SPO).

DOE projects are required to comply with Executive Order (EO) 13514 (2009), *Federal Leadership in Environment, Energy, and Economic Performance*, and EO 13423 *Strengthening Federal Environmental, Energy and Transportation Management*. To comply with EO 13514 and EO 13423, the SPO has adopted the guidelines under the Guiding Principles for Federal Leadership in High Performance and Sustainability Buildings. These principles include the following:

- Employ integrated design principles (new construction)/employ integrated assessment, operation, and management principles (existing buildings)
- Optimize energy performance
- Protect and conserve water
- Enhance indoor environmental quality
- Reduce environmental impact of materials

The construction and operation of the HE S&E facility will fall under the guidance of the SPO. The SPO Strategic Sustainability Performance Plan of 2011 requires that all new construction and major renovations exceeding \$5 million be at least LEED New Construction Gold certified.

Site planning, drainage, and landscaping designs following the criteria under the LEED Sustainable Sites credits must also comply with EISA 2007 and EPA Section 438 for Low Impact Development (LID).

All buildings and ramps will incorporate a white, cool-roof membrane meeting the LEED SR1 of 78 or greater over much of the building roof surfaces and the requirements of EO 13514.

Parking and Road Areas:

- A POV parking lot intended for 150 spaces plus six Americans with Disability Act (ADA) - accessible spaces; including walking paths for personnel safety.
- A GOV parking lot intended for 33 spaces plus two spaces for electric vehicle charging stations and two ADA-accessible spaces.
- Parking lots with permeable surfaces to reduce run-off.
- Interconnecting sidewalks intended for personnel access.
- Road access from the Limited Area for deliveries to the truck unloading area.
- Asphalt fire lane/service drive sized for the largest Pantex fire truck.

- A bicycle rack near the intersection of TD&DL building and R-H-2 ramp.
- Three access gate locations from the existing roads.
- Guard rail from west side perimeter road to and around POV parking to meet current security requirements.

Administration/Office Area:

The administration and office area would be located on the west side of the TD&DL building to allow personnel entry from the Property Protection Area (PPA) POV parking lot and to facilitate a visitor entrance and office and conference room space for un-cleared personnel.

HE Staging Area:

The HE material staging area would be a Class III level of operations. It would be approximately 1,684 ft² and would be in a bunker-type structure that would be covered with earth. The HE staging area would be placed to provide adequate protection and separation from other structures. Access would be controlled by an Argus system.

It would have the following available storage spaces (all dimensions are approximated):

- One storage unit: 12 ft. wide × 2 ft. deep × ~6 ft. high.
- Second storage unit: 12 ft. wide × 1 ft-6-in. deep × ~6 ft. high.
- Six small barrel type containers: 16-inch diameter × 18 inches tall), stacked two high.
- Two refrigerators: 3 ft. wide × ~2 ft. 6 in. deep × ~5 ft. 4 in. high.
- Work shelf for entry log: 3 ft. wide × 1 ft. 6 in. deep.

HE Laboratory:

The HE Laboratory building would be a single-story structure consisting of inspection/test bays used for operations involving HE material. Within this building are a number of smaller support areas, including a control room, storage areas, a break room, restrooms, mechanical equipment room, electrical equipment room and a personnel/equipment corridor. The HE Laboratory building would have rooms that perform Class I and II laboratory operations, contain support areas, and has a total area of approximately 26,767 ft². The HE Laboratory building will be designed and modeled using the criteria created by Labs21.

TD&DL Building:

The TD&DL building would have both a non-classified area and a classified area. The non-classified area must be separated from the classified area by a wall constructed for this required separation. Access into the classified area would be controlled by an Argus security access turnstile and an Argus security access turnstile that would be ADA accessible. It will be certified under the LEED program.

Ramp System:

Enclosed corridors (i.e., ramps) would connect the three buildings. These corridors will be provided to protect personnel and equipment from the outside environment while transiting between buildings. A truck access area would be located between the HE Laboratory building and the HE staging magazine.

- R-H-1 and R-H-1a: 12' x ~138' - Running from the HE laboratory building to the HE staging magazine. A 10-ft wide roll-up door would allow deliveries and fork lift access to the Truck Access Area.
- Ramp R-H-2 is 12' x ~118' - Running from the HE laboratory building to TD&DL building.

Utilities:

Surveys for new utilities include (but are not limited to) natural gas, compressed air, high- pressure fire, water, sanitary sewer, potable water, electricity, LAN, telephone, public address system (PAS), and maintenance communication system.

Coordinates and elevations would be determined for utilities at principal points of definition. Principal points of definition for water and fire protection water would be valve boxes, post indicator valves (PIVs), mainline intersects, and fire hydrants. The principal points of definition for roads are roadway centerline intersects and edge of pavement. Road alignment surveys include stationing, bearings, and curve information tied to these principal points of definition.

Where exact routes of existing underground utilities are not defined within record drawings, the Pantex Maintenance and Operating (M&O) would coordinate necessary electronic line detection. The Architect – Engineer (A-E) would be responsible for locating and marking the utilities surveyed and documented.

All aboveground utilities that cross roadways would be elevated a minimum of 16.5 ft. above the roadway. All utilities that cross roadways that have less than the required clearance would be replaced with new utility lines.

Underground utilities available near the HE S&E site include potable water, high-pressure fire loop (HPFL), sanitary sewer, and electricity. Natural gas and compressed air would have to be extended onto the site. All phone and communications would have to be extended onto the site within the existing duct-bank from Building 11-27 to the new HE Pressing Facility, Building 11-61 then extending south along the Zone 11 fence line in a new duct-bank.

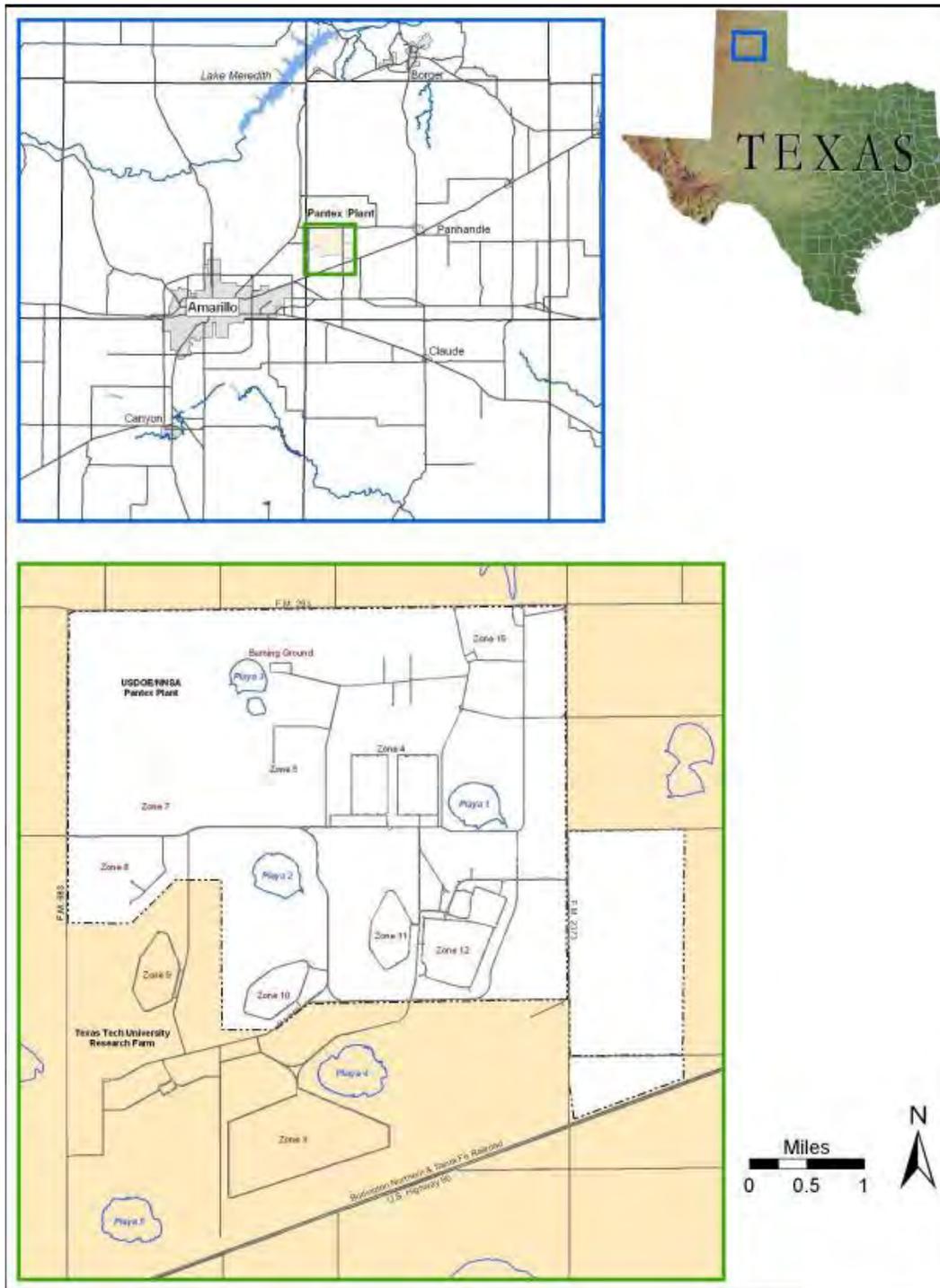


Figure 1: Pantex Plant Site Location

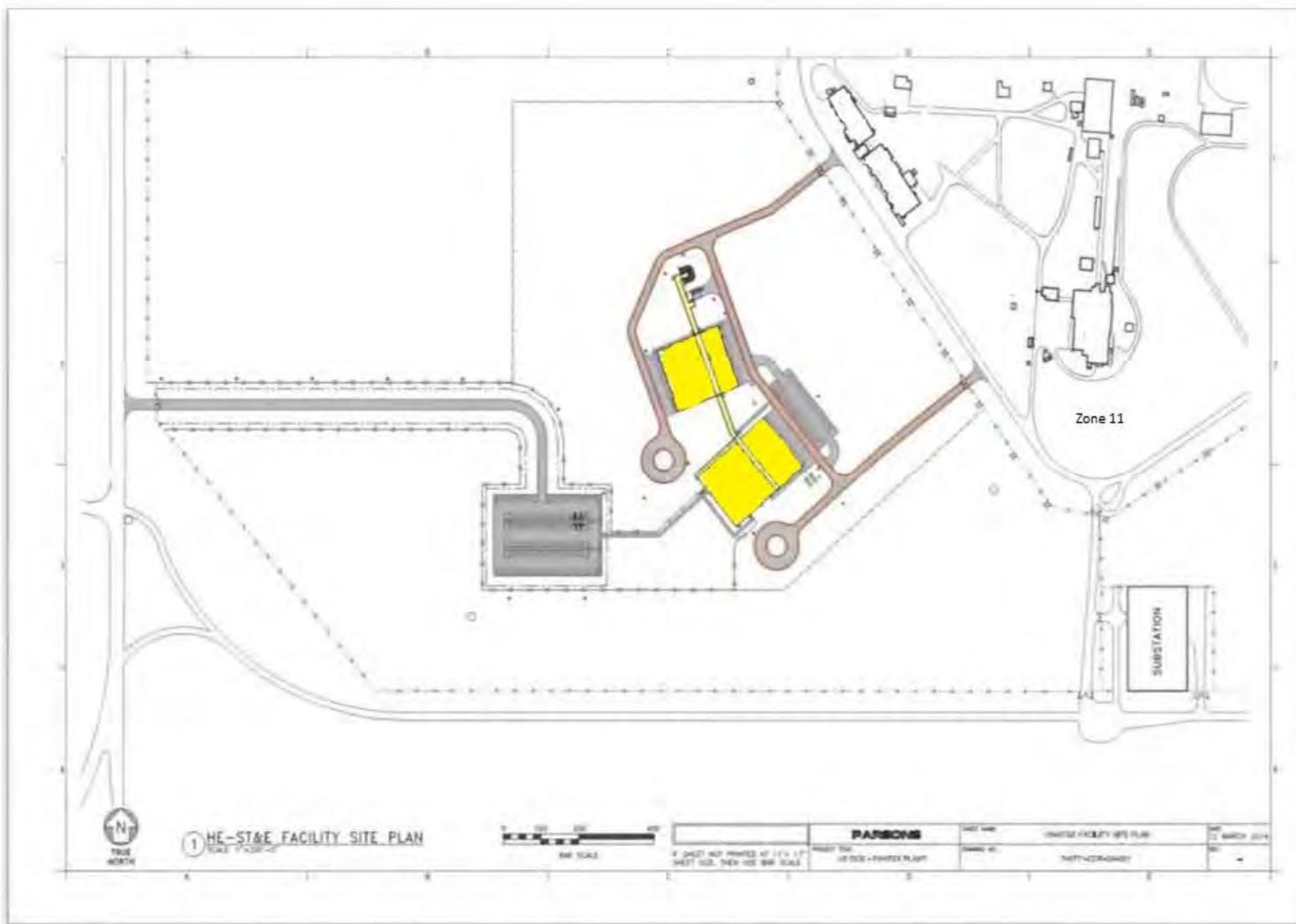


Figure 2: Proposed Action

2.3 NO-ACTION ALTERNATIVE

Use existing HE S&E facilities with normal maintenance and no significant renovation.

2.4 OTHER ALTERNATIVES CONSIDERED

The following alternatives are developed and referenced in the Conceptual Design Report for HE S&E Project.

2.4.1 Integrated Building Alternative

This alternative would construct a new integrated HE S&E facility in southwest Zone 11 using shared walls and a single basement/foundation.

2.4.2 Close-coupled Building Alternative

This alternative is similar to the Integrated Building Alternative but with separate structural walls; which would be connected by corridors and the basements/foundations/roofs would be separated for the HE labs, non-HE labs, and the office complex.

2.4.3 Campus Structures: Sub-option B Alternative

This alternative would be similar to the Proposed Action with the exception that it would be constructed with two stories.

2.4.4 Distributed Building

This alternative would construct new HE S&E distributed facilities. The HE lab would be located in Zone 11 and the non-HE lab would be located east of Zone 12. The office/administration areas would be located with one lab or the other (or some combination) as needed.

2.4.5 Distributed Building: Sub-option A Alternative

This alternative would construct a single story office in a separate structure located near a newly constructed HE lab in Zone 11. The non-HE (TD&DL) lab would be located separately in an area east of Zone 12, closer to the SNM operations areas.

2.4.6 Distributed Building: Sub-option B Alternative

This alternative would construct a two story office located in a separate structure near a newly constructed HE lab in Zone 11. The non-HE (TD&DL) lab would be constructed separately in an area east of Zone 12, closer to the SNM operations areas.

2.4.7 Distributed Building: Sub-option C Alternative

This a would construct a two story office and non-HE (TD&DL) lab located in an area east of Zone 12, closer to the SNM operations area and a newly constructed HE lab located in Zone 11 near other HE operations, without separate office facilities.

The following alternatives were considered but rejected because they did not meet the purpose and need of the project.

Table 1. Initial Screening of Alternatives Dismissed From Further Consideration

Alternative	Reason for Alternatives Dismissed From Further Consideration
Upgrade Alternative	Existing facilities could not be upgraded sufficiently to meet a 50-year service life and also provide a safe and secure operating environment. In addition, reconstruction of the existing facilities would effectively shut down the on-going operations for the entire duration.
Upgrade/Relocate Alternative	Existing facilities could not be upgraded sufficiently to meet a 50-year service life and also provide a safe and secure operating environment. In addition, reconstruction of the existing facilities would effectively shut down the on-going operations for the entire duration.
Upgrade/New Office Alternative	Existing facilities could not be upgraded sufficiently to meet a 50-year service life and also provide a safe and secure operating environment. In addition, reconstruction of the existing facilities would effectively shut down the on-going operations for the entire duration.
Move HE to 11-50/New Office-Lab Alternative: 1) Sub-option A – Single Story 2) Sub-option B – Two Story	At initial screening, Building 11-50 showed that it had sufficient floor space to accommodate the HE laboratories. After further review, Building 11-50 has thick walls and labyrinths that significantly reduced the floor space needed to accommodate the HE laboratories. In addition, the equipment to be installed is larger than the space available. In addition, the fire protection in Building 11-50 is primarily deluge which is not compatible with laboratory instrumentation.
Distributed Building: Sub-option D Alternative	Similar reason as the Move HE to 11-50/New Office-Lab Alternative.

2.5 SCOPE OF THE ENVIRONMENTAL ASSESSMENT (EA)

A sliding scale approach was used for analyzing potential environmental and socioeconomic effects and determined that certain aspects of the proposed action have a greater potential for creating environmental effects than others. The aspects with greater potential for impacts are discussed in more detail in this EA. Those aspects of the action judged to have little potential for impact are the following:

Environmental Justice: Executive Order 12898, Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations, directs Federal agencies to address the environmental justice impacts of their actions on minority and low-income populations. Based on 2010 census data, 243 people reside within a 5-mile radius of the Pantex Plant, 7.2 percent are living below the poverty line in Carson County, and there are no minorities or low-income families living within a 5-mile radius of the Pantex Plant.

Floodplains/Wetlands: The proposed project site is not within the 100-year floodplain. The site can be categorized as upland and does not support wetlands. No floodplains or wetlands would be impacted during the construction or operation of this project.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 REGIONAL SETTING

The Pantex Plant is centered on approximately 17,503 acres (including Pantex Lake, land east of FM 2373, and TTU leased land) in western Carson County of the Texas Panhandle, north of U. S. Highway 60 and 17 miles northeast of downtown Amarillo. The Plant consists of land that is owned and leased by the DOE/NNSA. A safety and security buffer zone south of the main Plant consists of 5,800 acres leased from TTU.

Pantex Plant is located on the Southern High Plains (SHP) portion of the Great Plains, at an elevation of approximately 3,500 feet. Topography is relatively flat, characterized by rolling grassy plains and numerous natural playa basins. The region is a semi-arid farming and ranching area. Pantex Plant is surrounded by agricultural land, but several industrial facilities are also located nearby.

The primary surface deposits in the project area are the Pullman soils on the plains and Randall soils in the playas, which grade downward to the Blackwater Draw Formation. This formation consists of about 15 meters (50 feet) of interbedded silty clays with caliche and very fine sand with caliche.

The principal surface water feature on the SHP is the Canadian River, which flows southwest to northeast approximately 17 miles north of the Plant. Plant surface waters do not drain into this system, but for the most part, discharge into onsite playas. Storm water from agricultural areas at the periphery of the Plant drains into offsite playas. From the various playas, water either evaporates or infiltrates the soil. Two principal subsurface water-bearing units exist beneath Pantex Plant and adjacent areas: The Ogallala Aquifer and the underlying Dockum Group Aquifer.

The Ogallala Formation consists of fluvial sands and gravels that occupy the paleo-valleys and eolian sands and silts that overly paleo-uplands between paleo-valleys as well as fluvial sections. Buried caliche-rich soils and buried clay-rich horizons are commonly developed in eolian sections. The top of the Ogallala Formation is capped by the Caprock caliche. The Ogallala was deposited on an irregular erosional surface developed on underlying Permian and Triassic strata. As a result, depths to the base of the Ogallala vary considerably. At the Pantex Plant site, the depth to the base of the Ogallala varies from approximately 90 meters (300 ft.) at the southwest corner of Pantex Plant to approximately 220 meters (720 ft.) at the northwest corner of the Plant. The vadose or unsaturated zone, above the Ogallala Aquifer consists of as much as 460 feet of sediments that lie between the land surface and the aquifer.

Environmental issues related to the local geology fall mainly into four general areas: (1) how the extent and characteristics of the geologic materials affect the flow of groundwater and the fate of contaminants that might be carried in the groundwater; (2) the potential for local or regional earthquakes to cause engineered structures to fail and initiate a release of hazardous materials; (3) the potential for dissolution of salt beds in the subsurface to disrupt overlying materials or the ground surface; and (4) the engineering properties of near-surface materials that affect how structures are built and how they perform.

3.2 SITE-SPECIFIC DESCRIPTION AND ANALYSIS

3.2.1 Land Use

Affected Environment: The primary surface deposits at Pantex are the Pullman and Randall soil series, which grade downward to the Blackwater Draw Formation. This formation consists of about 15 meters (50 feet) of interbedded silty clay with caliche, and very fine sand with caliche. Underlying the Blackwater Draw Formation, the Ogallala Formation consists of interbedded sand, silt, clay, and gravel. The base of the Ogallala Formation is an irregular surface that represents the pre-Ogallala topography. As a result, depths to the base of the Ogallala vary. At Pantex Plant, the vertical distance to the base of the Ogallala varies from 394 feet at the southwest corner to 889 feet at the northeast corner of the Plant. Underlying the Ogallala Formation is sedimentary rock of the Dockum Group, consisting of shale, clayey siltstone, and sandstone. Geotechnical sampling would occur at the proposed site as a standard practice for a free-standing structure to determine foundation strength and reduce the risk of structural failure. The only impacts would be small diameter boreholes, which would not affect the underlying formations.

The site for the proposed project is formerly cultivated upland that is restored short grass prairie with buffalograss (*Buchloe dactyloides*) and blue grama (*Bouteloua dactyloides*) as the dominant plant species. The area is mowed periodically to help reduce fuel loading because grazing is not allowed in this protected area.

Shortgrass prairie, consisting of buffalograss, blue grama, and, in mesic sites, western wheatgrass (*Agropyron smithii*), represents the primary habitat for species of concern in the area, such as Texas Horned Lizard (*Phrynosoma cornutum*), Ferruginous Hawk (*Buteo regalis*), Western Burrowing Owl (*Athene cunicularia hypugaea*), and song birds.

Trapping and spotlight surveys have been conducted on Pantex and TTU property to document the presence or absence of Swift Fox (*Vulpes velox*) and Plains Spotted Skunk (*Spilogate putorius interrupta*), rare species without regulatory status. Data suggests that these two species do not occur on these sites, and thus it is believed that they do not occur in the vicinity of the proposed project.

Colonies of Black-tailed Prairie Dog (*Cynomys ludovicianus*) provide habitat for some special status species such as Ferruginous Hawk, Bald Eagle (*Haliaeetus leucocephalus*), Golden Eagle (*Aquila chrysaetos*), Western Burrowing Owl, and some songbirds. Prairie dog colonies are found on Pantex, but not within the proposed project area.

The Texas Horned Lizard is the only State threatened or endangered species that is a year-round resident in areas of Pantex. It could be found at the proposed project site. The American and Artic Peregrine falcons (*Valco peregrinus anatum* and *Falso peregrinus tundruis*), as well as the Bald Eagle and Whooping Crane (*Grus America*), are migratory, and may be observed along the project route during the fall through spring migrational and wintering periods. There is no designated Critical Habitat on the proposed project site or Pantex, nor is the habitat on the site considered unique compared to adjacent portions of the same grass stand.

Pantex Plant contains several soil types classified as prime farmland, which is defined in *Prime and Unique Farmlands* (7 CFR 657) as land containing the best combination of physical and chemical characteristics for producing crops. This includes cropland, pastureland, rangeland, and forestland, which covers the majority of Pantex Plant. The proposed project site has not been in cultivation since the 1990s and is not expected to be cultivated in the future, since it is within the protected area of the Plant. No farmland in production would be impacted by the proposed project.

Environmental Consequences of Proposed Action: Approximately 2 acres of reestablished shortgrass prairie would be impacted by both permanent and temporary features of the proposed project. Of the total

area impacted, approximately 1.67 acres would remain in industrial use after project completion including an access road.

Excess soil, generated as a result of construction activities, would be handled in accordance with applicable rules and regulations. Depending on characterization, the excess soil may be sent to the onsite borrow pit for reuse, or to an applicable landfill as solid waste.

Non-cultivated land would be reseeded with the appropriate seed mix of native grasses for the soil type and land use. The grasses are best planted between February and April. Wheat can be planted in the fall to prevent erosion, and native grasses can be planted the following spring. If project construction were completed in May or June, the native grasses could still be planted, though that is not the ideal time for establishment.

If nests of birds were discovered in the proposed project site, the Pantex Wildlife Biologist would be contacted for assistance in mitigating disturbance of these nests. Nests could possibly be encountered during the March through August nesting season.

If Texas Horned lizards were encountered at the proposed site, they would be moved out of harm's way and released adjacent to the site. Horned lizards could possibly be encountered from March/April through September/October. It is possible that the acreage of temporary disturbance left from the construction would be of use to the Texas Horned lizards and other species that utilize bare, soft, or recently disturbed ground.

Impact to transient species would be minimal, since the habitat disturbance area would be geographically small scale, temporary, and not a critical or unique habitat.

Environmental Consequences of No Action Alternative: There would be no changes to current Pantex land use in the proposed project area.

Environmental Consequences of All Alternatives: The impacts would be the same as the Proposed Action.

3.2.2 Water Resources

Affected Environment: The major surface water source near Pantex is the Canadian River, located about 17 miles northwest of the facility, which flows in a generally eastward direction into Lake Meredith, a constructed reservoir. Plant surface waters do not drain into this system, but mostly discharge into onsite playas. Storm water, from agricultural areas at the periphery of the Plant, drains into offsite playas. From the various playas, water either evaporates or infiltrates the soil.

Groundwater beneath the proposed site is first encountered approximately 265 feet deep, and is perched above a low permeability fine-grained zone. The Ogallala Aquifer is present beneath the proposed site about 410 feet deep. None of the construction surface work would result in contaminants reaching the perched groundwater or the Ogallala Aquifer. There would be zero discharge of untreated water to the perched groundwater or the Ogallala Aquifer during operations.

Environmental Consequences of Proposed Action: Runoff with increased suspended solids could occur during the proposed site work. Good engineering practices, including soil erosion and sediment control measures, and spill prevention and waste management practices, would minimize any suspended sediment and pollutant transport that could result in potential water quality impacts. The installation of permanent

access roads has the potential to affect surface water drainage patterns. The access roads would be all weather and the design would require proper sized culverts to allow for drainage and support the weight of equipment.

Environmental Consequences of No Action Alternative: There would be no changes to surface water drainage patterns or surface water quality.

Environmental Consequences of All Alternatives: The impacts would be the same as the Proposed Action.

3.2.3 Air Quality and Climate Change

Affected Environment: Modeling results of concentrations for criteria and toxic pollutants using Plant emissions for ongoing operations indicated that none of the National Ambient Air Quality Standards (NAAQS) would be exceeded at the Pantex Plant boundary. All of the toxic air pollutants were estimated to be below their respective annual Effect Screening Levels (ESLs) at the Plant boundary. Modeling performed during the period 1996-2001 indicated that no NAAQS or annual ESLs were exceeded during that time. Similarly, concentrations at the Pantex Plant boundary are estimated to continue to remain within all NAAQS and annual ESLs based on projected emissions for continued operations since the Pantex Plant is in an area of attainment or unclassified status of attainment for NAAQS.

Environmental Consequences of Proposed Action: Air emissions would include dust (trenching and movements of construction vehicles), emissions from vehicles exhausts, and dust and emissions from operation of the concrete batch plant; but these emissions would not require monitoring. Standard dust suppression methods such as water spraying would be used to minimize dust from excavation or construction. Appropriate best management practices would be used to control fugitive dust and particulate emissions.

Operations at the proposed new facility would not introduce any new processes to the Plant, so additional modeling of concentrations for criteria and toxic pollutants using Plant emissions for ongoing operations would be unnecessary. Presently, the emissions of the 14 separate facilities currently operating are *de minimis*. (Pickett, D., 2015).

The permit limits, presented in Table 1 would not be exceeded. It is conceivable that operation of the more modern equipment used in the proposed new facility would result in a slight reduction of emissions, but that premise cannot be quantified.

Table 2: Emissions Estimates and Permit Limits

Air Quality

Construction Emission	Estimated to be less than 3 metric tons per year of PM10 in peak construction year
Stationary source operation emissions, metric tons/year	CO – 4.72 NOx – 22.88 TSP – 10.24 SO _x – 0.34 Lead – 0.0 VOC – 1.32 HAP – 3.44

Environmental Consequences of No Action Alternative: Air quality would not be impacted because there would be no short-term emissions from construction or operational activities. Based upon the *de minimis* emissions of Greenhouse Gases (GHG) and limited changes to water resources, there are no known climate change impacts.

Environmental Consequences of All Alternatives: The impacts would be the same as the Proposed Action.

3.2.4 Visual Resources

Affected Environment: The topography of the project area is relatively flat. The office and production buildings at Pantex are visible to some landowners, and to traffic along Highway 60 and FM 2373, 683, and 293. As for the proposed site, it would be visible to Pantex employees as an undeveloped area.

Environmental Consequences of Proposed Action: Heavy equipment and hauling operations, staging areas, site preparation activities, trenching, construction, and operation of the concrete batch plant, and construction traffic would denude approximately 2 acres of revegetated prairie and create temporary adverse visual effects. The proposed new facility would be adjacent to an industrial zone within the security fence and from a distance would present a façade similar in sizes and appearance to existing facilities. For the public traveling on area roads, there would be a slight change in the distant view-scape.

Environmental Consequences of No Action Alternative: There would be no changes to current visual resources.

Environmental Consequences of All Alternatives: The impacts would be the same as the Proposed Action.

3.2.5 Noise

Affected Environment: Sources of environmental noise offsite consist of background sounds from vehicular traffic on Highway 60 and FMs, county roads, airport traffic, railroad traffic, and the operations of heavy equipment during agricultural activities.

Sources of environmental noise at Pantex Plant include background sounds from industrial processes, vehicular traffic, routine operations, occasional HE testing, firearms training of security police officers, and ongoing construction and demolition. Average onsite sound levels are 40-60 decibels A-weighted (dBA) (DOE/NNSA, 2008).

Environmental Consequences of Proposed Action: The temporary increase in noise levels from proposed construction activities and traffic would be similar to other construction activities and vehicular noise at Pantex, as well as offsite vehicular traffic, airport traffic, railroad traffic, and agricultural activities. Temporary increases would not be expected to cause sufficient change in noise levels to result in more than a temporary annoyance to employees or adjacent landowners. Temporary, intermittent noise levels (between 80 and 90 dBA) could result from the use of heavy equipment like backhoes, large trucks, and cranes during construction activities. These levels attenuate rapidly with distance, and will not likely impact neighboring landowners because construction activities would be confined to the central portion of the Plant, away from residential populations. Noise levels would return to pre-construction levels following completion of proposed construction activities.

Environmental Consequences of No Action Alternative: There would be no changes to the current ambient noise levels.

Environmental Consequences of All Alternatives: The impacts would be the same as the Proposed Action.

3.2.6 Cultural Resources

Affected Environment: A major thrust of the Plant's Cultural Resources Program has been systematic survey coverage of all areas surrounding playas located on DOE-owned land plus a substantial sample of non-playa areas. Based on these surveys, a prehistoric archeological site location model was developed and confirmed. This site location model holds that prehistoric archeological sites at Pantex Plant, and probably throughout the Llano Estacado, will be located within approximately 1/4 mile of playas or their major drainages. Conversely, such sites will not occur in the interplaya upland areas.

Environmental Consequence of Proposed Action: This site location model was included in formal consultation with the Texas State Historic Preservation Office (SHPO), and is included in the *Pantex Plant Cultural Resource Management Plan*. Features related to more permanent occupations (such as hearths, tipi rings, fire-cracked rock concentrations, architectural evidence, or human burials) have not been found at any Pantex Plant sites, as either surface or subsurface expressions. Since at least the early 1900s, historic agricultural activities, such as plowing and grazing, have extensively and aggressively modified virtually all of the Llano Estacado. Consequently, most surface or shallow prehistoric archeological sites are seriously disturbed, lacking the original spatial relationships of their artifacts and features. The NPO and the SHPO have agreed that the disturbed sites lack the integrity required for consideration of inclusion in the National Register. It is not anticipated that any activities from this project would occur within 1/4 mile of a playa.

There are limitations to this EA in the design, siting, construction, operation, and maintenance of the HE S&E Facility. This EA does not cover the deactivation and decommissioning (D&D) of the existing facilities that the HE S&E facility would replace. Some of the existing facilities that would be scheduled for D&D are eligible for the National Register; they are not included for preservation in accordance with Stipulation I.A.2 and E and Stipulation IIB of the Pantex Cultural Resource Management Plan. NEPA documentation would be required for each building scheduled for D&D.

Environmental Consequences of No Action Alternative: There would be no changes to the current cultural resources.

Environmental Consequences of All Alternatives: The impacts would be the same as the Proposed Action.

3.2.7 Human Health

Affected Environment: Pantex workers and subcontractors involved in potentially hazardous operations are protected by administrative and engineering controls, and are required to wear appropriate personal protective equipment. Workers receive training that is required to identify and avoid or correct potential hazards typically found in the work environment, and to respond to emergency situations. Pantex subcontractors must adhere to Occupational Safety and Health Administration (OSHA) standards in performing all work.

Environmental Consequences of Proposed Action: The types of activities during the construction of the new HE S&E facility include building an access road to the facility and normal construction of the buildings. The operational aspect of the facility is to develop and sustain diagnostic tools for the evaluation of technology development of HE. There would be no radiological impacts or radiological hazards within the facility.

Environmental Consequences of No Action Alternative: There would be no changes to the current human health impacts.

Environmental Consequences of All Alternatives: The impacts would be the same as the Proposed Action.

3.2.8 Transportation/Traffic

Affected Environment: Regional and site transportation routes are the primary methods used to transport Pantex-affiliated employees, hazardous materials, and radioactive materials. Inter-zonal transfers are carried out on paved roads. Transportation between buildings in various zones is frequently carried out via enclosed ramps. Track roads are sometimes used for production and monitoring well access and utility access. Onsite transfer of radioactive material is governed by DOE orders and Pantex-specific standards (DOE, 1996).

Offsite, Highway 60 and FMs 683, 2373, and 293 are paved roads that are most heavily used within the project area. There are also unpaved county roads offsite that are less heavily used.

Environmental Consequences of Proposed Action: There would be some temporary increase in traffic from proposed construction, and there might also be rerouting of onsite traffic. No offsite routes would have traffic flow interrupted directly by construction, because the proposed construction would occur within the industrialized area of Pantex, away from Plant boundaries. Construction activities would not be expected to cause sufficient change in traffic to result in more than a temporary annoyance to Plant employees or adjacent landowners. Upon completion and start-up of the proposed facility, there could be a slight reduction in Plant traffic, and an accompanying reduction in fuel use and vehicle maintenance costs, by consolidating existing operations from several facilities in various zones into a single facility.

Environmental Consequences of No Action Alternative: There would be no change to current transportation or traffic activities.

Environmental Consequences of All Alternatives: The impacts would be the same as the Proposed Action.

3.2.9 Waste

Affected Environment: Waste at Pantex Plant is generated from ongoing weapons operations, HE production, and support operations such as medical services, vehicle maintenance activities, general office work, construction activities, environmental monitoring, laboratory activities, and environmental restoration activities (DOE, 1996).

Environmental Consequences of Proposed Action: Construction would result in the potential for the generation, treatment, storage, and disposal of solid waste as defined in 40 CFR 261.2. Waste would be

handled in a manner that is appropriate to its characterization; including but not limited to waste from a Solid Waste Management Unit (SWMU) and is consistent with federal and state regulations and the contractor's approved waste management plan. Waste minimization principles would be incorporated into the project. All waste would be evaluated for recycling or reuse options.

Operational impacts would not change from current waste management practices. The same types of waste would be generated by the proposed new facility as that generated by existing HE facilities, since the processes would be the same. Current waste generation numbers are not available for specific HE S&E operations. Volume and/or weights of waste generated from the various facilities are available but the waste cannot be separated into one single process. It is conceivable that reductions in maintenance at the proposed new facility would result in a slight reduction of generated waste, but that premise can only be quantified through time.

Environmental Consequences of No Action Alternative: There would be no changes to the current generation of solid waste.

Environmental Consequences of All Alternatives: The impacts would be the same as the Proposed Action.

3.2.10 Utilities Infrastructure

Affected Environment: The existing underground utilities that consist of electric, sewer, and High Pressure Fire Loop (HPFL) would require minimal trenching for extensions to the facility. The trenching for basic utilities would be from the perimeter road of the adjacent industrial zone to the proposed facility. All underground utility lines such as fire protection water lines, new water lines, sanitary sewer lines, and electric lines would not be placed under pavement, except when crossing such pavement is unavoidable, or when adequate space is not available. All above ground utilities that cross roadways would have a minimum vertical and horizontal clearance of a minimum of 16.5 ft.

The following underground utilities would be extended to the proposed new facility:

- Potable water
- HPFL
- Electricity
- Sewer
- Telephone
- Local Area Network(s)
- Public Address System
- Natural Gas
- Compressed Air

Environmental Consequences of Proposed Action: The project manager would coordinate the underground piping requirements with the cathodic protection coordinator to ensure that the piping is properly protected.

Connection to the potable water system would comply with the requirements and specifications outlined in the National Sanitation Foundation/American Water Works Association manuals. Any materials used would be approved for use in a potable water system. Any connections (and/or disconnections) with the

sanitary sewer system and/or potable water system would be approved by the Utilities System Engineer. A final inspection and approval would be provided by the water system purveyor before operations begin.

The Site-Wide Environmental Impact Statement (SWEIS) evaluated alternatives related to continued operations of Pantex Plant. Utility usage was evaluated for water, wastewater treatment, steam, electricity, and natural gas. The *Supplement Analysis for the Final Environmental Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components (SA)*, DOE/EIS-0225/SA-12, stated that utility usage would remain within the range evaluated in the SWEIS and within the capacities of the current utility system. Usage by the proposed new facility should not exceed the ranges of utility usage evaluated in the SA, since the activities occurring in the new facilities would be a consolidation of current activities and no new activities would be introduced. However, new and improved energy-saving equipment, devices, and procedures would be in place at the proposed new facility and could result in reductions in energy use during HE S&E activities. Exact numbers quantifying current utility usage from the various buildings involved in the existing HE operations is not available due to lack of meters on individual buildings at Pantex.

Environmental Consequences of No Action Alternative: The current utilities infrastructure would not change with this alternative.

Environmental Consequences of All Alternatives: The impacts would be the same as the Proposed Action.

3.2.11 Socioeconomic Resources

Affected Environment: Pantex employs approximately 3,400 people, including management, operating contractors, USDOE/NNSA and the National Laboratory staff, consultants, and oversight personnel. This employment figure has remained relatively constant for the past 10 years.

Pantex is the major employer in Carson County and is one of the largest employers within the four county regions of influence that includes Carson, Armstrong, Potter, and Randall counties, and the Amarillo metropolitan area.

Environmental Consequences of Proposed Action: The majority of construction materials and temporary construction workers would most likely be drawn from the local community. As a result, permanent increases in population would not occur and housing and community services would not be permanently impacted. The increase in economic activity would be temporary and would subside with project completion.

Environmental Consequences of No Action Alternative: The current socioeconomic would not change with this alternative.

Environmental Consequences of All Alternatives: The impacts would be the same as the Proposed Action.

4.0 CUMULATIVE EFFECTS

Actions that could contribute to cumulative impacts include those conducted by Federal or non-Federal agencies or persons on lands adjacent to the Pantex Plant, within a 50-mile area of influence. Actions in the Area of Influence (AAI) include:

- Construction of a new Staging Facility
- Construction of a new Administrative Support Complex
- Construction of a new Intermediate Use of Force Facility
- Demolition projects within the Plant
- Construction of a new addition to an existing building
- Construction of power grid transmission lines in Carson, Potter, and Gray counties
- Private development of wind turbine generators (wind farms [this seems to be ongoing])

Analyzed resources, which could receive cumulative effects, are land use, water resources, biological resources, air quality and climate change, visual, noise, cultural resources, human health, transportation, waste, utilities, and socioeconomic.

AAI are mostly temporary and short-term. Most of the acreage that is needed for the construction phases of these projects would be returned to the original condition of open space or cultivation. For the long-term impacts of these projects, only the footprint of the facilities would remain and the land not necessary for the footprint would be restored. Pipelines and some electrical connections are underground, so after installation, the surfaces would be returned to the original condition. Regarding the demolition projects, the footprints would be removed and the site returned to open space. Therefore, the incremental impact of the proposed action, when added to those from actions of a similar nature, would be minor.

4.1 Water Resources

Water use during construction is generally associated with dust suppression, soil compaction, and the mixing of concrete. These uses are temporary and short-term. Occupancy of buildings would require long-term use of water resources similar to the normal use of office buildings. The incremental impact of the proposed action, when added to those from actions of a similar nature, would be minor.

4.2 Air Quality and Climate Change

AAI are intermittent and short term for air quality and, in a region with an average annual wind speed of 14 miles per hour, would not degrade the local air quality of the Plant, which continues to meet the allowable emission limits and permit requirements. The incremental impact of the proposed action, when added to those from actions of a similar nature, would not result in cumulative impacts on air quality or create climate change.

4.3 Noise

Sounds produced by construction equipment are attenuated by winds, distances, and by their temporary nature. The incremental impact of the proposed action, when added to those from actions of a similar nature, would be minor.

4.4 Cultural Resources

Some of the existing buildings scheduled for D&D that the HE S&E will replace are eligible for the National Register. Since NEPA documentation is needed for each building scheduled for D&D, Cultural Resources would be addressed at that time.

4.5 Construction Waste

No wastes are expected to remain at the proposed project site. All wastes would be handled appropriately in accordance with the approved waste management plans and applicable procedures. The waste would not require special handling beyond the capabilities of licensed disposal facilities. The planned or potential projects making up the AAI would probably not all be constructed simultaneously; therefore, the capacities of licensed disposal facilities should not be exceeded at any given time. The incremental impact of the proposed action, when added to those from actions of a similar nature, would be minimal.

5.0 ACCIDENT ANALYSIS

The proposed action consists of activities that are performed on a routine basis in construction. Therefore, specialized accident types that are considered at NNSA facilities are not a consideration. The most serious potential accident considered for the Proposed Action would be a fatality, although none are likely to result from the proposed construction. Potentially, serious exposures to various hazards or injuries are possible during the construction phase of the Proposed Action. Adverse effects could range from relatively minor (e.g., lung irritation, cuts, or sprains) to major (e.g., lung damage, broken bones, or fatalities).

The *National Census of Fatal Occupational Injuries in 2013* from the U.S. Department of Labor - Bureau of Labor Statistics, found that construction activities accounted for 2,104 fatal work injuries, the most of any industry sector. The Occupational Injuries and Illnesses and Fatal Injuries Profile, also from the Bureau of Labor Statistics, includes the following data as causes of fatalities in the construction industry: contact with objects and equipment, falls, exposure to harmful substances or environments, transportation incidents, fires and explosions, assaults and violent acts. Potential worst case industrial accident scenarios from the construction of the proposed HE S&E Facility could include: excavation collapse, wall collapse, crane collapse, chemical exposure, contact with an electrical current, or grassfire from a welding spark.

The HE S&E facility would not have any radiological impacts or radiological hazards within the facility.

CNS Pantex has stringent safety requirements for all employees and contractors and the safety statistics are lower than national averages – in 2014, Pantex Plant underwent a change of ownership in the M&O contract; therefore, the total recordable case rate for B&W (the prior M&O contractor) was .89; for CNS (the current contractor) was .34 (Lacy, P., 2015). The potential for any accidents related to the construction of the proposed facility would be anticipated to be no worse than the current safety statistics at Pantex.

The SWEIS analyzed two accident scenarios that involved HE detonation – one initiated from an internal process involving HE development, manufacturing, testing, evaluation, and treatment, and one initiated from an external event or natural phenomena. Both types of potential accidents were analyzed in the *High Explosive Science and Engineering Facility Process Hazard Analysis* (PHA) for the proposed HE S&E Facility. The SWEIS concluded that the likelihood of the internal event could occur at a frequency greater than or equal to 10^{-2} per year (*anticipated*). The scenario involving an external event or natural

phenomena would be *unlikely* – or potentially occurring less than 10^{-2} per year but greater than or equal to 10^{-4} per year. Either scenario could fatally injure a worker; however, members of the public and non-involved workers would not be at risk.

The PHA was performed for the construction of a proposed new HE S&E Facility that would house processes now operating in existing facilities at Pantex. The HE process equipment would be located in various areas of the new facility. These areas would contain the manufacturing support, surveillance, materials testing, and technology development already being performed at Pantex. The PHA qualitatively evaluated both facility and high-level process hazards. Also evaluated was the interaction of the identified hazards and potential external and natural phenomena events. The result of a PHA is a set of controls, both preventive and mitigative, that can be relied upon to prevent or minimize the event consequences. Upon completion of construction, this document would be revised to reflect the “as built” modifications and to evaluate the HE S&E Facility process procedures written for specific operations performed in each area.

The facility design, location, construction, and established material limits would meet the requirements of DOE-STD-1212-2012, *Explosives Safety*. It shall comply with Unified Facilities Criteria (UFC) 3-340-02, *Structures to Resist the Effects of Accidental Explosions* (formerly TM 5-1300); DOE/TIC-11268, *A Manual for the Prediction of Blast and Fragment Loading of Structures*, and Department of Defense (DOD) 6055.9-STD, *DOD Ammunition and Explosives Safety Standards* to resist the impacts of an explosion from a nearby facility and would also take into account protecting nearby facilities. The Explosives Safety Program establishes the quantity distance and correct location distances for facilities. The location criteria, in conjunction with the Nuclear Materials and Explosives Inventory Control Program bay limits, ensure an explosion that occurs in one building would not result in a sympathetic explosion in a nearby building.

The HE S&E Facility would consist of bays with blast doors, which would comply with the DOE-STD-1212-2012, that provide protection from blast overpressure and fragments. The HE S&E Facility would include individual control areas for remote operation bays. The bay walls would be designed in accordance with UFC 3 340-02. The proposed HE S&E Facility bay structures would be designed to mitigate the effects of an explosive accident in an adjoining bay, prevent penetration of primary missiles from the bay of explosive occurrence into adjoining bays, vent the blast pressures associated with internal explosions, and provide protection for personnel in occupied areas outside the bay of occurrence.

The bay structures would also be designed to mitigate the effects of design basis Natural Phenomena Hazard (NPH) events, as classified by DOE-STD-1021-93, *Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems, and Components*. The proposed HE S&E Facility would be constructed to withstand a PC-2 seismic event and PC-2 wind and PC-3 tornado loads. The construction of the building would also withstand mechanical impact due to an impact by a surface vehicle. The construction of the HE S&E Facility must have a roof design that would not fail up to the load requirements of PC-2 snow/ice/rain/hail accumulation.

A Fire Hazards Analysis (FHA) was prepared to ensure that fire protection and life safety features are incorporated into the design of the proposed new HE S&E Facility. The FHA is a comprehensive evaluation of the risks from fire and its related perils in this facility. This document identifies major fire protection and life safety features required for this facility and the necessary codes and standards to correctly design and install those features. In addition, this document identifies key occupancy and hazard classifications. It also identifies key design criteria (i.e., sprinkler system densities/remote area

and hose streams, etc.). The potential for catastrophic accidents would be reduced due to safety features built into the design of the proposed new facility.

6.0 INTENTIONAL DESTRUCTIVE ACTS

A fundamental principle of DOE's Safeguards and Security Program is a graded approach to the protection of its employees and assets. This approach is embodied in the relevant threat considerations and designations of facilities. DOE intends that the highest level of protection be given to security interests where loss, theft, compromise, or unauthorized use would adversely affect national security, the health and safety of employees and the public, or the environment.

Scenarios for intentional destructive acts at the proposed new facility (e.g. terrorism, internal sabotage) have been evaluated and determined to have a low potential to impact security, public health and safety. The impact of an intentional destructive act would have no greater environmental, public health or safety consequence than the worst-case industrial accident scenario hazard discussed above the detonation of HE.

7.0 AGENCIES, ORGANIZATIONS, AND PERSONS CONTACTED

Cultural/Historic: None

NNSA has a programmatic agreement with the Texas State Historic Preservation Office and an accepted *2004 Pantex Plant Cultural Resource Management Plan*; therefore, project-to-project consultation is not necessary.

Based on personal contact in the past and a Native American Treaty search in 1996, no Native American tribes have an interest in the area of the Pantex Plant.

Special Status/Wildlife and Plants: None

The site biologist has coordinated and received concurrence from the Texas Parks & Wildlife Department and the U.S. Fish & Wildlife Service (FWS) with specific environmental practices and management plans followed at Pantex Plant. The FWS concurred with a 1996 Biological assessment on Threatened and Endangered Species for the Pantex Plant.

If finalized and approved, the EA and FONSI can be found at the following website:
<http://www.pantex.com/mission/Pages/Environmental-Compliance-Documents.aspx>.

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