DRAFT ENVIRONMENTAL ASSESSMENT (EA)

FOR

REPLACEMENT OF AIRFIELD DRAINAGE SYSTEM AND CIRCUIT 1

U.S. AIR FORCE

PREPARED BY:

Department of the Air Force
82 CES/CEIV

October 2016

Letters or other written comments provided may be published in the Final EA. As required by law, substantive comments will be addressed in the Final EA and made available to the public. Any personal information provided will be kept confidential. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final EA. However, only the names of the individuals making comments and their specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

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DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)

AND

FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)

Replace Airfield Drainage System and Circuit 1

Agency: Department of the Air Force, Air Education and Training Command (AETC), 82nd Training Wing, Sheppard Air Force Base (AFB), Replace Airfield Drainage and Circuit 1, at Sheppard AFB, Wichita County, Texas

Pursuant to provisions of the National Environmental Policy Act (NEPA), Title 42 United States Code (USC) Sections 4321 to 4347, implemented by Council on Environmental Quality (CEQ) Regulations, Title 40, Code of Federal Regulations (CFR) §1500-1508, and 32 CFR §989, Environmental Impact Analysis Process, the U.S. Air Force (Air Force) assessed the potential environmental consequences associated with the replacement of 28,500 linear feet of corrugated drainage pipe along the airfield at Runways (RWY)15C/33C and 15L/33R as well as replacement of the following for Circuit 1: primary and secondary electrical distribution lines, all associated appurtenances, pad mounted transformers, street lights, grounding components, ducting, control cables, regulators, the main airfield utility vault, and end building node electrical and communication lines to support the Intrusion Detection System (IDS) along the 80th Flight Training Wing (80 FTW) campus. (The reconfiguration of the vault interior is included in this project for high voltage safety measures). This proposed action is to take place at Sheppard AFB, Wichita County, Texas.

The purpose of the project is to replace drainage pipes and airfield lighting materials along the airfield and 80 FTW locations.

The need for the proposed replacement of airfield drainage pipes, circuit 1 and associated utility/communication systems along the 80 FTW campus at Sheppard AFB is driven by the requirement to support unrestricted airfield operations as articulated in AFI 13-213 and FAA Order 6850.5. Damage to the integrity of the drainage system has led to an identified safety hazard Risk Assessment Category 2 (RAC 2) due to exposure of drainage pipes. Open sinkholes from weathering and erosion of the topsoil exist along the drainage area which creates Bird/Wildlife Aircraft Strike Hazard (BASH) concerns. The failing condition of the drainage pipes along the airfield affects long-term mission readiness. Eventually, ongoing deterioration of the drainage area along the airfield will render RWYs 15C/33C and 15L/33R unfit for continued use causing the installation to fail to meet the 80 FTW mission.

In order to allow for compliance with Unified Facilities Criteria (UFC) 3-535-01, a new dedicated bank for the medium voltage distribution system is required as well as updates to the current regulators in order to maintain adaptability to rapid current load changes. Current control cable is no longer capable of utilizing the five brightness intensity levels required IAW UFC 3-535-01. This capability is necessary in order for the system to compensate for environmental light changes at dawn, dusk, and in certain weather conditions to take place. Additionally, based on FAA AC150/5345-10G regulatory requirements, current regulators should be compliant ferroresonant constant current regulators (CCR). This lack of compliance and continued degradation has been identified as a possible safety hazard.

The current copper line installation in buildings located at the 80 FTW requires repair and modernization in order to maintain current mission operations. Existing aged and degraded wiring is causing weak or inconsistent signals creating communication gaps and network connectivity interruptions. Current distribution lines do not support consistent clear monitoring of the current Installation Detection System (IDS) used by Security Forces and therefore do not meet the needs of the installation IAW AFI 31-101.

The Environmental Assessment (EA), incorporated by reference into this finding, analyzes the potential environmental consequences of activities associated with replacement and provides environmental protection measures to avoid or reduce adverse environmental impacts.

The EA considers all potential impacts of Alternative-1, the Preferred Alternative and the No-Action Alternative. The EA also considers cumulative environmental impacts with other projects in the Region of Influence (ROI).

ALTERNATIVE-1 Replace Airfield Drainage System and Circuit 1 (Preferred Alternative)

Under Alternative 1,(Preferred Alternative), SAFB would replace the existing airfield drainage system and upgrade the current drainage pipes with HDPE pipes along the airfield located between RWYs 15C/33C and 15L/33R. Trenches would be dug along the current drainage pipe installation site to allow for removal and replacement of old corrugated piping. Areas that would be disturbed during this process would be filled with approved soil and seeded per construction permit requirements.

Circuit 1 repairs would include replacement of overhead lines with underground lines and all appurtenances, replacement of existing constant current regulators with ferroresonant regulators, modification of airfield lighting and current distribution configuration, and upgrading of current copper wires to fiber optic cables. Cables would be sheathed in Linear Low Density Polyethylene (LLDPE) due to the project location being in a 100-year floodplain.

Along the 80th FTW, repairs would include an upgrade of existing copper wires with fiber optic cables and installation of hand hole infrastructure and conduit systems in support of current IDS.

A simplified analysis of alternatives was reviewed and it was determined that the course of action for the proposed projects would include the choice of Alternative-1 or the No-Action Alternative. Due to construction constraints, regulatory requirements, and location of the projects considered, there are no other identifiable alternatives. The proposed projects being evaluated are to correct deficiencies from previous construction activities located in areas already established. It is not feasible to move the projects to a new area as this would negate the need for action.

NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the Preferred Alternative (or any of the action alternatives) would not occur and the sinkholes identified in the drainage project would continue to expand further exacerbating the safety hazard. The proximity to the runway is a flying safety hazard and the edge of the active runway is less than 300 feet from the storm sewer system where the

exposed pipes and sinkholes are located. In order to maintain 80 FTW mission, safe runways must be accessible. Additionally, unrelenting exposure to the elements continues to degrade the exposed pipes, increasing safety hazards, and furthers pollution of storm water as sediment is deposited into outfalls running north of the drainage project.

Under the No-Action Alternative, the Preferred Alternative (or any of the action alternatives) would not occur and Circuit 1 would continue to be the primary feed for the airfield. The regulators would continue to age, maintenance costs would increase, efficiency of the circuit feed would decrease, and loss of compatibility with updated technology would occur. This would significantly adversely impact the flight mission of Sheppard AFB. Since Sheppard AFB is home to the Wichita Falls Municipal Airport, which provides daily commercial flight service, airfield lighting failure has the potential to negatively impact regional air traffic as well.

Under the No-Action Alternative, the Preferred Alternative would not occur and infrastructure requirements would not be met. Future network expansions would be curtailed and the current mission critical buildings could be subjected to loss of network and/or communication lines. The end building nodes and alternate route fiber optic cables are support systems for the Intrusion Detection System (IDS). Without the upgrade from copper to fiber optic cables, the IDS would fail to be reliable, as is evidenced by the false readings currently being issued by the system.

SUMMARY OF FINDINGS

The analyses of the affected environment and environmental consequences of implementing the Preferred Alternative presented in the EA concluded that by implementing standing environmental protection measures and operational planning, the Air Force would be in compliance with all terms and conditions and reporting requirements

The Air Force has concluded that no significant adverse effects would result to the following resources as a result of the Preferred Alternative:

Cultural/Historic/Archeological Resources: The proposed action will occur on semi-developed areas on Sheppard AFB property. There are no historical buildings in the area and currently there are no identified cultural/archeological sites. There will be no impacts at this particular site. However, should artifacts or archeological sites be discovered; the Cultural Resource Manager should be notified immediately.

Biological Resources: The proposed action will occur on semi-developed areas on Sheppard AFB property. Per the requirements of 36 CFR Part 800, Section 7 of the Endangered Species Act and implementing regulations, possible Texas Horned Toad habitat was identified in the proposed area. Though this habitat is present, threatened and/or endangered species are not anticipated to be significantly affected by the proposed action. Construction activities will be evaluated and monitored to ensure protection for possible migrating threatened and/or endangered species in the proposed area. Minor impacts are anticipated.

Water Resources: The airfield drainage and circuit 1 repairs along the airfield will disturb more than five acres; therefore a TCEQ General Construction Permit would be required. The Energy Independence Security Act (EISA) requirements for storm water do not apply. A storm Water Pollution Prevention Plan (SWP3) must be maintained and include dust control, re-

fueling operations, and erosion control methods. IAW AFI32-1067 and 40 CFR §122.26, best management practices will be used in order to prevent storm water pollution from construction activities and utility work. There are no identified wetlands in the proposed project area therefore; the requirements of Executive Order (EO) 11990, Protection of Wetlands, are not applicable. Negligible impacts are anticipated.

Air Quality: Sheppard AFB is currently in attainment for all criteria pollutants. All emissions are below the title V threshold therefore Sheppard AFB operates under permit by rules (30 TAC 106). Construction activity conducted on base is considered both fugitive and mobile and does not require recordkeeping nor emissions calculations. IAW 30 TAC 111.145 all construction activity should be allowed with precautions taken to achieve control of dust emissions. Negligible impacts are anticipated.

Utilities/Transportation Resources: The Proposed Action would involve repairs to electrical distribution lines. Construction activity would be located on the airfield and not interfere with traffic. As a result, the USAF anticipates no significant short or long-term adverse impacts, and this resource area was not carried forward for detailed analysis. There would be no significant impacts to Utilities/Transportation Resources.

Noise: Anticipated noise impacts will be a temporary increase of noise levels at the construction site which will attenuate to levels less than the thresholds of concern. As activities will take place on the airfield, the noise impacts will be negligible. As a result, the USAF anticipates no significant short or long term adverse impacts, and this resource was not carried forward for detailed analysis.

Solid Waste and Hazardous Materials: The potential contaminants of concern include materials associated with refueling operations, the use of heavy equipment, and possible electrical supply components. IAW AFI32-7042, should hazardous waste be discovered as the result of the implementation of this project, it would be removed and disposed of in accordance with applicable federal, state and local laws. Impacts will be negligible.

Earth Resources (Soil/Geology): Implementation of best management practices including the use of native plants, native soils, and storm water protection measures during construction will minimize erosion. Impacts will be negligible.

Floodplains: The location of the proposed project is in the 100-year floodplain. Executive Order 11988, Floodplain Management, seeks to avoid construction of facilities or structures within the floodplains "to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains".

No significant adverse cumulative impacts would result from activities associated with Alternative-1 (Preferred Alternative) when considered with past, present, or reasonably foreseeable future projects.

FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)

Repairs to the Airfield Drainage System, Circuit 1, and end building node electrical/communication lines for the 80 FTW will be completed in a 100 year floodplain. These repairs would not result in adverse effects on human health or welfare and would not create additional safety risks.

Considering the information contained herein, in accordance with EO 11988, and pursuant to the authority delegated under SAFO 791.1, I find that there is no practicable alternative to completing the proposed project within the 100-year floodplain. The Proposed Action, as designed, includes all practicable measures to minimize harm to and within the floodplain.

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Based on my review of the facts and analyses contained in the attached EA, conducted under the provisions of NEPA, CEQ Regulations, and 32 CFR §989, I conclude that the Preferred Alternative Repair Airfield Drainage System and Circuit 1 would not have a significant environmental impact, either by itself or cumulatively with other known projects. Accordingly, an Environmental Impact Statement is not required. The signing of this Finding of No Significant Impact and Finding of No Practicable Alternative completes the environmental impact analysis process.

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Cynthia Oliva GS-15, USAF DATE
Deputy Division Chief Resource Integration
Civil Engineer Headquarters Air Education and Training Command

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AF	Air Force
AFB	Air Force Base
AICUZ	Air Installation Compatible Use Zone
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CRM	Cultural Resource Management
DOPAA	Description of the Proposed Action and Alternatives
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
ENJJPT	Euro-NATO Joint Jet Pilot Training
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
IICEP	Interagency/Intergovernmental Coordination for Environmental Planning
ISA	Initial Site Assessment
MAJCOM	Major Command
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHRP	National Register of Historic Places
NRCS	Natural Resources Conservation Services
POL	Petroleum Oil Lubricants
PREIAP	Planning Requirements for the Environmental Impact Analysis Process
RAC	Risk Assessment Code
ROD	Record of Decision
RSU	Runway Supervisory Unit
RWY	Runway
SHPO	State Historic Preservation Officer
SPCC	Spill Control and Countermeasures Plan
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Division
USACE	United States Army Corps of Engineers
USAF	United States Air Force
UFC	Unified Facility Code
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

Department of the Air Force, Air Education and Training Command (AETC), and 82d Training Wing (82 TRW) at Sheppard Air Force Base (SAFB), TX, have identified the need to replace the airfield drainage system, Circuit 1 electrical distribution systems, airfield lighting electrical distribution systems, and end building nodes due to recognized safety hazards and failure to meet Unified Facilities Criteria (UFC). This Environmental Assessment (EA) was prepared to evaluate the potential environmental impacts of these proposed project in compliance with the National Environmental Policy Act of 1969 (NEPA) (42 United States Code [USC] 4331 et seq.), the regulations of the President's Council on Environmental Quality (CEQ) that implement NEPA procedures (40 Code of Federal Regulations [CFR] 1500-1508), the Air Force Environmental Impact Assessment Process (EIAP) Regulations at 32 CFR Part 989, and Air Force Instruction 32-7061 (Secretary of the Air Force, 2003).

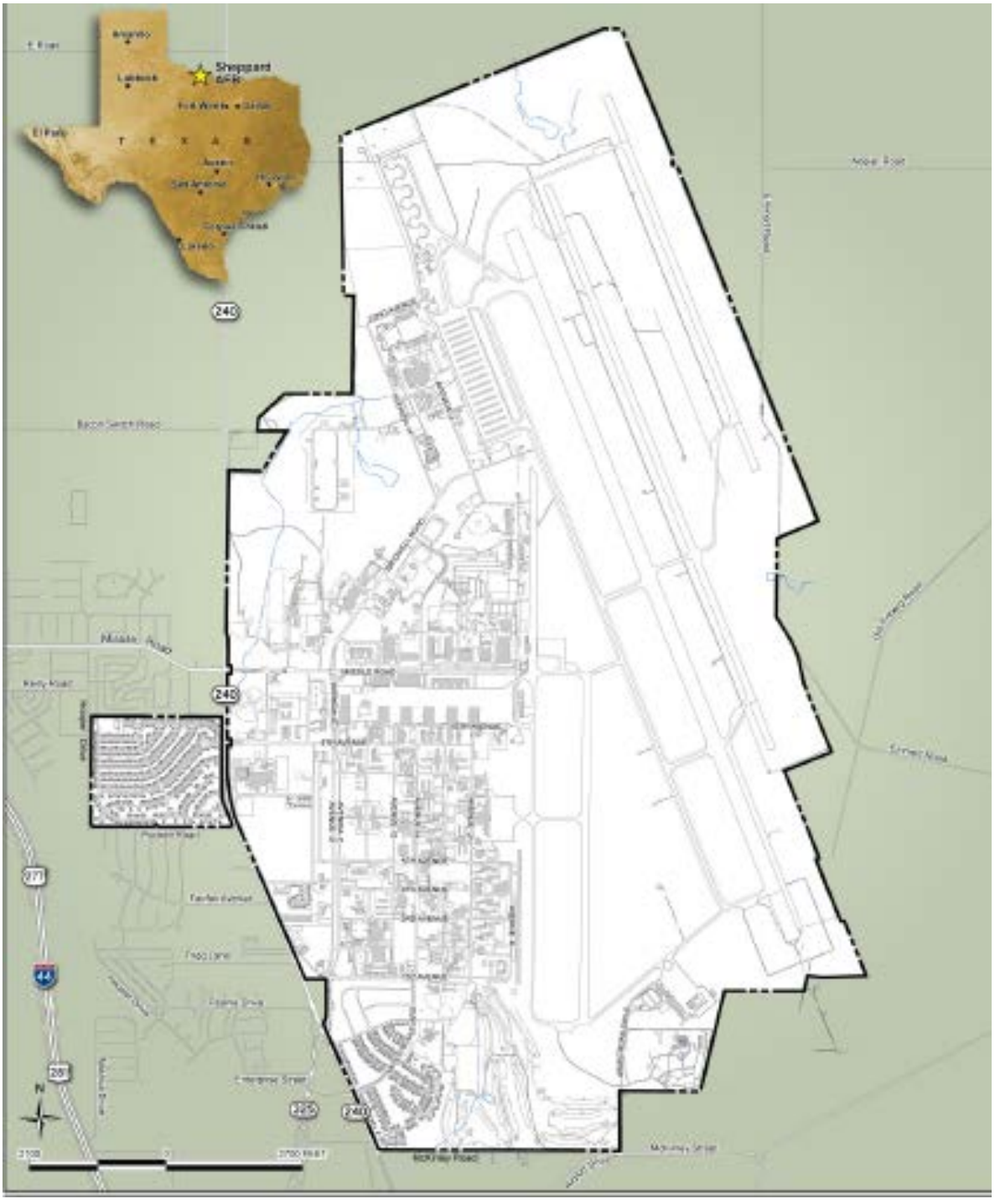
SAFB is located in the north-central region of Texas, six miles south of the Texas/Oklahoma border, adjacent to the city of Wichita Falls, and occupies 5,297 acres of land. The installation was established in 1941 and. is home to the 82nd TRW and hosts both the 80th Flight Training Wing (80 FTW), and Euro-NATO Joint Jet Pilot Training (ENJJPT) Program. As a joint training host for the Air Force, Army, Navy and Marine Corp, SAFB graduates over 60,000 students in nearly 1,000 courses annually from the Air Force's largest technical training wing and produces nearly 200 pilot training graduates while operating the Air Force's second busiest joint-use non-combat airfield. Airfield operations must be maintained in order to ensure mission continuity for the 80 FTW and ENJJPT program. In 2010 a three phased effort began to redirect the above ground ancestral stream associated with the construction of RWY 15L/33R underground to mitigate an excessive grade variance caused by above ground channel. The final phase of this project was completed in 2013. During execution the RWY 15C/33C underdrains were either damaged or blocked rendering them non-functional. A 100-year flood event that occurred in May 2015 highlighted catastrophic failures in the existing drainage lines resulting in airfield wide sinkholes developing less than 300'feet from an active runway. These sinkholes, some as much as eight feet in depth, have been assessed a Risk Assessment Code (RAC) 2(I,C) by 82d TRW Ground Safety, which is defined as a potential serious mishap resulting in death, permanent disability, or loss of a facility of asset valued at $2,000,000 or more. Severe degradation of the rubber gasket joints designed to join the pipe sections together were identified by base civil engineers. This degradation resulted in full pipe section separations of up to ten inches. A geotechnical survey (Appendix C) completed in March 2016 identified sediment deposits within the line. The sediment deposits exit the drainage pipes and enter surface waters that flow off base.

Electrical distribution systems currently serving the airfield require repair to comply with UFC 3-535-01 and UFC 3-550-01 with Change 1 requirements. Currently medium voltage electrical distribution lines and airfield lighting series circuits share a concrete-encased duct bank with the airfield's low voltage control cable. Applicable government regulations direct that low voltage and medium voltage cabling may not share a duct bank and must comply with minimum separation distances. The current duct bank configuration requires that maintenance and repair

crews comply with medium voltage safety protocols in order to access and repair the low voltage cables.

The existing copper wiring used in the installation's infrastructure in support of communications requirements is no longer a reliable signal distributor for service to critical buildings located in the 80 FTW. Network access is essential to the continuity of base operations and to comply with communications regulations. Installation of fiber optic cables to replace current copper wires in the end building node (EBN) infrastructure will create a closed-loop fiber optic network resulting in increased efficiency of network capability and the ability to monitor and support base-wide Intrusion Detection Systems (IDS).

The information presented in this document will serve as the basis for deciding whether the proposed action would result in a significant impact to the human environment, requiring the preparation of an environmental impact statement (EIS), or whether no significant impacts would occur, in which case a finding of no significant impact (FONSI) would be appropriate. If the execution of any of the proposed action would involve "construction" in a wetland as defined in Executive Order (EO) 11990, *Protection of Wetlands*, or "action" in a floodplain under EO 11988, *Floodplain Management* as amended by EO 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*, a Finding of No Practicable Alternative (FONPA) would be prepared in conjunction with the FONSI.



Map 1 Location Map

1.2 PURPOSE OF THE ACTION

The purpose of the proposed repairs to existing airfield drainage pipes, (located east of Runway (RWY) 15C/33 C), Circuit 1 electrical distribution lines and appurtenances, airfield lighting electrical distribution, and EBN with associated utility/communication lines (located within/adjacent to the 80 FTW campus) at SAFB is to correct significant deficiencies in the integrity of the airfields drainage system, update technology and adaptability within the Circuit 1 feed and airfield lighting distribution systems, and improve supporting utility/communication lines located in the 80 FTW. A recent evaluation of the airfield subsurface drainage system revealed multiple sections of failure, resulting the assignment of a RAC 2(I, C) by 82TRW Ground Safety due to the presence on sinkholes in close proximity to active airfield pavements. Open sinkholes from weathering and erosion of the topsoil exist along the drainage area which create sedimentation and deposition in storm water outfalls. The formation of sinkholes also indicates failure to properly drain storm water which creates **Bird/Wildlife Aircraft Strike Hazard (BASH**) concerns. In addition, sinkholes create a flying hazard for pilots during flight operations. In an emergency, an active inbound aircraft operating at a high rate of speed may leave the primary runway surface; large open sinkholes in close proximity to the active pavement represent a serious hazard in such a situation not only to military pilots but also to the commercial pilots operating on the airfield. Additionally, rock fragments resulting from the active erosion in the proposed project area increase the foreign object damage (FOD) risk to aircrafts operating in the area. These features can damage and stress aircraft landing gear and tires.

Additionally, the existing constant current regulators are aged and are in need of replacement due to updated technology and adaptability within the Circuit 1 feed. Currently the high voltage system is in the same duct bank as the control wire series circuits that are used for airfield lighting. This is not in accordance with UFC and could be a potential safety hazard. Current control cable is no longer capable of utilizing the five brightness intensity levels required IAW UFC 3-535-01. This capability is necessary in order for compensation to environmental light changes to take place.

The current copper line installation in buildings located at the 80 FTW requires repair and modernization in order to maintain current mission operations. Existing aged and degraded wiring is causing weak or inconsistent signals thus causing communication gaps and network connectivity interruptions. Current distribution lines do not support consistent clear monitoring of the current Installation Detection System (IDS) used by Security Forces and therefore do not meet the needs of the installation IAW AFI 31-101.

1.3 NEED FOR THE ACTION

The need for the proposed replacement of airfield drainage pipes, Circuit 1 and associated utility/communication systems along the 80 FTW campus is driven by SAFB's requirement to support unrestricted airfield operations as articulated in AFI 13-213 and FAA Order 6850.5. The

deficient condition of the airfield drainage pipes and electrical systems affects long-term mission readiness. Eventually, ongoing deterioration of the drainage area along the airfield will render RWYs 15C/33C and 15L/33R unfit for continued use causing the installation to fail to meet the 80 FTW mission.

In accordance with UFC 3-535-01, a new dedicated bank for the medium voltage distribution system is required as well as life cycle replacement of the airfield lighting control cable in order to maintain uninterrupted flying missions. Due to the aforementioned regulatory requirements, voltage distribution cables should be separated by at least twelve inches from other cables. This lack of separation and continued degradation has been identified as a possible safety hazard.

In support of the current IDS used by Security Forces as a preventative and protective means, hand holes, conduit systems, and copper lines require replacement in critical building areas in the 80 FTW campus. IAW AFI 31-101, upgrading components when they deteriorate or fail to meet operational needs is necessary in order for mission sustainability. Without the supporting communication lines, the IDS will prove inefficient and fail to meet the AFI requirements for SAFB.

1.4 INTERAGENCY/INTERGOVERNMENTAL COORDINATION AND CONSULTATIONS

1.4.1 Interagency Coordination and Consultations

Scoping is an early and open process for developing the breadth of issues to be addressed in the EA and for identifying significant concerns related to a proposed action. Per the requirements of Intergovernmental Cooperation Act of 1968 (42 U.S.C. 4231(a)) and EO 12372, Federal, state, and local agencies with jurisdiction that could be affected by the proposed action were notified during the development of this EA.

1.4.2 Government to Government Consultations

E.O. 13175, *Consultation and Coordination with Indian Tribal Governments* directs Federal agencies to coordinate and consult with Native American tribal governments whose interests might be directly and substantially affected by activities on federally administered lands. Consistent with that executive order, DoDI 4710.02, *Interactions with Federally-Recognized Tribes*, and AFI 90-2002, *Air Force Interaction with Federally-recognized Tribes*, federally-recognized tribes that are historically affiliated with the SAFB geographic region will be invited to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. The tribal consultation process is distinct from NEPA consultation or the interagency coordination process, and it requires separate notification of all relevant tribes. The timelines for tribal consultation are also distinct from those of other consultations. The SAFB point-of-contact for Native American tribes is the Installation Commander. Concurrence indicating a preliminary finding of no historic properties affected, was received from the SHPO on DATE. On DATE, concurrence indicating a primary finding of (will not affect, may effect, not likely to adversely affect or likely to adversely affect) was received from the USFWS/TPWD.

1.4.3 Other Agency Consultations

Per the requirements of Section 106 of the National Historic Preservation Act and implementing regulations (36 CFR Part 800), Section 7 of the Endangered Species Act and implementing regulations such as the Migratory Bird Treaty Act, findings of effect and request for concurrence were transmitted to the Texas State Historic Preservation Officer (SHPO) and the US Fish and Wildlife Service (USFWS).

1.5 PUBLIC AND AGENCY REVIEW OF EA

Because the Proposed Action area coincides floodplains, it is subject to EO 11988, *Floodplain Management* as amended by EO 13690. The Air Force published early notice that the proposed action would occur in a floodplain in the newspapers of record (listed below) on 24 June 2016. The notice solicited public comment on the proposed action and any practicable alternatives. The comment period for public and agency input on these projects ended on July 25 2016

A Notice of Availability (NOA) of the Draft EA and Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) was published in the newspapers of record (listed below), announcing the availability of the EA for review on 9 Oct 2016. The NOA invited the public to review and comment on the Draft EA. The public and agency review period ended on 9 Nov 2016. The NOA and public and agency comments are provided in Appendix A.

The NOA and early notice of project execution in a floodplain was published in the following newspapers: Times Record News, Wichita Falls, Texas

Copies of the Draft EA and FONSI/FONPA were also made available for review at the following locations:

Wichita Falls Public Library
600 11th Street
Wichita Falls, TX
76301-4604

1.6 DECISION TO BE MADE

The EA evaluates whether the proposed action would result in significant impacts on the human environment. If significant impacts are identified, SAFB would undertake mitigation to reduce impacts to below the level of significance, undertake the preparation of an EIS addressing the proposed action, or abandon the proposed action.

This document is a planning and decision-making tool that will be used to guide SAFB in implementing the proposed action in a manner consistent with Air Force standards for environmental stewardship.

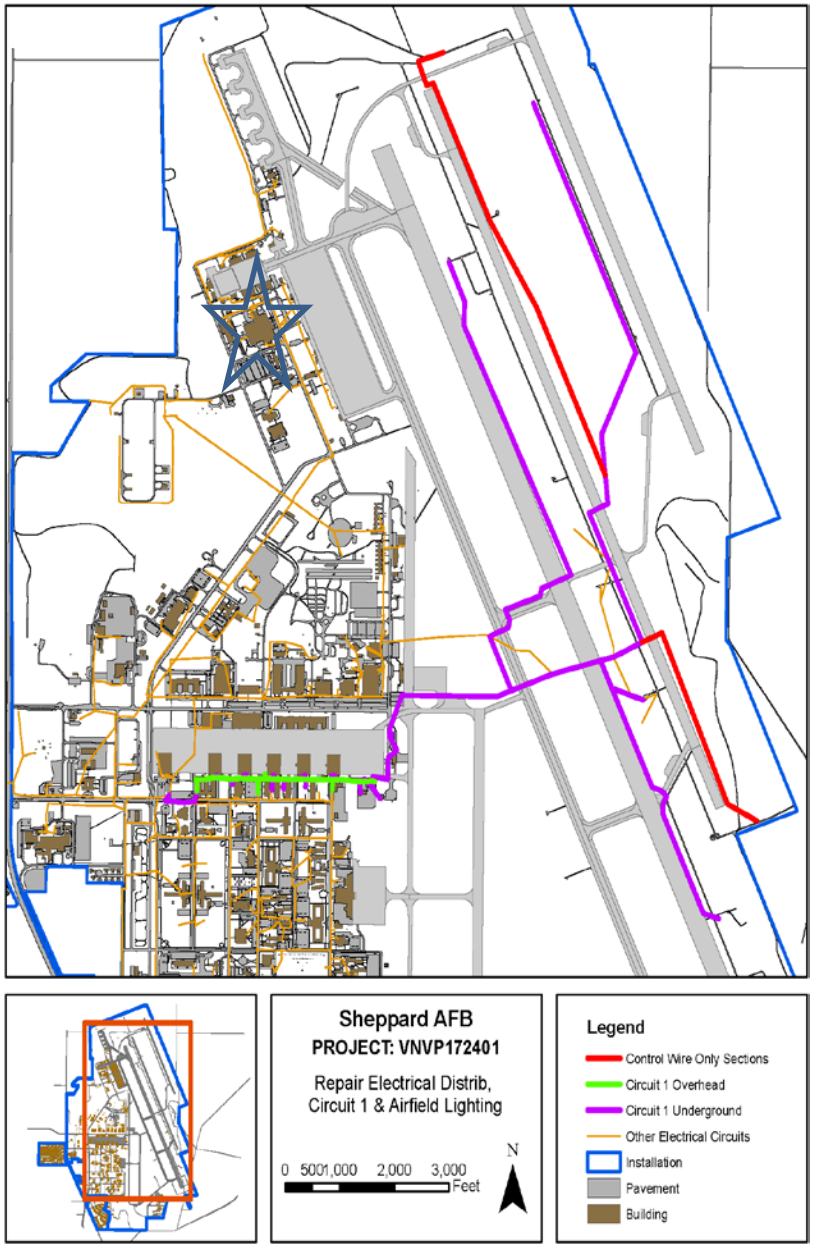
2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The Air Force and SAFB propose to:

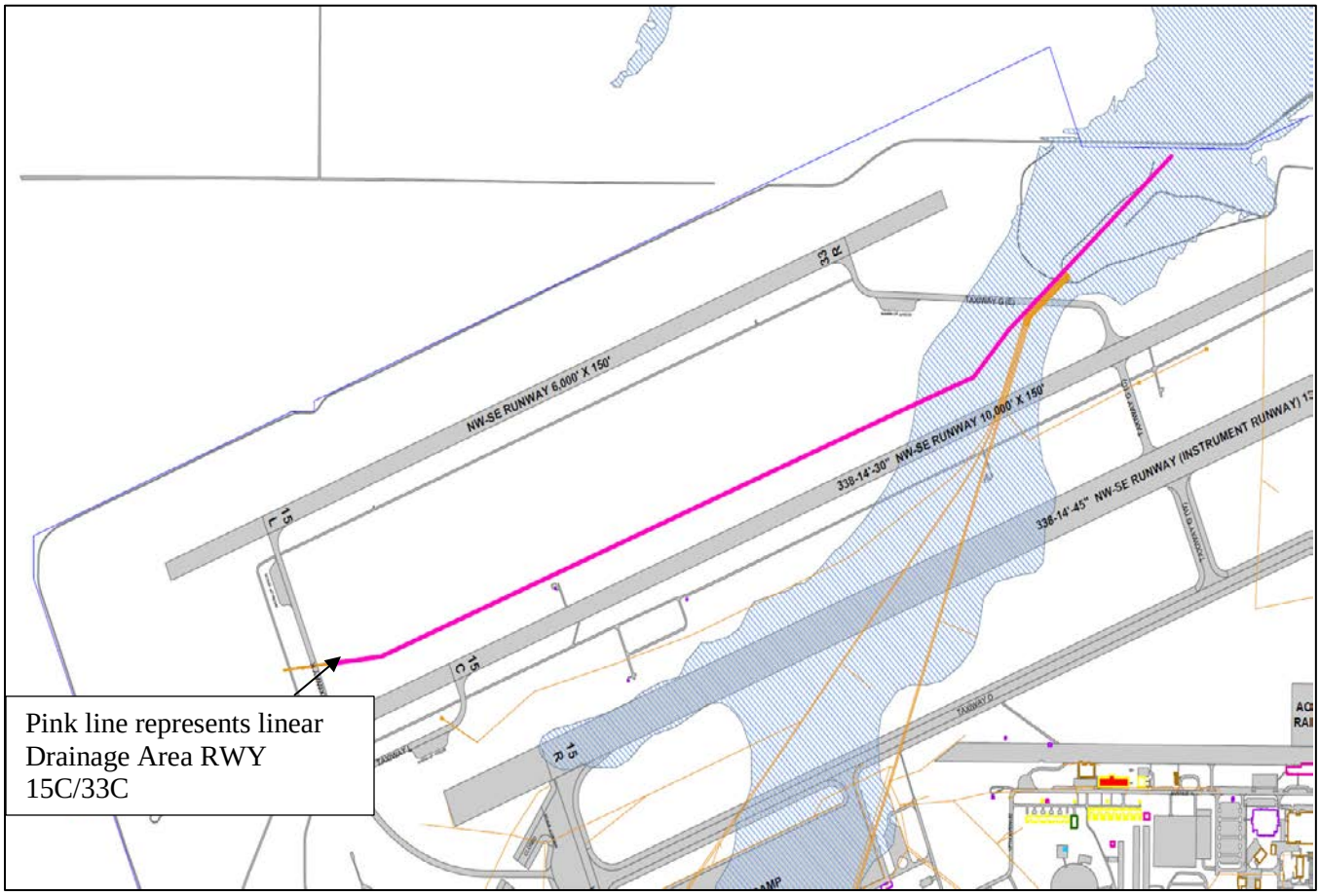
- repair existing failed north-south 72” corrugated steel drainage pipe located between RWYs 15C/33C and 15L/33R beginning just south of Taxiway (TWY) Kilo and ending just south of TWY Golf (east)
- repair Circuit 1 and airfield lighting electrical distribution lines and appurtenances
- replace copper utility/communication lines with end building node fiber optic lines, install hand holes, and install new medium voltage bank within the 80 FTW campus to satisfy the purpose and need for the action described in Sections 1.2 and 1.3.

Figure 2.1-1 : SAFB Installation Boundaries and Infrastructure



☆ 80th FTW location

Figure 2.1-2 Airfield Boundaries and Infrastructure



2.2 SELECTION STANDARDS

NEPA and the CEQ regulations mandate the consideration of reasonable alternatives for the proposed action. "Reasonable alternatives" are those that also could be utilized to meet the purpose of and need for the proposed action. Per the requirements of 32 CFR §989, the Air Force EIAP regulations, selection standards are used to identify alternatives for meeting the purpose of and need for the proposed action.

In selecting alternatives for the repairs of the airfield drainage system, Circuit 1 distribution, and EBN repairs at SAFB, the Air Force used the following selection standards:

- The selected alternative will minimize the disruption to SAFB ongoing airfield operations and mission. It will be implementable in a timely fashion, without excessive delays (such as for land acquisition), and will avoid further foreseeable mission impacts.
- The selected alternative will reduce risk of equipment damage and loss of life associated with aircraft/runway activities.
- The selected alternative will be compliant with existing permits and regulatory requirements, and must take into account the presence of flora and fauna. The selected alternative will be designed such that permits and regulatory concurrence from TCEQ may be obtained.
- The selected alternative will reduce maintenance cost and conform to applicable codes and regulations.

2.3 SCREENING OF THE ALTERNATIVES

The following potential alternatives that might meet the purpose and need were considered:

2.3.1 Alternative 1 (Preferred Alternative)

Alternative-1 repairs for the existing drainage area includes:

- replacing 28,500 linear feet of corrugated metal drainage pipe with up to three 60" HDPE pipes. (Final configuration of the 60" HDPE drainage pipes will be determined based on the geotechnical survey findings. The new lines will either be tied in to the existing underdrains located perpendicularly beneath RWY 15C/33C, be cleared of any obstructions to ensure a clear path of drainage, or tied directly into the new drainage line)
- trenching activities as needed adjacent to the pipeline
- grading activities after pipe has been laid

Project accomplishment is planned for execution in three phases.

- Phase One: 2,262 LF Northernmost Section of Line
- Phase Two: 5,200 Center Section of Line
- Phase Three: 2,156 LF Southernmost Section of Line

Circuit 1 replacement activities include:

- replacement of existing overhead (O/H) lines with underground (U/G) lines to include replacement of all associated appurtenances (i.e. transformers, switches, manholes, conduits, etc.)

- replacement of existing U/G lines with new U/G lines to include replacement of all associated appurtenances
- replacement of existing constant current regulators (CCRs) with ferroresonant CCRs
- modification of airfield lighting vault (Building 986)
- modification of current U/G distribution configuration from the Control Tower eastward to comply with UFC 3-535-01 (Reconfiguration will include separating existing U/G medium voltage (MV) distribution, airfield lighting control wire, and airfield lighting series lines to dedicated ducts).
- upgrade existing copper airfield control wire to fiber optic cable 80th FTW campus repairs include:
- upgrade of existing copper wire for communication systems with single mode fiber optic cables and splice new fiber optic cables to existing cables to create a closed-loop fiber optic network
- installation of conduit systems infrastructure for base network
- placement of hand hole infrastructure for communication lines in support of fiber optic upgrade

2.3.2 No Action Alternative

Under the No-Action Alternative, the Preferred Alternative would not occur and the sinkholes identified in the drainage project would continue to expand further exacerbating the safety hazard. Failure to remediate the open RAC assessment will result in increased probability for loss of life and equipment should an aircraft leave the runway surface. Improper water flow will increase the likelihood of BASH concerns. Since the edge of the active runway is less than 300 feet from the storm sewer system where the exposed pipes and sinkholes are located, improper water flow will also allow sediment erosion to impact existing gradients and may attribute to blockage in the storm sewer conveyance system, thus incurring possible permit violations.

Under the No-Action Alternative, the Preferred Alternative would not occur and Circuit 1 would continue to be the primary feed for the airfield. The regulators would continue to age, maintenance costs would increase, efficiency of the circuit feed would decrease, and loss of compatibility with updated technology would occur. Current duct configuration will continue to present a major safety hazard to maintenance and repair personnel requiring them to initiate medium voltage safety protocols whenever accessing or repairing the low voltage lines that occupy the same duct. Reliability of the airfield lighting system would continue to degrade, resulting in a negative impact to ongoing flying mission continuity to both 80FTW and commercial air traffic.

Under the No-Action Alternative, the Preferred Alternative would not occur and infrastructure requirements would not be met. Future network expansions would be curtailed and the current mission critical buildings could be subjected to loss of network and/or communication activity. The EBN and alternate route fiber optic cables are support systems for the IDS. Without the supporting communication lines, the IDS will prove inefficient and fail to meet the AFI requirements for SAFB.

The selection standards described in Section 2.2 were applied to these alternatives to determine which alternative(s) could serve the purpose of and need for the action. A simplified analysis of alternatives was reviewed and it was determined that the course of action for the proposed projects would include the choice of Alternative-1, the Preferred Alternative, or the No-Action Alternative. The proposed projects being evaluated are to correct actions that have already occurred, in areas already established. It is not feasible to move the projects to a new area as this would negate the need for action**.**

2.4 DETAILED DESCRIPTION OF THE ALTERNATIVES

NEPA and CEQ regulations mandate the consideration of reasonable alternatives to the proposed action. "Reasonable alternatives" are those that also could be utilized to meet the purpose of and need for the proposed action.

No alternatives to the proposed action were identified, as there is no reasonable alternative capable of answering the Purpose of and Need for the proposed action. The proposed action satisfies applicable Air Force, DoD, State and/or Federal requirements, and supports current and future mission requirements. The NEPA process is intended to support flexible, informed decision-making; the analysis provided by this EA and feedback from the public and other agencies will inform decisions made about whether, when and how to execute the proposed action. Among the alternatives evaluated is a No-Action alternative. The No-Action alternative will substantively analyze the consequences of not undertaking the proposed action, not simply conclude no impact, and will serve to establish a comparative baseline for analysis.

Alternative 1, the Preferred Alternative, was found to answer the purpose of and need for the action and to satisfy the selection standards. It, and a "No-Action" Alternative, are carried forward for detailed analysis. Alternatives considered but eliminated from further consideration are discussed in Section 2.5.

2.4.1 Alternative 1: Replace Airfield Drainage System and Circuit 1 (Preferred Alternative)

Under Alternative 1 (Preferred Alternative) SAFB would upgrade the current drainage pipes with HDPE pipes along the airfield located between RWYs 15C/33C and 15L/33R. Trenches would be dug along the current drainage pipe installation site to allow for removal and replacement of deficient corrugated piping. Areas that would be disturbed during this process would be filled with approved soil and seeded per construction permit requirements.

Circuit 1 electrical distribution repairs would include replacement of overhead lines with underground lines and all appurtenances, replacement of existing constant current regulators with ferroresonant regulators, modification of airfield lighting and current distribution configuration, and upgrading of current copper wires to fiber optic cables. Cables would be sheathed in Linear Low Density Polyethylene (LLDPE) due to the project location being in a 100-year floodplain.

Along 80 FTW, repairs would include upgrading existing copper wires with fiber optic cables and installation of hand hole infrastructure and conduit systems to create a closed loop fiber optic network resulting in increased efficiency of network capability and support the current IDS.

2.4.2 No-Action Alternative

Under the No Action Alternative, the proposed repair of the existing airfield drainage system, Circuit 1 electrical distribution system, and EBN communication/electrical lines at 80 FTW campus at SAFB would not proceed. Under this alternative, SAFB would be unable to maintain full mission readiness or support unrestricted, full-time airfield operations in inclement weather conditions. Eventually, the ongoing deterioration of the airfield and Circuit 1 lighting system would render the runway unfit for use; the current IDS would fail to be reliable causing an increased security risk as well as an increase in maintenance cost. Buildings would be left isolated which could impact the mission requirements of SAFB by hampering the ability to provide technical support to base personnel and reliable monitoring of base security feeds.

The No-Action Alternative cannot be considered reasonable as it fails to address the purpose of and need for the action as described in Chapter 1. However, it will be carried forward for further analysis, consistent with CEQ regulations, to provide a baseline against which the impacts of the proposed action and alternatives can be assessed.

2.5 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

The following alternatives have been eliminated from further consideration on the basis of the results of screening presented in section 2.3.

Alternative 2 includes partial replacement of the airfield drainage system to include only phase one activities and a partial replacement of Circuit 1 systems and appurtenances. This alternative does not satisfy the need or the selection criteria of the proposed action. Implementing Alternative 2 will continue to impact airfield operations until a full replacement of the existing airfield drainage system is complete. Additionally, only implementing a partial replacement of Circuit 1 systems will continue to result in increased maintenance costs and fails to conform to UFC.

Alternative 3 includes the replacement of current airfield drainage system with corrugated metal pipe (CMP) instead of high-density polyethylene (HDPE) pipes. Current failing drainage pipes are situated along the airfield located between RWYs 15C/33C and 15L/33R. These pipes are corrugated metal with rubber gasket joints used between pipe sections. Pipe sections show severe degradation and sediment deposition as well as water penetration. Replacing current pipe systems with pipes of similar materials may incur future maintenance costs as coupling and joint fixtures holding the corrugated pipe fail more readily than those constructed of HDPE. Full replacement of Circuit 1 electrical distribution systems and 80 FTW campus would be completed under this alternative, meeting the purpose of and need for the action.

Alternative 4 would include selecting/constructing a new runway elsewhere, thus creating new lighting and communication systems to support airfield operations. While this alternative would meet the need for the proposed action, it would not meet the selection criteria if implemented. This alternative would be costly to execute and would create foreseeable mission impacts as operations at SAFB and commercial flights would be delayed until a suitable runway was constructed or leased from another entity as it must meet the mission requirements of the installation.

This Alternative is neither practical nor feasible at this time, thus it was eliminated from further consideration.

	Selection Standards				
	Minimize mission impact	**Reduce risk**	**Compliant with regulations**	**Reduce maintenance cost**	**Conform to applicable code**
Alternatives	**A**	**B**	**C**	**D**	**E**
Alternative 1	Meets	Meets	Meets	Meets	Meets
Alternative 2	Does not Meet	Meets	Does not Meet	Does Not Meet	Does not Meet
Alternative 3	Meets	Meets	Meets	Does Not Meet	Meets
Alternative 4	Does not Meet	Meets	Meets	Does Not Meet	Meets

Table 1 Comparison of Selection Standards

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The Region of Influence (ROI) for the Proposed Action is Sheppard AFB, unless otherwise specified below for a particular resource area where a resource would have a different ROI.

3.1 SCOPE OF THE ANALYSIS

This chapter describes the current conditions of the environmental resources, either man-made or natural, that would be affected by implementing the Preferred Alternative, or the No Action Alternative

Additionally, this chapter describes the potential environmental consequences that are likely to occur as a result of implementation of all Alternatives that are being considered and analyzed. Impacts described in this chapter are evaluated in terms of type (positive/beneficial or adverse), context (setting or location), intensity (none, negligible, minor, moderate, or severe), and duration (short-term/temporary or long-term/permanent). The type, context, and intensity of an impact on a resource are explained under each resource area. Unless otherwise noted, short-term impacts are those that would result from the activities associated with a project's construction and/or demolition phase, and that would end upon the completion of those phases. Long-term impacts are generally those resulting from the operation of a proposed project.

Based on the scope of the Proposed Action, issues with minimal or no impacts were identified through a preliminary screening process.

3.2 CUMULATIVE EFFECTS

This EA also considers the effects of cumulative impacts as required in 40 CFR 1508.7 and concurrent actions as required in 40 CFR 1508.25[1]. A cumulative impact, as defined by the CEQ (40 CFR 1508.7) is 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 which agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

For this EA analysis, the affected environment, environmental consequences and possible cumulative effects are addressed and are analyzed in this section. Any announced future actions would be evaluated under separate NEPA actions conducted by the appropriate involved federal agency.

Descriptions of the Cumulative Effects and Anticipated Environmental Consequences for the resource areas follow: Those resource areas not carried forward for a detailed analysis, along with the rationale for their elimination are also included in this section.

Regardless of the alternative selected, the following resources would not be affected by the Proposed Action and are not discussed in detail in this EA:

- ***Utilities / Transportation Resources:*** The Proposed Action would not involve utilization or disruption of utility services. Construction activity would not result in increases to local traffic. As a result, the USAF anticipates no significant short or long-term adverse impacts, and this resource area was not carried forward for detailed analysis. There would be no significant impacts to Utilities/Transportation Resources.
- ***Air Installation Compatible Use Zone (AICUZ)/Land Use/Noise:*** Anticipated noise impacts will be a temporary increase of noise levels at the construction site which will attenuate to levels less than the thresholds of concern. As activities will take place on the airfield; the noise impacts will be negligible. In addition, land use will not be altered as activities associated with the proposed action will take place in existing areas. As a result, the USAF anticipates no significant short or long term adverse impacts, and this resource was not carried forward for detailed analysis.
- ***Socioeconomic Resources/ Environmental Justice***: Given the nature of the project vicinity, the proposed project will not divide, separate, or isolate any neighborhood or community. As a result, , the USAF anticipates no significant short or long term adverse impacts, and this resource was not carried forward for detailed analysis
- ***Safety and Occupational Health:*** As the Proposed Action would take place on an US Air Force installation, Air Force regulations and standards regarding health and safety would be followed. All plans and specifications for this project must be in compliance with OSHA construction industry standards in 29 CFR 1926. As a result, , the USAF anticipates no significant short or long term adverse impacts, and this resource was not carried forward for detailed analysis

3.3 AIR QUALITY

The ambient air quality in an area can be characterized in terms of whether or not it complies with the National Ambient Air Quality Standards (NAAQS) established by the U.S. Environmental Protection Agency (EPA) (40 CFR 50 and CAA §108). The EPA has established NAAQS for six criteria air pollutants: ozone, lead, carbon monoxide, sulfur dioxide, nitrogen dioxide and inhalable particulate matter. Texas has adopted the NAAQS as its state ambient air quality

standards under 30 TAC §101.21. The EPA is tasked with constantly reviewing the NAAQS and recommending changes based on improved scientific knowledge and understanding of how these pollutants impact health and the environment.

All emissions related to actions that take place on Sheppard AFB are below the title V threshold and therefore operates under permit by rules (30 TAC 106). Construction activity conducted on base is considered both fugitive and mobile and neither requires recordkeeping nor emissions calculations. IAW 30 TAC 111.145 all construction activity is allowed as long as precautions to achieve control of dust emissions are implemented. The proposed project, including construction and operation, will not impact federal and/or state air quality standards. The project is located in Wichita County, Texas, which is in attainment for all NAAQS criteria pollutants. Therefore, a conformity determination under the Clean Air Act is not required.

No cumulative effects are anticipated due to intermittent construction activities located in the proposed project area. The Proposed Action would have negligible impacts on air quality. The No-Action Alternative would have no impact on ambient air quality in the project area.

3.4 WATER RESOURCES:

3.4.1 Surface Water

The proposed project area is located in the Red River Basin. Sheppard AFB is dependent wholly on surface waters for its water supply. Drainage of the region is east and southwest. The northern half is drained by tributaries of the Red River. Major contributors are the Wichita, Little Wichita, and Pease Rivers. Water bodies that do not meet applicable water quality standards with technology-based controls alone are placed on the section 303(d) list of water bodies not meeting standards. Water bodies on the 303(d) list require development of a Total Maximum Daily Load. A Total Maximum Daily Load is a calculation of the maximum amount of a pollutant that a water body can receive. The Total Maximum Daily Load is determined after a review of the specific properties of the water body and the pollutant sources that contribute to the non-compliant status. Generally, the Total Daily Maximum Load determines load based on a Waste Load Allocation, Load Allocation and Margin of Safety. Once the Total Maximum Daily Load assessment is completed and the maximum pollutant loading capacity is defined, an implementation plan is developed that outlines the measures needed to reduce pollutant loading to the non-compliant water body and bring it into compliance. Sheppard AFB does not directly discharge into any waters on the 303(d) list.

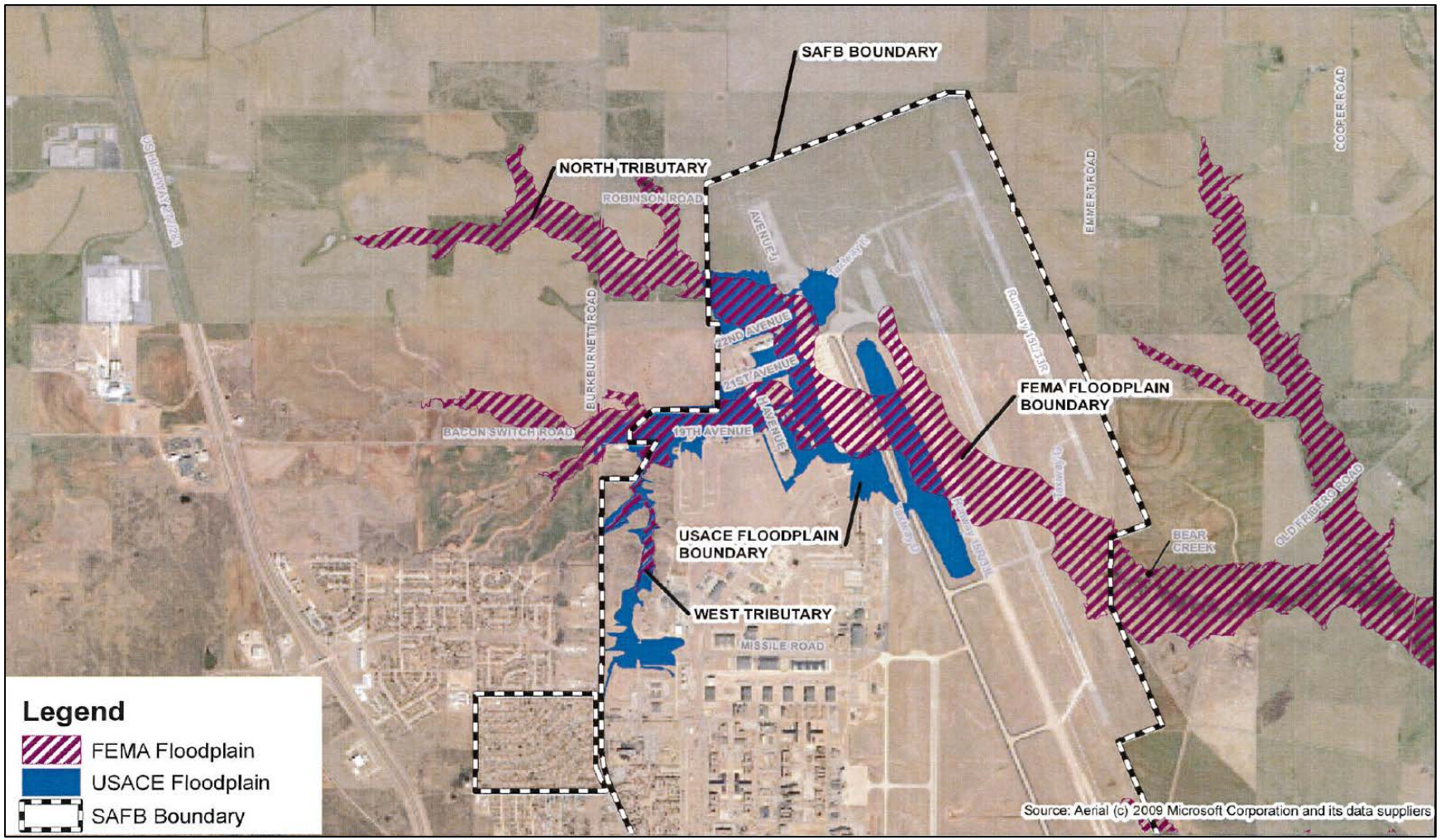
This section of the Clean Water Act addresses effluent discharge, cooling water discharge and storm water discharge. There will be no discharge in regards to cooling. The Texas Commission on Environmental Quality (TCEQ) now has federal regulatory authority over discharges of pollutants to Texas surface water, with the exception of discharges associated with oil, gas and geothermal exploration and development activities which are regulated by the Railroad Commission of Texas. The TCEQ regulations will be reviewed during construction plan development.

The Proposed Action would impact greater than five acres of area which will require a Texas Pollution Discharge Elimination System (TPDES) Construction storm water permit. The primary contractor would be responsible for all permit requirements and storm water BMP's in order to prevent storm water pollution from construction activities. As the actions in the proposed project area are temporary, there are no anticipated cumulative effects from the Preferred Alternative. There would be minor impacts to storm water resources from the temporary actions of the Preferred Alternative and no additional impacts from the No-Action Alternative.

3.4.2 Floodplains

The proposed project is located with the Federal Emergency Management Agency (FEMA) designated 100-year floodplain. Coordination with the local Floodplain Administrator would not be required as a result of this project due to the following: drainage repairs and utility work will take place in existing areas where utilities and drainage pipes were previously installed. No change to the Floodplain, such as an increase base flood elevation to a level that would violate applicable floodplain regulations and/or ordinances, is anticipated to occur from either the Preferred Alternative or the No-Action Alternative as discussed in this EA. Below is the Boundary Floodplain Map of Sheppard AFB (map 4).

No cumulative floodplain or surface water effects are anticipated due to the Preferred Alternative. The No-Action alternative would increase natural flooding and therefore have a minor impact on the floodplain.



Map 4 Floodplain Boundary Map

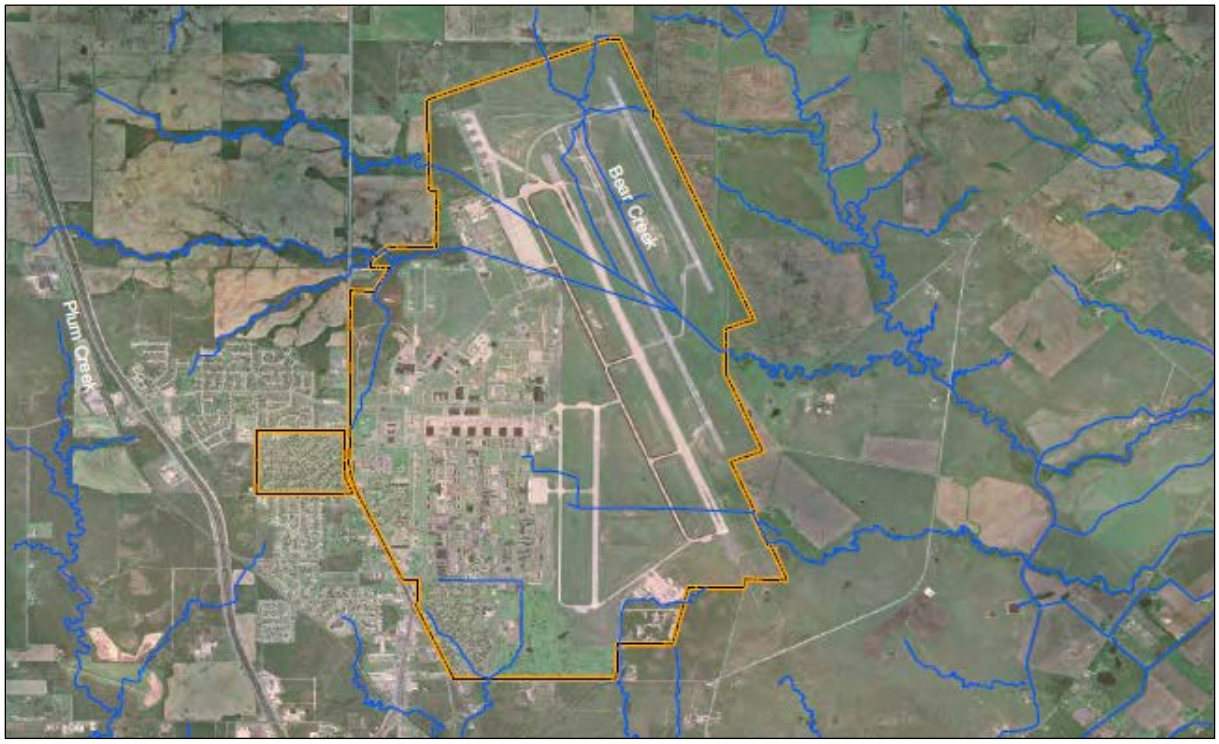
3.4.3 Groundwater

Groundwater in the project area is found in many of the sandstones of the Cisco formation. The recharge source of the groundwater is dominantly precipitation. Shallow wells derive water supply directly from rainfall in the immediate locality or from adjacent regions. Much of the water found in this formation is thought to be mineralized and can be reached at considerable depths. Much of the strata in Wichita County is tilted which produces two strata facies, the exposed area and the catchment area. This catchment area is where the storage reservoir for deep water is located. The quantity of mineral material in solution is dependent on rock type and proximity to the point of entry. Thus, water from shallow wells may contain more soluble mineral matter and be of good quality, while others that are at deeper reaches may be charged with an overabundance of mineral matter and be considered unusable. Distribution of underground waters depend on the character and arrangement of the rocks or the geologic structure that the water can be found within (Gordan, 1913).

There are no anticipated effects to groundwater sources anticipated by either the Preferred Alternative, or the No-Action Alternative.

3.4.4 Wetlands

Wetlands are defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, (and that under normal circumstances do support), a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas (33 CFR 328.3, 8b).



Map 5-Wetland Delineation Map

Using data from the 2014 USACOE wetland studies, there are no designated wetland areas within the project site. There would be no impact to wetlands from the either the Proposed Action or No-Action Alternative.

3.5 HAZARDOUS MATERIALS / WASTE

Based on the 2013 Initial Site Assessment (ISA) related to a nearby headwall project, there is no evidence of contamination or hazardous materials within the proposed project area. Old landfills, fire training areas, disposal areas and abandoned underground storage tanks are a few of the common targets associated with Installation Restoration Program (IRP) sites. At this current time, all IRP sites at Sheppard AFB are closed. This designation indicates that TCEQ agrees with the Air Force that no further remedial action is needed. Based on information gathered from the USEPA Enviromapper website (Appendix B), there are no superfund sites, hazardous waste sites or toxic releases in or adjacent to the proposed project areas.

Activities related to the proposed action that generate hazardous waste will be handled in accordance with Sheppard AFB Hazardous Waste Management Plan. Should hazardous materials be discovered as a result of the proposed action, removal of such materials would comply with all applicable federal, state, and local regulations. Construction waste will be addressed, and those eligible materials will be safely disposed of in accordance with federal, state and local laws. The contractor will be required to make arrangements for transportation and disposal of the project waste.

3.5.1 Tanks/SPCC

The proposed drainage project will potentially involve generator sets (GenSets) located along the airfield for emergency power in support of the Runway Supervisory Unit (RSU)'s. In the event that they are directly in the path of construction activities or transportation of personnel and/or materiel to and from the construction site/zone, GenSets are designed to remain in situ. The GenSet fuel tanks are double walled and considered to be manufactured integral to the structure. Should there be a need for movement of a GenSet unit, the fuel could be drained via petcock, thus ensuring proper pollution prevention. Personnel working around both RSU's and GenSets receive training in Spill Containment/Countermeasures should there be a release during this process. Appropriate Spill Recovery Materials are stored adjacent to each site.

During the proposed Circuit 1 project, the movement of overhead lines to underground installation along 10th Avenue should not impact any Petroleum Oil and Lubricants (POL's) located in that area. All POL's located along the north side of 10th Avenue are used oil tanks that are housed inside of the hangars adjacent to the proposed project area. Used oil tanks in the project area are either double walled rectangular shaped or single walled barrel tanks that are located on a containment pallet. Double wall tanks are considered integral secondary containment and therefore do not require dikes for leak containment. Appropriate spill recovery materials are stored adjacent to each work area and personnel are trained in Spill Containment and/or Countermeasures should there be a release. The Used Oil Tanks are small and designed to be mobile. They can be moved safely and efficiently if the mission warrants such action.

Due to the nature of the proposed action and spill prevention methods in place, there are negligible effects anticipated related to tanks and SPCC. There are no cumulative effects anticipated with regards to tanks/SPCC from the proposed action or No-Action Alternative.

3.6 BIOLOGICAL / NATURAL RESOURCES

The proposed project area includes areas that were previously disturbed from projects completed at an earlier time. Excavation activities will take place in areas that had been disturbed during those construction events.

3.6.1 Flora:

Sheppard AFB contains vegetative grasses such as bermuda (*Cynodon dactylon*), buffalo grass (*Buchloe dactyloides*), Texas wintergrass (*Stipa leucotricha*), Johnson grass (*Sorghum halepense*) and purple three-awn (*Aristida purpurea*) (Table 1). Vegetation of disturbed areas would be in compliance with the Executive Memorandum on Beneficial Landscaping (26 April 1994) and the Executive Order on Invasive Species (EO 13112). Regionally native and non-invasive plants will be used to the extent practical in landscaping and re-vegetation. A review of the Texas Parks and Wildlife Department (TPWD) database shows no known endangered flora species in Wichita County.

Grasses in the Vicinity of Municipal Airport/Runways				
Common Name	Scientific Name	Native	TYPE	BASH Perspective
Barnyard Grass	*Echinocholoa crus-galli*	No	Annual	Worst
Bermuda	Cynodon dactylon	No	Perennial	Best
Blue Grama	*Bouteloua gracilis*	Yes	Perennial	Best
Buffalo Grass	*Bouteloua dactyloides*	Yes	Perennial	Best
Dallis Grass	*Paspalum dilatatumm Poir*	No	Perennial	Worst
Johnson	*Sorghum halepense*	No	Perennial	Worst
Purple Three-awn	*Aristida purpurea*	Yes	Perennial	Best
Perennial Rye	*Lolium perenne*	No	Perennial	Best
Silver Bluestem	*Bothriochola saccharoides*	Yes	Perennial	Fair
Texas Grama	*Bouteloua rigidiseta(Steud.) Hitchc.*	Yes	Perennial	Fair
Texas Wintergrass (Spear Grass)	*Nassella leuotrcha*	Yes	Perennial	Best
Tumble Windmill	*Chloris verticillata Nutt*	Yes	Perennial	Best
White Tridens	*Tridens albescens (Vasey)Woot.& Standl.*	Yes	Perennial	Worst
Old World Bluestems	*Bothrochloa ischaemum spp.*	No	Perennial	Best

Table 2 Flora List

3.6.2 Fauna

Fauna identified on Sheppard AFB that are categorized as Threatened or Endangered are listed below on Table 2.

Common Name	*Scientific Name*	Federal Status	State Status
Bald Eagle	*Haliaeetus leucoephalus*	DL	T
Interior Least Tern	*Sterna antillarum athalassos*	DL	E
Peregrine Falcon	*Falco peregrinus anatum*	DL	T
Whooping Crane	*Grus americana*	E	E
Texas Horned Lizard	*Phrynosoma cornutum*	C	T
Texas Kangaroo Rat	*Dipodomys elator*	C	SOC

Table 3 Threatened and Endangered Species List

Federal: (E): Endangered, (T): Threatened, (PT): Proposed threatened, (C): Candidate, (DL): Delisted, (LE): Listed Endangered

State: (T): Threatened, (E): Endangered, (SOC): Species of Concern

Representative fauna include, but is not limited to the following: Eastern Cottontail (*Sylvilagus floridanus*), Coyote (*Canis latrans*), Bobcat (*Lynx rufus*), Opossum (*Didelphis virginiana*) and White-tailed Deer (Odocoileus virginianus), Red-Tailed Hawk (*Buteo jamaicensis*), Mourning Dove (*Zenaida macroura*), Barn Swallow (*Hirdundo rustica*), Western and Eastern Meadowlark (*Sturnella neglecta/Sturnella magna*), Killdeer (*Chaadrius vociferous*), Horned Lark (*Eremophila alpestris*), Wild Turkey (*Meleagris gallopavo*) , American Kestrel (*Falco sparverius*), common Grackle (*Quiscalus quiscula*), Red-eared Slider (*Trachemys scripta elegans*), Ornate Box Turtle (*Terrapende ornate ornate),* common Snapping Turtle (Chelydra serpentine), Ribbon Snake (*Thamnophis sauritus*) and Bullsnake (*Pituophis catenifer).*

The proposed project area is West and East of an active runway, therefore; the site visit determined that the project area lacked suitable habitat to support the Texas Kangaroo Rat. There are no mesquite communities with dense clay soils located within the project vicinity and no tree are allowed to be developed on the airfield due to safety restrictions.

During a site evaluation of locals adjacent to the proposed project area, the Texas Horned Lizard was observed, primarily near the northern ends of the airfield, and a trend has been identified as the lizard has shown signs of slowly heading south. The site visit determined that the project had some areas of suitable habitat to support the Texas Horned Lizard; however it is believed that the Texas Horned Lizard has not moved that far south due to variation in vegetation.

Based on the site evaluation, operating procedures will need to be addressed to ensure that staging areas for construction crews will not impede the actions of the Texas Horned Lizard and reduce the likelihood of contact during construction process. Equipment shall be staged as far south as possible to prevent interaction of the Horned Lizard in the northern part of the air field. Construction crews shall be informed of what to look for and how to move the Lizard from danger. There are minor anticipated effects to federal and/or state listed species identified on/or near the proposed project area as the habitat could potentially house the Horned Lizard. Minor cumulative effects to threatened or endangered species is anticipated due to implementation of

the Preferred Alternative, though it is expected to be negligible. No cumulative effects to threatened or endangered species is anticipated due to implementation of the No-Action Alternative.

3.6.3 Migratory Bird Treaty Act

Sheppard AFB follows strict procedures to adhere with the Migratory Bird Treaty Act. There are no known species protected under the Migratory Bird Act that would be impacted by implementing the Preferred Alternative. The project area at this time does not have structures containing migratory birds or indications of nesting migratory birds. Preventative measures will be taken to avoid the taking of migratory birds and their occupied nests, eggs or young in accordance with the Migratory Bird Treaty Act through phasing of work.

Actions in the proposed project area due to the Preferred Alternative or the No-Action Alternative are expected to have negligible effects on flora and fauna due to migratory and adaptive behavior.

Construction activities associated with the Preferred Alternative would not have significant impacts on natural resources or energy development.

3.7 CULTURAL RESOURCES

Surveys evaluating historic buildings, structures and landscapes at Sheppard AFB were conducted in 1993 and 2002. In addition Sheppard AFB completed an Inventory and Assessment of Select Building and Structures (dating through 1976) in June 2012. No buildings were eligible for the National Register of Historic Places (NRHP). It is unknown if there are cultural resources located at the proposed site, adjacent to or in the vicinity of the proposed project area due to the lack of test plots or surveys. Observations of existing developed areas and ongoing construction-related activities indicated that there was an extremely low probability of any intact cultural deposits within Sheppard AFB boundaries, however precautions should be taken during excavation in areas previously undeveloped. Even though the probability of encountering artifacts is low, the potential is always present. Prior to any ground disturbing activities, construction crews should be briefed on procedures related to the discovery of archaeological materials, including the need to halt work immediately in the area where archaeological materials are found. Additionally, personnel should be made aware of potential penalties, both state and federal, for non-compliance should such materials be uncovered and proper handling not be implemented. Archaeological materials would include such things as:

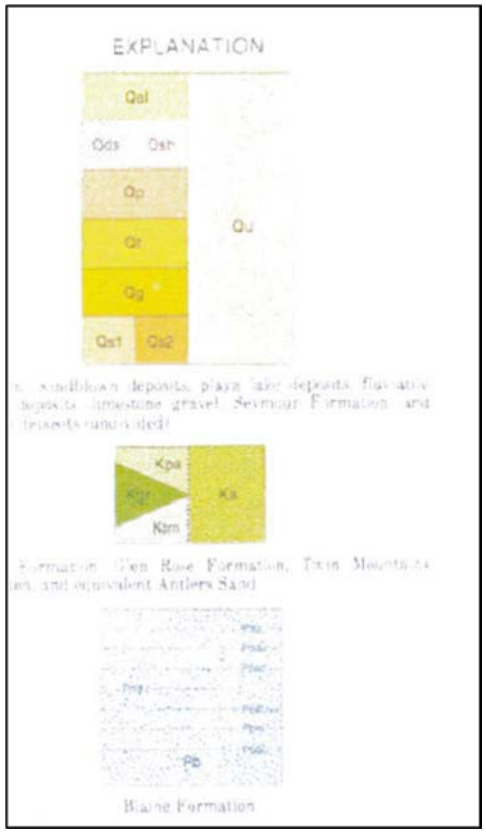
- accumulations of broken (or whole) pottery vessels
- stone tools, such as arrowheads
- sharp flakes that could have served as knives
- scraping or grinding implements (manos or metates)
- bones
- charcoal stains, possibly with broken rock fragments
- rock or adobe concentrations suggestive of walls

Should such materials be found in the proposed project area, the Cultural Resource Manager and applicable Environmental Staff should be contacted immediately. If work in the proposed project area is contracted, language regarding cultural resource management should be included in the construction contract or delivery order. Due to the aforementioned, it is believed that there will be negligible impacts to cultural resources from either the Preferred Alternative or the No-Action Alternative. No cumulative effects are anticipated from the temporary activities associated with the proposed action.

3.8 EARTH RESOURCES

3.8.1 Geology

The majority of the strata found in Sheppard AFB are Carboniferous and Permian in age and have an eastward slope. Exposed rocks in Wichita County, where Sheppard AFB is located, contains predominantly Permian aged rocks. The Permian strata include those formations found within the Cisco Group. The Cisco Group include red clays, shales, and sandstones. The shales are generally sandy and are comprised of ferric material. Some areas in Wichita County contain limestones at higher elevations and appear in bluff regions of the county. These limestones are thin and nodular. In the valley of the Wichita River deposits of Quaternary alluvial sands and gravels have been identified. These deposits range in thickness from 20-30 feet. The alluvial deposits are believed to be Tertiary in age (map 6).



Map 6 Geology of Sheppard AFB

3.8.2 Soils

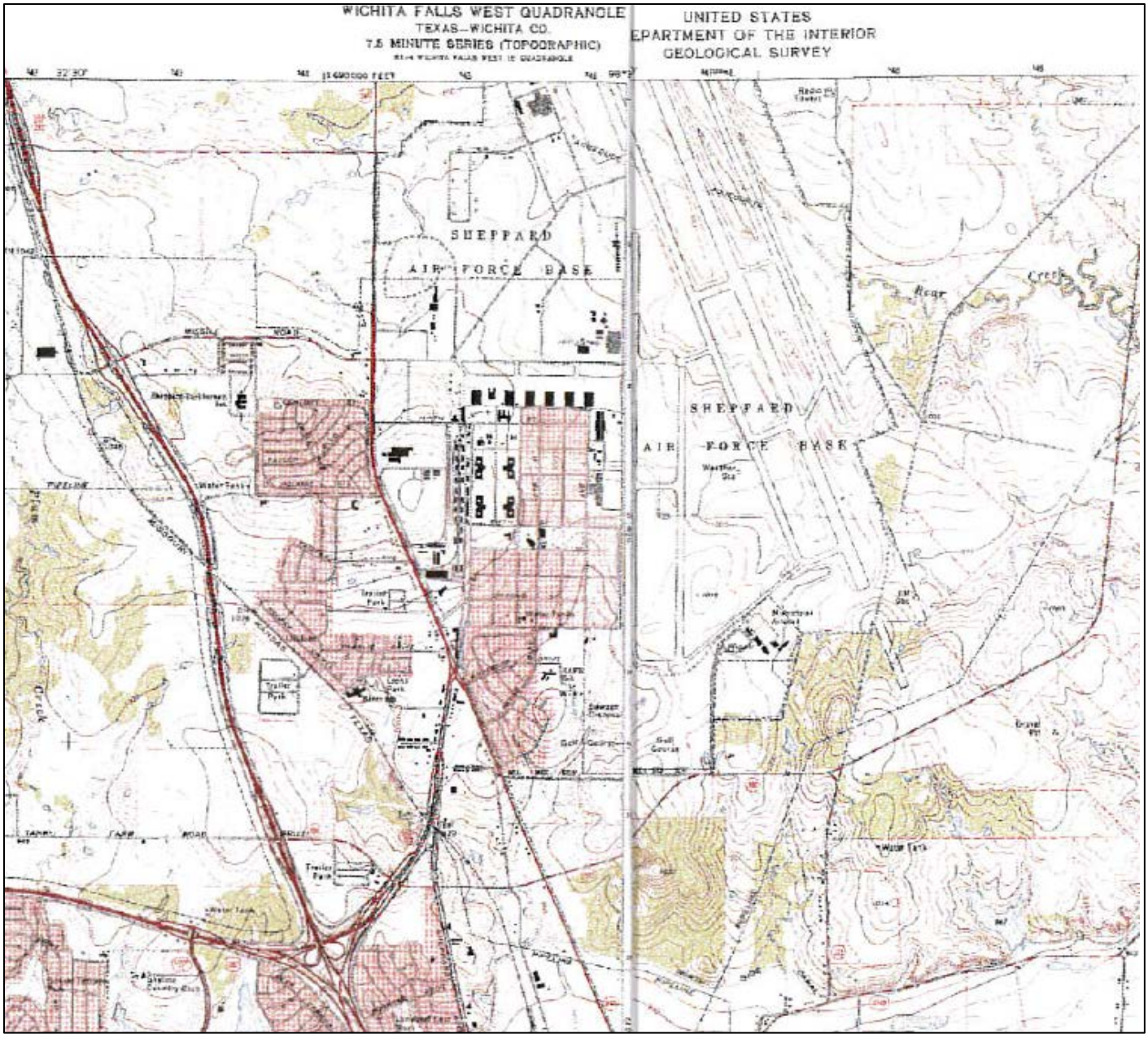
Sheppard AFB is located within various soil series. According to the United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS), the following soils have been identified: Wheatwood and Port soils, Blue grove loam, Blue grove-Urban complex, Deandale silt loam, Frankirk loam, Kamay silt loam, Jolly fine sandy loam, and Rotan loam (map 7). As the names imply, the majority of the soils are loamy clay soils that are well drained and tend to be found in plains areas. These soils are generally susceptible to wind and water erosional activities. In order to prevent additional soil erosion, native plant species should be used in the extent practicable in landscaping and re-vegetation activities upon completion of construction projects.

Map Unit Symbol	Map Unit Name
Aw	Wheatwood and Port soils, frequently flooded
BeB	Bluegrove loam, 1 to 3 percent slopes
BuB	Bluegrove-Urban land complex, 1 to 3 percent slopes
DaA	Deandale silt loam, 0 to 1 percent slopes
DaB	Deandale silt loam, 1 to 3 percent slopes
DbA	Deandale silt loam, loamy substratum, 0 to 1 percent sl opes
FrB	Frankirk loam, 1 to 3 percent slopes
KaB	Kamay silt loam, 1 to 3 percent slopes
KcB	Kamay-Urban land complex, 0 to 3 percent slopes
ObC	Jolly fine sandy loam, 1 to 5 percent slopes
Ua	Urban land
VcB	Vernon clay loam, 1 to 3 percent slopes
VcC	Vernon clay loam, 3 to 5 percent slopes
W	Water
WnC	Winters loam, 3 to 5 percent slopes

Map 7 Soil Survey Map of Sheppard AFB

3.8.3 Topography

Sheppard AFB is in a region that gently slopes eastward and is dissected by many systems of drainage. It is in an elevation of approximately 1,000-1,600 feet above sea level. Most of the land is characterized as semi-improved or improved.(Map 8)



Map 8 Topographic Map of Sheppard AFB

3.9 OTHER NEPA CONSIDERATIONS

3.9.1 Unavoidable Adverse Effects

This EA identifies any unavoidable adverse impacts that would be required to implement the Proposed Action and the significance of the potential impacts to resources and issues. Title 40 of the *Code of Federal Regulations* §1508.27 specifies that a determination of significance requires consideration of context and intensity

Unavoidable short-term adverse impacts associated with implementing the Proposed Action would include: temporary erosion and sedimentation from soil disturbance, a temporary increase in fugitive dust and air emissions during construction, intermittent noise, and minor alterations to airfield operations. However, these effects are considered minor and would be confined to the immediate area. Use of environmental controls and implementing such controls required in permits and approvals obtained would minimize these potential impacts.

For the Proposed Action to be accomplished, these impacts would occur. The action is required to ensure safe airfield operations, reduce safety hazards, and maintain the 80 FTW mission in accordance with FAA regulations and Air Force guidance.

No other alternatives would provide the engineering solution to meet the safety standards for this mission.

4.0 LIST OF PREPARERS

This EA has been prepared under the direction of the Air Force Civil Engineer Center, USAF, and Sheppard AFB.

The individuals that contributed to the preparation of this EA are listed below.

Table 5-1. List of Preparers

Name	Organization	Address	Phone Number
Jennifer Nader	82 CES/CEIV	237 9th Street Sheppard AFB, TX 76311	940-676-2415
Leslie Peña	82 CES/CEIV	237 9th Street Sheppard AFB, TX 76311	940-676-7481
Andy Wallander	82 CES/CEIV	237 9th Street Sheppard AFB, TX 76311	940-676-5719

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5.0 PERSONS AND AGENCIES CONSULTED/COORDINATED

The following Persons and Agencies were contacted in the preparation of this EA

Table 6-1. Persons and Agencies Consulted/Coordinated

Agencies	
Ms. Debra Bills Field Supervisor U.S. Fish and Wildlife Service Ecological Services Field Office -Arlington 2005 NE Green Oaks Blvd., Suite 140 Arlington Texas	Mr. Brent Boydston Attorney Advisor 317 F Ave Sheppard AFB, TX 76311
Ms. Denise Francis Director, State Grants Team Governor's Office of Budget and Planning P.O. Box 12428 Austin TX, 78711	Ms. Elizabeth McKeefer, CAPM NEPA Coordinator, MC122 Texas Commission on Environmental Quality P.O. Box 13087 Austin TX 78711
Mr. Mike Robb Project Reviewer Central and West Texas Military Projects Division of Architecture Texas Historical Commission P.O. Box 12276 Austin TX, 78711	Mr. Russell Schreiber Director of Public Works 1300 7th St. Room 402 Wichita Falls, TX 76301
Ms. Julie Wicker Texas Parks and Wildlife Department Wildlife Division-Habitat Assessment Program 4200 Smith School Road Austin TX, 78744	
Tribal Agencies	
Mr. Jim Aterberry Tribal Historic Preservation Officer Comanche Nation #6 Southwest D Ave, Suite C Lawton, OK 73502	Mr. Wallace Coffey Chairman Comanche Nation P.O. Box 908 Lawton, OK 73501
Mr. Brian Stillwell Environmental Program Director Comanche Nation 8527 NW Madische Rd. Lawton, OK 73507	Mr. Juan Garza Jr. Chairman Kickapoo Traditional Tribe of Texas 162 Chick Kazen Eagle Pass, TX 78852

Mr. Antonio Garza Environmental Program Kickapoo Traditional Tribe of Texas 162 Chick Kazen Eagle Pass, TX 78852	Mr. Jeff Houser Chairman Fort Sill Apache Tribe of Oklahoma Rt. 2, Box 121 Apache, OK 73006
Ms. Jennifer Heminokeky EPA Director Fort Sill Apache Tribe of Oklahoma 43187 Us Hwy 281 Apache OK, 73006	Ms. Terry Parton President Wichita and Affiliated Tribes P.O. Box 729 Anadarko, OK 73005
Mr. Gary McAdams Environmental Program Wichita and Affiliated Tribes P.O. Box 729 Anadarko, OK 73005	Mr. Don L. Patterson President Tonkawa Tribe of Indians of Oklahoma 1 Rush Buffalo Rd. Tonkawa, OK 74653-4449
Ms. Kellie Poolaw Tribal Historic Preservation Officer Kiowa Indian Tribe of Oklahoma P.O. Box 50 Carnegie, OK 73015	Mr. Ronald D. Twohatchet Chairman Kiowa Indian Tribe of Oklahoma P.O. Box 30 Carnegie, OK 73015

6.0 REFERENCES

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APPENDIX A

Interagency/Intergovernmental Coordination and Public Participation

Kiowa Tribe of Oklahoma
Office of Historic Preservation
P.O. Box 50
100 Kiowa Way
Carnegie, OK 73015

August 23, 2016

Leslie Pena
NEPA Program Manager
82 CES/CEIV
231 9th Avenue
Sheppard AFB, TX 76311

RE: Section 106 Consultation and Review for proposed Environmental Assessment and Floodplain Management repairs to base infrastructure;

Dear Ms. Pena,

The Kiowa Tribe Office of Historic Preservation has received the information and materials requested for our Section 106 Review and Consultation. Section 106 of the National Historic Preservation Act of 1966 (NHPA), and 36 CFR Part 800 requires consultation with the Kiowa Tribe.

Given the information provided, you are hereby notified that the proposal project location should have minimal potential to adversely affect any known Archaeological, Historical, or Sacred Kiowa sites. Therefore, in accordance with 36 CFR 800.4(d) (1), you may proceed with your proposed project. However, please be advised undiscovered properties may be encountered and must be immediately reported to the Kiowa Tribe Office of Historic Preservation under both the NHPA and NAGPRA regulations.

This information is provided to assist you in complying with 36 CFR Part 800 for Section 106 Consultation procedures. Please retain this correspondence to show compliance. Should you have any questions, please do not hesitate to contact me at kellie@tribaladminservices.org. Thank you for your time and consideration.

Sincerely,

Kellie J. Poolaw
Acting Tribal Historic Preservation Officer (THPO)

Kellie J. Poolaw
Acting Tribal Historic Preservation Officer (THPO)
Phone: (405) 435-1650 ***kellie@tribaladminservices.org*** ***Complex: (580) 654-2300***

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 22, 2016

Leslie Peña
Department of the Air Force
82 CES/PAE-DS2/CEIV
231 9th Avenue
Sheppard AFB, Texas 76311
Via: leslie.pena.ctr@us.af.mil

Re: Revised TCEQ NEPA Request #2016-123, Replace Existing Airfield Drainage System, City of San Antonio, Wichita County

Dear Ms. Pena:

The Texas Commission on Environmental Quality (TCEQ) has reviewed the above-referenced project and offers the following comments:

A review of the project for general conformity impact in accordance with 40 CFR Part 93 indicates that the proposed action is located in Wichita County, which is currently unclassified or in attainment of the National Ambient Air Quality Standards for all six criteria air pollutants. Therefore, general conformity rules do not apply.

We recommend the environmental assessment address actions that will be taken to prevent surface and groundwater contamination.

Any debris or waste disposal should be at an appropriately authorized disposal facility.

Thank you for the opportunity to review this project. If you have any questions, please contact the agency NEPA Coordinator, at (512) 239-3500 or NEPA@tceq.texas.gov.

Sincerely,

Mark Harmon

Mark Harmon
Division Director
Intergovernmental Relations

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Anna B. Galo
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Jeanne W. Latimer
San Antonio

James H. Lee
Houston

S. Reed Morian
Houston

Dick Scott
Wimberley

Kelcy L. Warren
Dallas

Lee M. Bass
Chairman-Emeritus
Fort Worth

Carter P. Smith
Executive Director

July 26, 2016

Mr. Mark Mc Burnett
Base Civil Engineer
82 CES/CL
149 Hart St, Ste 8
Sheppard AFB, TX 76311

RE: Environmental Assessment for replacement of airfield drainage systems and repairs to airfield lighting systems at Sheppard Air Force Base, Texas

Dear Mr. Mc Burnett:

Texas Parks and Wildlife Department (TPWD) has received the request for input regarding the proposed project referenced above. TPWD staff has reviewed the information provided and offers the following comments and recommendations concerning this project.

TPWD Wildlife Habitat Assessment Program is now accepting projects through electronic submittal. Future project review requests can be submitted to WHAB@tpwd.texas.gov. If submitting requests electronically, please include geographic location files when available (e.g. GIS shape file, .kmz, etc.).

Please be aware that a written response to a TPWD recommendation or informational comment received by a state governmental agency may be required by state law. For further guidance, see the Texas Parks and Wildlife Code, Section 12.0011, which can be found online at http://www.statutes.legis.state.tx.us/Docs/PW/htm/PW.12.htm#12.0011. For tracking purposes, please refer to TPWD project number 36835 in any return correspondence regarding this project.

Project Description

Sheppard Air Force Base (SAFB) is preparing an Environmental Assessment for the replacement of airfield drainage systems and repairs to airfield lighting systems. Drainage system replacement includes 28,500- linear feet of metal drainage pipe. Repairs to the airfield lighting system includes replacement of the following: primary and secondary electrical distribution lines, all

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.texas.gov

associated appurtenances, pad mounted transformers, street lights, grounding components, control cables, regulators, and the main airfield utility vault.

Federal Laws

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits taking, attempting to take, capturing, killing, selling/purchasing, possessing, transporting, and importing of migratory birds, their eggs, parts and nests, except when specifically authorized by the Department of the Interior. This protection applies to most native bird species, including ground nesting species. The U.S. Fish and Wildlife Service (USFWS) Migratory Bird Office can be contacted at (505) 248-7882 for more information on potential impacts to migratory birds.

> **Recommendation:** If migratory bird species are found nesting on or adjacent to the project area, they must be dealt with in a manner consistent with the MBTA. TPWD recommends excluding vegetation clearing activities during the general bird nesting season, March through August, to avoid adverse impacts to this group. If clearing vegetation during the migratory bird nesting season is unavoidable, TPWD recommends SAFB survey the area proposed for disturbance to ensure that no nests with eggs or young will be disturbed by operations. Any vegetation (trees, shrubs, and grasses) where occupied nests are located should not be disturbed until the eggs have hatched and the young have fledged.

The potential exists for birds to collide with power lines and associated guy wires and static lines. Bird fatalities can also occur due to electrocution if perching birds simultaneously make contact with energized and grounded structures.

> **Recommendation:** For additional information, please see the guidelines published by USFWS and the Avian Power Lines Interaction Committee (APLIC) in the updated guidance document Reducing Avian Collisions with Power Lines: State of the Art in 2012. This manual, released on December 20, 2012, identifies best practices and provides specific guidance to help electric utilities and cooperatives reduce bird collisions with power lines. A companion document, Suggested Practices for Avian Protection on Power Lines, was published by APLIC and the USFWS in

2006. For more information on both documents, please visit www.aplic.org.

State Laws

Parks and Wildlife Code, Section 68.015

Section 68.015 of the Parks and Wildlife Code regulates state-listed species. Please note that there is no provision for the capture, trap, take, or kill (incidental or otherwise) of state-listed species. A copy of *TPWD Guidelines for Protection of State-Listed Species*, which includes a list of penalties for take of species, can be found on-line at http://tpwd.texas.gov/huntwild/wild/wildlife_diversity/habitat_assessment/media/tpwd_statelisted_species.pdf. State-listed species may only be handled by persons with appropriate authorization from the TPWD Wildlife Permits Office. For more information, please contact the Wildlife Permits Office at (512) 389-4647.

The state-listed threatened Texas kangaroo rat (*Dipodomys elator*) has been documented less than one mile from the project area in the Texas Natural Diversity Database (TXNDD).

Suitable habitat for the Texas kangaroo rat (TKR) may occur in the project area. TPWD notes that in January 2010, this species was petitioned for federal listing under the Endangered Species Act (ESA). The petition can be found at http://www.wildearthguardians.org/site/DocServer/listing_petition_tx_krat_1.11.10.pdf?docID=616&AddInterest=1059. On March 8, 2011, the USFWS issued a 90-day finding on the petition. Based on their review, the USFWS found that the petition presents substantial scientific or commercial information indicating that listing the TKR may be warranted. The USFWS has therefore initiated a status review to determine if listing is in fact warranted. Based on this status review, the USFWS will issue a 12-month finding.

Recommendation: TPWD recommends the SAFB avoid disturbing suitable TKR habitat where possible. Individual TKRs on the project site should be allowed to safely leave the project site or be relocated by a permitted individual to an area that would not be disturbed by

construction. The TKR is highly nocturnal, and relocation may involve live trapping.

TPWD recommends the SAFB monitor the listing status of the TKR during project planning, construction, and maintenance. If this species becomes federally listed under the ESA, coordination with the USFWS may be required for project impacts.

The SAFB Integrated Natural Resource Management Plan states that the state-listed threatened Texas horned lizard (*Phrynosoma cornutum*) has been observed on SAFB.

If present in the project area, the Texas horned lizard could be impacted by ground disturbing construction activities. Horned lizards may hibernate on-site in the loose soils a few inches below ground during the cool months from September/October to March/April. Construction in these areas could harm hibernating lizards. Horned lizards are active above ground when temperatures exceed 75 degrees Fahrenheit. If horned lizards (nesting, gravid females, newborn young, lethargic from cool temperatures or hibernation) cannot move away from noise and approaching construction equipment in time, they could be affected by construction activities.

Recommendation: TPWD recommends that a pre-construction survey be conducted to determine if horned lizards are present on the project site or directly adjacent to the construction area. A useful indication that the Texas horned lizard may occupy the site is the presence of harvester ant (*Pogonomyrmex barbatus*) nests since harvester ants are the primary food source of horned lizards. The survey should be performed during the warm months of the year when the horned lizards are active. Fact sheets, including survey protocols and photos of Texas horned lizard can be found on-line at http://tpwd.texas.gov/huntwild/wild/wildlife_diversity/texas_nature_trackers/horned_lizard/facts/ and http://tpwd.texas.gov/huntwild/wild/species/thlizard/.

If horned lizards are found on site, TPWD recommends contacting this office to develop plans to relocate them, particularly if there is likelihood that they would be harmed by project activities. To minimize impacts to the Texas horned lizard, TPWD recommends the use of the best management practices (BMPs) described in the *Texas Horned Lizard*

Watch – Management and Monitoring Packet which can be found on-line at http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_w7000_0038.pdf and *Texas Tortoise Best Management Practices* which can be found at http://tpwd.texas.gov/huntwild/wild/wildlife_diversity/habitat_assessment/media/texas_tortoise_bmps.pdf Please note that Texas tortoise BMPs are applicable to the Texas horned lizard.

Rare Species

In addition to state and federally-protected species, TPWD tracks special features, natural communities, and rare species that are not listed as threatened or endangered. TPWD actively promotes their conservation and considers it important to evaluate and, if necessary, minimize impacts to rare species and their habitat to reduce the likelihood of endangerment and preclude the need to list. These species and communities are tracked in the Texas Natural Diversity Database (TXNDD). The most current and accurate TXNDD data can be requested at: TexasNatural.DiversityDatabase@tpwd.texas.gov.

In a recent check of the TXNDD, no records of rare, threatened, or endangered species, other than the previously noted Texas kangaroo rat occurrence, have been documented within 1.5 miles of the project area.

Please note that the absence of TXNDD information in an area does not imply that a species is absent from that area. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and cannot be used as presence/absence data. This information cannot be substituted for on-the-ground surveys.

Recommendation: Please review the TPWD county list for Wichita County, as rare species could be present, depending upon habitat availability. These lists are available online at http://tpwd.texas.gov/gis/rtest/. If during construction, the project area is found to contain rare species, natural plant communities, or special

features, TPWD recommends that precautions be taken to avoid impacts to them. The USFWS should be contacted for species occurrence data, guidance, permitting, survey protocols, and mitigation for federally-listed species. For the USFWS threatened and endangered species lists by county, please visit http://ecos.fws.gov/ipac/.

Determining the actual presence of a species in a given area depends on many variables including daily and seasonal activity cycles, environmental activity cues, preferred habitat, transiency and population density (both wildlife and human). The absence of a species can be demonstrated only with great difficulty and then only with repeated negative observations, taking into account all the variable factors contributing to the lack of detectable presence. If encountered during construction, measures should be taken to avoid impacting wildlife.

TPWD strives to respond to requests for project review within a 45 day comment period. Responses may be delayed due to workload and lack of staff. Failure to meet the 45 day review timeframe does not constitute a concurrence from TPWD that the proposed project will not adversely impact fish and wildlife resources.

TPWD appreciates the opportunity to provide comments on this EA. Please contact me at (806) 761-4936 or Richard.Hanson@tpwd.texas.gov if you have any questions or need additional assistance.

Sincerely,

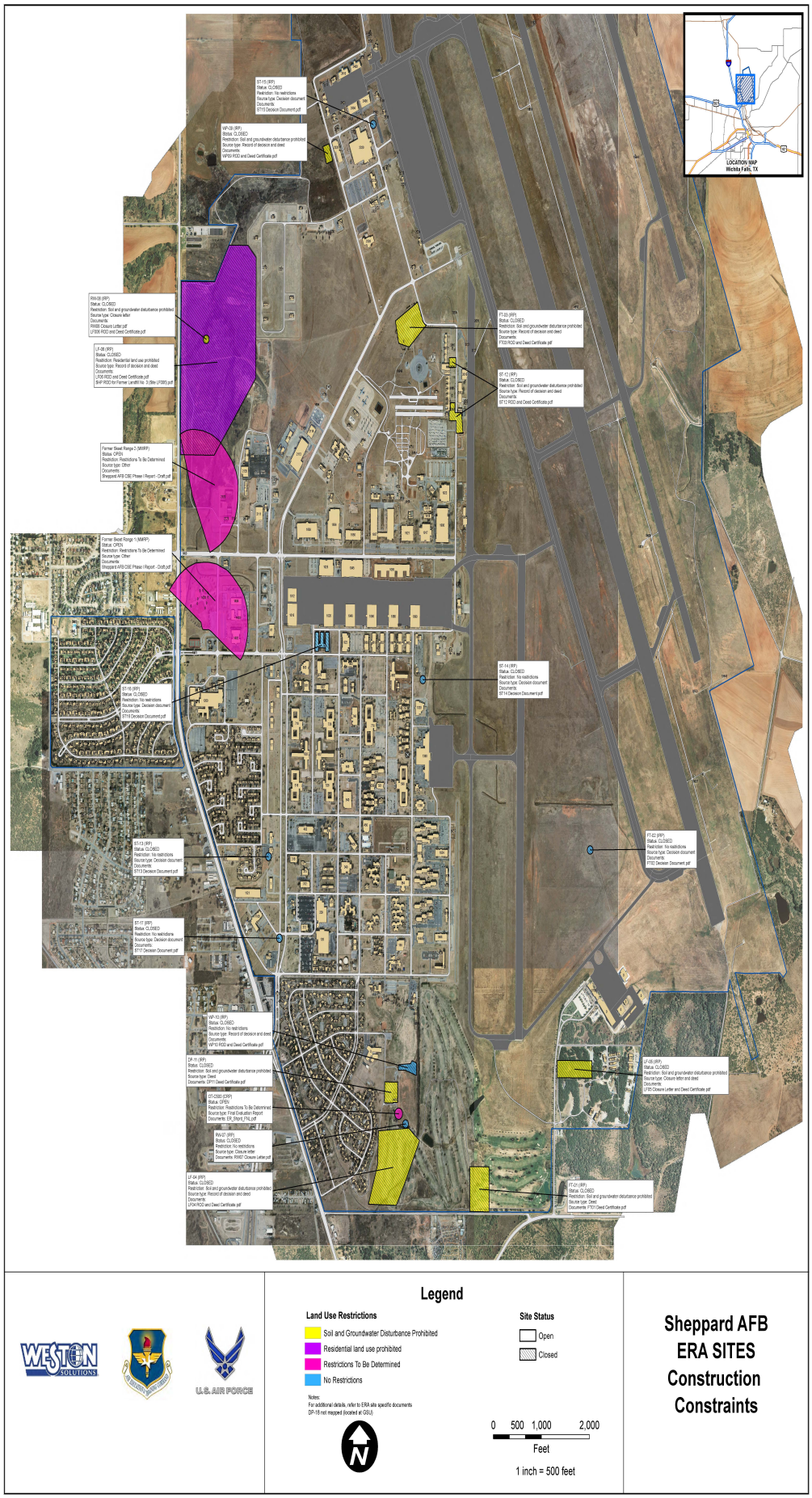
Rick Hanson

Rick Hanson
Wildlife Habitat Assessment Program
Wildlife Division

RH: gg.ERCS-13148

APPENDIX B

Environmental Restoration Data


LOCATION MAP
Wichita Falls, TX
Legend
Land Use Restrictions
Soil and Groundwater Disturbance Prohibited
Residential land use prohibited
Restrictions To Be Determined
No Restrictions
Site Status
Open
Closed
Notes:
For additional details, refer to ERA site specific documents
DP-16 not mapped (located at GSU)
N
0 500 1,000 2,000
Feet
1 inch = 500 feet
WESTON SOLUTIONS
U.S. AIR FORCE
Sheppard AFB
ERA SITES
Construction
Constraints

APPENDIX C

Geotechnical Study

Sheppard AFB, TX
Airfield Geotechnical Study

FA3002-07-D-0016-D401
VNVP 15-8004
May 13, 2016

PRESENTED TO

82d Contracting Squadron/LGCB
206 J Ave Bldg. 1662
Sheppard AFB, TX 76311-2746

PRESENTED BY

Tetra Tech
700 N. St Mary's St
San Antonio, TX 78205

P +1-210-299-7900
F +1-210-226-8497
tetratech.com

Prepared by:

Jeff Karafa — 13 May 2016
Civil Engineer

Reviewed by:

Kraig A. Evenson — 13 May 2016
VP/Sr Project Manager

Authorized by:

Troy Dorman, PhD — 13 May 2016
Sr. Engineer/Manager

EXECUTIVE SUMMARY

Sheppard Air Force Base (SAFB) is experiencing surface and sub-surface drainage problems within the airfield footprint of the base. The drainage issues have manifested themselves in various manners since the airfield was first constructed in the 1950s and have expanded in subsequent years. These issues are affecting the structural integrity of the airfield pavements and the existing drainage system. Tetra Tech's team investigated the extent and cause of all drainage problems within the northern section of the airfield and will make recommendations in this report to resolve these drainage issues. Field activities conducted as part of this study included the following:

a. Closed Circuit TV examination of 10,000 linear feet (LF) of Bear Creek storm drains

b. Soil research of in-situ conditions throughout the airfield by drilling 100 soil borings

c. Comprehensive survey of all soil boring locations as well as existing storm drainage networks within the airfield

d. Airfield as-built plan review to determine existing airfield drainage systems and how each component contributes to the overall airfield drainage network

e. Storm drain network modeling to determine/validate current capacity of the airfield drainage network

All field activities were concluded by the end of January 2016. The preliminary issues discovered during field activities are summarized into the below categories:

a. Operations & Maintenance (O&M). Lack of required Operations & Maintenance activities on the entire airfield storm drain network to include catch basin inlets/outfalls

b. Installation/Construction Methods. Poor installation/construction methods of the middle section of the Bear Creek Drainage system

c. Airfield Underdrain Network. Lack of underdrains at various locations within the airfield pavement network in addition to a lack of maintenance of existing underdrain systems limits the effectiveness of this network

This draft drainage study will provide the background details along with recommended solutions in order to rectify the drainage network issues.

CONTENTS

ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
SAFB	Sheppard Air Force Base
CAD	Computer-Aided Drafting
LF	Linear Feet
PVC	Polyvinyl Chloride
UFC	Unified Facilities Criteria
CMP	Corrugated Metal Pipe
TOC	Time of Concentration
NRCS	National Resources Conservation Service
USDA	US Dept of Agriculture
HSG	Hydrologic Soil Group
SSA	Storm and Sanitary Analysis

1.0 INTRODUCTION

1.1 SUBSURFACE DRAINAGE SYSTEM

The purpose of a subsurface drainage (underdrain) system is to remove subsurface water from underneath pavement sections. Subsurface water causes problems in pavement surfaces as it is known to weaken or erode materials found beneath the pavement, thereby undermining its surface structure. In rigid pavements, water trapped between the impermeable pavement surface and a natural impermeable layer below the subgrade will move when pressure is applied from surface loads. This movement of subsurface water is known as pumping and can cause voids in the material below the pavement surface. The weakening of base, subbase or subgrade material by subsurface water is one of the main causes of flexible pavement failures (U.S. Army Corps of Engineers, 2004).

Tetra Tech's review indicates inadequate subsurface drainage conditions exist at Sheppard Air Force Base (SAFB). This report will discuss the existing underdrain system, the condition of the system, data analysis and modeling of the existing underdrain system along with prioritized recommendations for improving the pavement performance throughout the airfield via subsurface drainage improvements.

1.2 STORMWATER DRAINAGE SYSTEM

Sheppard AFB is situated near the confluence of several local tributaries of Bear Creek (Exhibit 1). The main stem of Bear Creek that completely crosses the airfield from east to west is mapped as a FEMA floodplain and has been previously studied by both FEMA and the USACE. The surface drainage study under this contract focused on the airfield north of Taxiway Golf where localized drainage enters onsite storm drain inlets and is conveyed through underground storm drain systems.

Most of the storm drain systems in the study area were built more than 20 years ago. However, the largest system (Bear Creek) was built within the last 10-years and is experiencing significant soil loss along the alignment. The goals of the stormwater study were to determine if the storm drain systems meet current design criteria, what is causing soil loss, and make recommendations on fixing the issues.

2.0 AIRFIELD SUBDRAIN SYSTEM EVALUATION & ANALYSIS

2.1 BACKGROUND -- EXISTING SUBSURFACE DRAINAGE SYSTEM

The location of the existing airfield underdrain network was determined by reviewing as-built drawings provided by the SAFB Civil Engineering squadron. Tetra Tech's detailed review of these drawings led to the conclusion that the SAFB airfield underdrain system is incomplete. According to the as-built plans, Runways "15L/33R" and "15R/33L" along with Taxiways Kilo and Lima do not have underdrain systems. Taxiway Golf does not have an underdrain system in the eastern most section between Runways "15C/33C" and "15L/33R" but does have an underdrain system beneath both shoulders throughout the remainder of the taxiway network. Runway "15C/33C" has a partial underdrain system installed when this runway was originally built in 1966 and was initially designated as Runway "15L/33R." In the mid-1990s, the current Runway "15L/33R" was built, giving Runway "15C/33C" its current designation. Runway "15C/33C" has three (3) separate underdrain systems to include one that drains the entire perimeter of the "15C" overrun. Another system at the "15C" approach end drains both shoulders from the point of the former intersection with Taxiway Hotel southward approximately 1,000 LF. Of note, this system's outlet daylights in the infield east of the runway. A similar system running along both shoulders drains the "33C" approach end starting at the overrun and running northward 1,000 LF. Of note, this system's outlet also daylights in the infield east of the runway. Taxiways Charlie, Echo, and Foxtrot have underdrain systems that run the majority length of the taxiway underneath both shoulders, excluding small portions of Taxiways Charlie and Echo where they are not needed beneath both shoulders. Taxiway Hotel has an underdrain system that runs

along the southern shoulder. The largest underdrain system on the airfield runs along Taxiway Delta. Approximately 9,000 LF of the southern portion of the taxiway has underdrains beneath both shoulders. The remaining 4,000 LF at the northern end of Taxiway Delta has an underdrain beneath the eastern shoulder.

For those runways and taxiways that have an underdrain system, field observations led to the conclusion that many of the systems do not function as intended, particularly those systems which have lateral drains that daylight to infields. The majority of the lateral drainage outfalls indicated on the plans could not be located during field observations and are believed to be buried under accumulated soil and vegetation. Those that were located were in such poor condition that they would not allow the system to drain properly (see Figure 2.1).

Figure 2.1 – Underdrain Outfall near Taxiway Charlie

Another issue identified during site visits was the condition of the underdrain manholes and flushing risers. UFC 3-230-06A specifies that manholes should be spaced no more than 1,000 LF apart, with a flushing riser between each manhole and at the end of the underdrain system (U.S. Army Corps of Engineers, 2004). According to the as-built drawings, several portions of the subsurface drainage system had lengths greater than 1,000 LF but lacked a manhole. Some flushing risers were located during on-site inspections, but many were not. It is believed that several of the manholes and risers have been paved over during re-surfacing projects (see Figure 2.2). This condition prevented Tetra Tech from observing the functionality of the existing underdrain systems and also inhibits required annual maintenance activities needed to ensure proper operation.

Figure 2.2 – Underdrain Riser sealed with concrete

It should be noted that the two taxiways with the most problematic surface pavement, Taxiways Kilo and Lima, lack subsurface drainage systems.

2.2 AIRFIELD SUBDRAIN SYSTEM EVALUATION & ANALYSIS

One hundred (100) soil borings were drilled throughout the SAFB airfield. Only those in the vicinity of the taxiways and runways are relevant to the underdrain systems. In this section, the soil borings nearest to the airfield infrastructure and their relevance to the subsurface drainage systems will be discussed. This section will also address the existing layout of the individual subsurface drainage systems that were identified on as-built drawings of the airfield.

2.2.1 Taxiway Kilo

The eight (8) soil borings taken in the vicinity of Taxiway Kilo were: Borings B1-05, B1-12, B1-13, B1-19, P1-07, P1-11, P1-14 and P1-17. The soil borings along this taxiway all have a soil type of lean or fat clay to a depth of at least 5'. These soils are fine-grained, making them relatively impermeable. These soil borings were taken outside the shoulder of Taxiway Kilo, but the assumption can be made that the soil beneath the subgrade will be similar to those found in the soil borings. This indicates that it is likely subsurface water is present beneath Taxiway Kilo, as it can get trapped between the subgrade and the existing clay layer. This subsurface water is likely the cause of the failing pavement on this taxiway.

2.2.2 Taxiway Lima

The three (3) soil borings taken in the vicinity of Taxiway Lima were: Boring B1-10, B1-11 and B1-16. The results from these soil borings are similar to those found near Taxiway Kilo. Taxiway Lima is also experiencing pavement failure, and, like Taxiway Kilo, the existing conditions make it likely that subsurface water is trapped between the subgrade of the taxiway and the existing clay layer below it. It is believed that the presence of subsurface water is the primary cause of the surface pavement failure for Taxiway Lima.

2.2.3 Taxiway Hotel

The four (4) soil borings taken in the vicinity of Taxiway Hotel were: Boring B1-13, B1-14, B1-15 and B1-20. These borings show the same soil types (lean or fat clay) as those found on Taxiways Kilo and Lima. Groundwater was encountered in Boring B1-14 at a depth of 11'. The concrete pavement on Taxiway Hotel is in fair condition even though there is groundwater present in the vicinity and there is an impervious soil layer beneath the subgrade. It is likely that the improved performance of this taxiway's pavement is due to a properly functioning underdrain system. As shown in Figure 3.1, the subgrade of Taxiway Hotel is drained by a 6" perforated PVC pipe that runs along the southern shoulder. Both ends of the underdrain run toward the center of the taxiway, where it connects to a 48" storm drain pipe which bisects the taxiway. The direct connection to the storm sewer system has allowed the subsurface drainage system to function properly with a minimal amount of maintenance.

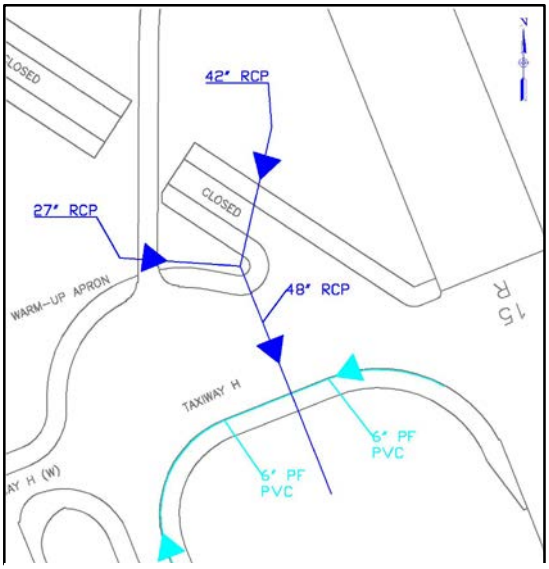


Figure 3.1 – Taxiway Hotel Drainage Structures

2.2.4 Taxiway Delta

Taxiway Delta is a 13,100 LF taxiway that runs parallel to Runway "15R/33L". The seventeen (17) soil borings taken along Taxiway Delta were: Borings B1-21, B1-22, B1-25, B1-28, B1-29, B1-30, B1-31, B1-32, B1-37, B1-38, B1-43, B1-44, B1-58, B1-66, B1-67, B1-71 and B1-75. Due to the observation of water seepage on the shoulders of Taxiway Delta, several borings were taken on the asphalt shoulder. The details for those borings are listed below:

- Boring B1-21: 1" Asphalt, 1" Base, 8' Sandy Lean Clay
- Boring B1-22: 1/2" Asphalt, 4" Base, 13' Lean Clay w/ Sand
- Boring B1-25: 4" Base, 5' Silty Sand w/ Gravel, 3' Lean Clay w/ Sand
- Boring B1-28: 4" Base, 8' Lean Clay w/ Sand
- Boring B1-29: 4 ½" Base, 20' Lean Clay w/ Sand, Groundwater at 15'
- Boring B1-30: 5" Base, 13' Sandy Lean Clay, Groundwater at 13'
- Boring B1-31: 4" Base, 4' Sandy Silty Clay, 4' Lean Clay w/ Sand
- Boring B1-32: 4 ¾" Base, 4' Sandy Lean Clay, 20' Lean Clay w/ Sand, Groundwater at 12'
- Boring B1-38: 1" Asphalt, 6" Base, 6' Sandy Lean Clay (gravel from 3'-6')

The results from the soil borings taken on the asphalt surface of Taxiway Delta show that the average subsurface base is 4" thick and that directly beneath the base course is a layer consisting of lean clay with sand. There are several instances of groundwater found in the borings.

The observed surface seepage on Taxiway Delta indicates that the underdrain system on the taxiway is not functioning properly. Examination of the as-built plans for Taxiway Delta show that the maximum spacing between flushing risers is 400' and that the minimum slope of the underdrain is 0.2%, both of which meet the criteria set forth in UFC 3-230-06A (U.S. Army Corps of Engineers, 2004). However, the criteria for lateral outlet piping that is set forth in UFC 3-230-06A is not met by the subsurface drainage system of Taxiway Delta. Lateral outflow pipes are to have a maximum spacing of 500' and are to be set at a 45° angle from the direction of flow to facilitate cleanout. The lateral outlet pipes should also have a minimum slope of 3% (U.S. Army Corps of Engineers, 2004). These criteria are violated throughout the subsurface drainage system of Taxiway Delta. The UFC also states that manholes should be provided at a minimum interval of 1,000 LF. Despite having several sections of underdrain that are longer than 1,000 LF, the existing underdrain system for Taxiway Delta has no manholes.

In addition, observation of flushing risers filled with concrete (see Figure 2.2) leads to the conclusion that proper maintenance of the system has not been performed. The presence of clays in the subgrade and the lack of maintenance has likely led to the accumulation of debris in the pipes over time, resulting in a loss of functionality of the underdrain system along Taxiway Delta.

Finally, the as-built plans for Taxiway Delta show that there are two sections of Taxiway Delta that daylight into the infield. These sections drain the eastern shoulder of the taxiway north of Taxiway Golf and the western shoulder of the taxiway north of Taxiway Charlie. Field observations of existing underdrain outlets leads to the conclusion that these portions of the system are not functioning properly due to constricted flow at the outlet caused by the presence of soil and vegetation. Based on the reasons described in this section, it is our conclusion that the subsurface drainage system for Taxiway Delta does not function as it was intended.

2.2.5 Taxiway Golf

Taxiway Golf consists of three sections; the western section which connects Taxiway Delta to Runway "15R/33L", the center section which connects Runway "15R/33L" to Runway "15C/33C" and the eastern section which connects Runway "15C/33C" to Runway "15L/33R". According to the as-built drawings, both the western and center portions of Taxiway Golf have underdrain systems that run along both shoulders. Both of these systems drain into the existing storm drain system. The underdrain system for the western portion of the taxiway has a 0.2% grade and the center portion has a 0.5% grade. No underdrain system could be found for the eastern portion of Taxiway Golf.

A total of nine (9) soil borings were taken in the vicinity of Taxiway Golf. Borings B1-60 and B1-61 were taken near the western section. Borings B1-63, B1-64 and B1-65 were taken along the center section while Borings B1-46, B1-47, B1-48 and B1-55 were taken along the eastern section. Borings B1-60 and B1-61 (western section) encountered groundwater at an average depth of 12'. The soil types found in the borings along all sections of Taxiway Golf were lean clays, indicating that an impermeable layer exists beneath the subgrade, necessitating the presence of a functional underdrain system.

The condition of the surface pavement for the western and center sections of Taxiway Golf is fair and the condition of the eastern section is poor. Based on the surface conditions and the review of the as-built plans, it appears that subsurface drainage systems on the western and center portions of the taxiway are functioning as designed. For the eastern portion of the taxiway, it appears that the lack of a subsurface drainage system is causing deterioration of the pavement surface.

2.2.6 Taxiway Foxtrot

Taxiway Foxtrot consists of two sections. The western section connects Taxiway Delta to Runway "15R/33L" and the center section connects Runway "15R/33L" to Runway "15C/33C". The western section of the system drains into the existing storm drain via an 8" non-perforated PVC pipe that runs approximately 2,225 LF through the infield between Taxiway Delta and Runway "15R/33L." The underdrain system for the center section of Taxiway Foxtrot ultimately drains along the western shoulder of Runway "15C/33C" where it flows across the runway and daylights into the infield between Runway "15C/33C" and Runway "15L/33R".

Both systems have potential issues depending upon the conditions found within the pipes. The as-built plans show that the western section has flushing risers that are spaced correctly, however there are no manholes shown. These manholes are required per UFC 3-230-06A (U.S. Army Corps of Engineers, 2004). The lack of manholes will make assessing the efficacy of the underdrain system difficult. Therefore, Tetra Tech believes that the western portion of this system is functioning properly. It should be noted that this assessment is based solely on the condition of the pavement surface. Due to lack of access, recommend this system be checked via the flushing risers to confirm the analysis.

The issue with the center system is that it drains into the infield via an outlet structure which was determined to be obstructed during the site visit. Due to the poor condition of the outfall, it is assumed that the underdrain system in the center section of Taxiway Foxtrot does not function as it was intended. It is Tetra Tech's opinion that if this section of taxiway were to receive proper maintenance (i.e. removal of debris from the outfall and flushing) that the functionality of this system could be restored.

2.2.7 Taxiway Charlie

The western portion of Taxiway Charlie was under construction at the time of the site visit, therefore the most current as-built plans were unavailable. Pre-construction, Taxiway Charlie showed a 4" perforated PVC pipe running along the northern shoulder of the taxiway and draining into the infield approximately 800 LF north of the intersection of Taxiways Charlie and Delta. This outfall was located during the site visit and was determined to be obstructed by soil and vegetation (see Figure 2.1), rendering the system non-functional. Construction plans for Taxiway Charlie should be obtained to determine the configuration of the new underdrain system. No soil borings were taken in the vicinity of the western portion of Taxiway Charlie.

The eastern portion of Taxiway Charlie runs between Runway "15R/33L" and Taxiway Delta. This portion of Taxiway Charlie is drained by a 6" perforated PVC pipe running 800 LF along the northern shoulder of the taxiway. The underdrain continues to run an additional 200 LF along the eastern shoulder of Taxiway Delta where it is drained by an 8" non-perforated PVC pipe that connects to the existing storm drain system in the infield between Taxiway Delta and Runway "15R/33L". One boring, B1-78, was taken in the vicinity of this taxiway. The boring showed that sandy lean clay was present to a depth of 8' and that groundwater was encountered at a depth of 14'. The subsurface drainage system in the eastern portion of the taxiway has the following features: flushing risers at the end and in the center of the taxiway, a 0.2% slope and a lateral outlet pipe set at a 45° angle. All of these features meet the criteria set forth in UFC 3-230-06A (U.S. Army Corps of Engineers, 2004). Based on the proper construction of the subsurface drainage system and the fair condition of the surface pavement, it is believed that the subsurface drainage system in this area is functioning properly.

2.2.8 Taxiways Alpha and Echo

Taxiway Echo has two separate underdrain systems that run along the northernmost shoulder. Both systems connect to an existing storm sewer pipe that intersects the taxiway near Taxiway Delta. The system draining the western section of Taxiway Echo runs for 750 LF without a lateral outlet drain. The rest of the subsurface drainage on Taxiway Echo conforms to the specifications found in UFC 3-230-06A and, when coupled with the fact that the surface pavement is in fair condition, leads to the conclusion that the subsurface drainage on this taxiway is functioning properly. No subsurface drainage system was found for Taxiway Alpha. No soil borings were taken in the vicinity of either taxiway as the surface of the taxiways was determined to be in fair condition.

2.3 AIRFIELD SUBDRAIN FINDINGS & RECOMMENDATIONS

Based on observation of the existing infrastructure and analysis of the data gathered from as-built drawings and soil borings, we recommend the following actions be taken in regards to the airfield underdrain systems. First, it is our recommendation that all underdrain systems be tied into existing storm drain structures whenever possible to reduce the amount of maintenance needed to keep the underdrains operating properly. We also recommend that

a minimum slope of 0.5% be used when installing underdrains, as this slope will increase the velocity of the water in the pipes, thereby reducing sediment build-up and the need for future maintenance (i.e. less frequent flushing). Finally, we recommend that all future subsurface drainage systems installed on the airfield meet the requirements set forth in UFC 3-230-06A.

2.3.1 Priority 1: Install Subsurface Drainage Systems for Taxiways Kilo, Lima, and Golf

It is believed that many of the problems that plague the surface of these two taxiways can be attributed to the lack of underdrain systems. In order for an underdrain system to function properly, it is important that the subgrade allows for sufficient drainage. Prior to the future design of these two underdrain systems, we recommend that soil borings be taken within the pavement surfaces of the shoulders and taxiways to determine the exact composition of the existing subgrade prior to the design of the underdrain system. If it is determined that the subgrade underneath the taxiways meets the standards set forth in UFC 3-230-06A, then the underdrains can be added via construction along the shoulders. However, any areas where pumping is determined to have occurred should be completely reconstructed, as there will be voids in the subgrade that will cause future problems if not corrected. For the purposes of this report, we will assume that no pumping had occurred in order to determine estimated construction costs for the DD1391s to be submitted with the final report. If the subgrade is found to be inadequate during the future design effort, it is recommended that the underdrain system be added during a complete reconstruction of the taxiways. This construction shall include installation of subgrade to a depth determined by the criteria set forth in UFC 3-230-06A. Tetra Tech will not consider this option when preparing the DD1391s in the final report.

2.3.2 Priority 2: Reconstruct the Subsurface Drainage System on Taxiway Delta

There is visual evidence that subsurface water is causing the pavement surface on the northern end of Taxiway Delta to deteriorate. The cause of this surface deterioration is believed to be twofold. First, the layout of the underdrain system does not conform to the standards set forth in UFC 3-230-06A. Second, physical observation of the system shows that several of the flushing risers have been paved over and that the lateral outlet drains which daylight in the infield have been clogged with soil and vegetation. These observations lead to the conclusion that proper maintenance of the system has not been performed, thus causing the system to fail.

Based on the fact that the current system on Taxiway Delta does not conform to UFC 3-230-06A, it is our recommendation that the underdrain system for this taxiway be reconstructed so that the new system fully complies with UFC 3-230-06A. This would include:

- Assessment of subgrade to determine whether it allows for adequate drainage of the surface. If it is determined that the subgrade is deficient, it is recommended that a complete reconstruction of the taxiway be performed with a subgrade that meets the standards specified in UFC 3-230-06A
- Lateral outlet pipes placed at a 45° angle to the direction of flow and with a minimum grade of 3%. These pipes are to have a maximum spacing of 500 LF. Whenever possible, lateral outlet pipes shall be connected to the existing storm drain system. Lateral outlet pipes not connecting to the storm drain system shall have end-walls and reference markers and shall be kept free of debris
- Manholes are to be placed in any section of subsurface drainage longer than 1,000 LF and at all points where underdrain pipes intersect with each other. Maximum spacing between manholes is to be set at 1,000 LF
- Flushing risers shall be placed at all dead ends of the system and in between manholes. These risers shall be kept clean of debris to allow routine flushing of the system to occur

Reconstruction of the subsurface drainage system on Taxiway Delta and routinely performed maintenance of that system should alleviate the surface pavement problems that the airfield is currently experiencing in the area.

2.3.3 Priority 3: Perform Maintenance/Repairs on Existing Subsurface Drainage Infrastructure

Much of the airfield currently has an underdrain system that, were it functioning properly, would provide adequate drainage of the pavement surface. However, due to lack of maintenance, many of the underdrain systems do not function properly. Our recommendation is that for each of the existing subsurface drainage systems that are to remain, the flushing risers and outfalls shown on the as-built drawings (the locations of which have been placed on a CAD file by Tetra Tech) be located in the field and all foreign material (concrete, asphalt, soil, etc.) found in them shall be removed. Upon clearing the debris, the system should be flushed to ensure that it is working properly. Regularly scheduled maintenance should then be adhered to for all subsurface drainage infrastructure to ensure that the system continues to function properly well into the future.

2.3.4 Priority 4: All New Airfield Construction Should Include Construction/Reconstruction of the Subsurface Drainage Infrastructure

All of the runways located within the airfield and one section of Taxiway Golf are currently operating without complete underdrain systems. It is our recommendation that when it is time to re-surface these structures, an analysis is conducted to determine the quality of the subgrade (i.e. soil borings on the surface of the runway/taxiway). If the subgrade of the runway/taxiway is found to provide adequate drainage, subsurface drainage systems should be added via shoulder reconstruction. If the subgrade is found to be deficient, then a complete reconstruction of the runway/taxiway should occur with the addition of subgrade and subsurface drainage systems that meet the criteria specified in UFC 3-230-06A to prevent future problems within the structure.

3.0 STORMWATER DRAINAGE SYSTEM EVALUATION & ANALYSIS

3.1 BACKGROUND

Multiple sources of existing information were referenced for this study. The information was used in scoping, scheduling and performing analysis throughout the study period. The information came from various publicly available sources as well as SAFB personnel.

3.2 HISTORIC AERIAL IMAGERY

The Google Earth application was used to look at the construction phasing and vegetated cover in the area of the Bear Creek Storm Drain system. A series of six images spanning May 2006 to July 2015 were available from a variety of sources and with varying resolution. Screen captures of the images are included below with each image date including an “upstream” image showing the area north of Taxiway G and a downstream image showing the area from Taxiway G to the outfall. Review of the images confirmed that Phase 1 was constructed in late 2005/early 2006, Phase 3 from Taxiway G to the outfall was constructed in spring to summer 2008, and Phase 2 was completed in late 2010/2011.

The imagery also provides a good overview of the vegetation establishment on Phase 2 which has experienced erosion and subsidence. Unlike Phases 1 and 3, much of the Phase 2 project is not covered by native grasses that are typical of the airfield area. Grass establishment was likely impacted by the severe drought that Texas experienced before, during and after construction of Phase 2. However, there is also evidence from the site visit discussed later, that construction practices did not follow design requirements and backfill or topsoil spreading was not completed satisfactorily.

Date: 04/05/2006

Upstream

Downstream

Date: 10/30/2008
Upstream

Downstream

Date: 11/29/2009
Upstream

Downstream

Date: 12/06/2011
Upstream

Downstream

Date: 03/04/2013
Upstream

Downstream

Date: 07/12/2015
Upstream

Downstream

Historical streams and lakes location (Exhibit 1) within the study area were delineated, using ESRI ArcMap, from the following USGS quadrangles:

- Wichita Falls West Quadrangle 1957
- Randlett Quadrangle 1957
- Burkburnett Quadrangle 1957

A storm drain system map of the base was provided by 82nd CES personnel. The map file was an AutoCAD drawing with general alignments, most of the storm drain inlets and junctions and some pipe sizes and materials. The map was used to determine areas to be surveyed, approximate locations for borings and test pits, and limits of hydraulic models.

As-built information of the three phases of the Bear Creek System were provided by SAFB staff. The “as-builts” do not include surveyed grades, inverts or notes from the contractors on construction means and methods. The information was used as a reference and to verify slopes, inlet sizes, and drainage areas determine from field survey and LiDAR derived contour data.

3.3 FIELD INVESTIGATION

A site visit was completed the week of November 30th – Dec 4th, 2016 by Tetra Tech staff and subcontractors. The site visit included field survey, test pit digging, and CCTV recording of Phase 2 of the Bear Creek storm drainage system. In addition, the surface drainage features including streams, ditches, and remnant agricultural grading, inlets and outlets of the storm drain systems within the study area were photographed and observed. Photographs are included in Appendix D and on the attached digital media.

The entire Bear Creek system from the inlet north of Taxiway Lima to the outlet near the east boundary of the base was walked to document surface conditions. At the outlet, significant sediment deposits were observed in front of the two 72-inch pipes at the terminus of the Bear Creek System. In addition, during the initial site visit in September, these pipes were observed to be discharging highly sediment laden stormwater. South of Taxiway Golf, the alignment was 75-90% covered in native grass vegetation. A few small sinkholes and animal burrows were observed but the two 72-inch pipes were not exposed to the surface and there were not any inlets to check the condition of the interior of the pipes. The Phase 2 portion of the Bear Creek system that has been identified as failing was exposed at several large sinkholes (image left). There were sinkholes up to 8 feet deep where large gaps were discovered at pipe joints. The metal bands and gaskets designed to join the pipe sections together were loose and along with soil movements or wasting have created holes up to 10-inches wide at the joints. The bands and pipe have also experienced corrosion likely due to exposure to the elements and high PH conditions. The Phase 1 portion of the Bear Creek system was observed to have good vegetative cover with only a few small erosional areas.

The remaining storm drain systems north of Taxiway Golf that parallel Taxiways Delta, Runway 15L and 15C were also photographed. A few areas of erosion and soil piping were observed around some of the inlets (see left photo below), but in general, the pipes and joints appear to be functioning properly. One existing corrugated metal pipe (CMP) in the infield area between Runways 15L and 15C has severe corrosion. The pipe drains a small area near the demolished taxiway that previously connected 15L and 15C. The pipe is corroded along the crown which is indicative of gaseous deposition and corrosion. The corroded pipe has caused a significant sinkhole that should be repaired when the pipe is replaced. A CMP that originates outside of the study area and terminates at the large outfall structure near the eastern boundary was also observed to be failing structurally. The pipe crown was "reinforced" with multiple 4x4 posts (see right photo below). This likely indicates that the CMP pipe either does not have enough cover per manufacturer recommendations or is not strong enough to carry live loads from vehicles that are driving over the pipe.

3.3.1 Survey

Field survey of boring locations, storm drain inlets, outlets, junctions, culverts, and significant surface drainage features was performed by Lamb-Star Inc. with oversight by Tetra Tech staff. The survey data was collected using a survey grade GPS receivers and tied into the Sheppard AFB survey benchmarks. The data was reviewed by Lamb-Star and Tetra Tech staff and corrected as necessary to meet project requirements. The complete set of survey information is included in Appendix E. The survey information was primarily used to build the hydraulic model described in a later section. The boring survey data was used to analyze the spatial patterns of the geotechnical lab results.

3.3.2 Geotechnical Findings

A geotechnical report prepared by PSI for the 100 borings taken throughout the site is included in Appendix A. In addition to standard soil size analysis, pH, soluble chloride, organic content and soluble sulfate were measured from each soil sample. The soil parameters were mapped in GIS to look for trends and hotspots that could explain corrosion of the Bear Creek system. In general there were no distinct trends except for soluble chloride. Exhibit 2 shows soluble chloride concentrations over 100 ppm with some areas over 800 PPM in the vicinity of the Bear Creek system. High chloride concentrations are known to accelerate corrosion of galvanizing and steel pipe.

Two geologic cross sections were prepared by PSI to evaluate bedding and potential movement of groundwater through contiguous higher permeability layers. Although there was not a complete contiguous layer of sandstone or sandy clay across the site, there are pockets of intermixed high and lower permeability layers that are likely transporting shallow groundwater with significant hydrostatic head across the site. The layers when intercepted by pavement subgrades may be causing localized increases in the groundwater table that can lead to pavement failure and slab heaving.

3.3.3 CCTV Inspection

The CCTV inspection was completed by Acme Utility Inspection Services on December 3rd and 4th, 2015. The inspection focused on Phase 2 of the Bear Creek system where significant sinkholes have occurred and the pipe is exposed. The inspection began at Inlet 1 which is just north of the upstream extent of Bear Creek Phase 2 (Exhibit 3). The inspection looked at the condition of all the inlets, laterals, and main pipes along the Bear Creek system from Inlet 1 down to Taxiway Golf. The videos produced from the CCTV inspection are included separately on two DVD's and as described in Appendix B. The video inspection confirmed that there are multiple issues with the structural integrity of the 72-inch CMP pipes. The pipes have bent, collapsed at the top, sagged to an egg shape or separated at the joints. Many locations in the pipes contained significant deposits of native soil and gravel bedding. The gravel is likely being sucked into the pipes at the broken joints.

3.4 HYDROLOGY AND HYDRAULICS

3.4.1 Introduction

Sheppard Air Force Base (SAFB) is located in the City of Wichita Falls, Wichita County, Texas. The approximate watershed boundaries delineated for this study area are Bailey Road to the north; the NW-SE Runway (6000' X 150') and Taxiway G (E) to the east; Taxiway D, Taxiway J (closed), and Avenue K to the west; and Taxiway G (W) and Taxiway G (Center) to the south. The study area comprises three basins and three storm drain systems: Taxiway D system, NW-SE Instrument system, and the Bear Creek system shown in Exhibit 4. The Taxiway D system runs in a north-west to south-east direction, parallel to Taxiway D. This system conveys stormwater runoff from areas in between the taxiway and the runway into a larger capacity storm drain system, which bypasses the runways area and discharges onto Bear Creek. The NW-SE Instrument system runs in a north-west to south-east direction, parallel to the NW-SE Instrument Runway. This system conveys stormwater runoff from areas in between runways to an outfall discharging into Bear Creek. The Bear Creek system line runs in a north-west to south-east direction, parallel to the NW-SE Runway (10,000' x 150'). The Bear Creek system conveys stormwater runoff from adjacent properties located north of SAFB, in addition to the areas in between runways, to an outfall discharging onto Bear Creek.

The three basins within the study area were divided into different subbasins (Exhibit 5) based on 2-foot contours provided by 82nd CES personnel. These subbasins were delineated using ESRI ArcMap and imported into the Autodesk Storm and Sanitary Analysis (SSA) model. The subbasins represent the drainage area for each of the surveyed storm drain inlets. A summary of each storm drain system input is presented in Appendix F.

3.4.2 Hydrology Overview

The US DOT and FAA's Advisory Circular 150/5320-FD titled Airport Drainage Design recommends a minimum design criteria of the 2-yr storm for drainage systems on DOD airfields. Minimum criteria for airfields per FAA criteria is the 5-yr storm. Tetra Tech selected the 2-yr and 5-yr storms for capacity analysis with the 10-yr storm serving as a check storm for extreme conditions. The three storm drain systems were modeled for the 2-year, 5-year, and 10-year return frequencies for Wichita County, Texas, generated by the Rainfall Designer feature in the SSA model. This feature allows to select the desired location and the software will provide the design rainfall for the specified storm frequency. The rainfall total depths generated by the Rainfall Designer were compared for verification purposes with local values found in the Texas Department of Transportation (TxDOT) Rainfall Intensity-Duration-Frequency Coefficients for Texas Counties spreadsheet (Appendix E). The Rainfall Generator rainfall depth values were used in the model, since these were higher than the TxDOT values. Table 1 presents a summary of the rainfall data used by the SSA model.

Table 1. Rainfall data generated by the Rainfall Designer

Return frequency	Storm distribution	SSA Rainfall Generator (inches)	TxDOT IDF (inches)
2 year	SCS Type II 24-hour	3.65	3.38
5 year		4.80	4.70
10 year		5.60	5.33

The SSA model used the Soil Conservation Service Technical Release 55 (SCS TR-55) method to model basin runoff. The time of concentration (TOC) calculation also used the SCS TR-55 method, where five minutes was the minimum allowable TOC. The model also allows for different TOC calculation methodologies, in this case the summation method was chosen. The summation method considers the sum of the sheet flow, shallow concentrated flow, and channel flow as the total TOC for a basin. Several subbasins in the Bear Creek system had similar characteristics and TOC as other subbasins (reference subbasin), therefore, TOC was manually entered in the model for (labeled as *user-defined TOC override*).

Table 2. Subbasins with a user-defined TOC override

Subbasin (TOC override)	Reference Subbasin
5aa	5g
5bb	5l
5cc	5l
5dd	5l
5e	5d
5ee	5l
5h	5g
5i	5g
5j	5g
5m	5g
5n	5d
5o	5q
5t	5l
5v	5g
5w	5g
5x	5l

The Hydrologic Soil Group (HSG) data was obtained from the Web Soil Service operated by the USDA National Resources Conservation Service (NRCS). In addition, impervious cover areas were delineated with ESRI ArcMap based on SAFB plans and aerial imagery. Appendix E shows the extent of the HSG and impervious areas. The subbasin areas, the impervious cover areas, and the HSG data were analyzed with a geoprocessing tool (union) in ESRI ArcMap. Based on this analysis the Curve Number for each Hydrologic Soil Group is presented in Table 3. The results of the data analysis with ESRI ArcMap are presented in Appendix E.

Table 3. Curve Number selection

Table 2·2c Runoff curve numbers for other agricultural lands [1/]

Cover description — Cover type	Hydrologic condition	Curve numbers for hydrologic soil group — A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2/]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3/]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4/]	48	65	73
Woods—grass combination (orchard or tree farm). [5/]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6/]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4/]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.
2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

Source: Soil Conservation Service Technical Release 55 (SCS TR-55)

3.4.3 General Hydraulic Model Characteristics

The Autodesk Storm and Sanitary Analysis (SSA) software was used to model the existing storm drain system at SAFB. The Taxiway D system, NW-SE Instrument system, and the Bear Creek system were modeled using 2-feet contours provided by SAFB personnel and field survey data. The models are georeferenced which involves defining locations of the pipes and inlets using real world coordinates in the State Plane, Texas North Central coordinate system. Exhibit 5 shows the SSA model configuration for the study area. The information used to define the SSA model was obtained from a SAFB geodatabase containing the location of the storm drain pipes and inlets. Also, this geodatabase information was complemented with field survey data. The complete set of information was imported into the SSA model.

The inlets in the study area were modeled as a *median and ditch inlet* type. The invert and rim elevations for these inlets were entered according to the field survey information. Ponding at nodes was modeled as a surcharge elevation over the inlet, estimated as the difference between the rim elevation and a spill over elevation. This spill over elevation is the contour at which runoff drains into the downstream inlet, after ponding upstream. Inlets modeled using this approach had significant ponding potential due to their locations within the study area. The ponding area information is presented in Appendix E. The remaining inlets were modeled with an approach where the ponding depth was based on the 2-foot contours and as-built information provided by SAFB. The information obtained from these contours and as-builts was used to adjust the *channel ditch specifications* at each inlet to determine the sensitivity of these parameters. Then the longitudinal slope of the inlet was modified to match the ponding depth based on the contour data and as-builts.

The model used the Kinematic Wave method for flow routing within a channel or pipe. The bypass link routing between inlets assumed a triangular open channel section with a 50-ft top, one foot depth, n value of 0.045, and inlet and entrance losses value of 0.1. Pipes under pressurized flow used the Hazen-Williams equation. The exit/bend loss coefficients used for each model were selected from standard tables

3.4.4 Unique Characteristics for Each Model

Each watershed presented a few unique situations that did not follow the standard characteristics described above. The model inputs were adjusted as described below to best model the particular configurations.

Taxiway D

- The main storm drain pipe and laterals are made of corrugated metal pipe (CMP), which Manning's roughness (n) value ranges from 0.020 to 0.030. Since this CMP is old and in questionable condition an n value of 0.025 was assumed
- This storm drain system discharges into a larger capacity storm drain system therefore, the model outfall was located at the junction of these two systems
- Conveyance links (surface links) between inlets were assumed as an open channel rectangular section with the following parameters: width = 40 feet, height = 1 foot, Manning's n = 0.032, entrance and exit losses = 0.01, inlet invert elevation = spillover elevation, outlet invert elevation = inlet rim elevation downstream

NW-SE Instrument

- The main storm drain pipe and laterals are made of corrugated metal pipe (CMP), which Manning's roughness (n) value ranges from 0.020 to 0.030. Since this CMP is old and in questionable condition an n value of 0.025 was assumed
- Conveyance links (surface links) between inlets were assumed as an open channel rectangular section with the following parameters: width = 20 feet, height = 1 foot, Manning's n = 0.045, entrance and exit losses = 0.01, inlet invert elevation = spillover elevation, outlet invert elevation = inlet rim elevation downstream. The remaining surface links are *direct* link type, which routes flow from the upstream inlet to the downstream inlet without considering any losses in the routing

Bear Creek

- The main storm drain pipe and laterals are made of corrugated metal pipe (CMP), which Manning's roughness (n) value ranges from 0.020 to 0.030. Since this CMP is old and in questionable condition an n value of 0.030 was assumed
- 5 feet x 5 feet junctions were assumed along the 60 inch diameter CMP and 6 feet x 6 feet along the 72 inch CMP.
- A clogging factor of 50% was used for inlet #1 at the Bear Creek system, due to the large quantity of vegetative debris observed.
- Inlets #32 through #35 have one inlet on each side of the main storm drain pipe. The SSA model allows only one basin to be connected with one inlet. Therefore, those inlets were modeled as one hydraulically equivalent inlet at each basin, 48 inch x 48 inch instead of 24 inch x 24 inch.
- A 1% slope was assumed for the lateral's pipe invert elevations.
- Conveyance links (surface links) between inlets were assumed as an open channel triangular section with the following parameters: width = 5 feet, height = 1 foot, Manning's n = 0.045, entrance and exit losses = 0.01, inlet invert elevation = spillover elevation, outlet invert elevation = inlet rim elevation downstream. The remaining surface links are *direct* link type, which routes flow from the upstream inlet to the downstream inlet without considering any losses in the routing.

3.5 STORMWATER DRAINAGE NETWORK FINDINGS & RECOMMENDATIONS

The three stormwater systems modeled for this analysis generally meet the Advisory Circular 150/5320-FD minimum standards for conveying the 2-year storm without impacting airfield operations. The inlets north of Taxiway Kilo are within depressed areas that provide ponding during intense rainfall events. These areas act as detention to reduce peak flows in the downstream systems. Although this is likely contributing to the collection of debris on the inlets, it is an effective stormwater management approach that should be maintained or replaced if future construction requires filling in the ponding areas. Table 4 below presents results for the inlets where ponding was allowed within the model to mimic the “detention” effect of the undersized pipes and inlets. The full modeling results for each scenario are included in Appendix F.

. Storm Drain System	Inlet	Inlet Rim Elevation (ft)	Max HGL	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Return frequency (years)
Taxiway D	973	988.965	991.51	156.22	82.24	2
			992.65	241.01	120.1	5
			993.3	301.68	147.19	10
	969	987.836	987.96	42.71	12.93	2
			988.07	62.35	16.75	5
			988.16	76.15	19.17	10
	975	987.177	985.58	44.17	27.51	2
			987.18	64.4	36.59	5
			987.24	78.6	42.37	10
NW-SE Instrument	976	993.124	993.53	30.73	20.07	2
			994.21	44.98	27.27	5
			994.78	54.99	31.97	10
	978	983.483	984.72	52.71	39.71	2
			985.76	85.96	60.02	5
			986.32	105.24	70.98	10
Bear Creek	1	1001.55	999.95	203.88	182.78	2
			999.95	332.33	294.06	5
			999.95	427.03	376.64	10
	2	1000.263	998.51	36.72	24.53	2
			1000.35	53.09	33.03	5
			1000.56	64.58	38.58	10

The majority of the remaining inlets within the system have adequate capacity for the 2-yr and 5-yr storm events but surcharge during the 10-yr event. However, the inlets are designed to spill over to the next downstream inlet and the overall system according to the model is able to handle the 10-yr event. Actually performance of the system is dependent on keeping inlets free of debris that reduces the opening area.

Maintenance of infield areas especially around inlets is critical to long term performance of the systems. The Taxiway Delta system and NW-SE Instrument System should be visually inspect at least once per year. Where soil erosion is occurring on the surface, filling or regrading and vegetation establishment should be performed. In areas that currently lack vegetation (see picture at right) soil samples should be sent to the Texas A&M Agrilife lab to determine if soil characteristics are inhibiting plant growth. Soils should be amended to improve and maintain plant establishment or different grass species that thrive in the soil conditions should be selected.

Where soil loss is occurring around inlets that are otherwise in good shape, a spray on lining or injected sealant should be considered for the inlet and adjacent pipe segments. This treatment can cost effectively seal up leaking storm drainage systems and prevent additional soil loss.

The Phase 2 portion of the Bear Creek system has experienced significant failures that most likely cannot be fixed without replacement. The recommended fix involves reconstructing Phase 2 with new pipe, a full aggregate backfill envelope and a separation layer around the entire envelope to prevent migration of soil fines into the bedding material. The separation layer should be selected per the Advisory Circular 150/5320-FD guidance for pavement drainage layers. Further, groundwater and surface water samples should be taken to determine the corrosivity of pipe materials before final design. The 10 existing inlets nearest to Taxiway Golf could be repaired and reattached to the new storm drain system with proper joints.

Exhibit #1

Exhibit #2

Exhibit #3

Exhibit #4

Exhibit #5

4.0 BIBLIOGRAPHY

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APPENDICES

Appendix A: Geotech Study Report

Appendix B: Closed Circuit TV inspection of Bear Creek Drainage Network

Appendix C: Overview Map of the SAFB Underdrain System

Appendix D: Field Survey Data

Appendix E: Hydrology and Hydraulics Support Data Field Survey Data

Appendix F: Storm Drain Modeling Reports Storm Drain System Input

Appendix G: DD1391s

APPENDIX A

Geotech Study Report

APPENDIX B

Closed Circuit TV inspection of Bear Creek Drainage Network

APPENDIX C

Overview Map of the SAFB Underdrain System

APPENDIX D

Field Survey Data

APPENDIX E

Hydrology and Hydraulics Support Data

APPENDIX F

Storm Drain Modeling Reports

(See files on DVD)

APPENDIX G

DD1391s

APPENDIX D

Notice of Availability

PUBLIC NOTICE

NOTICE OF AVAILABILITY
DRAFT ENVIRONMENTAL ASSESSMENT AND PROPOSED FINDING OF NO SIGNIFICANT IMPACT FOR AIRFIELD DRAINAGE REPAIR AND CIRCUIT I SHEPPARD AIR FORCE BASE (AFB), TEXAS

The 82nd Civil Engineer Squadron (CES) at Sheppard Air Force Base (AFB), TX has made available a Draft Environmental Assessment (EA) addressing the potential environmental impacts for the proposed project, *Replacement of Airfield Drainage System and Circuit One*, at Sheppard AFB in a 100-year floodplain per Executive Order (E.O.) 11988. The U.S. Air Force (AF) is inviting public comments on the Draft Environmental Assessment for the project at Sheppard Air Force Base. The U.S. Air Force (Air Force) assessed the potential environmental consequences associated with the replacement of 28,500 linear feet of corrugated drainage pipe along the airfield at Runways (RWY)15C/33C and 15L/33R as well as replacement of the following for Circuit 1: primary and secondary electrical distribution lines, all associated appurtenances, pad mounted transformers, street lights, grounding components, ducting, control cables, regulators, the main airfield utility vault, and end building node electrical and communication lines to support the Intrusion Detection System (IDS) along the 80th Flight Training Wing (80 FTW) campus. (The reconfiguration of the vault interior is included in this project for high voltage safety measures.) It is estimated that all of the aforesaid proposed actions will cost approximately $30 million.

The EA, prepared in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations, and Air Force instructions implementing NEPA; evaluates potential impacts of the Preferred Alternative and the No-action Alternative. Based on this analysis, the Air Force has prepared a proposed Finding of No Significant Impact (FONSI).

The Draft EA and proposed FONSI, dated 9 Oct 2016, are available for review at the following locations:

Wichita Falls Public Library
600 11th Street
Wichita Falls, TX
76301-4604

You are encouraged to submit comments through 9 Nov 2016 Comments should be provided to 82 CES/CEIV,C/O Leslie Pena 231 9th Ave, Bldg. 1402, Sheppard AFB, TX 76311.

PRIVACY ADVISORY NOTICE

Public comments on this Draft EA are requested pursuant to NEPA, 42 United States Code 4321, et seq. All written comments received during the comment period will be made available to the public and considered during the final EA preparation. Providing private address information with your comment is voluntary and such personal information will be kept confidential unless release is required by law. However, address information will be used to compile the project mailing list and failure to provide it will result in your name not being included on the mailing list.

NATION

Marines: Man in iconic photo misidentified

■ Actual Marine pictured died in 1995

By Jim Michaels
USA TODAY NETWORK

SMITHSONIAN CHANNEL VIA AP

Pfc. Harold Schultz was identified Thursday as one of the men in the Iwo Jima photo.

WASHINGTON – The Marine Corps acknowledged Thursday it had misidentified one of the six men in the iconic 1945 World War II photo of the flag-raising on Iwo Jima.

The Marine Corps investigation identified a man who has never been officially linked to the famous photo: Pfc. Harold Schultz, who died in 1995 and went through life without publicly talking about his role.

"I think he took his secret to his grave," said Charles Neimeyer, a Marine Corps historian who was on the panel that investigated the identities of the flag raisers.

The investigation concluded with near certainty that Schultz was one of the Marines pictured.

The investigation also determined that John Bradley, a Navy corpsman, was not in the famous photo taken by Associated Press photographer Joe Rosenthal. The Feb. 23, 1945, photo that has been reproduced over seven decades actually depicts the second flag-raising of the day.

Bradley's son James Bradley and co-author Ron Powers, wrote a best-selling book about the flag raisers, "Flags of our Fathers," which was later made into a movie. John Bradley had been in the first flag-raising photo on Iwo Jima and may have confused the two, Neimeyer said.

Schultz, who enlisted in the Marine Corps at age 17, was seriously injured in fighting on the Japanese island and went on to a 30-year career with the U.S. Postal Service in Los Angeles after recovering from his wounds. He was engaged to a woman after the war, but she died of a brain tumor before they could wed, said his stepdaughter, Dezreen MacDowell. Schultz married MacDowell's mother at age 63.

Analysts believe Schultz, who received a Purple Heart, knew he was in the iconic image, but chose not to talk about it.

"I have a really hard time believing how it wouldn't have been known to him," said Matthew Morgan, a retired Marine officer who worked on a Smithsonian Channel documentary on the investigation. The filmmakers turned over their evidence to the Marine Corps to examine.

Schultz may have mentioned his role at least once. MacDowell recalls he said he was one of the flag raisers over dinner in the early 1990s when they were discussing the war in the Pacific.

"Harold, you are a hero," she said she told him.

"Not really. I was a Marine," he said. She described him as quiet and self-effacing.

It's difficult to fathom his desire to keep his role quiet in an era when many Navy SEALs and other servicemen are rushing books into print about their exploits. During World War II many veterans were reluctant to speak about their experiences because it reminded them of the horrors of war.

One of the flag raisers, Ira Hayes, initially asked to remain anonymous, but the Marines were under orders from President Franklin Roosevelt to identify the Marines so they could go on a war bonds tour.

The photo appeared in thousands of newspapers and raised the morale of a nation that had grown weary of the bloody slog in the Pacific.

"We were winning the war but it was the hardest part of the war," historian Eric Hammel said of the Pacific island-hopping campaign.

"It went viral in the 1945 equivalent of the word," Neimeyer said.

The new investigation was prompted by growing doubts about the identity of Bradley in the photo.

Two amateur historians, Eric Krelle and Stephen Foley, went further and were able to identify Schultz as a possible flag raiser. They examined the Rosenthal photo and compared it to others taken the same day, including a film that was shot at the same time as Rosenthal took his photo. Their research was highlighted in a lengthy 2014 Omaha World-Herald article.

More than a year later the Marine Corps agreed to investigate the claim, appointing a nine-person panel headed by Jan Huly, a retired Marine Corps three-star general.

The faces in Rosenthal's photos are mostly obscured, but investigators were able to identify distinctive ways the Marines wore their equipment and uniforms in the photo and then compared it to other photos taken of the unit on the same day.

"It's obvious to the untrained eye," said Michael Plaxton, a consultant who examined the photographs for a documentary, "The Unknown Flag Raiser of Iwo Jima," which will air on the Smithsonian Channel on July 3.

"People have pointed out the inconsistencies over the years," Plaxton said.

He said it required more careful and independent analysis to draw any firm conclusions, however. Plaxton's report and other material uncovered by the Smithsonian Channel was used by the Marine Corps in their investigation.

Neimeyer said the Marine Corps didn't immediately launch an investigation because it frequently receive competing claims about the presence of people in famous war photos. Once the Marine Corps realized how compelling the evidence was in this case, it agreed to look into the issue earlier this year.

It wasn't the first time the Marines had to correct the record. A Marine Corps investigation in 1947 determined that Henry Hansen had been misidentified as a flag raiser instead of Harlon Block. Both men had been killed in action on the island, as were two other men identified in the photo, Franklin Sousley and Michael Strank.

ASSOCIATED PRESS FILE

U.S. Marines raise the American flag atop Mount Suribachi, Iwo Jima, Japan on Feb. 23, 1945. The Marine Corps announced Thursday one of the six men long identified in the iconic photograph was actually not in the image. A panel found that it was actually Pfc. Harold Schultz.

Feds say filtered Flint tap water safe

■ Caution lifted as test results announced

By Ed White
Associated Press

DETROIT – Filtered tap water is safe for everyone in Flint, Michigan, the federal government said Thursday, lifting a recommendation that pregnant women, nursing mothers and children under 6 drink only bottled water to avoid lead exposure.

The announcement was based on tests of filters that have been distributed for months for free by the state of Michigan. The Environmental Protection Agency said the filters remove or reduce lead to well below the action level of 15 parts per billion, although no lead is considered safe. Some samples from high-risk areas in Flint have been coming back at less than 1 part per billion.

"It is encouraging news," said Mayor Karen Weaver, who still wants all lead-tainted plumbing replaced.

Flint used the Flint River for 18 months, but lead leached from old pipes at homes, because the water wasn't treated to control corrosion. Although the city switched water sources last fall, there still is lead in the system.

Officials have been telling most Flint residents that it's OK to drink filtered tap water, including President Barack Obama, who sipped from a glass during a visit in May. Michigan Gov. Rick Snyder said he drank filtered water from a Flint home for more than 30 days.

6 tornadoes touch down as storms batter Illinois

By The Associated Press

ASSOCIATED PRESS

A car's windshield is pierced by a board Thursday in Pontiac, Ill., after it was damaged Wednesday night by a tornado.

CHICAGO – At least six tornadoes touched down in northern Illinois on Wednesday night, as powerful storms swept across the upper Midwest, damaging rural communities and forcing thousands of soccer fans to seek shelter during the Copa America semifinal in Chicago.

The National Weather Service said an EF-2 tornado with estimated top wind speeds of 115-125 mph cut a path more than 11 miles long and about four football fields wide through the city of Pontiac, injuring four people Wednesday night. Survey crews also identified three EF-1 tornadoes, with maximum winds up to 110 mph, that struck Cissna Park, Ottawa and West Brooklyn. No injuries resulted from those storms.

Survey crews were investigating damage along three supercell paths, the weather service said. "We are fortunate things are not worse and are thankful there were no fatalities," Illinois Gov. Bruce Rauner said in a Thursday statement.

The storm system produced dime-sized hail in some areas, and its high winds snapped trees, blew roofs off buildings and downed power lines.