DRAFT
ENVIRONMENTAL ASSESSMENT

Runway Improvements Project

Sioux Gateway Airport
Sioux City, Iowa

Prepared for:

City of Sioux City
and
U.S. Department of Transportation
Federal Aviation Administration

As lead Federal Agency pursuant to the National Environmental Policy Act of 1969

Prepared by:

RS&H Iowa, P.C.

OCTOBER 2025

This Environmental Assessment becomes a Federal document when evaluated, signed and dated by the Responsible Federal Official.

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Responsible Federal Official Date

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Acronyms and Abbreviations

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185th ARW	185th Air Refueling Wing

A

AC	Advisory Circular
ACAM	Air Conformity Applicability Model
ACHP	Advisory Council on Historic Preservation
AEDT	Aviation Environmental Design Tool
AFFF	Aqueous Film-Forming Foam
AIP	Airport Improvement Program
Airport	Sioux Gateway Airport/Brigadier General Bud Day Field
Airport Sponsor	City of Sioux City
ALP	Airport Layout Plan
AOC	Area of Concern
ANG	Air National Guard
APE	Area of Potential Effects
ARFF	Aircraft Resuce and Fire Fighting
ASDA	Accelerate Stop Distance Available
ATCT	Air Traffic Control Tower

B

BFE	base flood elevation
BMPs	best management practices
Board	Airport Board of Trustees
BP	Business Park
BSNP	Missouri River Bank Stabilization and Navigation Project

C

CAA	Clean Air Act
CEI	Construction Emissions Inventory
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	Methane
City	Sioux City
CMMP	Contaminated Materials Management Plan
CO	Carbon Monoxide
CO_2	Carbon Dioxide
County	Woodbury County
CWA	Clean Water Act

D

dB	Decibel
dBA	A-Weighted Decibel
DME	Distance Measuring Equipment
DNL	Day Night Average Sound Level
DwPPP	Dewatering Pollution Prevention Plan

E

EA	Environmental Assessment
E.O.	Executive Order

F

FAA	Federal Aviation Administration
FAA Order 1050.1F	FAA Order 1050.1F, Environmental Impacts: Policies and Procedures
FBO	Fixed Base Operator
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
Floodplain Permits	Floodplain & Sovereign Lands Permits
FPPA	Farmland Protection Policy Act
FTA	Fire Training Area

G

GC	General Commercial

GHG	Greenhouse Gases
GI	General Industrial
GP	General Permit
GPS	Global Positioning System
GS	Glideslope

H

HFPO-DA	Hexafluoropropylene Oxide Dimer Acid
HI	Hazard Index
HIRL	High Intensity Runway Lights
HUC	Hydrologic Unit Code

I

IAANG	Iowa Air National Guard
IDNR	Iowa Department of Natural Resources
IIJA	Infrastructure Investment and Jobs Act
ILS	Instrument Landing System
IPaC	Information for Planning and Conservation
ISWMM	Iowa Stormwater Management Manual

J

K

L

LDA	Landing Distance Available
LID	Low Impact Development
LMOP	Landfill Methane Outreach Program
LOA	Letter of Agreement
LOC	Localizer
LOMC	Letter of Map Change
LOMR	Letter of Map Revision
LOS	Line of Sight

M

MALS	Medium-Intensity Approach Lighting Systems
MALSR	Medium-Intensity Approach Lighting System with Runway Alignment Indicator
MOSUP	Military Only Special Use Pavement
MS4	Municipal Separate Storm Sewer System

N

N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAVAIDs	Navigational Aids
NAVD88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NGB	National Guard Bureau
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NOI	Notice of Intent
NORDO	no radio
NPDES	National Pollutant Discharge Elimination System
NPDWR	National Primary Drinking Water Regulation
NPIAS	National Plan of Integrated Airport Systems
NPS	National Park Service
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge

O

O_3	Ozone
OTR	Ozone Transportation Region

P

PAPI	Precision Approach Path Indicator
Pb	Lead
PCI	Pavement Condition Index
PFAS	Per- and Polyfluoroalkyl substances
PFC	Perfluorinated Compounds
PFHxS	Perfluorohexane Sulfonate
PFNA	Perfluorononanoic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
Phase I ESA	Phase I Environmental Site Assessment
PM_{10} and $_{2.5}$	Particulate Matter-10 and -2.5
PMMS	Pavement Management and Maintenance System
PRL	Potential Release Locations

Q

R

RCRA	Resource Conservation and Recovery Act
RNAV	Area Navigation
RPZ	Runway Protection Zone
RSL	Residential Regional Screening Levels

S

SARA	Superfund Amendments and Reauthorization Act
Section 4(f)	Section 4(f) of the U.S. Department of Transportation Act of 1966
Section 6(f)	Section 6(f) of the Land and Water Conservation Fund Act of 1965
SHPO	State Historic Preservation Officer
SO_2	Sulfur Dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SRMP	Safety Risk Management Panel
SWPPP	Stormwater Pollution Prevention Permit
SWSs	Statewide Standards

T

T&E	Threatened and Endangered
TERPS	Terminal Instrument Procedures
THPO	Tribal Historic Preservation Officers
TODA	Takeoff Distance Available
TORA	Takeoff Runway Available

U

USFWS	U.S. Fish and Wildlife Service
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCB	U.S. Census Bureau
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency

V

VASI	Visual Approach Slope Indicator
VMT	Vehicle Miles Traveled

W

WSR	Wild and Scenic Rivers
WUS	Waters of the U.S.

X

Y

Z

1 Purpose and Need and Proposed Action

The Federal Aviation Administration (FAA) and the City of Sioux City (Airport Sponsor), in coordination with the National Guard Bureau (NGB) and the Air National Guard (ANG) 185th Air Refueling Wing (185th ARW), have prepared this Environmental Assessment (EA) to identify and evaluate potential environmental impacts related to the proposed Runway Improvements Project at the Sioux Gateway Airport, also known as Brigadier General Bud Day Field (Airport).

The FAA is the lead federal agency to ensure compliance with the National Environmental Policy Act (NEPA) for airport development actions. This EA is prepared pursuant to Section 102(2)(c) of NEPA, and in accordance with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act Implementing Instructions for Airport Actions*.[1]

1.1 Airport Overview

The Airport is located within Sioux City (City), which is in Woodbury County (County), Iowa. **Figure 1-1** shows the location of the Airport. The Airport is owned and operated by the City. The airport manager and airport staff oversee the day-to-day operations and are governed by a seven-member Airport Board of Trustees (Board) who are appointed by the City Council and serve three-year terms. The Board establishes rules, rates, fees, and regulations regarding the Airport's services and facilities and prepares the annual budget for approval by the City Council, among other duties.[2]

In the National Plan of Integrated Airport Systems (NPIAS), the FAA classifies the Airport as a non-hub, primary commercial service airport.[3] The primary service classification indicates that the Airport is a public use facility with scheduled air carrier service and has 10,000 or more enplaned passengers per year.

The Airport has two runways (see **Figure 1-2**):

- Runway 13-31 is 9,002 feet long by 150 feet wide; and
- Runway 18-36 is 6,401 feet long by 100 feet wide.[4]

Other facilities at the Airport include a taxiway network, taxilanes, and aprons; as well as flight schools, fixed-based operators (FBO), maintenance and safety facilities, the terminal building, and other Airport features and structures. In addition, the Airport is a shared-use airport with the Iowa Air National Guard's (IAANG) 185th ARW, which operates exclusively out of the Airport.

[1] On June 30, 2025, the FAA published FAA Order 1050.1G, *FAA National Environmental Policy Act Implementing Procedures*. Those procedures were immediately effective. However, because the drafting of this EA was substantially complete prior to the Order's publication, the FAA has relied on the version of the agency-wide Order and ARP-specific order that were in effect at the time the EA's analytical work was completed. This EA deviates from the environmental analysis requirements outlined in FAA Order 1050.1F where an executive order or decisions of the U.S. Supreme Court require it. This includes elimination of analyses as described in FAA Order 1050.1F pertaining to environmental justice, climate change, and cumulative impacts.

[2] City of Sioux City. (2023, June 30). Airport Board of Trustees. Retrieved January 29, 2024, from: https://www.sioux-city.org/government/boards-commissions/airport-board-of-trustees.

[3] FAA. (2022, September 30). National Plan of Integrated Airport Systems (NPIAS) 2023-2027, Appendix A. Retrieved January 29, 2024, from: https://www.faa.gov/sites/faa.gov/files/2022-10/ARP-NPIAS-2023-Appendix-A.pdf.

[4] FAA. (2023, December 28). Airport Diagrams, Sioux Gateway/Brig General Bud Day Fld (SUX), 28 Dec 2023 to 25 Jan 2024. Retrieved January 2, 2024, from: https://www.faa.gov/airports/runway_safety/diagrams/.

Figure 1-1
Airport Location

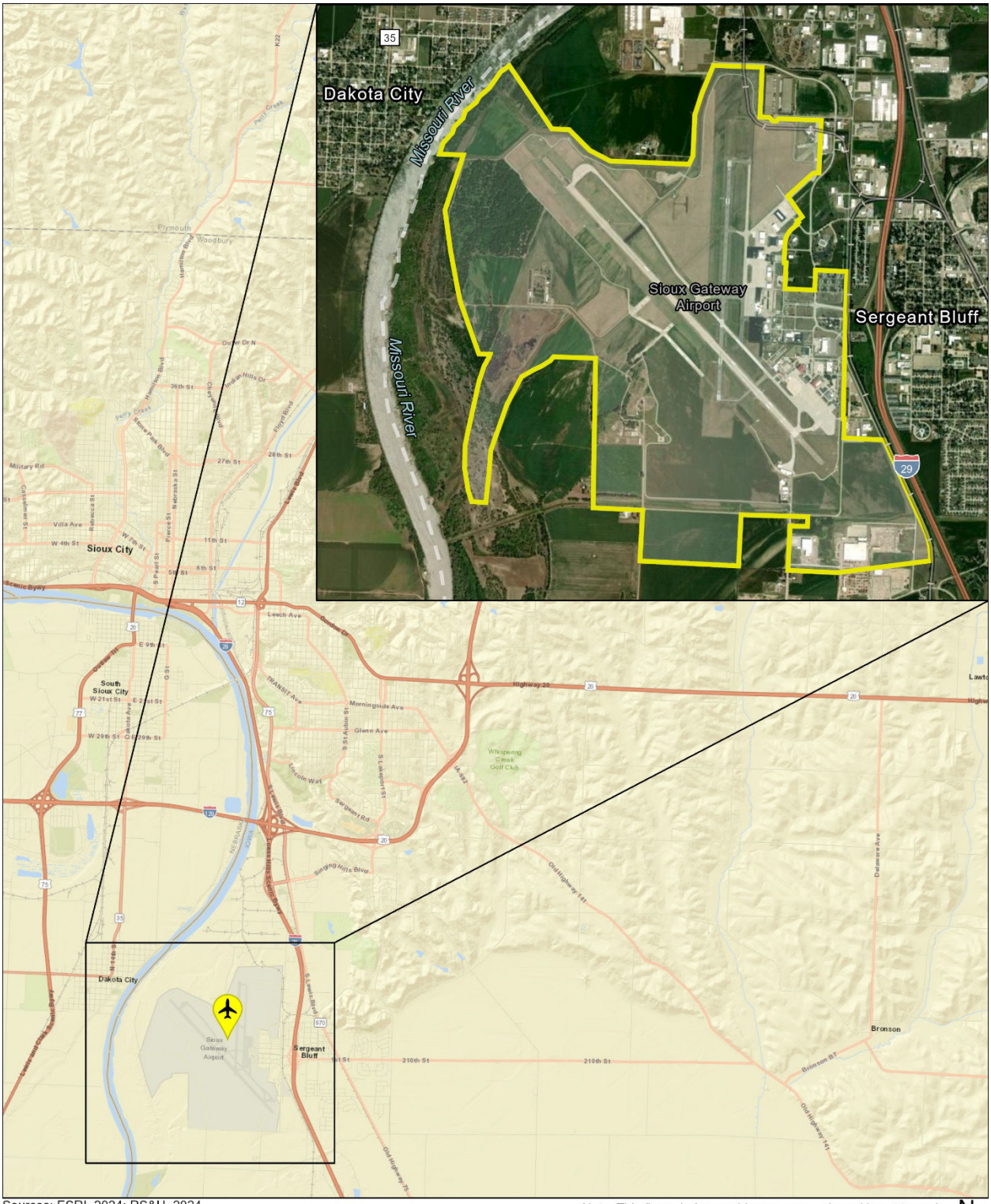


Figure 1-2
Airport Runways

The IAANG also operates a paint facility at the Airport, which is the only paint operated facility within the Air National Guard system.

1.2 Purpose and Need

According to FAA Order 1050.1F, Section 6-2.1(c), the “purpose" describes what the proposed action would achieve, and the “need” identifies the problem facing the airport sponsor. This section provides the foundation for identifying reasonable alternatives to a proposed action.

1.2.1 Purpose

The purpose of the runway improvements project is to provide a runway pavement length and runway pavement strength to meet the operational requirements and safety standards for the 185th ARW to operate the KC-135R aircraft with full takeoff weight at the Airport.

1.2.2 Need

The need for the proposed runway improvements project is because the pavement condition of Runway 13-31, as the only runway used by the 185th ARW, is deficient in terms of pavement strength and length for the 185th ARW to operate its missions at full payload capacity. The existing length and pavement strength of Runway 13-31 places restrictions on the 185th ARW’s refueling tanker missions at the Airport, resulting in a fuel payload reduction on KC-135R departures necessitating additional fueling stops.

1.2.2.1 185th Air Refueling Wing Requirements

The 185th ARW’s sole aircraft type is the KC-135R, a multi-engine refueling tanker with dual tandem landing gear. The existing runway length and runway pavement strength places a restriction on the 185th ARW’s refueling tanker missions.

The 185th ARW recently sent a memorandum to the Board stating that Runway 13-31 does not meet the operational requirements necessary to adequately support the 185th ARW’s state and federal missions. The requirements put forth by the 185th ARW specify the necessary operational standards that Runway 13-31 must meet to safeguard the 185th ARW’s existing and future operational capabilities (see **Appendix A**).

Existing taxiways must also be properly sized and oriented to meet safety requirements.[5] In addition, an aircraft warm-up/holding pad is a U.S. Air Force requirement at commercial airfields for tanker operations.[6]

Runway Length

Runway 13-31 is the only runway at the Airport that the KC-135R can currently operate on, but the current length and thickness results in payload restrictions. The KC-135R requires a minimum runway length of 10,000 feet and runway width of 150 feet for a fully loaded mission.[7] **Table 1-1** details the existing declared distances of Runway 13-31 at the Airport, as well as the 185th ARW’s stated operational requirements to achieve full mission capacity.

[5] FAA. (2022). Advisory Circular 150/5300-13B, Change 1 *Airport Design*.
[6] Air National Guard. (2023, October 31). Air National Guard Handbook 32-1084 Facility Space Standards. Retrieved March 7, 2024, from https://www.wbdg.org/FFC/ANG/ANGH/ANGH_32_1084_Oct_2023.pdf.
[7] Air National Guard. (2023, October 31). Air National Guard Handbook 32-1084 Facility Space Standards. Retrieved March 7, 2024, from https://www.wbdg.org/FFC/ANG/ANGH/ANGH_32_1084_Oct_2023.pdf.

Table 1-1
Runway 13-31 Declared Distances (feet)

Condition	Takeoff Runway Available (TORA) (feet)	Takeoff Distance Available (TODA) (feet)	Accelerate Stop Distance Available (ASDA) (feet)	Landing Distance Available (LDA) (feet)
Existing	9,002	9,002	9,002	9,002
185th ARW Requirements	10,000	10,000	11,000	9,000

Source: RS&H Analysis, 2023.

Runway 13-31 is currently 9,002 feet long, deficient for Takeoff Runway Available (TORA) and Takeoff Distance Available (TODA) by about 1,000 feet, and deficient for Accelerate Stop Distance Available (ASDA) by about 2,000 feet.

Runway Pavement Conditions

Runway 13-31 does not meet the strength and thickness requirements for the KC-135R to operate at full payloads. When Runway 13-31 was originally constructed, the concrete was constructed to a thickness of 12 inches.[8] A fully loaded KC-135R requires a minimum runway depth of 16 inches to support the weight of the aircraft.[9] In addition, the KC-135R aircraft requires pavement strength stressed to 322,500 pounds for dual tandem landing gear aircraft[10] and Runway 13-31 is currently stressed to 220,000 pounds.[11]

1.3 Proposed Action

The Proposed Action would reconstruct, strengthen, and extend Runway 13-31 to a total length of 11,002 feet for military (i.e., 185th ARW) use, with the runway extension on both runway ends to be designated as a Military Only Special Use Pavement (MOSUP) for military aircraft use only. The MOSUP would use displaced thresholds and declared distances for non-military operations to prevent alteration of the existing location of either threshold. This would be accomplished by using a standard FAA displaced threshold marking scheme that features white arrows painted on the extended pavement that direct towards the existing thresholds. The displaced thresholds also prevent alterations to the existing Terminal Instrument Procedures (TERPS).

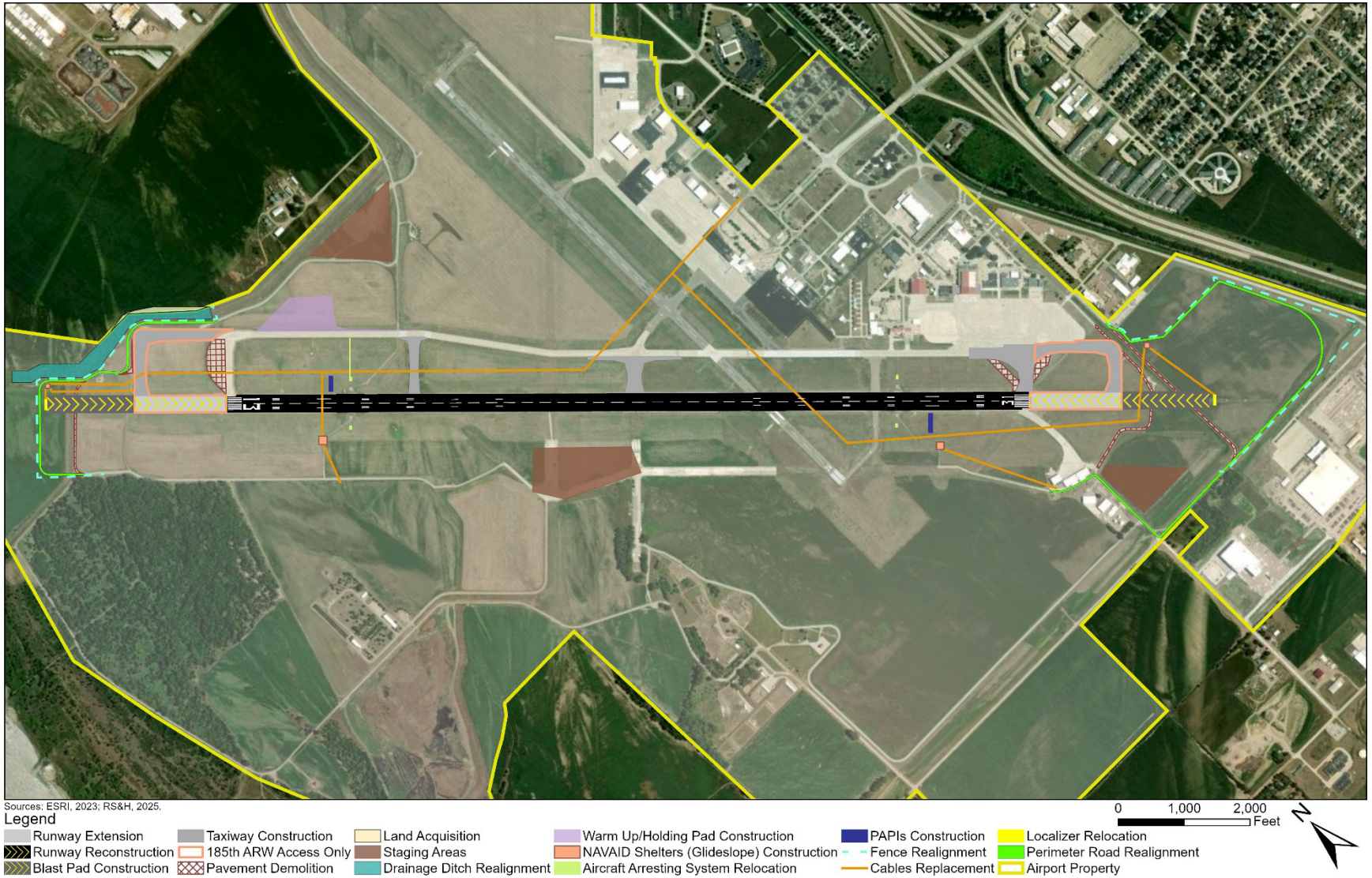
Detailed components of the Proposed Action, shown in **Figure 1-3**, include:

- Extending Runway 13-31 to 11,002 feet length by adding 1,000 feet to both runway ends
- Reconstructing Runway 13-31 to a thickness of sixteen inches
- Retaining the current runway thresholds positions resulting in displaced thresholds totaling 1,000 feet at both ends
- Constructing 1,000-foot blast pads adjacent to both the extended runway pavement ends

[8] RS&H. (2021). Sioux Gateway Airport Runway 13-31 Rehabilitation and Lighting Upgrade. Retrieved March 7, 2024.
[9] Air National Guard. (2023, October 31). Air National Guard Handbook 32-1084 Facility Space Standards. Retrieved March 7, 2024, from https://www.wbdg.org/FFC/ANG/ANGH/ANGH_32_1084_Oct_2023.pdf.
[10] RS&H. (2023). Sioux Gateway Airport, Airport Layout Plan Update.
[11] RS&H. (2023). Sioux Gateway Airport, Airport Layout Plan Update.

- Extending parallel Taxiway A to be a full parallel taxiway on the Runway 13 end
- Marking the runway and taxiway extensions as 185th ARW access only by marking Military Only Special Use Pavement
- Acquiring about one acre of land north of the Runway 13 end for realignment of drainage ditch
- Removing the existing aircraft warm up/holding pad at Runway 13 end
- Constructing a new aircraft warm up/holding pad east of Taxiway A
- Realigning the drainage ditch on Runway 13 end
- Realigning the perimeter road on both runway ends
- Realigning the Airport perimeter fence on both runway ends
- Removing portions of Taxiway A and Taxiway G at the Runway 31 end
- Realigning Taxiway A to right angle runway connectors at the Runway 31 end
- Widening Taxiway D to 75 feet with 25-foot shoulders
- Reconstructing 300 linear feet of Taxiway F to raise the surface to the new height of the runway
- Replacing the FAA owned Fiber Optic Cables
- Replacing the FAA owned Visual Approach Slope Indicator (VASI) lights with FAA owned Precision Approach Path Indicator (PAPI) lights
- Replacing the FAA owned Localizers (LOC)
- Replacing the FAA owned Glideslopes (GS)
- Replacing the FAA owned Runway 31 Medium-Intensity Approach Lighting System with Runway Alignment Indicator (MALSR) and the FAA owned Runway 13 MALSR
- Relocating the IAANG owned Aircraft Arresting System
- Amending Runway 13-31 Instrument Approach Procedures (for military operations only). The proposed procedures would be developed at a later date.
- Temporarily relocating aircraft operations to Runway 18-36 during reconstruction of Runway 13-31

Figure 1-3
Proposed Action



Airports can make use of a displaced threshold, which reduces runway length available for landings in one direction, but that same portion of the runway prior to the displaced threshold typically remains available for takeoffs (see **Figure 1-4**).[12] Only the 185th ARW would have access to the portion of the runway behind the displaced threshold available for takeoff. A 1,000-foot extension to both ends of Runway 13-31 using displaced thresholds would enable a TORA/TODA of 10,002 feet for the 185th ARW, without affecting the current location of the existing thresholds on Runway 13-31 for public operations. Using displaced thresholds on Runway 13-31 to maintain the current landing thresholds, runway threshold locations allow for a Landing Distance Available (LDA) of 10,002 feet for the 185th ARW, as the extended portions of the runway can be used for landing rollout. The runway's full proposed length of 11,002 feet could be used for ASDA calculations for 185th ARW operations.[13] The specific declared distances with the Proposed Action meet the 185th ARW requirements and are shown in **Table 1-2**. The public distances would remain at 9,002 feet for TORA, TODA, ASDA, and LDA as they are currently.

Table 1-2
Runway 13-31 Declared Distances (feet) with Proposed Action

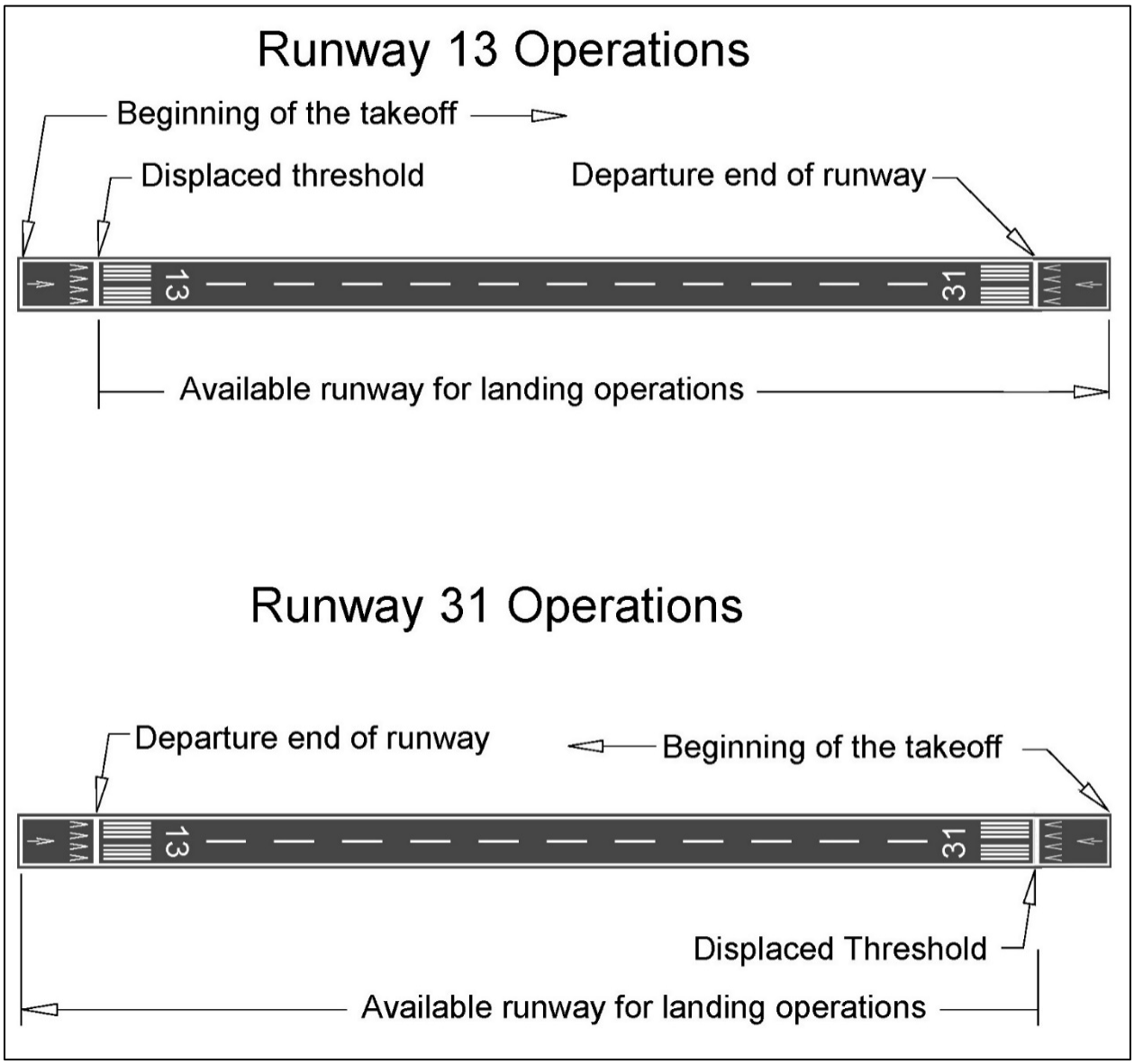
Condition	Takeoff Runway Available (feet)	Takeoff Distance Available (feet)	Accelerate Stop Distance Available (feet)	Landing Distance Available (feet)
With Proposed Action – Public Distances	9,002	9,002	9,002	9,002
With Proposed Action – Military Distances	10,002	10,002	11,002	10,002
185th ARW Requirements	10,000	10,000	11,000	9,000

Source: RS&H Analysis, 2023.

During construction, access to the Proposed Action's site would be via Seaboard Triumph Parkway. Three construction staging areas for the Proposed Action would be required on different areas of Airport property (see **Figure 1-3**). One would be on an existing staging area accessible by Seaboard Triumph Parkway, a second construction staging area would be in a disturbed area off Sully Road, and a third would be near the intersection of Sully Road and Harbor Drive. The Proposed Action would add about 31 acres of new impervious surface and would remove about 6 acres of impervious surface for a net addition of about 25 acres of new impervious surface at the Airport.

[12] FAA. (2022). Advisory Circular 150/5300-13B, Change 1 *Airport Design*.
[13] RS&H. (2023). Sioux Gateway Airport, Airport Layout Plan Update.

Figure 1-4
Displaced Thresholds Example



Source: Adapted from FAA, 2022.

Construction of the Proposed Action would occur from 2026 through 2029, with the first full year of operation being 2030. The first year of construction, 2026, would include the reconstruction of the existing 9,000 feet of Runway 13-31, cables replacement, Taxiway D widening, Taxiway F reconstruction, PAPI replacement, and relocating the Aircraft Arresting System. The 185th ARW would relocate their operations to Offutt Air Force Base in Nebraska for the first construction year. The second year of construction would focus on the Runway 13 end components and all remaining navigational aids (NAVAIDs). The third year of construction would focus on the Runway 31 end components. Commercial operations would continue only on Runway 18-36 during construction; however, the Airport would shut down to commercial operations for about one month during construction of the runway intersection. After the second construction year,

Runway 13-31 would reopen with a length of 8,000 feet using displaced thresholds. Private aircraft would continue operating on Runway 18-36 throughout the duration of construction.

As stated in **Section 1.2.1**, the purpose of the Proposed Action is to meet operating requirements and safety standards for the 185th ARW. It is not to increase operations or capacity at the Airport.

A Safety Risk Management Panel (SRMP) met to assess the safety implications of the Proposed Action on the Runway 31 end because of the existing line of sight (LOS) issues resulting in the two hot spots.[14] The proposed runway extension on the Runway 31 end would not be fully visible from the air traffic control tower (ATCT) due to a maintenance hangar and fuel station on the ANG base. The SRMP determined the Proposed Action would create two hazards: a LOS hazard from the ATCT, and a no radio (NORDO) condition for vehicles hazard.

The LOS hazard would occur if non-military aircraft taxi onto the MOSUP where the taxiway and runway are not visible from the ATCT. The SRMP determined that the LOS hazard is a medium risk because non-military aircraft would not venture too far into the MOSUP without recognizing the change and would stop and call air traffic control for instruction. In addition, a ramp manager for the ANG would monitor the MOSUP due to the nature of their mission and would stop the non-military aircraft and escort them out of the area. The effects of a non-military aircraft entering the MOSUP would be an increase in ATCT workload and a decrease in ATCT situational awareness.

The NORDO hazard would occur if the ATCT could not see a vehicle operating in the MOSUP and the vehicle had an equipment failure resulting in losing communication with the ATCT. The SRMP determined that the NORDO hazard is a low risk and the existing controls of personnel spotting and vehicles requiring an escort in the MOSUP would keep the hazard low. The effects of a vehicle losing communication with ATCT would be a cancelled approach for an incoming aircraft, an increase in ATCT workload and a decrease in ATCT situational awareness.

The SRMP also determined that a monitoring plan for each hazard with safety performance targets and durations for monitoring would be needed. For the LOS hazard, a safety performance target of one or less events per quarter of a non-military aircraft entering the MOSUP would be an acceptable threshold, with monitoring for three years. For the NORDO hazard, a safety performance target of 1 or less events per year of a vehicle that cannot be seen by the ATCT in the MOSUP and has a NORDO resulting in a cancelled approach by an incoming aircraft would be an acceptable threshold, with monitoring for three years.

1.4 Runway 13-31 Background

The primary runway, Runway 13-31 is constructed of grooved concrete. The pavement strength for Runway 13-31 is 100,000 pounds for a single wheel gear, 120,000 pounds for dual wheel

[14] The FAA defines a “hot spot” as “a location on an airport movement area with a history or potential risk of collision or runway incursion, and where heig htened attention by pilots and drivers is necessary.” (Hot Spots | Federal Aviation Administration.) Hot spots generally lead to increased risk for runway incursions. FAA defines runway incursions as “any occurrence at an airport involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft.” These areas are of specific interest to correct as they contribute to safety at an airport . The Airport currently has two hot spots. The FAA designated the hot spots because the areas are not visible from the Air Traffic Control Tower (ATCT). The current Aircraft Rescue and Fire Fighting building (ARFF) blocks the line of sight (LOS) from the ATCT to Taxiway A, resulting in hot spot 1. Existing buildings that are part of the 185th ARW block the ATCT LOS to Taxiway G, resulting in hot spot 2.

gears, and 220,000 pounds for dual tandem gears. Runway 13-31 has precision markings on both ends to support Instrument Landing System (ILS) approaches.[15] This runway accommodates most of the commercial takeoff and landing operations at the Airport and is the only runway for 185th ARW operations.

Runway 13-31 is categorized as D-III,[16] which can accommodate regular use of aircraft with a wingspan of less than 118 feet, a tail height of less than 45 feet, and an approach speed of less than 165 knots.[17] An example of a D-III aircraft is a Boeing 737-800.

Runway 13-31 is equipped with high intensity runway lights (HIRL) and NAVAIDs, which are "physical devices on the ground that aircraft can detect and fly to"[18] and are designed to "assist the pilot to land safely and efficiently."[19] The FAA establishes specific criteria to allow each NAVAID to function properly, including the location of the NAVAID in relation to a runway or taxiway. In addition, there are specific separation and clearance standards for each NAVAID.[20] See **Table 1-3** and **Figure 1-5** for Runway 13-31 NAVAIDs.

Table 1-3
Navigational Aids and Visual Aids for Runway 13-31

Runway End	GPS	DME	ILS	LOC	GS	VASI	MALS	MALSR
Runway 13 end	Y	Y	Y	Y	Y	Y	Y	N
Runway 31 end	Y	Y	Y	Y	Y	Y	N	Y

Note: GPS = Global Positioning System; DME = Distance Measuring Equipment; ILS = Instrument Landing System; LOC = Localizer; GS = Glideslope; VASI = Visual Approach Slope Indicator; MALS = Medium-Intensity Approach Lighting System, MALSR = Medium-Intensity Approach Lighting System with Runway Alignment Indicator
Source: RS&H, 2023.

Runway 13-31 has an aircraft arresting system for military (i.e., the 185th ARW) operations to support the paint facility (see **Figure 1-5**). The military installs and maintains aircraft arresting systems at authorized civil airports with military operations. Aircraft arresting systems are a safety feature that prevent aircraft runway overruns in cases where the pilot is unable to stop the aircraft during landing or aborted takeoff operations.[21]

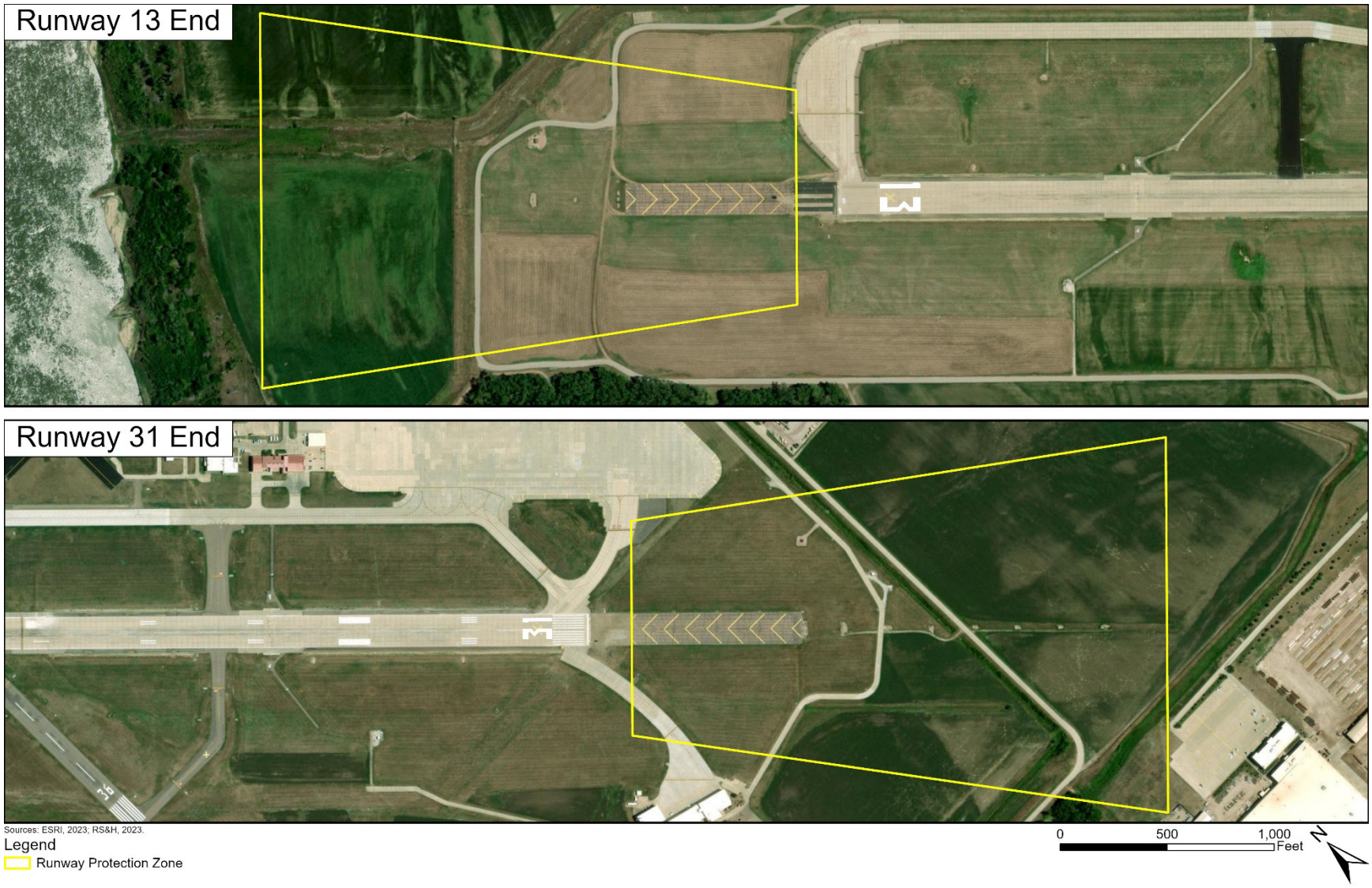
1.4.1 Runway Protection Zone

A runway protection zone (RPZ) is a trapezoidal area at ground level prior to the threshold or beyond the runway end. The RPZ serves to enhance the protection of people and property on the ground by keeping the area clear of incompatible objects, obstructions, and land uses.[22] The RPZs for Runway 13-31 are currently clear of incompatible objects and incompatible land uses (see **Figure 1-6**).

[15] RS&H. (2023). Sioux Gateway Airport, Airport Layout Plan Update.
[16] D-III is an Airplane Design Group classification based on wingspan and tail heigh determined by the Federal Aviation Administration in Advisory Circular 150/5300-13B, Change 1 *Airport Design*. Runway length and width determines what size airplane can operate on a given runway.
[17] FAA. (2022, March 31). Advisory Circular 150/5300-13B, Change 1 *Airport Design*.
[18] FAA. (2019, June). NAS Animated Storyboard. Retrieved January 2024, from: NAVAIDs: https://www.faa.gov/about/office_org/headquarters_offices/ang/offices/tc/library/storyboard/detailedwebpages/navaid.html.
[19] FAA. (2019, June). NAS Animated Storyboard. Retrieved January 2024, from: NAVAIDs: https://www.faa.gov/about/office_org/headquarters_offices/ang/offices/tc/library/storyboard/detailedwebpages/navaid.html.
[20] FAA. (2022, March 31). Advisory Circular 150/5300-13B, Change 1 *Airport Design*.
[21] FAA. (2023, July 10). Advisory Circular 150/5220-9B, *Aircraft Arresting Systems on Civil Airports*.
[22] FAA. (2022, March 31). Advisory Circular 150/5300-13B, Change 1 *Airport Design*.

Figure 1-5
Runway 13-31 NAVAIDs

Figure 1-6
Runway 13-31 Runway Protection Zones



1.4.2 Terminal Instrument Procedures

Terminal Instrument Procedures (TERPS) are approved public use approach and departure paths and surfaces that are defined after reviewing factors such as airspace obstructions, noise impacts, and airspace complexity in congested areas and are standardized methods for instrument flight procedures for aircraft under normal operations and performance.[23] Determining TERPS can be a complex and lengthy process that involves close coordination between the FAA, an airport sponsor, and other relevant stakeholders. Runway 13-31 has ILS, Localizer (LOC) and Area Navigation (RNAV) TERPS.[24]

1.5 Runway 13-31 Condition

The City constructed Runway 13-31 in 1996 with concrete pavement 12 inches thick.[25] In 2012, a Pavement Management and Maintenance System (PMMS) report examined Runway 13-31 and assigned a 2020 predicted Pavement Condition Index (PCI) of 70.3, which is when maintenance and rehabilitation projects help extend the life of the runway.[26]

In 2022, Runway 13-31 underwent a rehabilitation to extend the pavement life by up to five years by performing joint and crack sealing and select concrete panel replacements.[27] Therefore, by 2027, Runway 13-31 will require further construction efforts to address the deteriorating runway pavement.

1.6 185th Air Refueling Wing Current Operations

The mission of the 185th ARW is to provide ready airmen to support global strategic competition, nuclear deterrence, and aerial refueling across federal and state missions.[28] For the last twenty years, the unit has solely operated the KC-135R, a multi-engine refueling tanker.

Over the past 20 years temporary fixes have been completed to Runway 13-31, but the long-term effects of a heavy aircraft (i.e., the KC-135R) on the runway not designed for a heavy aircraft has taken its toll. The mission functionality of KC-135R aircraft is degraded to 64 percent of takeoff capacity and mission support is limited due to the lack of sufficient runway length and weight bearing capacity. The runway length and pavement sub-base was identified as needing to be corrected when the 185th ARW switched to the KC-135R as the only aircraft type.[29]

1.7 Requested Federal Aviation Administration Action

The Airport Sponsor is requesting the following Federal approvals from the FAA:

- Unconditional approval of the Airport Layout Plan (ALP) to depict the proposed improvements pursuant to 49 United States Code (USC) §§ 40103(b) and 47107(a)(16)(B).

[23] FAA. (2023, September 7). Order 8260.3F - United States Standard for Terminal Instrument Procedures (TERPS). Retrieved March 11, 2024, from https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.current/documentNumber/8260.3
[24] FAA. (2024, March 6). Terminal Procedures. Retrieved March 14, 2024, from https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/dtpp/search/results/?cycle=2402&ident=SUX.
[25] RS&H. (2021). Sioux Gateway Airport Runway 13-31 Rehabilitation and Lighting Upgrade. Retrieved March 7, 2024.
[26] RS&H. (2021). Sioux Gateway Airport Runway 13-31 Rehabilitation and Lighting Upgrade. Retrieved March 7, 2024.
[27] RS&H. (2021). Sioux Gateway Airport Runway 13-31 Rehabilitation and Lighting Upgrade. Retrieved March 7, 2024.
[28] 185th Air Refueling Wing. (n.d.). About Us. Retrieved January 29, 2024, from: 185th Mission and Vision: https://www.185arw.ang.af.mil/About-Us.
[29] 185th Air Refueling Wing. (2023). Future Initiatives FY 2023. Sioux City. Retrieved February 28, 2024.

- Determination that environmental analysis prerequisites associated with any future Airport Improvement Program (AIP) funding application associated with the Proposed Action have been fulfilled pursuant to 49 USC § 47101-47144.
- Determination under 49 USC § 44502(b) that the airport development is reasonably necessary for use in air commerce or in the interest of national defense.
- Approval of changes to the airport certification manual pursuant to 14 CFR Part 139 (49 USC §44706).
- Determinations under 49 USC 47106 and 47107 relating to the eligibility of the Proposed Action for federal funding under the AIP, Infrastructure Investment and Jobs Act (IIJA), and other FAA administered federal funding programs, and/or determinations under 49 USC 40117, as implemented by 14 CFR 158.25, to impose and use passenger facility charges collected at the airport to assist with construction of potentially eligible development items shown on the ALP and associated actions.

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2 Alternatives

Federal Aviation Administration (FAA) Order 1050.1F, Section 6-2.1(d) describes requirements of an alternative analysis within an FAA Environmental Assessment (EA). EAs are required to discuss the alternatives that the approving official will consider. There is no requirement for a specific number of alternatives and an EA may limit the range of alternatives to the proposed action and no action. For alternatives considered but eliminated from further study, the EA should briefly explain why these were eliminated.[30]

2.1 Alternatives Screening Process Overview

For this EA, there is a two-step screening process to evaluate the list of potential alternatives to determine which of them are reasonable for analysis in the environmental impact analysis.

2.1.1 Step 1 Alternatives Screening: Purpose and Need

The Step 1 alternatives screening evaluated each alternative's ability to satisfy the Purpose and Need of the Proposed Action. A part of the evaluation of the Purpose and Need was the ability of the Airport Sponsor to provide a provide a runway pavement length and runway pavement strength to meet the operational requirements and safety standards for the 185th Air Refueling Wing (185th ARW) to operate the KC-135R aircraft with full takeoff capacity at the Airport (see **Section 1.6**).

2.1.2 Step 2 Alternatives Screening: Technically Feasible and Reasonable

The Step 2 alternatives screening evaluated whether each alternative was technically feasible and reasonable in terms of comparative safety, policy, environmental, social, or economic consequences. Step 2 alternatives screening was governed by a rule of reason to develop a range of alternatives that is reasonable, practical, and not boundless.[31]

2.2 Alternatives Considered

This section provides a description of potential alternatives that are subject to the screening process. The alternatives were developed based on the alternatives discussed in the 2023 ALP Update. Due to the critical operational need, in 2023, the 185th ARW, with the assistance of its consultants, conducted an advanced runway analysis to identify alternatives that fulfill the requirements of the 185th ARW missions.

2.2.1 Runway 13-31 Extension Alternatives

Runway 13-31 is the primary runway at the Airport and would be extended and strengthened to meet 185th ARW requirements. This group of alternatives shares the following project components that would be required regardless of how the runway is extended:

- Reconstruct Runway 13-31 to a thickness of sixteen inches
- Construct 1,000-foot blast pads adjacent to both the extended runway pavement ends
- Extend parallel Taxiway A to be a full parallel taxiway on the Runway 13 end

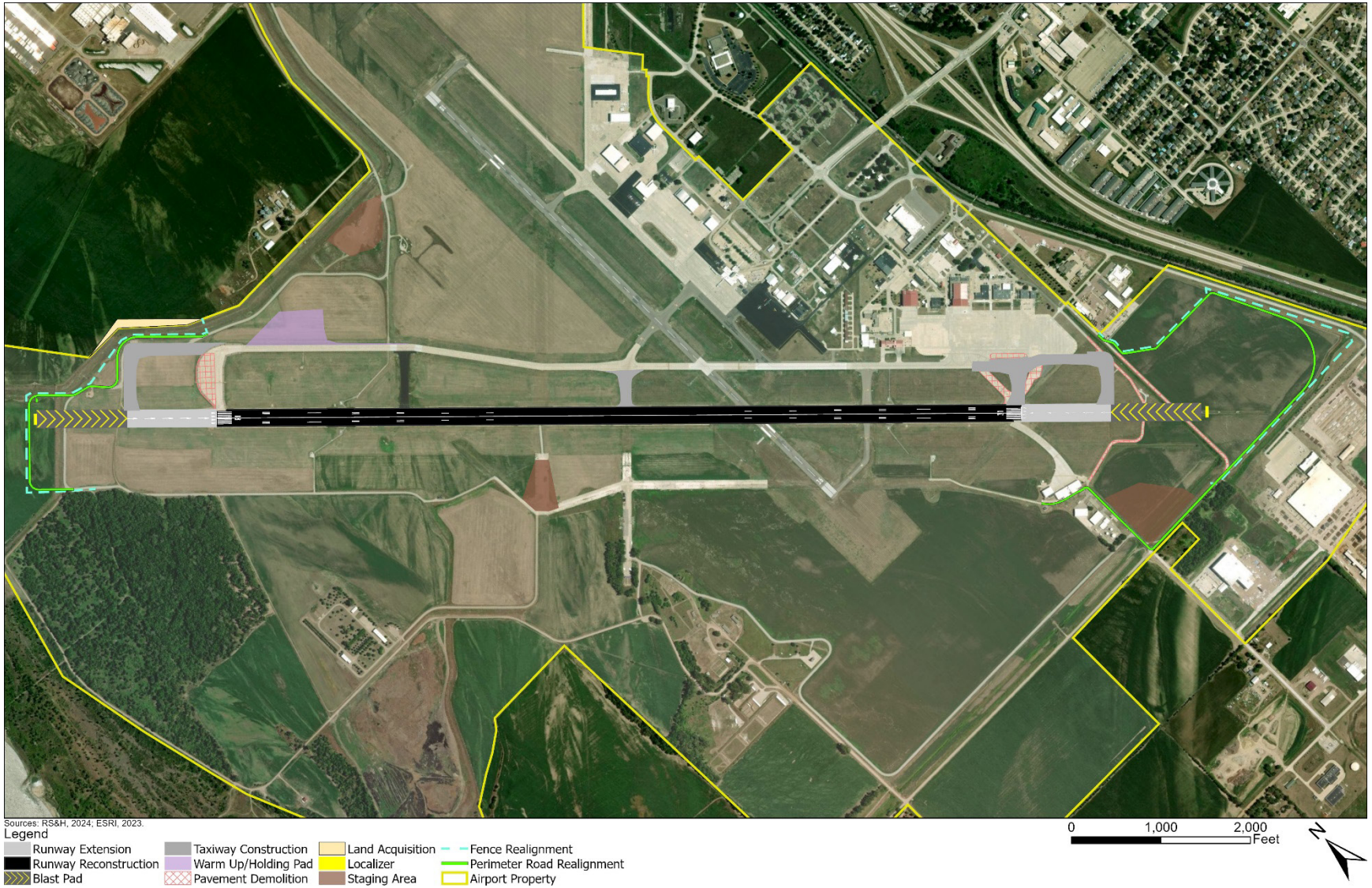
[30] FAA. (2015). FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Paragraph 6-2.1(d).
[31] FAA. (2015). FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Paragraph 6-2.1(d).

- Acquire about one acre of land north of Runway 13 end
- Remove the existing aircraft warm up/holding pad at Runway 13 end
- Construct a new aircraft warm up/holding pad east of Taxiway A
- Realign the drainage ditch on Runway 13 end
- Realign the perimeter road on both runway ends
- Realign the Airport perimeter fence on both runway ends
- Remove portions of Taxiway A and Taxiway G at the Runway 31 end
- Realign Taxiway A to right angle runway connectors at the Runway 31 end
- Widen Taxiway D to 75 feet with 25-foot shoulders
- Reconstruct 300 linear feet of Taxiway F to raise the surface to the new height of the runway
- Replace the FAA-owned Fiber Optic Cables
- Replace the FAA-owned Visual Approach Slope Indicator (VASI) lights with FAA owned Precision Approach Path Indicator (PAPI) lights
- Replace the FAA-owned Localizers (LOC)
- Replace the FAA-owned Glideslopes (GS)
- Replace the FAA-owned Runway 31 Medium-Intensity Approach Lighting System with Runway Alignment Indicator (MALSR) and the FAA owned Runway 13 MALSR
- Relocate the Iowa Air National Guard (IAANG) owned Aircraft Arresting System
- Temporarily relocate aircraft operations to Runway 18-36 during reconstruction of Runway 13-31

2.2.1.1 Alternative 1: Runway 13-31 Extension for Military and Public Use

Alternative 1 would extend Runway 13-31 on both runway ends by 1,000 feet (**Figure 2-1**) for both military and public aircraft operations. The project components for Alternative 1 are the same as the shared project components in **Section 2.2.1**. The existing runway thresholds would remain but would use displaced thresholds for landings and to meet 185th ARW declared distances. The declared distances for public operations would also change under Alternative 1. The 1,000-foot extension on both runway ends would enable a Takeoff Runway Available (TORA)/Takeoff Distance Available (TODA) of 10,002 feet, without affecting the current location of the associated departure surfaces. Using displaced thresholds to maintain the current landing runway threshold locations would allow for a Landing Distance Available (LDA) of 10,002 feet, as the extended portions of the runway could be used for landing rollout. The runway's full proposed length of 11,002 feet could be used for Accelerated Stop Distance Available (ASDA) calculations. As a result, the specific declared distances would meet 185th ARW requirements. Alternative 1 would include a standard FAA displaced threshold marking scheme that features white arrows painted on the extended runway pavement that directs aircraft towards the existing thresholds. 1,000-foot blast pads would be constructed behind the runway extensions on both ends.

Figure 2-1
Alternative 1: Runway 13-31 Extension for Military and Public Use



The Terminal Instrument Procedures (TERPS) associated with the runway, including both the approach and departure surfaces, would not change since the existing runway thresholds would not change. Although there would be displaced thresholds on both ends of the runway, the extra 1,000 feet of runway would be available only to departing aircraft. Departing aircraft would need to exit the runway at the same location as today; therefore, the departure flight tracks would not change. Conversely, arriving aircraft would need to touch down on the runway at the same location as they currently do today, but would be able to use the extra 1,000 feet to rollout.

2.2.1.2 Alternative 2: Runway 13-31 Extension for Military Use Only

Alternative 2 would extend Runway 13-31 by 1,000 feet on both runway ends, but the extended runway and Taxiway A would be for 185th ARW use only (see **Figure 2-2**). Alternative 2 contains the project shared components listed in **Section 2.2.1** and the following two components:

- Retaining the current runway thresholds positions resulting in displaced thresholds totaling 1,000 feet at both ends (designated for public use)
- Amending Runway 13-31 Instrument Approach Procedures (for military operations only)

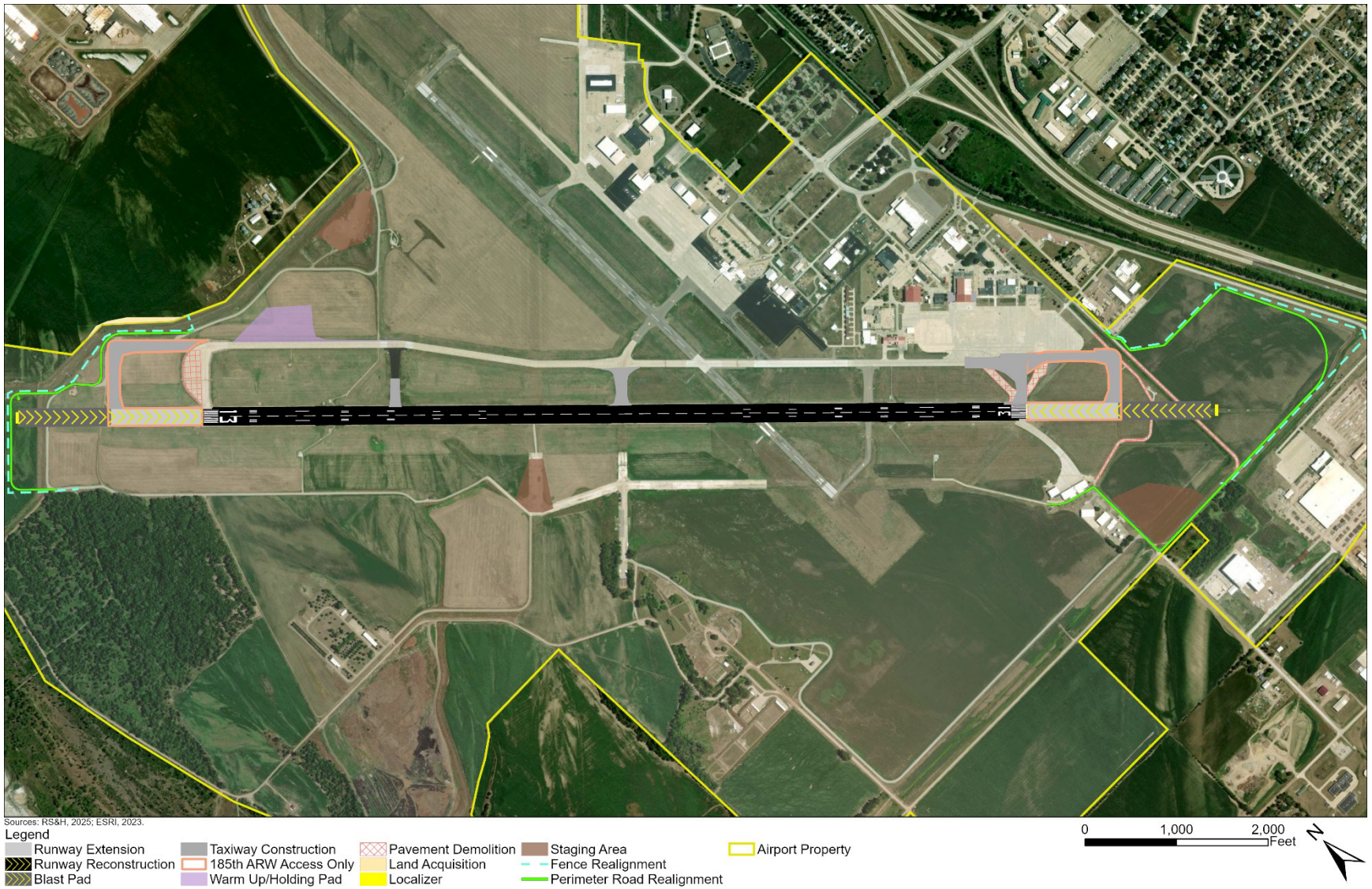
The existing runway thresholds would remain and would be for public use. The declared distances for public operations would not change under Alternative 2. Alternative 2 would employ a different pavement marking scheme that would include painted yellow chevrons leading up to the existing thresholds. These chevroned areas on both ends of the runway would be exclusively designated for use by the 185th ARW.

The extended portions of the runway and parallel segments of Taxiway A would be designated as Military Only Special Use Pavement (MOSUP). MOSUP would be a designated portion of an airport where access is strictly controlled and the Airport Sponsor and 185th ARW would complete a letter of agreement (LOA) for how to operate the MOSUP. The proposed MOSUP would be used exclusively by the 185th ARW and special MOSUP signage, markings, and lighting would be necessary to restrict public aircraft access to the new taxiways and runway ends. Special MOSUP management protocols for the Air Traffic Control Tower (ATCT) would also be necessary.

The 185th ARW would use the extended runway pavement for takeoff, landing rollout, and as an overrun to achieve the following military-only declared distances: TORA/TODA of 10,002 feet, LDA of 10,002 feet, and ASDA of 11,002 feet, meeting 185th ARW requirements. The length of the public use runway would remain at 9,002 feet.

The TERPS associated with the runway, including both the approach and departure surfaces, would not change since the existing runway thresholds would not change. Although there are displaced thresholds on both ends of the runway, the extra 1,000 feet of runway would be available only to departing 185th ARW KC-135R aircraft. Departing KC-135R aircraft would be required to exit the runway at the same location as today, therefore the departure tracks would not change. Conversely, arriving KC-135R aircraft would be required to touch down on the runway at the same location as they do today but would be able to use the extra 1,000 feet to rollout.

Figure 2-2
Alternative 2: Runway 13-31 Extension for Military-Use Only



2.2.1.3 Alternative 3: Runway 13-31 Extension with Paved Overruns

Alternative 3 would include an extension of Runway 13-31 of 1,000 feet by shifting the Runway 13 threshold 700 feet north and the Runway 31 threshold 300 feet south (**Figure 2-3**). The project components for Alternative 1 are the same as the shared project components in **Section 2.2.1**, and the following project component:

- Blast pads that also serve as paved overruns measuring 1,000 feet behind each runway threshold would be constructed and marked with yellow chevrons.

The paved overruns would not be for use during takeoff, but rather designed to be used only in the event of an overrun of a military aircraft, thereby providing the 185th ARW with 11,002 feet of ASDA.

The 1,000-foot extension of the runway would enable a TORA/TODA of 10,002 feet. Using displaced thresholds would allow for an LDA of 10,002 feet, as the extended portions of the runway would be able to be used for landing rollout. The runway's full proposed length of 11,002 feet could be used for ASDA calculations. As a result, the specific declared distances would meet 185th ARW requirements.

Under Alternative 3, the length of the runway available for public use would increase to 10,002 feet, without any displaced thresholds or declared distances. The ASDA is the only military-only declared distance that would differ from the full length of the proposed runway extension.

The Runway 13 end Runway Protection Zone (RPZ) would include a portion of the Missouri River, outside existing Airport property (see **Figure 2-4**). The Runway 31 end RPZ would include a portion of a public parking lot and a building situated on property the Airport is releasing from Airport control (see **Figure 2-5**).

The TERPS associated with the runway, including both the approach and departure surfaces, would change. Modifying TERPS can be a complex and lengthy process that involves coordination between the FAA, Airport Sponsor, and other relevant stakeholders. Likewise, the 185th ARW would need to adjust the TERPS for military operations. The duration of this process can vary significantly, ranging from several months to several years, depending on factors such as airspace complexity, funding availability, and the number and needs of stakeholders involved. In addition, adjusting flight procedures would result in changes to aircraft flight paths, requiring further environmental study to assess potential noise and other environmental impacts associated with the revised procedures. This would delay the 185th ARW in achieving their full mission capacity at the Airport.

Figure 2-3
Alternative 3: Runway 13-31 Extension with Paved Overruns

Figure 2-4
Alternative 3: Runway 13 End Protection Zone Incompatible Uses

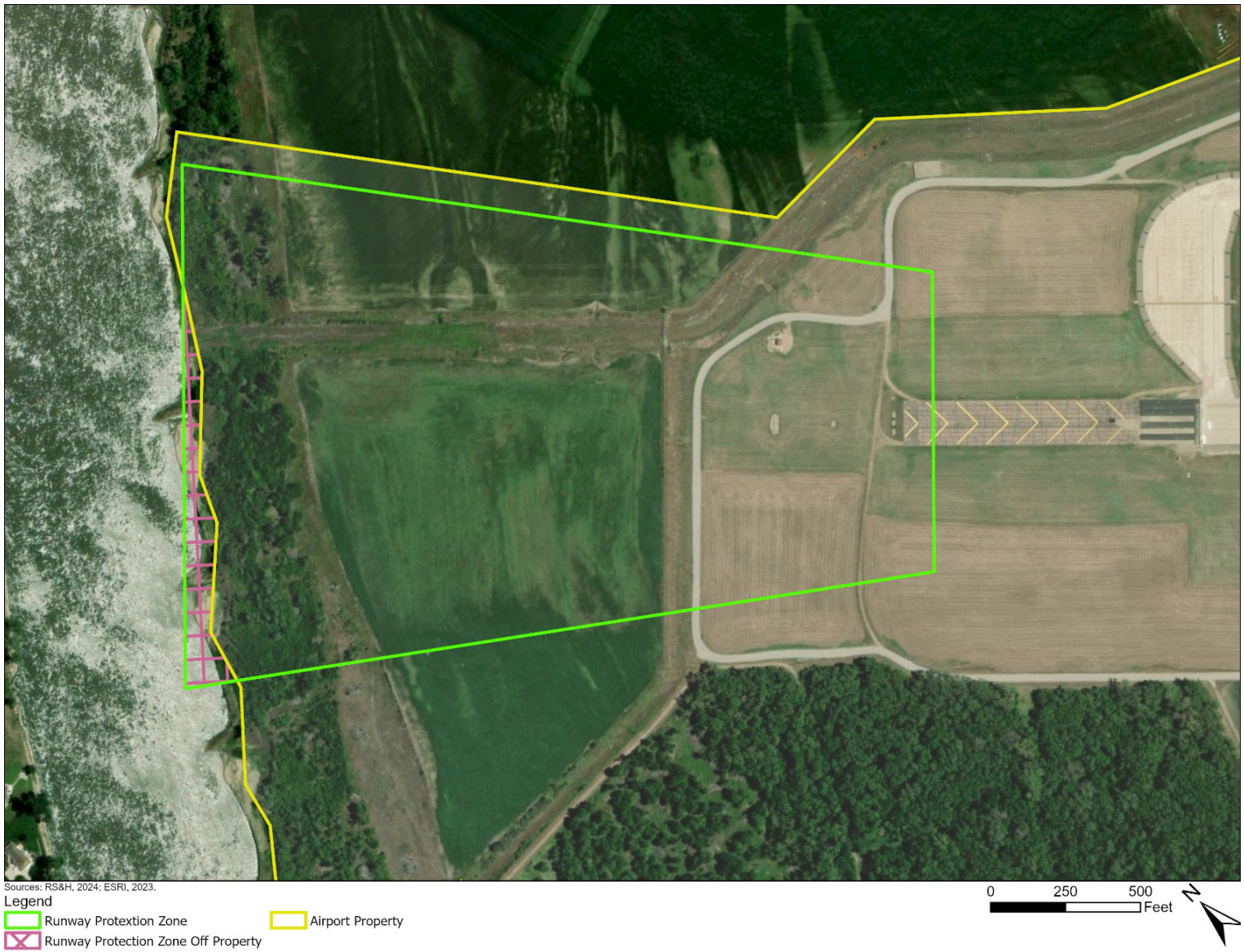
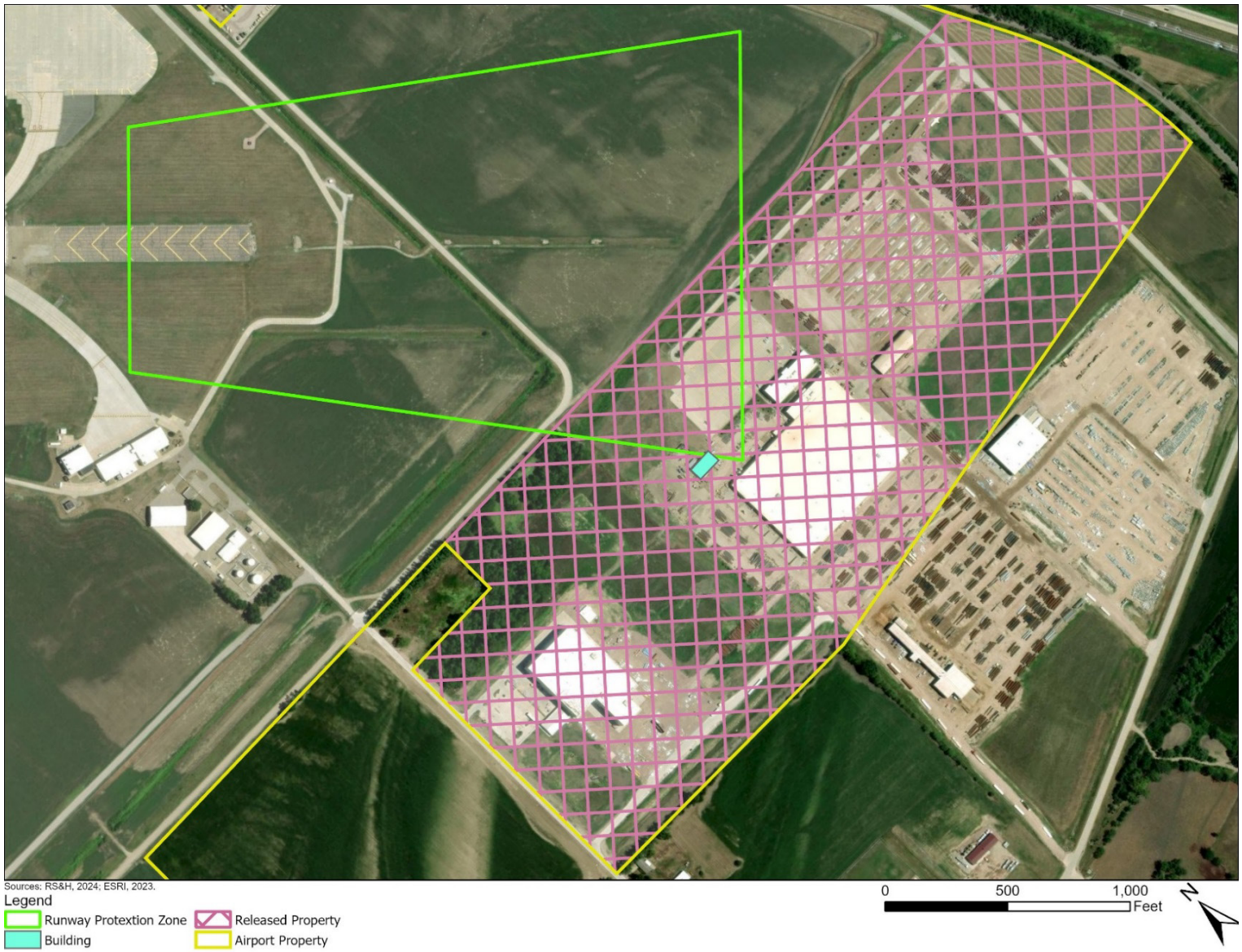


Figure 2-5
Alternative 3: Runway 31 End Protection Zone Incompatible Uses



2.2.2 Alternative 4: Runway 18-36 Extension

In this alternative, Runway 18-36 would be extended by up to 4,601 feet to meet the 185th ARW requirements. However, Runway 18-36 can be extended to a maximum length of 8,000 feet and keep the RPZs within the current Airport property boundary (see **Figure 2-6**). Extending Runway 18-36 to 11,000 feet would require significant land acquisition and obstruction removals, depending on the direction of extension, to ensure that there are no incompatible land uses on land that the Airport does not control. In addition, the runway would need to be widened from 100 feet to 150 feet to accommodate 185th ARW requirements. Widening the runway would also require the existing Taxiway C to be extended to be a full parallel taxiway.

If the Airport Sponsor does not acquire land, a Runway18-36 measuring 8,000 feet in length would be deficient to the 185th ARW's stated needs of TORA/TODA of 10,000 feet by 2,000 feet. The runway would also be deficient for the ASDA of 11,000 feet by 3,002 feet, and the LDA of 9,000 feet by 1,000 feet.

2.3 Step 1 Alternatives Screening: Meets Purpose and Need

Each alternative was analyzed to determine whether it meets the purpose and need and can therefore, be advanced to Step 2 of the screening process (see **Table 2-1**).

Alternatives 1, 2, and 3 would meet the Purpose and Need of extending and strengthening Runway 13-31 to accommodate the full payload of the KC-135R. Therefore, these three alternatives were retained for evaluation in the Step 2 alternatives screening process.

Alternative 4 would not meet the Purpose and Need as described in **Section 1.6**. Runway 18-36 cannot be configured to meet the requirements of the KC-135R aircraft and is therefore, eliminated from further analysis.

Table 2-1
Step 1 Alternatives Screening Summary

Step 1 Screening Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Meets the Purpose and Need	Yes	Yes	Yes	No
Retained for Step 2 Screening Analysis?	Yes	Yes	Yes	No

Source: RS&H, 2025.

Figure 2-6
Alternative 4: Runway 18-36 Extension

2.4 Step 2 Alternatives Screening: Technically Feasible and Reasonable

The following questions were answered for each alternative that was advanced from the Step 1 alternatives screening process to determine whether the alternative is reasonable and feasible, and therefore, advanced through the Step 2 alternatives screening process.

- Does the alternative maintain the current TERPS for public aircraft operations
- Does the alternative maintain existing thresholds for public aircraft operations?
- Does the alternative avoid declared distances for public aircraft operations?
- Does the alternative maintain RPZs that are clear from obstructions?

Alternative 1 would not maintain the current TERPS for public aircraft operations because the extended runway would be available to all operations, military and public. The existing thresholds for public aircraft operations would also change to the new extended Runway 13-31 thresholds. Alternative 1 would not avoid declared distances for public aircraft operations. There would be displaced thresholds as the full length of the extended runway would be available for takeoffs, but displaced thresholds would be used to maintain the existing landing thresholds. According to FAA AC 150/5300-13B, Change 1 *Airport Design*, using declared distances by displacing a runway's threshold should only be considered "after a full evaluation establishes that displacement is the best available alternative." While threshold displacement can provide a convenient solution for constrained airports, it is important to carefully evaluate the trade-offs and consequences of implementing such a solution. These considerations encompass factors such as the increased complexity or operational restrictions imposed on adjacent taxiways and the need for relocating approach lighting systems and Navigational Aids (NAVAIDs).[32] The RPZs for Alternative 1 would be clear of obstructions.

Alternative 2 would maintain the current TERPS for public aircraft operations and would also maintain existing thresholds for public aircraft operations. The extended Runway 13-31 would only be available for military operations. Alternative 2 would avoid declared distances for public aircraft operations because the same runway length that is currently available for takeoffs and landings would remain. The RPZs for Alternative 2 would be clear of obstructions.

Alternative 3 would not maintain the current TERPS for public aircraft operations as the thresholds would change positions on both ends of the extended Runway 13-31. The existing thresholds for public aircraft operations would also change. Alternative 3 would avoid declared distances for public aircraft operations as the same runway length would be available for public and military operations. The RPZs for Alternative 3 would not be clear of obstructions and would go off-Airport property.

Alternatives that met all elements of the Step 2 alternatives screening criteria were retained for a detailed evaluation of their environmental impacts in the EA. Alternatives that would not be reasonable and feasible to construct were eliminated from further consideration.

[32] RS&H. (2023). Sioux Gateway Airport Airport Layout Plan Update (RS&H, 2025)

2.4.1 Step 2 Alternatives Screening Summary

Table 2-2 provides a summary of the Step 2 alternatives screening process. One of the three alternatives carried forward from Step 1 Screening, Alternative 2, would meet every requirement outlined in **Section 2.4**. Therefore, Alternative 2 was retained for detailed evaluation in the EA.

Table 2-2
Step 2 Alternatives Screening Summary

Step 2 Screening Criteria	Alternative 1	Alternative 2	Alternative 3
Maintains Existing TERPs for Public Aircraft Operations	Yes	Yes	No
Maintains Existing Thresholds for Public Aircraft Operations	Yes	Yes	No
Avoid Declared Distances for Public Aircraft Operations	No	Yes	Yes
Maintains RPZs Clear of Obstructions	Yes	Yes	No
Retained for Detailed Analysis in the EA?	No	Yes	No

Source: RS&H, 2025.

2.5 Summary of Alternatives Carried Forward for Analysis

2.5.1 No Action Alternative

The No Action Alternative is retained in accordance with FAA Order 1050.1F Section 6-2.1(d) *Environmental Assessment Format*, and is referred to as the No Action Alternative for the remainder of this EA. Although the No Action Alternative does not meet the project's purpose and need, it does serve as a baseline for a comparison of impacts to the preferred alternative and is therefore retained for analysis.

2.5.2 Alternative 2: Runway 13-31 Extension for Military Use Only

Alternative 2 is the only alternative that meets both Step 1 and Step 2 screening criteria. Alternative 2 is referred to as the Proposed Action for the remainder of this EA. **Section 1.3** provides a detailed description of the Proposed Action with all project components shown in **Figure 1-3**.

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3 Affected Environment, Environmental Consequences, and Mitigation Measures

This chapter provides an overview of potential impacts related to the alternatives discussed in **Section 2.5** on each resource category identified in Federal Aviation Administration (FAA) Order 1050.1F, *Environmental Impacts: Policies and Procedures* (FAA Order 1050.1F). The analysis of each resource category includes the following:

- Affected Environment: describes the existing natural, ecological, cultural, social, and economic conditions that could be affected by the Proposed Action.
- Significance Threshold: Significance thresholds for each resource category described in FAA Order 1050.1F, Exhibit 4-1, aid in the analysis provided in this chapter. The analysis of the impacts associated with the Proposed Action is a comparison of the impacts to the No Action Alternative and is based on the information known at the time of this EA's preparation.
- Environmental Consequences: evaluates the reasonably foreseeable human and environmental consequences of the No Action Alternative and the Proposed Action.
- Mitigation Measures: describes mitigation measures related to anticipated impacts.

The Airport Sponsor, reviewing public databases, conducting field site surveys, and consulting with agencies with specific knowledge of a resource category provided the data used to determine the affected environment. FAA Order 1050.1F Section 6-2.1(d) *Environmental Assessment Format* requires including the No Action Alternative, which provides a baseline comparison for potential impacts from the Proposed Action.

3.1 Project Study Area

According to the FAA Order 1050.1F Desk Reference, the project study area varies based on the impact category being analyzed. A Project Study Area was identified to describe the existing conditions and potential environmental effects at the Airport for resource categories that require site surveys as well as resources that would only be affected by the construction of the Proposed Action (**Figure 3-1**). The Project Study Area encompasses the areas where ground disturbing activities would occur with a buffer to allow for construction activities.

Figure 3-1
Project Study Area

City of Sioux City and Woodbury County projects that were listed within a one-mile radius of the Project Study Area occurring in the same time frame as the Proposed Action were considered and are listed in **Table 3-1**.

Table 3-1
Reasonably Foreseeable Future Projects

Project	Location	Project Description
185th ARW Apron Rehabilitation	On-Airport	Rehabilitation of the 185th ARW apron pavement
185th ARW Hangars Construction	On-Airport	Demolition of existing hangars and construction of new hangars for 185th ARW
Runway 18-36 and Taxiways B, C, D, and E Rehabilitation[33]	On-Airport	Crack seal and seal coat of existing airfield pavements. The project also includes the placement of pavement markings on existing airfield pavements.
Southbridge Interchange[34]	Off-Airport	New diamond interchange with an overpass above Interstate-29. Construction of additional road connecting Port Neal Road and Old Highway 75.

This EA uses information presented in **Chapter 3** to determine potential impacts considered for those resources the Proposed Action would affect. The Proposed Action would not result in impacts to resources that the Proposed Action would not affect. Each reasonably foreseeable future project was analyzed for its potential to affect the same environmental resources affected by the Proposed Action.

3.2 Environmental Resources Not Affected

The No Action Alternative or Proposed Action would not affect the following resources identified in FAA Order 1050.1F and the following subsection provides the rationale.

3.2.1 Coastal Resources

Iowa is not a coastal state and does not have coastal resources protected under the Coastal Zone Management Act, the Coastal Barrier Resources Act, the National Marine Sanctuaries Act, Executive Order 13089, Coral Reef Protection, or Executive Order (E.O.) 13547, Stewardship of the Ocean, Our Coasts, and the Great Lakes. In addition, the closest Coastal Barrier Resource Unit is over 300 miles northeast of the Project Study Area.[35] Therefore, there would be no effect on Coastal Resources from the Proposed Action.

3.2.2 Farmlands

Under Section 523(10)(B) of the Farmland Protection Policy Act (FPPA), land that is committed to urban development is not subject to provisions of the FPPA, and land identified as Urban Areas by the U.S. Census Bureau (USCB) are not subject to the FPPA.[36] The Project Study

[33] Sioux City. (2024, January 24). Post Bid/Pre-Construction. Retrieved May 8, 2024, from https://www.sioux-city.org/Home/Components/News/News/14252/614.
[34] Woodbury County, Iowa. (2023, February 2). News. Retrieved May 8, 2024, from Southbridge Interchange Improvement Project: https://www.woodburycountyiowa.gov/news/southbridge_interchange_improvement_project_advances/.
[35] U.S. Fish and Wildlife Service. (2023, August 16). Coastal Barrier Resources System Mapper. Retrieved February 1, 2024, from https://fwsprimary.wim.usgs.gov/CBRSMapper-v2/.
[36] FAA. (2023). 1050.1F Desk Reference.

Area is in the USCB Sioux City, Iowa Urban Area.[37] Therefore, there would be no effect on farmlands from the Proposed Action.

3.2.3 Wild and Scenic Rivers

There are no Wild and Scenic Rivers in the Project Study Area. The closest Wild and Scenic River (WSR) is a segment of the Missouri River, about 20 miles upstream of the Project Study Area.[38] The closest Nationwide Rivers Inventory segment is the Big Sioux River, about 85 miles north of the Project Study Area.[39] The closest state protected river is the Little Sioux River Protected Water Area, about 40 miles east of the Project Study Area.[40] Therefore, there would be no effect on WSR.

3.3 Environmental Resources Potentially Affected

3.3.1 Air Quality

The Clean Air Act (CAA) is the primary statute related to air quality. The CAA regulates air pollutant emissions from stationary and mobile sources and authorizes the U.S. Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) for criteria pollutants. The CAA also gives the USEPA the authority to regulate Hazardous Air Pollutants.

The USEPA sets NAAQS for certain air pollutants to protect public health and welfare. The USEPA has identified the following six criteria air pollutants and has set NAAQS for them: Carbon Monoxide (CO), Lead (Pb), Nitrogen Dioxide (NO_2), 8-Hour Ozone (O_3) Particulate Matter (PM_{10} and $PM_{2.5}$), and Sulfur Dioxide (SO_2).

“Nonattainment areas” classifies areas in violation of one or more NAAQS pollutants. States with nonattainment areas must develop a State Implementation Plan demonstrating how the areas will be brought back into attainment of the NAAQS within designated periods. “Attainment areas” classifies areas where concentrations of NAAQS pollutants are below (i.e., within) threshold levels. Areas with prior nonattainment status that have since transitioned to attainment are known as “maintenance areas.”

3.3.1.1 Affected Environment

The Project Study Area is in Woodbury County, Iowa, which is in attainment for all criteria pollutants.[41]

3.3.1.2 Significance Threshold

FAA Order 1050.1F, Exhibit 4-1 states that a significant impact would occur if the action would cause pollutant concentrations to exceed one or more NAAQS, as established by the USEPA

[37] U.S. Census Bureau. (2023, June). 2020 Census Urban Areas of the United States and Puerto Rico. Retrieved January 31, 2024, from https://www2.census.gov/geo/maps/DC2020/UA20/UA_2020_WallMap.pdf.
[38] National Wild and Scenic Rivers System. (n.d.). Find a River. Retrieved February 1, 2024, from https://www.rivers.gov/.
[39] National Park Service. (1982). Nationwide Rivers Inventory. Retrieved January 31, 2024, from https://www.nps.gov/maps/full.html?mapId=8adbe798-0d7e-40fb-bd48-225513d64977.
[40] Iowa Department of Natural Resources. (n.d.). Iowa's Protected Water Areas. Retrieved January 31, 2024, from Caring for Our Rivers: https://www.iowadnr.gov/Things-to-Do/Canoeing-Kayaking/Caring-for-our-Rivers.
[41] U.S. Environmental Protect Agency. (2024, April 30). Green Book. Retrieved May 3, 2024, from Iowa Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants: https://www3.epa.gov/airquality/greenbook/anayo_ia.html.

under the CAA, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.

3.3.1.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, no new operational emissions would occur other than what is forecast to occur. In addition, no construction emissions would occur from fuel combustion in construction equipment and vehicles and no fugitive dust emissions would occur along haul routes. As a result, there would be no significant effect on air quality.

Proposed Action

The Proposed Action would not increase or change the number or type of aircraft operations at the Airport beyond the current forecast. In addition, the Airport is in attainment with all the NAAQS.[42] The FAA lists four Screening Criteria questions in the current Air Quality Handbook to determine the appropriate level of analysis for attainment areas (see **Table 3-2**).[43] The Screening Criteria questions apply to the construction period and the operational period of a proposed action. The four screening criteria questions were applied to the Proposed Action and there are no emissions from the activity levels above the amounts specified in the four Screening Criteria questions (see **Table 3-2**); therefore, a construction emissions inventory (CEI) or operational emission inventory is not required.

Appendix B contains a quantitative analysis of the Proposed Action's construction emissions using the Air Force's Air Conformity Applicability Model (ACAM). The National Guard Bureau (NGB) can use this analysis for a future document that satisfies their National Environmental Policy Act (NEPA) requirements.

3.3.1.4 Mitigation Measures

As described above, the Proposed Action would not exceed any *de minimis* thresholds and would have no significant effect on air quality. All work would be conducted in compliance with applicable regulations. Therefore, mitigation measures are not required.

[42] U.S. Environmental Protect Agency. (2024, April 30). Green Book. Retrieved May 3, 2024, from Iowa Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants: https://www3.epa.gov/airquality/greenbook/anayo_ia.html.

[43] FAA. (2024, July 24). Technical Support Document for Attainment Area Screening Methodology. Retrieved February 27, 2025, from Aviation Emissions and Air Quality Handbook: https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook.

Table 3-2
FAA Air Quality Handbook Screening Criteria for Attainment Areas

Screening Criteria Question	Proposed Action Response
Will the FAA decision result in an increase of more than 14,000 commercial aircraft operations per year, or if the project is in an Ozone Transportation Region (OTR), more than 5,000 general aviation aircraft operations per year?	No, the Proposed Action would not increase operations at the Airport either during construction or operation and is not in an OTR.
Will the FAA decision result in an increase of more than 340,000 minutes of aircraft delay per year?	No, during the construction of the Proposed Action aircraft can use the existing Runway 18-36 and during operation of the Proposed Action there would be the same runway thresholds for commercial operations.
Will the FAA decision result in an additional 25 million Vehicle Miles Traveled (VMT) per year?	No, the Proposed action would result in about an additional 1 million VMT per year during construction of the Proposed Action. Operation of the Proposed Action would not result in additional VMT as the Proposed Action would not increase operations at the Airport.
Will the FAA decision result in the use of more than 125 construction vehicles or GSE during a year, or if the project is in the OTR, 50 construction vehicles or GSE during a year?	No, the construction of the Proposed Action is anticipated to use about 55 construction vehicles per year Operation of the Proposed Action would not increase operation at the Airport and therefore, is not anticipated to use more than 125 GSE in a year and is not in an OTR.

Source: FAA, 2024; RS&H, 2025.

3.3.2 Biological Resources

The FAA 1050.1F Desk Reference states that, “biological resources are valued for their intrinsic, aesthetic, economic, and recreational qualities and include fish, wildlife, plants, and their respective habitats. Typical categories of biological resources include terrestrial and aquatic plant and animal species; game and non-game species; special status species (state or federally listed threatened or endangered species, marine mammals, or species of concern, such as species proposed for listing or migratory birds); and environmentally-sensitive or critical habitats.” Many regulations provide for the protection of certain biological resources including the Endangered Species Act, Wildlife Coordination Act, and Migratory Bird Treaty Act, among many others.

3.3.2.1 Affected Environment

This section describes the coordination and investigation associated with fish, wildlife, and plant species within the Project Study Area. The evaluation includes coordination with the Iowa Department of Natural Resources (IDNR) and U.S. Fish and Wildlife Service (USFWS) regarding potential threatened and endangered (T&E) species issues that may result from the Proposed Action.

In an email dated May 7, 2024, the IDNR indicated that they had no site-specific records of rare species or significant natural communities in the Project Study Area that would be affected by the Proposed Action. The USFWS Information for Planning and Conservation (IPaC) database was reviewed for federally listed T&E species, including candidate species, with the potential to occur in the Project Study Area. According to the IPaC consultation, five T&E species may be present within the Project Study Area (see **Table 3-3**).

Table 3-3
Federally Listed T&E Species

Group	Name	Status
Mammal	Northern long-eared bat (*Myotis septentrionalis*)	Endangered
Mammal	Tricolored Bat (*Perimyotis subflavus*)	Proposed Endangered
Insect	Monarch Butterfly (*Danaus plexippus*)	Candidate
Fish	Pallid Sturgeon (*Scaphirhynchus albus*)	Endangered
Bird	Piping Plover (*Charadrius melodus*)	Threatened

Source: USFWS, 2024.

A biological resources site visit occurred on May 8, 2024, to evaluate whether the Project Study Area contains suitable habitat for federally- and state-listed T&E species and to assess the potential for adverse effects from the Proposed Action.[44] **Appendix C** provides a detailed report outlining the site survey. The report concluded that previous grading activities to create the airport, taxiways, terminal, and supporting features affected most of the Project Study Area and the area was disturbed.

A wooded riparian corridor is located along the Missouri River in the northwest portion of the Project Study Area. Observations of the wooded riparian corridor showed it contains very thick scrub/shrub vegetation, which did not become established until after the 1980s based on an aerial photograph review. The overall suitability of the Project Study Area for T&E bat species habitat is low due to the thick shrub/scrub vegetation and lack of mature trees.

The Project Study Area lacks unvegetated shorelines or sandbars, which are suitable habitat for the piping plover. Bald eagles frequently use the Missouri River and its riparian corridor as foraging and nesting habitat. However, there were no observations of bald eagles or eagle nests within the Project Study Area, nor were any mature trees within the Project Study Area of a size suitable for nest-building. Migratory birds may be present in the Project Study Area during construction; however, there is suitable habitat outside of the Project Study Area.

There were no observations of a suitable habitat for the pallid sturgeon due to the lack of channels with flowing water within the Project Study Area. Within the Project Study Area, there are two man-made ditches in upland areas to provide a path for stormwater to flow to the Missouri River. If pallid sturgeon habitat were to exist, it would likely be in the largest ditch, which is along the northeastern border of the Project Study Area. Historically, this ditch has been dry. Exceptions to the dry years are 1993, 2010, 2011, and 2019, which were all years of historic flooding and above-normal precipitation. During the site visit, there was no evidence of

[44] Foth. (2024). Biological Resources Evaluation; Environmental Assessment for the Runway Improvements Project, Sioux Gateway Airport, June, 2024.

drainage patterns that would indicate frequent or sustained flow within the ditch. The ditches in the Project Study Area would not be suitable habitat for the pallid sturgeon.

The monarch butterfly was identified as a candidate species; therefore, consultation with the USFWS is not required. The Airport Sponsor regularly mows and maintains vegetated areas within the Project Study Area. Observations of the farm ground within the Project Study Area were fallow or planted with alfalfa, which could be suitable habitat for the monarch butterfly when alfalfa is in bloom. There were no observations of Milkweed within the Project Study Area, which is a potential suitable habitat for the monarch butterfly. Therefore, there is minimal suitable habitat for the monarch butterfly within the Project Study Area.

3.3.2.2 Significance Threshold

The significance threshold for biological resources is if the USFWS or the National Marine Fisheries Service (NMFS) determines that the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species or would result in the destruction or adverse modification of federally designated critical habitat.

The FAA has not established a significance threshold for non-listed species; however, considerations of significance include if the action would have the potential for any of the following:

- A long-term or permanent loss of unlisted plant or wildlife species, i.e., extirpation of the species from a large project area (e.g., a new commercial service airport).
- Adverse impacts to special status species (e.g., state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats.
- Substantial, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations.
- Adverse impacts on a species' reproductive success rates, natural mortality rates, non-natural mortality (e.g., road kills and hunting), or ability to sustain the minimum population levels required for population maintenance.

3.3.2.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, the Airport Sponsor would not implement the Proposed Action. The Airport Sponsor would continue to operate the Airport and serve forecast aviation demands. This alternative assumes that future airport development is subject to review and approval under NEPA. Therefore, there would be no effect on biological resources.

Proposed Action

Construction activities associated with the Proposed Action would include clearing and grubbing. The habitats within the Project Study Area are not unique, rare, or protected. During construction, direct mortality to individual animals could occur due to excavation and grading. As **Section 3.3.2.1** describes, the Project Study Area has low overall suitability for two federally listed bat species. The suitable habitat is located within the wooded riparian corridor along the Missouri River in the northwest portion of the Project Study Area. However, the Proposed Action

does not propose removing any trees. Therefore, the Proposed Action would have no effect on the northern long-eared bat or tricolored bat. Due to the lack of river channels, shorelines, and sandbars, suitable habitat for the piping plover and pallid sturgeon is not present within the Project Study Area. Due to the lack of mature trees suitable for bald eagle nest-building in the Project Study Area, the Proposed Action would have no effect on bald eagles. Migratory birds could use a wooded area west-southwest of the Project Study Area that continues along the bank of the Missouri River as there is a lack of suitable habitat within the Project Study Area, therefore, the Proposed Action would have no effect on migratory birds. Finally, Milkweed was not present within the Project Study Area; therefore, the Proposed Action would have no effect on the monarch butterfly.

In addition, FAA Advisory Circular (AC) 150/5370-10G, Item P-156, *Temporary Air and Water Pollution, Soil Erosion, and Siltation Control* identified best management practices (BMPs) to minimize potential impacts during construction. Adherence to these BMPs would minimize potential impacts to biological resources.

3.3.2.4 Mitigation Measures

The Proposed Action would not require mitigation measures because there would be no effect on threatened and endangered species.

3.3.3 GHG Emissions[45]

Research has shown that an increase in atmospheric greenhouse gas (GHG) emissions is affecting the Earth's climate. GHGs are gases that trap heat in the atmosphere and are primarily a result of burning fossil fuels, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, and perfluorocarbons. Increasing concentrations of GHG emissions in the atmosphere affect global climate and results in localized impacts.

Consistent with section 102(2)(C) of NEPA, Federal agencies must disclose and consider the reasonably foreseeable effects of their proposed actions including the extent to which a proposed action and its reasonable alternatives (including the no action alternative) would result in reasonably foreseeable GHG emissions that contribute to climate change. FAA Order 1050.1F states that GHGs and climate change should be considered and evaluated as an impact category in FAA environmental documents, and where a proposed action or alternative(s) would result in an increase in GHG emissions, the emissions should be assessed either qualitatively or quantitatively.

3.3.3.1 Affected Environment

Climate Change due to GHG emissions is a global phenomenon, so the affected environment is the global climate. The specific GHG emissions associated with the Proposed Action would result from construction activities occurring in the immediate vicinity of the Airport. Information to

[45] E.O. 13990, which was relied upon for the January 2023 Council on Environmental Quality (CEQ) draft Greenhouse Gas guidance, was revoked. In addition, CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 U.S.C. 4321 *et seq*., as amended, in response to E.O. 14154. As a result of these changes, and notwithstanding anything to the contrary contained in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, references to climate and the qualitative climate evaluation that discussed the level of preparedness with respect to the impacts of climate change, the extent to which the alternatives could be affected by future climate conditions, and if the alternatives are consistent with national, state, and local climate goals are not included in this EA.

describe a baseline of existing GHG emissions in the vicinity of the Proposed Action is not available.

3.3.3.2 Significance Threshold

FAA Order 1050.1F does not provide a significance threshold for aviation related GHG emissions. There are currently no accepted methods of determining significance applicable to aviation or commercial space launch projects given the small percentage of emissions they contribute.[46]

3.3.3.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, the Airport Sponsor would not implement the Proposed Action. The Airport Sponsor would continue to operate the Airport and serve forecast aviation demands, which would result in no increase in GHG emissions beyond those that would occur with the forecasted aircraft operations. Therefore, there would be no effect on aviation related GHG emissions and no temporary increase in GHG emissions associated with construction.

Proposed Action

The main source of GHG emissions related to the Proposed Action would be CO_2 emissions generated by combustion connected with construction equipment vehicles. Construction is a temporary activity and would not result in a new emissions source past the 36-month construction period. The Proposed Action would not change the number of aircraft operations or accommodate larger aircraft or aircraft that can fly further distances and therefore, would not increase emissions. The Proposed Action would not change the taxi-in and taxi-out time after implementation of the Proposed Action as the runway ends would not change for non-military operations. The Proposed Action would not cause a significant or sustained increase in construction, vehicular, or aircraft traffic, and therefore, the increase in emissions is expected to be negligible.

3.3.3.4 Mitigation Measures

In the absence of potentially significant GHG impacts, no mitigation measures are proposed.

3.3.4 Department of Transportation, Section 4(f)

Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966[47] (Section 4(f)) protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Section 4(f) provides that the Secretary of Transportation may approve a transportation program or project requiring the use of a Section 4(f) resource, only if there is no feasible and prudent alternative to the using that land and the program or project includes all possible planning to minimize harm resulting from the use. Section 4(f) properties are publicly owned lands, including public parks, recreation areas, wildlife, and waterfowl refuges, or publicly-or privately-owned historic sites of National, State, and/or local importance.

[46] FAA. (2023). 1050.1F Desk Reference.
[47] Codified at 49 U.S.C. § 303.

Historic sites include prehistoric and historic districts, sites, buildings, structures, or objects listed in, or eligible for listing in, the National Register of Historic Places (NRHP).

Section 6(f) of the Land and Water Conservation Fund Act of 1965 (Section 6(f)) provides funds for buying or developing public-use recreational lands through grants to local and state governments. Section 6(f) prevents the conversion of lands purchased or developed with LWCFA funds to non-recreation uses, like airport projects, unless the Secretary of the Department of Interior, through the National Park Service (NPS), approves the conversion.

3.3.4.1 Affected Environment

No Section 4(f) resources exist in the Project Study Area. The closest Section 4(f) resource is Cottonwood Cove Park, across the Missouri River in Dakota City, Nebraska. The closest Section 6(f) resource is Seminary Square, about 3,000 feet west of the Project Study Area.[48] The closest NRHP resource is the Emmanuel Lutheran Church, about 2,500 feet west of the Project Study Area.[49] The closest National Wildlife Refuge (NWR) is the DeSoto NWR, about 60 miles south of the Project Study Area.[50]

An architectural survey occurred in 2024 to identify potential historic resources covering the Project Study Area and a one-half mile buffer. The survey identified 23 potentially eligible historic structures. For more discussion on historic structures, see **Section 3.3.6** and the architectural survey report in **Appendix D**. An archaeological survey also occurred in 2024 to identify potential eligible cultural resources in the Project Study Area. The survey identified three sites as potentially eligible for inclusion in the NRHP. For more discussion on cultural resources, see **Section 3.3.6**.

3.3.4.2 Significance Threshold

FAA Order 1050.1F, Exhibit 4-1, states a significant impact would occur if the action involves more than a minimal physical use of a Section 4(f) resource or constitutes a 'constructive use' based on an FAA determination that the aviation project would substantially impair the USDOT Section 4(f) resource.

3.3.4.3 Environmental Consequences

For Section 4(f) purposes, an action would "use" a resource in two ways.

- Physical Use: The action physically occupies and directly uses the Section 4(f) resource. An action's occupancy or direct control (via purchase) causes a change in the use of the Section 4(f) resource. Examples include land or a permanent easement, physical occupation of a portion or all the property, or alteration of structures or facilities on the property.
- Constructive Use: The action indirectly uses a Section 4(f) resource by substantially impairing the resource's intended use, features, or attributes. Examples include impacts resulting from noise, air pollution, and water pollution.

[48] LWCF. (2022, June). Past Projects. Retrieved May 3, 2024, from https://lwcf.tplgis.org/mappast/.
[49] National Park Service. (2020, September). National Register of Historic Places. Retrieved April 30, 2024, from https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466.
[50] U.S. Fish & Wildlife Service. (n.d.). Our Facilities. Retrieved May 3, 2024, from https://www.fws.gov/our-facilities.

No Action Alternative

Under the No Action Alternative, the Airport Sponsor would not implement the Proposed Action. The Airport Sponsor would continue to operate the Airport and serve forecast aviation demands. As there would be no change to aircraft operations or taxi distances, and no construction would occur, there would be no physical or constructive use to Section 4(f) properties.

Proposed Action

Construction of the Proposed Action would occur entirely within the Project Study Area and would not require the physical use (direct use) of any Section 4(f) property. In addition, there would be no constructive use (indirect use) of any Section 4(f) property during construction (see **Sections 3.3.1**, **3.3.3**, **3.3.8**, **3.3.9**, **3.3.10**, and **3.3.11**).

Implementation of the Proposed Action would not significantly affect the area's air quality, climate, historic, natural resources, noise, or visual effects (see **Sections 3.3.1**, **3.3.3**, **3.3.8**, **3.3.9**, **3.3.10**, and **3.3.11**) that could affect any Section 4(f) resources. There would be no Section 4(f) resources inside the 2029- and 2034-day night average sound level (DNL) 65+ decibel (dB) noise contours. As discussed in more detail in **Section 3.3.6**, the FAA determined *No Historic Properties Affected* due to the Proposed Action in a letter dated April 7, 2025, and the Iowa State Historic Preservation Officer (SHPO) concurred in a letter dated May 2, 2025. The FAA also consulted the *no historic properties affected* determination for the Proposed Action with the Nebraska SHPO on April 7, 2025. The Nebraska SHPO concurred with a *no adverse effect(s) to historic properties* determination on April 10, 2025. (See **Appendix D** for the consultations). For those reasons, the Proposed Action would not constructively use (indirectly use) any Section 4(f) property.

3.3.4.4 Mitigation Measures

The Proposed Action would not physically or constructively use any Section 4(f) resource. Therefore, no mitigation is required.

3.3.5 Hazardous Materials, Solid Waste, and Pollution Prevention

FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, requires an analysis of pollution prevention procedures and hazardous materials and solid waste that are either present or will be generated during a proposed action.

Legislation relevant to this analysis includes:

- The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which determines liability for cleanup costs of hazardous release sites, manages a trust fund to finance the cleanup of contaminated sites when liability is unclear, and manages the National Priorities List (NPL).
- The Superfund Amendments and Reauthorization Act (SARA), which was an amendment to CERCLA.
- The Resource Conservation and Recovery Act (RCRA), which establishes guidelines for waste (both hazardous and non-hazardous solid waste) storage, treatment, and disposal.

- Iowa Code Chapter 455B, specifically the sections related to solid waste and hazardous waste management. This chapter outlines the regulations for the management of solid waste, including disposal, recycling, and other related activities.[51]
- Code of Federal Regulations (CFR) Title 40 – Protection of Environment, which outlines the federal responsibilities, requirements, and specifications of items and materials that have the potential to impact the environment.
- U.S. Department of Transportation (U.S. DOT) Rules for Transportation of Hazardous Materials, which outlines the procedures and enforcement policies of the Hazardous Materials Program for the U.S.
- Aeronautics and Space Operating Requirements – Hazardous Materials (14 CFR Part 121), which outlines operational requirements, such as training and recordkeeping, for "air carriers and operators for compensation or hire."

According to FAA 1050.1F Desk Reference, a hazardous material is any substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and includes hazardous wastes and hazardous substances.

3.3.5.1 Affected Environment

Activities conducted by the Airport Sponsor and its tenants involve the storage and use of various hazardous materials, including gasoline, diesel, aircraft fuels, motor oils, lubricants, cleaning solvents, paint, and pesticides. Petroleum products such as AvGas, Jet-A, diesel, and gasoline are the primary hazardous materials stored and used at the Airport. To uphold their industrial storm water permit (further discussed in **Section 3.3.12.3**), the Airport Sponsor implements pollution prevention through the Stormwater Pollution Prevention Plan (SWPPP) and a Spill Prevention, Control, and Countermeasures (SPCC) Plan. Together, these plans outline emergency response procedures, potential migratory pathways, cleanup procedures, BMPs, housekeeping procedures, training requirements, inspection requirements and frequency, control measures, and deicing procedures, among other items. No significant activities occur within the Project Study Area, nor is there evidence of accidental releases of these materials within the Project Study Area.

Solid waste generated at the Airport is disposed of at the Northwest Iowa Area Sanitary Landfill, located over 60 miles northeast of the Airport.[52] According to the USEPA Landfill Methane Outreach Program (LMOP), the landfill is projected to be operational until 2082.[53]

In addition, the Airport Sponsor proposes to acquire a one-acre property as part of the Proposed Action, which is currently farmed. A Phase I Environmental Site Assessment (Phase I ESA) was conducted in April 2024 to document potential hazardous materials on the property (see **Appendix E**). The Phase I ESA of the one-acre property proposed for acquisition did not find

[51] Department of Natural Resources. (2024, November 19). Iowa Code 2025, Chapter455B. Retrieved August 7, 2025, from: https://www.legis.iowa.gov/docs/ico/chapter/455B.pdf.
[52] Iowa Department of Natural Resources. (n.d.). Solid Waste Permitting. Retrieved May 3, 2024, from https://www.iowadnr.gov/Environmental-Protection/Land-Quality/Solid-Waste/Solid-Waste-Permitting#Transfer-Stations-and-Citizen-Convenience-Center-139.
[53] U.S. Environmental Protection Agency. (2024, March 22). Landfill Methane Outreach Program (LMOP). Retrieved May 3, 2024, from Project and Landfill Data by State: https://www.epa.gov/lmop/project-and-landfill-data-state.

any Recognized Environmental Conditions, Controlled Recognized Environmental Conditions, or Historical Recognized Environmental Conditions (see **Appendix E**). While the Phase I ESA was not performed for the entire Project Study Area, data on hazardous material sites within certain distances of the Project Study Area were identified, as described below.

- There are 27 Toxic Release Inventory sites in Woodbury County, with the closest over one mile southeast of the Project Study Area.[54]
- There are no active Superfund, also known as the National Priorities List, sites in Woodbury County.[55]
- The closest Superfund site is Highway 3 PCE, about 30 miles northeast of the Project Study Area.
- There are no RCRA sites in the Project Study Area.[56]

A preliminary assessment site visit was conducted in November 2015 by the IAANG at the 185th ARW base property. The purpose of the site visit was to identify potential sites of historic environmental releases of perfluorinated compounds (PFCs), specifically from Aqueous Film Forming Foam (AFFF) usage and storage. These potential sites are shown on **Figure 3-2**.

The IAANG conducted research of any documented Fire Training Areas (FTAs) in operation since 1970, or any other use or release of AFFF in accordance with the Final PFC Preliminary Assessment Work Plan (see **Appendix E** for the PFAS Report). During the site visit, the IAANG conducted personnel interviews, reviewed on-site documentation and toured each potential site.

Eleven potential areas of concern were identified at the 185th ARW base property and of these eleven sites, nine were recommended for further investigation to characterize potential soil, groundwater, surface water, and sediment PFC contamination (see **Appendix E** for the PFAS Report). Subsequently, the IAANG conducted soil, sediment, surface and groundwater sampling and identified PFAS contamination of soil, surface water, and groundwater with a variety of PFAS chemicals (see **Appendix E** for the Final Site Inspection Report). While soil results did not exceed USEPA screening criteria at the time, the state of Iowa (through the IDNR) adopted soil screening criteria for some PFAS chemicals, and soil results exceeded some of the IDNR screening criteria. However, IAANG is not subject to state requirements. Groundwater results exceeded USEPA criteria, and the IAANG initiated additional investigations in July 2025.

[54] U.S. Environmental Protection Agency. (2023, October). 2022 TRI Factsheet: County – Woodbury, IA. Retrieved May 3, 2024, from https://enviro.epa.gov/triexplorer/tri_factsheet.factsheet?pZip=&pCity=&pCounty=woodbury&pState=IA&pYear=2022&pDataSet=TRIQ1&pParent=NAT&pPrint=1.

[55] U.S. Environmental Protection Agency. (2023, October 30). Superfund. Retrieved May 3, 2024, from https://www.epa.gov/superfund/search-superfund-sites-where-you-live.

[56] U.S. Environmental Protection Agency. (2025, June 5). RCRA Sites. Retrieved June 8, 2025, from https://map22.epa.gov/cimc/rcra

Figure 3-2
Areas with the Potential for Historic PFAS Usage

Most of the areas of concern are located within IAANG leased property and not within the Project Study Area. Groundwater contamination has migrated beneath Airport property and the IAANG continues to investigate and determine mitigation activities.

Some soil and sediment PFAS contamination was discovered adjacent to the Project Study Area, specifically Taxiway A and the portion of the drainage ditch in the future runway safety area. The Airport Sponsor is planning to conduct additional soil sampling to determine if contamination exists above regulatory levels within the Project Study Area and nearby the IAANG areas already investigated. The soil data will be used to help inform a Contaminated Materials Management Plan (CMMP) for the Proposed Action. See **Section 3.3.12.3** and **Section 3.3.12.4** for potential pathways for contaminant migration off Airport property.

3.3.5.2 Significance Threshold

FAA Order 1050.1F does not provide a significance threshold for hazardous materials, solid waste, and pollution prevention; however, it does provide several factors to consider in evaluating the context and intensity of potential environmental impacts. These include when the action would have the potential to:

- violate applicable federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management;
- involve a contaminated site (including but not limited to a site listed on the National Priorities List [NPL]);
- produce an appreciably different quantity or type of hazardous waste;
- generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity; or
- adversely affect human health and the environment.

In April 2024, the USEPA announced the final National Primary Drinking Water Regulation (NPDWR) for six PFAS. The USEPA established legally enforceable levels, called MCLs, for six PFAS in drinking water: perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS), perfluorohexane sulfonate (PFHxS), perfluorononanoic acid (PFNA), and hexafluoropropylene oxide dimer acid (HFPO-DA) as contaminants with individual MCLs, and PFAS mixtures containing at least two or more of PFHxS, PFNA, HFPO-DA, and Perfluorobutanesulfonic acid (PFBS) using a Hazard Index (HI) MCL. The HI accounts for the combined and co-occurring levels of these PFAS in drinking water.

The IDNR has developed an action plan to protect human and health and the environment from PFAS. The action plan focuses primarily on assessing and protecting public drinking water supplies and facilities from contamination by PFAS sources. IDNR promulgated statewide standards for PFAS in groundwater in 2016. The IDNR Land Recycling Program has promulgated PFAS Response Action standards for soil protective of groundwater.

3.3.5.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, the Airport Sponsor would not implement the Proposed Action. As there would be no change to the Airport's current operating setting, there would be no change to the Airport's hazardous materials, solid waste or pollution policies or procedures. Therefore, the No Action Alternative would have no effect on hazardous materials, solid waste, or pollution prevention.

Proposed Action

Construction of the Proposed Action would result in temporary increases in storing hazardous materials, primarily in the form of diesel fuel and lubricants for the operation and maintenance of construction equipment. The construction contractor would store and use the hazardous materials at the designated construction staging areas, and in compliance with federal, state, and local regulatory requirements and permit conditions requiring pollution prevention measures. In addition, the construction contractor would dispose of construction debris and waste at the appropriate authorized disposal facility. The construction contractor would obtain a construction stormwater permit and develop a SWPPP, and implement appropriate BMPs to minimize the release of contaminants during construction.

The IAANG continues to investigate past releases of AFFF and resulting PFAS contamination in soils, groundwater, and surface water. The IAANG maintains responsibility for the investigations and is ultimately responsible for any mitigations required. The Airport Sponsor has been regularly coordinating with the IAANG and discussing opportunities to minimize adverse impacts to the environment associated with past IAANG releases of AFFF. As reported in the Final Site Inspection Report (see **Appendix E**), the groundwater table near the 185th ARW base property is 9.5 to 22.5 feet below ground surface. The Airport Sponsor intends to conduct limited sampling to provide the contractor with data needed to make an assessment of effort associated with PFAS-containing materials and to confirm that materials to be handled during construction are managed properly. No other areas on the Airport where construction activities associated with the Proposed Action would occur are known to have PFAS contamination in the soils. Further, the Airport Sponsor anticipates that no soils from Airport property would leave the property and all soils would be managed onsite. Onsite management would be in accordance with a project-specific CMMP that would be developed by the Airport Sponsor and adhered to by the contractor during construction, and by the Airport Sponsor during operation of the Proposed Action. The following approaches, which are consistent with USEPA guidance on the handling and disposal of PFAS-containing materials, could be included in the CMMP:

- Excess or unsuitable soils that exceed the USEPA's PFAS Residential Regional Screening Levels (RSLs) and are not regulated by Federal, State, or local hazardous waste regulatory levels can be stockpiled with controls at a predetermined soil management location on the Airport. While not a destruction or disposal method, stockpiling may be an option if the destruction or disposal of PFAS-containing materials is not imperative, onsite storage capacity is readily available, and interim storage has proper controls in place to reduce releases into the environment. These include placing soils on an impervious liner and

covering the soil with plastic sheeting to restrict infiltration of precipitation or stormwater through these soils.

- Groundwater, while not anticipated, if encountered during excavation and construction activities, would be managed as PFAS-containing unless testing of the groundwater indicates that PFAS are not present. Groundwater would be managed under IDNR General Permit (General Permit) #9 (GP #9). GP #9 dictates management of dewatering of groundwater known or suspected to be contaminated (see **Section 3.3.12.3** for more details).
- If dewatering is necessary for construction activities, the water would be discharged onto the ground surface and infiltrated back into the ground onsite and as close to the original excavation as possible. If this is not possible due to site conditions, the water would be contained in frac-tanks and tested for PFAS. If the laboratory analysis of the water contains PFAS above the IDNR screening values, the water would be treated prior to being discharged to the ground surface or transported and disposed of off-site at a licensed waste treatment facility.

Operations resulting from the Proposed Action would not significantly change the type or quantity of hazardous materials stored and used at the Airport. Under the Proposed Action, the Airport Sponsor would store and use materials currently used at the Airport as they currently are today. The Airport Sponsor would adhere to the CMMP during the operation of the Proposed Action. The Airport Sponsor would be responsible for continuing to store and use hazardous materials in accordance with the federal, state, and local rules and regulations. The Airport Sponsor would update its SWPPP) for industrial activities and SPCC plan to reflect facility changes and maintain compliance with applicable regulatory requirements (see **Sections 3.3.12.2, 3.3.12.3, and 3.3.12.4** for more details).

Since the Proposed Action would comply with all federal, state, and local regulations and permitting conditions, construction and operation of the Proposed Action would not significantly affect hazardous materials, solid waste, or pollution prevention at the Airport.

3.3.5.4 Mitigation Measures

Prior to construction, a CMMP would be developed by the Airport Sponsor and implemented by the contractor during construction, and by the Airport Sponsor during operation of the Proposed Action. With adherence to the CMMP and local and state permit requirements, no significant impact would occur under the Proposed Action.

3.3.6 Historical, Architectural, Archaeological, and Cultural Resources

The National Historic Preservation Act (NHPA)[57] establishes the Advisory Council on Historic Preservation (ACHP). The ACHP oversees federal agency compliance with the NHPA. The NHPA also established the NRHP, which the NPS oversees.

Section 106 of the NHPA requires federal agencies to account for the effects of their undertaking[58] and consult with the SHPO, Tribal Historic Preservation Officers (THPO), and

[57] 54 U.S.C. §§ 300101 et seq.
[58] Under Section 106, an undertaking is the proposed action, or project.

other parties to develop and evaluate alternatives or modifications to the undertaking where necessary to avoid, minimize, or mitigate adverse effects on historic properties.

In consultation with the SHPO/THPO, the FAA evaluates a property's eligibility for inclusion in the NRHP. This section evaluates potential impacts to historical, architectural, archaeological, and cultural resources. Full details are provided in the Phase I Archaeological Investigation report and Historical/Architectural survey report (**Appendix D**).

3.3.6.1 Affected Environment

Area of Potential Effect

The Area of Potential Effects (APE) consists of a Direct APE and Indirect APE (**Figure 3-3**). The Direct APE is the same as the project study area described in **Section 3.1**. The Direct APE contains resources that could potentially be affected by construction of the Proposed Action. The Indirect APE is a one-half mile buffer area surrounding the Direct APE. Resources in the Indirect APE could potentially be affected by aircraft noise related to operation of the Proposed Action.

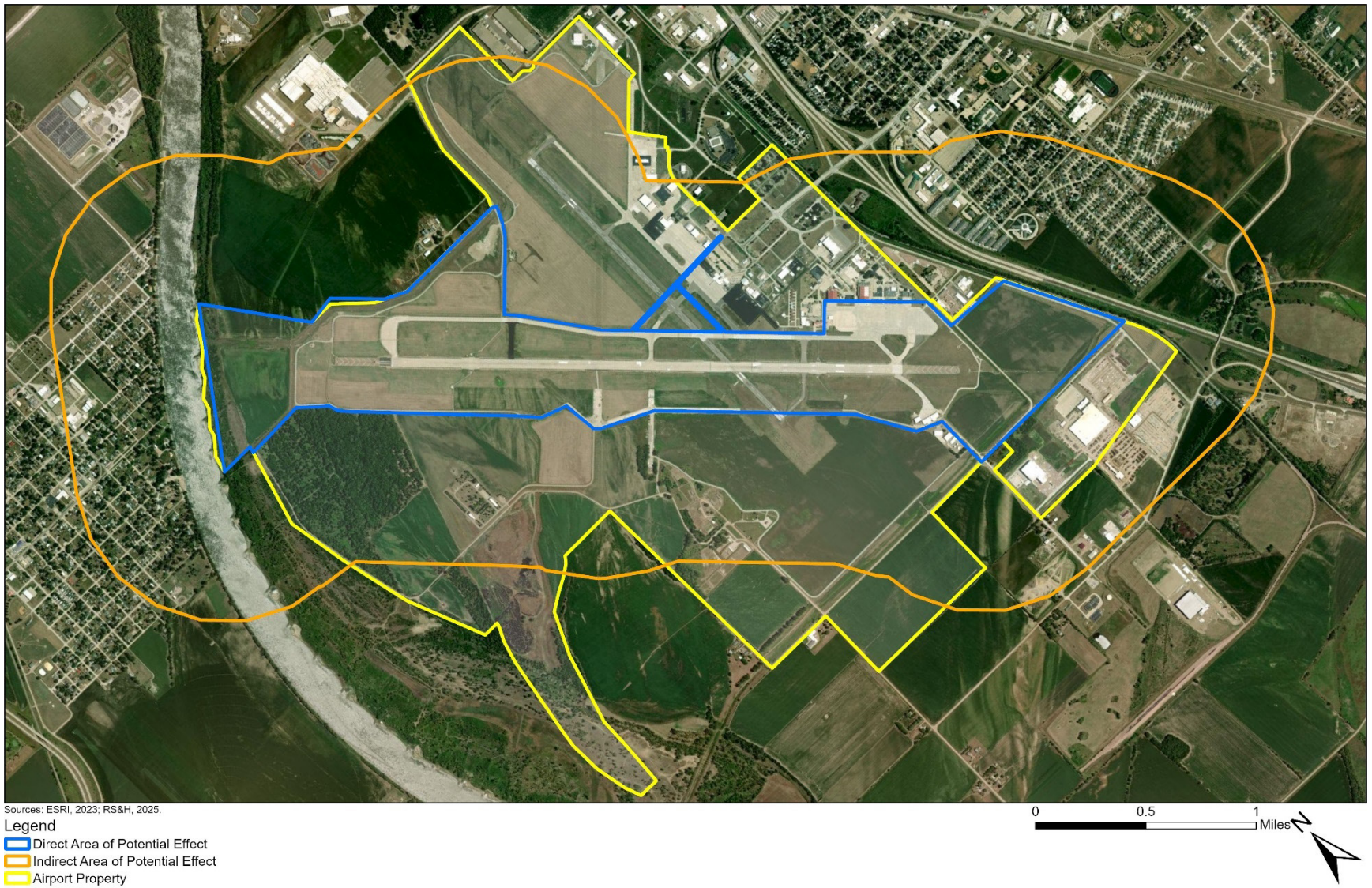
Historical and Architectural Resources

There are three Iowa Architecturally Inventoried Structures within the APE. A review of the Historic Indian Locations Database revealed no sites are in the APE. The only structures that would be demolished are the navigational aid (NAVAID) shelters, which would be relocated to a new position to maintain their functionality.

Archaeological and Cultural Resources

The APE is in Woodbury County, Iowa, along the bank of the Missouri River. Previous investigations in the area did not identify potential historic sites and noted a lack of potential for archaeological sites in the APE.

Figure 3-3
Direct APE and Indirect APE



The investigation consisted of two stages. The first stage of the investigation was records check of the Iowa Archaeology Database to locate any previous surveys of the area within a 1-mile radius. The second stage was fieldwork of the APE, which is identical to the Project Study Area consisting of a pedestrian survey and shovel tests to examine soil and any potential artifacts. A Phase I Archaeological Survey occurred in April 2024 and consisted of a pedestrian survey and shovel tests of the entire APE. The fieldwork investigation of the APE evaluated three sites under NRHP criteria, and assigned the site numbers 13WD254, 13WD255, and 13WD256 (**Table 3-4**). The survey evaluated each site for potential eligibility for inclusion in the NRHP using the integrity considerations and significance criteria of the NRHP. This evaluation resulted in a recommendation that none of these sites are eligible due to a lack of integrity and sparse artifact assemblages. Therefore, the survey recommends the sites as not eligible for inclusion in the NRHP and for no further archaeological investigation (see **Appendix D** for more details).

Table 3-4
Summary of Archaeological Resources Site Survey

Site Number	Site Type/Cultural Affiliation	NRHP Evaluation	Recommendation
13WD254	Historic farm/residence	Not eligible	No further study
13WD255	Historic farm/residence	Not eligible	No further study
13WD256	Historic structure	Not eligible	No further study

Source: Tallgrass, 2024.

A historical and architectural survey of the APE and a half-mile buffer occurred in May 2024. The survey found 23 resources recommended eligible or potentially eligible (see **Table 3-5** and **Appendix D** for more details). There are also two potential historic districts in the half-mile buffer, one which is eligible, and one which future surveys would determine eligibility (see **Appendix D** for more details). The closest NRHP listed site is the Emmanuel Lutheran Church, located over 2,000 feet away from the APE, across the Missouri River.[59]

Table 3-5
Summary of Architectural Resources Survey

Project Inventory Number	Resource	Location/Address	Recommendation
018	Circa-1950 Hangar	North part of Airport	Eligible
024	1952 Building and additions	North part of Airport	Further research
033	1940s Building	Central part of Airport	Further research
039	Circa-1960 Hangar	Central part of Airport	Further research
074	1955 Bunker	West part of Airport	Eligible
075	1955 Bunker	West part of Airport	Eligible
076	1955 Bunker	West part of Airport	Eligible
077	Circa-1950 Building	West part of Airport	Eligible
078	Circa-1950 Building	West part of Airport	Further research

[59] National Park Service. (2020, September). National Register of Historic Places. Retrieved April 30, 2024, from https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466.

Project Inventory Number	Resource	Location/Address	Recommendation
084	Potential District identified in previous surveys	East part of Airport	Eligible, in concurrence with previous evaluation
085	Potential District identified in previous surveys	East part of Airport	Further Research; previously eligible; loss of some contributing resources
086	Circa-1930 House; Outbuildings	2224 Banner Ave, Sergeant Bluff, IA	Eligible
087	Circa-1860 House; Outbuildings	2219 Port Neal Rd, Sergeant Bluff, IA	Eligible
090	Circa-1900 House; Outbuildings	216 Warrior Rd, Sergeant Bluff, IA	Eligible
096	1938 House; Outbuildings	308 D St S, Sergeant Bluff, IA	Eligible
102	1860 Church	1500 Hickory St, Dakota City, NE	NRHP-Listed
105	1970 House	501 River Rd, Dakota City, NE	Further Research
137	1856 House	1323 Myrtle St, Dakota City, NE	Further Research
160	1900 Commercial Building (apartments)	1500-02 Broadway, Dakota City, NE	Further research, in concurrence with previous evaluation
163	1952 House	1404 Broadway, Dakota City, NE	Further research
166	1917 Building (apartments)	1322 Broadway, Dakota City, NE	Further research
169	1946 House	102 S 13 St, Dakota City, NE	Further research
170	1936 House	1212 Broadway, Dakota City, NE	Further research
178	1890 House	123 S 14th St, Dakota City, NE	Eligible
181	1900 House	121 S 15th St, Dakota City, NE	Further research
186	1916 House and Garage	1522 Walnut St, Dakota City, NE	Further research

Source: Tallgrass, 2024.

3.3.6.2 Significance Threshold

FAA Order 1050.1F does not provide a significance threshold for historical, architectural, archaeological and cultural resources; however, it does provide a factor to consider in

evaluating the context and intensity of potential impacts. This factor includes, but is not limited to, situations in which a proposed action or alternative(s) would result in a finding of Adverse Effect through the Section 106 process. A finding of Adverse Effect would be a considering factor in a significance determination; however, this would not automatically be considered a significant impact.

3.3.6.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, the Airport Sponsor would not implement the Proposed Action. There would be no construction in the APE and no change to the Airport's existing operational setting resulting in a change in the APE. Therefore, there would be no effect on historic, architectural, archaeological, or cultural resources.

Proposed Action

Construction of the Proposed Action would require ground disturbing activities in the APE. The archaeological pedestrian survey excavated 494 subsurface tests and based on the results of the records investigation and fieldwork, there is low potential for the discovery of further archaeological materials in the APE. However, an Inadvertent Discovery Plan would be prepared that outlines procedures to perform in the event of the discovery of archaeological materials.

Construction of the Proposed Action would relocate the NAVAID shelters and would not demolish any other structures. In addition, implementation of the Proposed Action would not result in any significant impacts from noise or changes to setting that could affect the characteristics that qualify historic structures for listing on the NRHP.

In compliance with Section 106, the FAA made a "No Historic Properties will be Affected" determination on April 4, 2025, and requested concurrence from the Iowa SHPO and Nebraska SHPO. The Iowa SHPO concurred with this determination on May 2, 2025. The Nebraska SHPO determined that "no adverse effect(s) to historic properties is appropriate for this undertaking" on April 10, 2025. The FAA also coordinated with tribes on April 7, 2025, requesting input on properties of cultural or religious significance that may be affected by the proposed project and requested concurrence with the "No Historic Properties will be Affected" determination. No responses were received from the tribes. See **Appendix D** for SHPO and THPO correspondence.

3.3.6.4 Mitigation Measures

The Proposed Action does not require mitigation measures because construction and implementation of the Proposed Action would have no effect on historical, architectural, archaeological, and cultural resources.

3.3.7 Land Use

The Airport and Airway Improvement Act and state and local regulations are the primary regulations related to land use. Compatible land use around an airport increases safety and minimizes the effects from airport operations. Airport projects receiving federal funding may not be approved unless the Airport Sponsor provides written assurance that appropriate action,

including the adoption of zoning laws, has been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including the landing and takeoff of aircraft (see **Appendix F**).

3.3.7.1 Affected Environment

The Project Study Area is in the city of Sioux City in Woodbury County. According to the Sioux City Zoning Map, most of the Project Study Area is zoned as business park (BP), with the remainder zoned as general industrial (GI) and a small portion in the southwest of Airport property that is not designated.[60] Zoning surrounding the Airport is BP, GI, and General Commercial (GC) (**Figure 3-4**). Existing land uses around the Project Study Area generally includes industrial, agricultural, and residential to the north, agricultural, residential and the Missouri River to the west, agricultural land and industrial to the south, and residential to the east.

3.3.7.2 Significance Threshold

FAA Order 1050.1F does not provide a significance threshold or specific independent factors to consider for land use impacts; however, it does state that the determination that significant impacts exist in the land use impact category is normally dependent on the significance of other impact categories.

3.3.7.3 Environmental Consequences

No Action Alternative

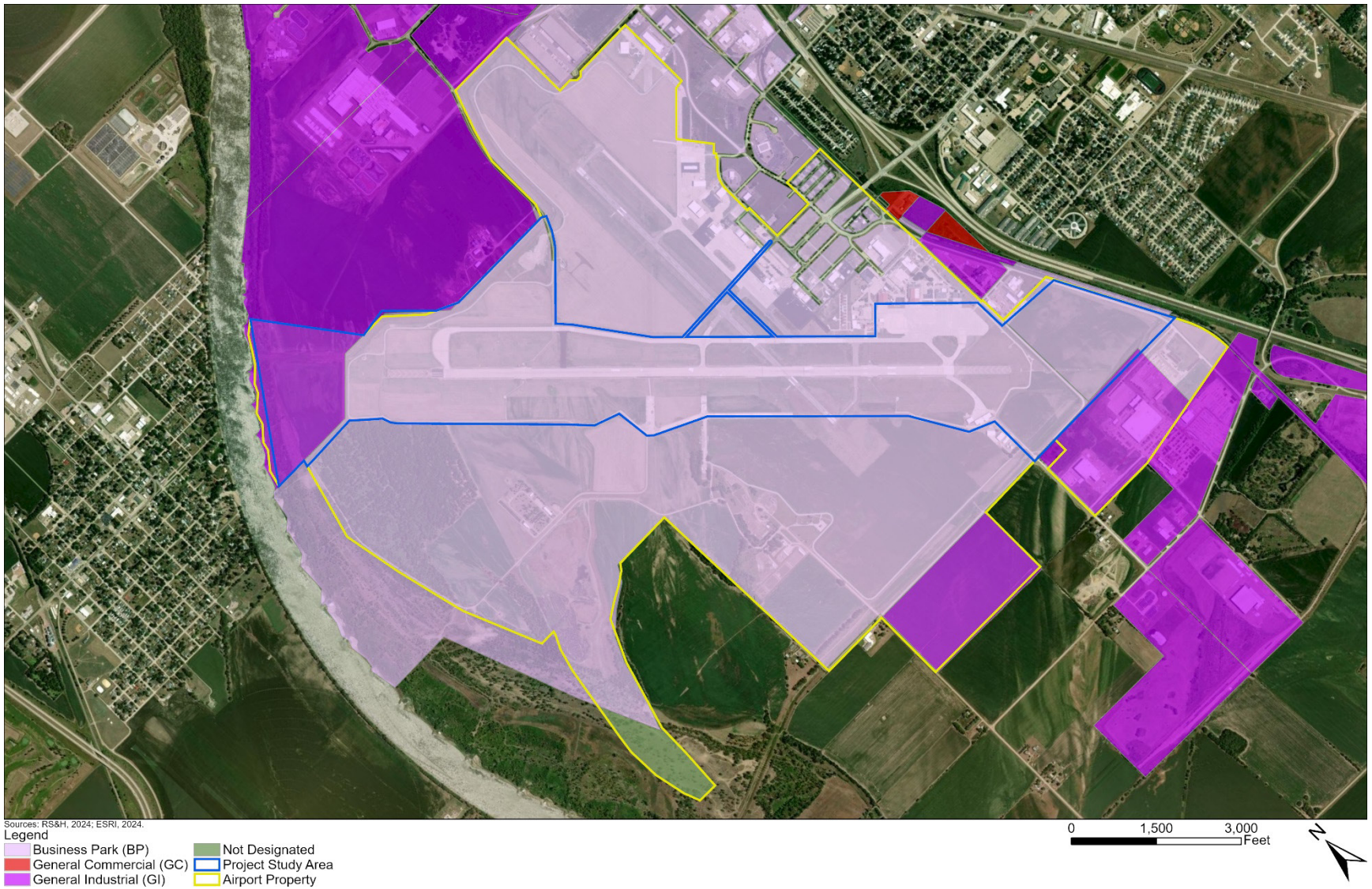
Under the No Action Alternative, construction of the Proposed Action would not occur and no changes to the Airport's existing operation would occur. Therefore, there would be no change to the Airport's land use or zoning, or new land uses introduced. Therefore, there would be no effect on land use.

Proposed Action

Construction and operation of the Proposed Action would occur entirely on Airport property and would be compatible with the existing land use at the Airport. As described in **Section 3.3.7.1**, the zoning for the Project Study Area is Business Park or General Industrial. The Proposed Action is consistent with the current zoning of the Project Study Area.

[60] Sioux City. (2017, June 21). Maps. Retrieved May 6, 2024, from https://www.sioux-city.org/business/maps.

Figure 3-4
Zoning in and Around the Project Study Area



Land acquisition is proposed as part of the Proposed Action. The land acquisition is currently zoned as General Industrial, which is a compatible land use with the Proposed Action. The land acquisition would not require a change to the zoning designation. Following the land acquisition, operation of the Proposed Action would not change the existing land uses within the Project Study Area. As described in **Section 3.3.9.2**, the change to the noise contours due to the Proposed Action would not affect any noise-sensitive land use. Further, as described throughout Chapter 3, the Proposed Action would not significantly affect other resources that could indirectly affect land use (e.g., the Proposed Action would not disrupt communities, affect Section 4(f) resources, etc.). Therefore, the Proposed Action would be consistent with local plans and policies in the Project Study Area.

In addition to the protection of compatible land uses surrounding the Airport with the AIAs, **Appendix F** contains the Airport Sponsor land use assurance letter providing written assurance that "*appropriate action has been or will be taken, to the extent reasonable to restrict the use of land adjacent to or in the immediate vicinity of the Airport to activities and purposes compatible with normal Airport operations, including landing and takeoff of aircraft. This assurance applies to both existing and planned land uses*."

3.3.7.4 Mitigation Measures

No significant impact would occur under the Proposed Action and therefore, no mitigation measures are required or proposed.

3.3.8 Natural Resources and Energy Supply

FAA Order 1050.1F requires "an evaluation of a project's consumption of natural resources and demands on energy supplies from projects, as well as the conservation potential of alternatives and mitigation measures. Consumption of natural resources and use of energy supplies may result from construction, operation, and/or maintenance of the proposed action or alternatives." FAA policy also encourages developing facilities to use the highest design standards and to incorporate sustainable measures into designs.

3.3.8.1 Affected Environment

Airport personnel and tenants regularly use consumable materials to maintain various airside and landside facilities and services. Those materials may include asphalt, concrete, aggregate for sub-base materials, various metals associated with such maintenance, and fuels associated with the operation of aircraft and vehicles.

Electrical power is necessary to keep the Airport operational and safe. Airport lighting within the Project Study Area consists of runway lighting, taxiway lighting, apron lighting, exterior building lighting necessary for safe aircraft operations, and Medium-Intensity Approach Lighting Systems (MALS). MidAmerican Energy supplies electricity and natural gas to the Airport.

3.3.8.2 Significance Threshold

FAA Order 1050.1F does not define a significance threshold for natural resources and energy supply; however, it provides several factors to consider in evaluating the context and intensity of potential environmental impacts. Potentially significant effects could occur if the action has the

potential to cause demand to exceed available or future supplies of these resources, which include aviation and surface vehicle fuel, construction material, and electrical power.

3.3.8.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, the Airport Sponsor would not implement the Proposed Action. There would be no new uses of natural resources or energy supply beyond what would occur what is forecast to occur. Therefore, there would be no effect on natural resources or energy supply.

Proposed Action

Construction of the Proposed Action would temporarily increase the use of natural resources at the Airport. These could include aggregate, sub-base materials, and oils associated with the construction of the Proposed Action. These resources are not rare or in short supply, and the quantity required for the development of this size would not place an undue strain on supplies. Construction would also temporarily increase the energy demand at the Airport; however, this increase would be temporary and minor, and within the supply capabilities of MidAmerican Energy.

Implementation of the Proposed Action would not introduce new aircraft or operations to the Airport and therefore, would not increase the use of natural resources at the Airport beyond supporting the expected growth in operations forecast to occur with or without implementation of the Proposed Action. The new runway lights, taxiway lights, and MALSR would result in a small increase in the required electrical demand at the Airport. However, the new lighting could use light-emitting diode lighting, which could result in a minor improvement in the energy efficiency at the Airport. Any increase in energy supply would not be significant and would be withing the supply capabilities of MidAmerican Energy.

3.3.8.4 Mitigation Measures

Construction and implementation of the Proposed Action would not result in a significant impact to natural resources and energy supply. Therefore, no mitigation is required or proposed.

3.3.9 Noise and Noise-Compatible Land Use

The Airport and Airway Improvement Act as well as the Airport Noise and Capacity Act are the primary regulations related to noise and noise-compatible land use. The FAA requires day-night average sound level (DNL) as the noise descriptor in aircraft noise exposure analysis and noise compatibility planning. DNL is a 24-hour time-weighted sound level expressed in A-weighted decibels (dBA). DNL includes the cumulative effects of several sound events rather than a single event. It also accounts for increased sensitivity to noise during relaxation and sleeping hours. In the calculation of DNL, for each hour during the nighttime period (10:00 p.m. to 6:59 a.m.), a 10-decibel (dB) weighting penalty increases the sound levels (equivalent to a 10-fold increase in aircraft operations) before computing the 24-hour value. The weighting penalty accounts for the more intrusive nature of noise during the nighttime hours. DNL levels are commonly shown as lines of equal noise exposure, like terrain contour maps, referred to as noise contours.

3.3.9.1 Affected Environment

The Airport's 2023 Annual Operational Statistics provided the aircraft operations modeled for the existing conditions analysis year, 2023. An analysis of the existing noise environment for the 2023 calendar year was modeled using the FAA's approved Aviation Environmental Design Tool (AEDT), version 3f. **Table 3-6** provides the 2023 modeled aircraft operations[61] by category. The annual operations modeled for 2023 totaled 26,973, which is an average of 74 operations per day. **Appendix G** contains the full noise study report that includes all the AEDT inputs for 2023.

Table 3-6
2023 Annual Aircraft Operations

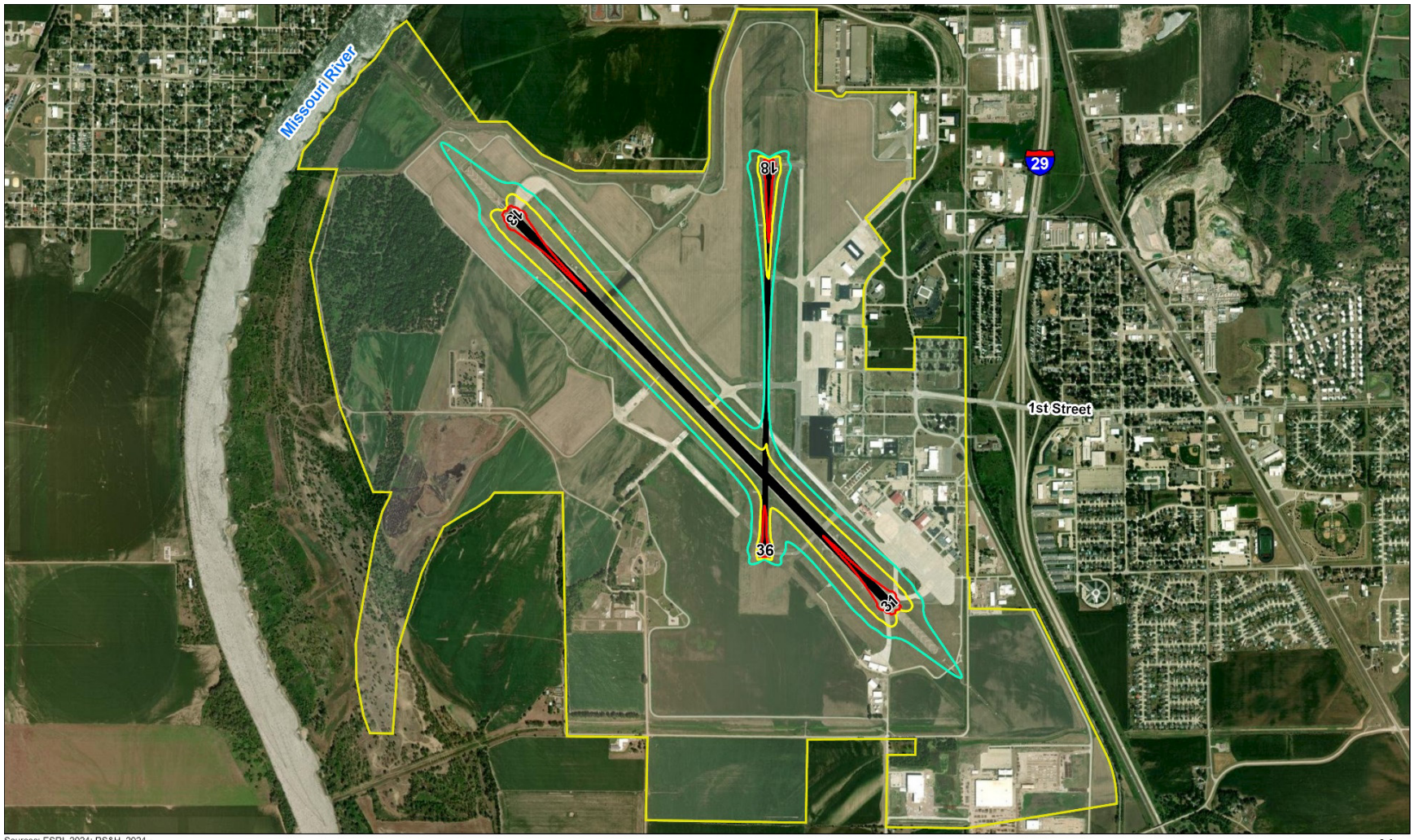
Aircraft Category	2023 Modeled Aircraft Operations
Air Carrier	1,643
Air Taxi	2,372
General Aviation	19,168
Military	3,790
Total	**26,973**

Source: SUX 2023 Airport Operational Statistics, January1-December 31, 2023.

Figure 3-5 presents the 2023 DNL 65, 70, and 75 dB noise contours. The total area within the DNL 65 dB and greater noise contours is approximately 237 acres and remains within the Airport property boundary. Per FAA guidelines, there are no incompatible land uses or noise sensitive areas within the 2023 DNL 65 dB and greater noise contours.

[61] An operation is defined as one arrival or one departure.

Figure 3-5
2023 Existing Conditions DNL Noise Contours



3.3.9.2 Significance Threshold

FAA Order 1050.1F identifies the threshold of a significant impact based on the yearly DNL and compatible land-use standards found at 14 CFR Part 150, *Airport Noise Compatibility Planning*, Table 1 in Appendix A of that regulation. FAA Order 1050.1F, Exhibit 4-1 states that there is a significant noise impact with respect to aircraft noise if an increase in noise of DNL 1.5 dB or more for a noise-sensitive area (one exposed to noise at or above the DNL 65 dB noise exposure level), or that would be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the No Action Alternative for the same timeframe. For example, a significant impact is an increase from DNL 65.5 dB to 67 dB, as is an increase from DNL 63.5 dB to 65 dB. The determination of significance must be obtained using noise contours and/or grid point analysis along with local land use information and general guidance contained in Appendix A of 14 CFR Part 150.

3.3.9.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, the Airport Sponsor would not implement the Proposed Action. There would be no change to the existing runway configuration and the forecast increase in operations would occur naturally under the No Action Alternative. As such, the No Action Alternative represents forecast conditions for future years 2030 and 2035 as presented in subsequent sections, with no improvements being made to the Airport.

No Action Alternative (2030)

Figure 3-6 presents the 2030 No Action Alternative DNL 65, 70, and 75 dB noise contours. The total area within the DNL 65 dB and greater noise contours is approximately 246 acres and remains within the Airport property boundary. Per FAA guidelines, there are no incompatible land uses or noise sensitive areas within the 2030 No Action Alternative DNL 65 dB and greater noise contours.

No Action Alternative (2035)

Figure 3-7 presents the 2035 No Action Alternative DNL 65, 70, and 75 dB noise contours. The total area within the DNL 65 dB and greater noise contours is approximately 248 acres and remains within the Airport property boundary. Per FAA guidelines, there are no incompatible land uses or noise sensitive areas within the 2035 No Action Alternative DNL 65 dB and greater noise contours.

Figure 3-6
2030 No Action Alternative Noise Contours

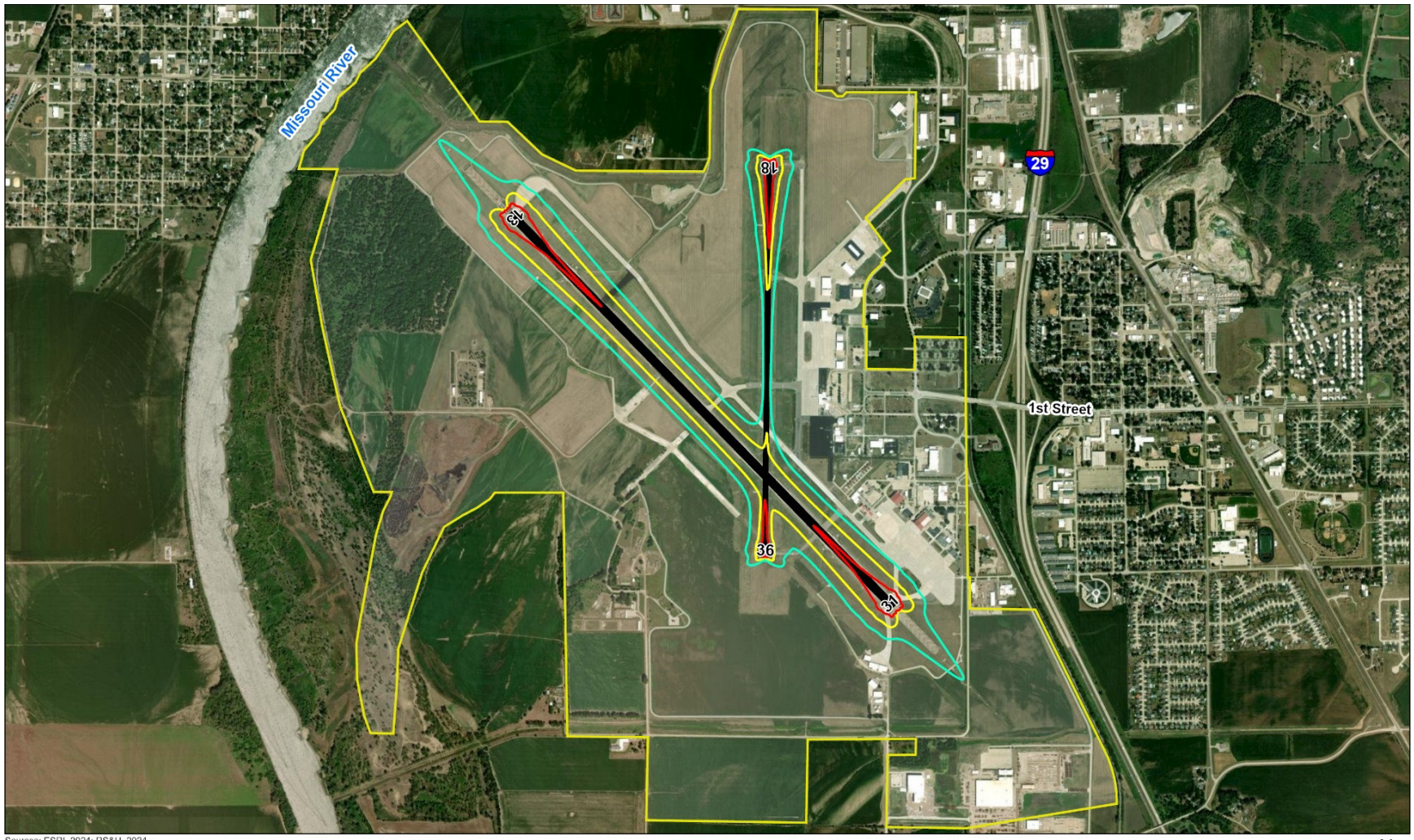
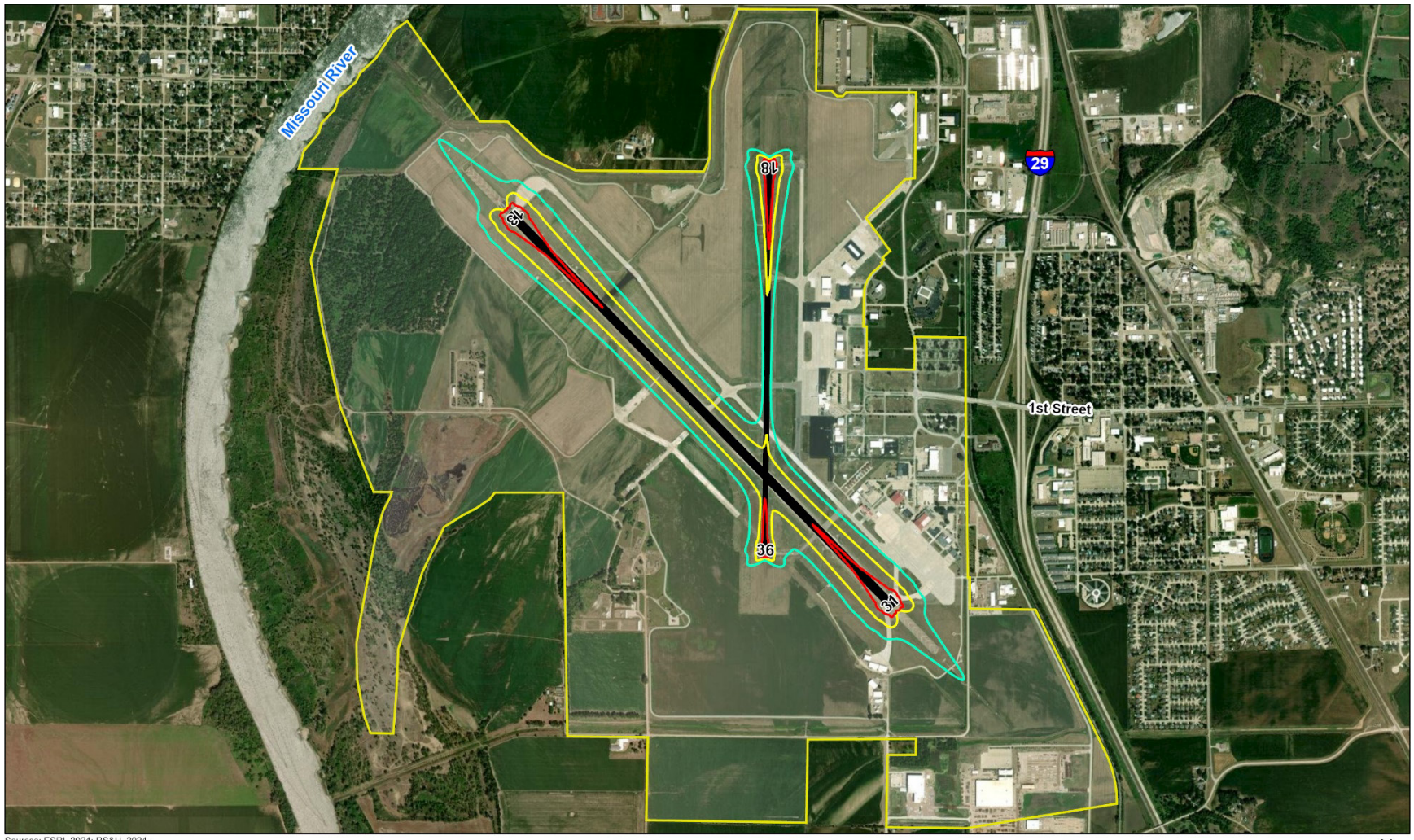


Figure 3-7
2035 No Action Alternative Noise Contours



Proposed Action

The Proposed Action would not change the number of aircraft operations or fleet mix forecast to occur in 2030 and 2035 over what is forecast to naturally occur. The Proposed Action temporarily relocates aircraft operations to Runway 18-36 during construction of Runway 13-31. Only commercial and general aviation aircraft operations will shift to Runway 18-36 in the first year of runway construction. The 185th Air Refueling Wing's KC-135 Stratotankers will relocate to Offutt Air Force Base in Nebraska for the first year of construction. Relocation of the military aircraft operations will result in a large overall reduction of military aircraft noise around the airport during the construction period. This change means that areas under the Runway 18-36 flight paths will experience a slight temporary increase in noise, while the areas near the ends of Runway 13-31 will see a decrease. Given that current significant noise levels, defined as the DNL 65 dB contour (includes noise from Commercial Service, GA, and Military), on Runway 13-31 do not extend off Airport property, the same would be expected with the temporary shift in operations to Runway 18-36, especially with no military operations during this time. It is anticipated that there will be no significant noise impacts to noise sensitive areas associated with the temporary relocation of commercial and GA aircraft operations to Runway 18-36 during construction.

The runway use, flight track locations, flight track use percentages, and time of day modeled for the Proposed Action public aircraft operations were the same as the No Action Alternative. The number and type of military aircraft operations are also the same as the No Action Alternative, but the runway end locations under the Proposed Action change for military aircraft operations. The change in runway end locations for military aircraft results in a difference in the contours for the Proposed Action when compared to the No Action Alternative. Non-military aircraft operations remain at the existing runway thresholds, keeping the noise from those operations where they currently exist. The military aircraft operating at the Airport, the KC-135R, would be able to operate at their full payload capacity with the Proposed Action, producing more noise at takeoff. The military aircraft would also land on the extended runway, shifting the noise from the current runway threshold to the extended runway threshold. These changes in military operations would result in a shortening of the noise contours to the new runway thresholds for military aircraft, but an overall widening of the noise contour as the noise is redistributed over the extended runway. The different thresholds for military and non-military aircraft operations result in a different shape to the noise contours for the Proposed Action compared to the No Action Alternative.

Proposed Action (2030)

The year 2030 represents the opening year for the Proposed Action. **Figure 3-8** presents the 2030 Proposed Action DNL 65, 70, and 75 dB noise contours. The total area within the 65 and greater DNL contours is approximately 258 acres and remains within the Airport property boundary. There are no noise sensitive areas within the 2030 Proposed Action DNL 65 dB and greater noise contours and no noise sensitive areas would receive an increase of DNL 1.5 dB. **Figure 3-9** presents the 2030 No Action DNL contours compared to the 2030 Proposed Action DNL contours. Therefore, no significant noise impacts would occur because of the Proposed Action.

Proposed Action (2035)

The year 2035 represents five years after the opening year for the Proposed Action. **Figure 3-10** shows the 2035 Proposed Action DNL 65, 70, and 75 dB noise contours. The total area within the DNL 65 dB and greater noise contours is approximately 260 acres and remains within the Airport property boundary. There are no noise sensitive areas within the 2035 Proposed Action DNL 65 dB and greater noise contours and no noise sensitive areas would receive an increase of DNL 1.5 dB. **Figure 3-11** presents the 2035 No Action DNL contours compared to the 2035 Proposed Action DNL contours. Therefore, no significant noise impacts would occur because of the Proposed Action.

3.3.9.4 Mitigation Measures

The Proposed Action does not include incompatible land uses or noise sensitive areas within the DNL 65 dB and greater noise contours in any scenario. Therefore, there are no significant noise impacts, and no mitigation measures are required.

Figure 3-8
2030 Proposed Action Noise Contours

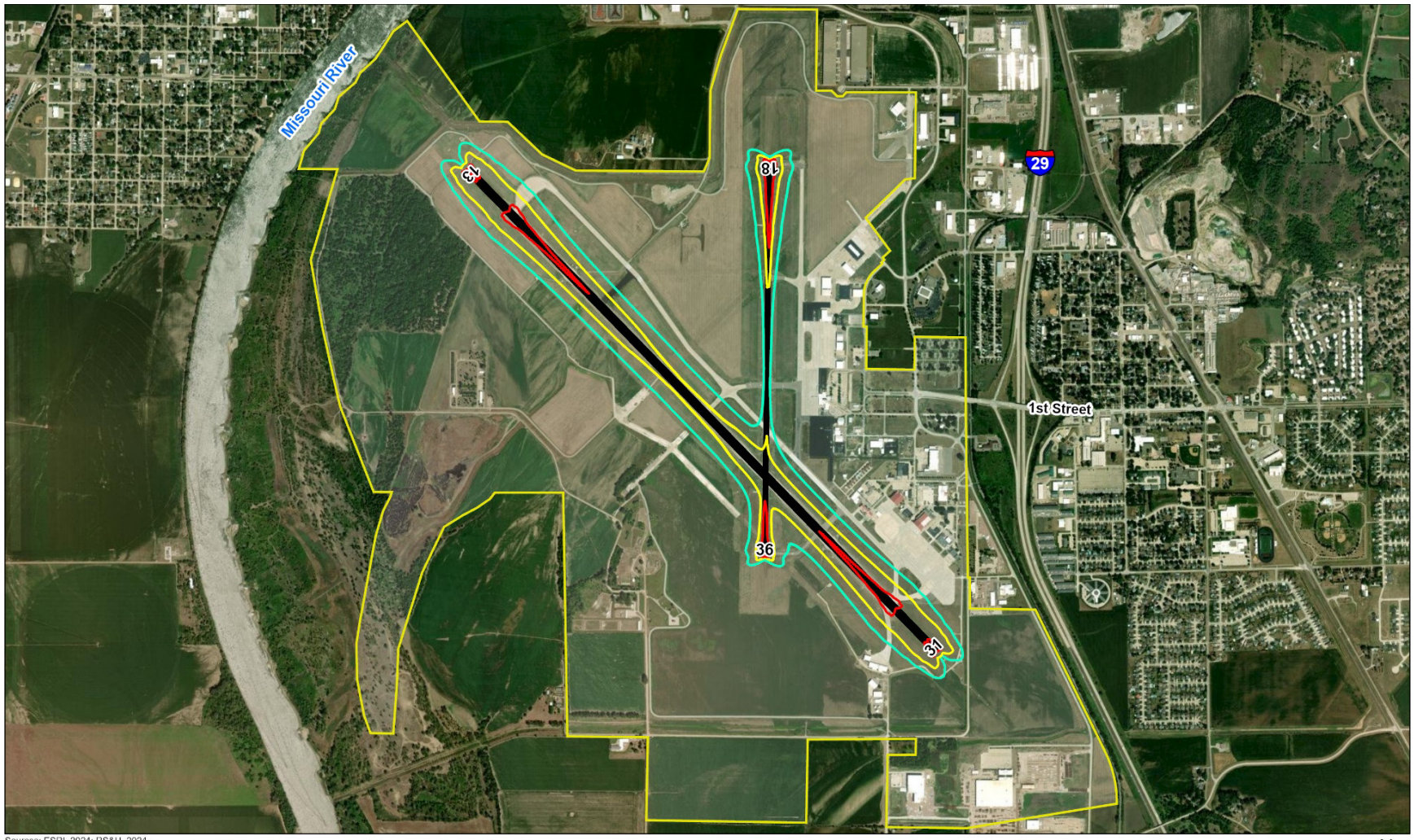


Figure 3-9
2030 No Action Noise Contours Compared to 2030 Proposed Action Noise Contours

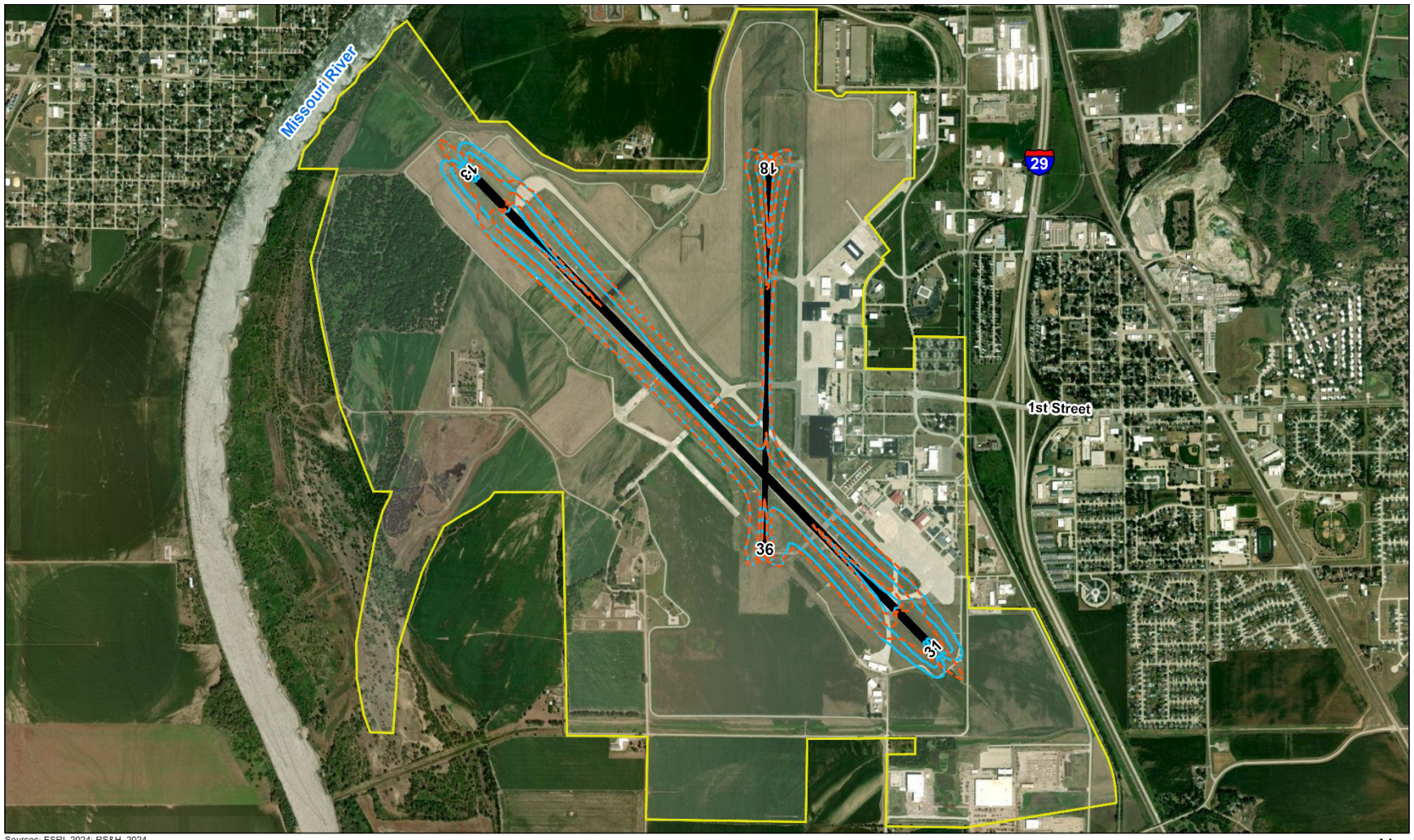


Figure 3-10
2035 Proposed Action Noise Contours

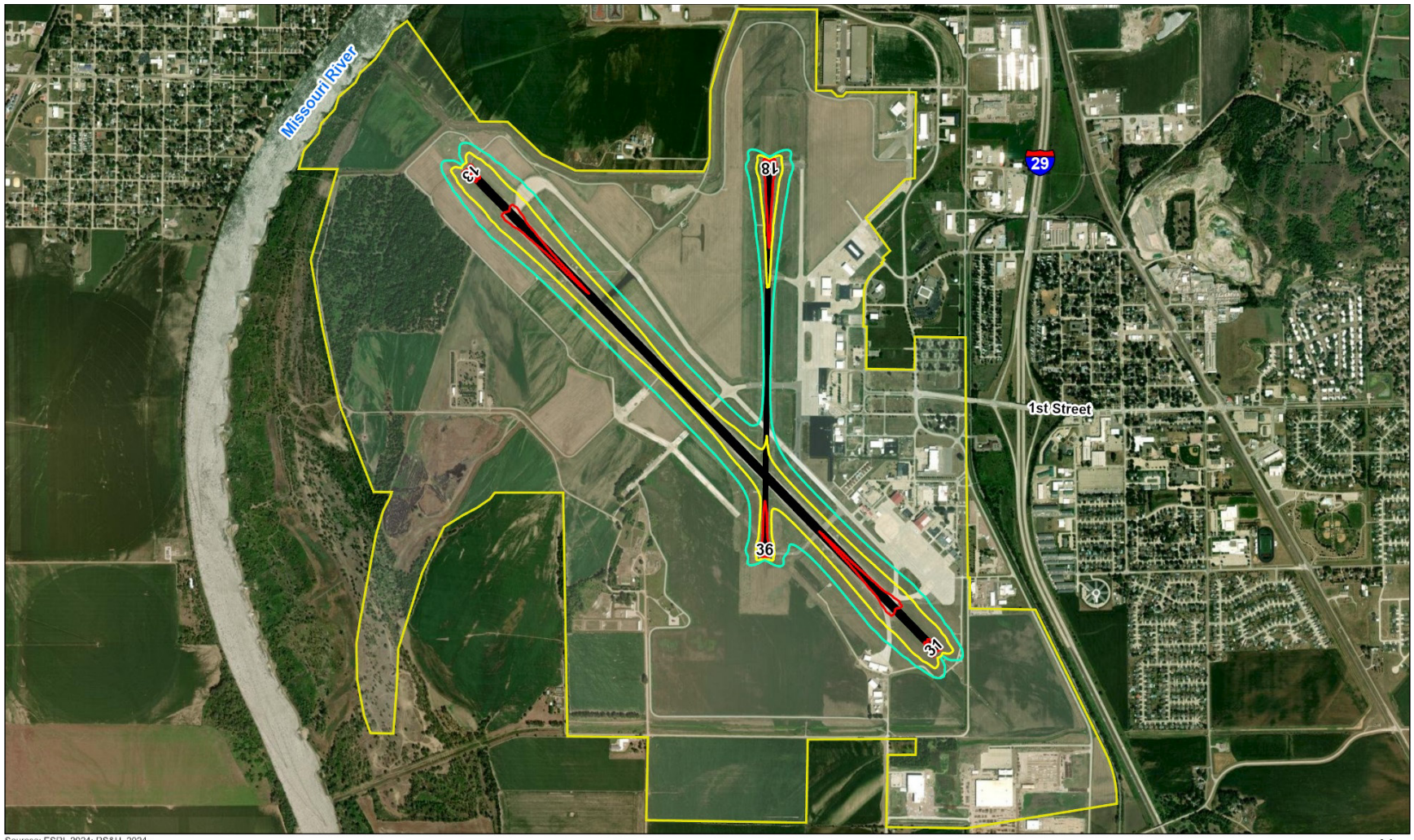
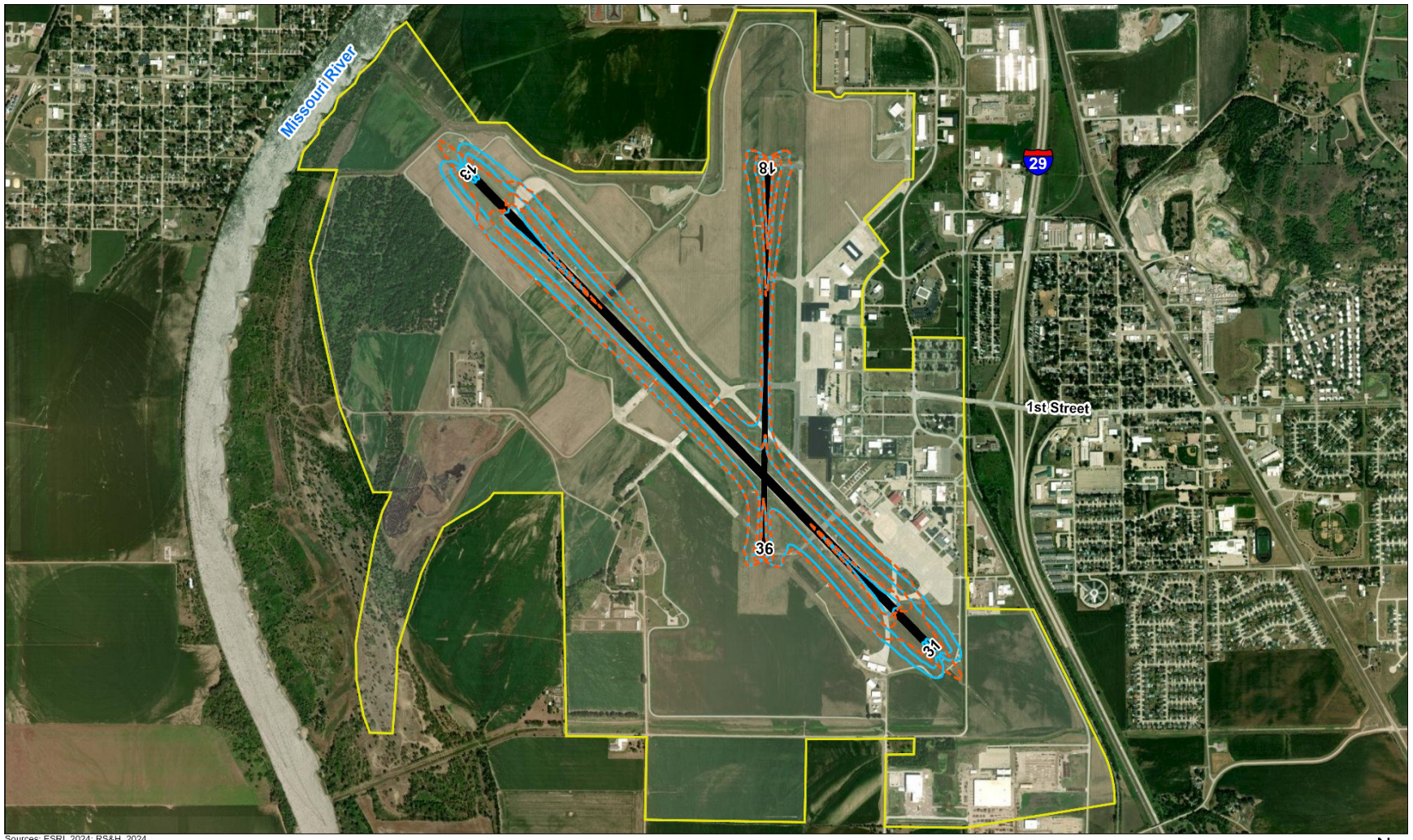


Figure 3-11
2035 No Action Noise Contours Compared to 2035 Proposed Action Noise Contours



3.3.10 Socioeconomics and Children's Environmental Health and Safety Risks

The Project Study Area and Airport are fully in U.S. Census Bureau (USCB) Census Tract 36, Block Group 4 (**Figure 3-12**). The USCB determines the boundaries of census tracts and block groups, and these boundaries do not exactly fit Airport property or another desired geographic area, such as the Project Study Area. Therefore, the analysis presented in this EA includes the census tract for which the Project Study Area falls.

3.3.10.1 Socioeconomics – Affected Environment

Socioeconomics is an umbrella term used to describe a project's social or economic aspects, or a combination of the two. A socioeconomic analysis evaluates how a proposed action and alternative(s) may affect elements of the human environment such as population, employment, housing, and public services. The Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970 is the main regulation governing socioeconomics and includes provisions that must be followed if property acquisition or displacement of people would occur because of implementing the proposed action.

Population and Housing Characteristics

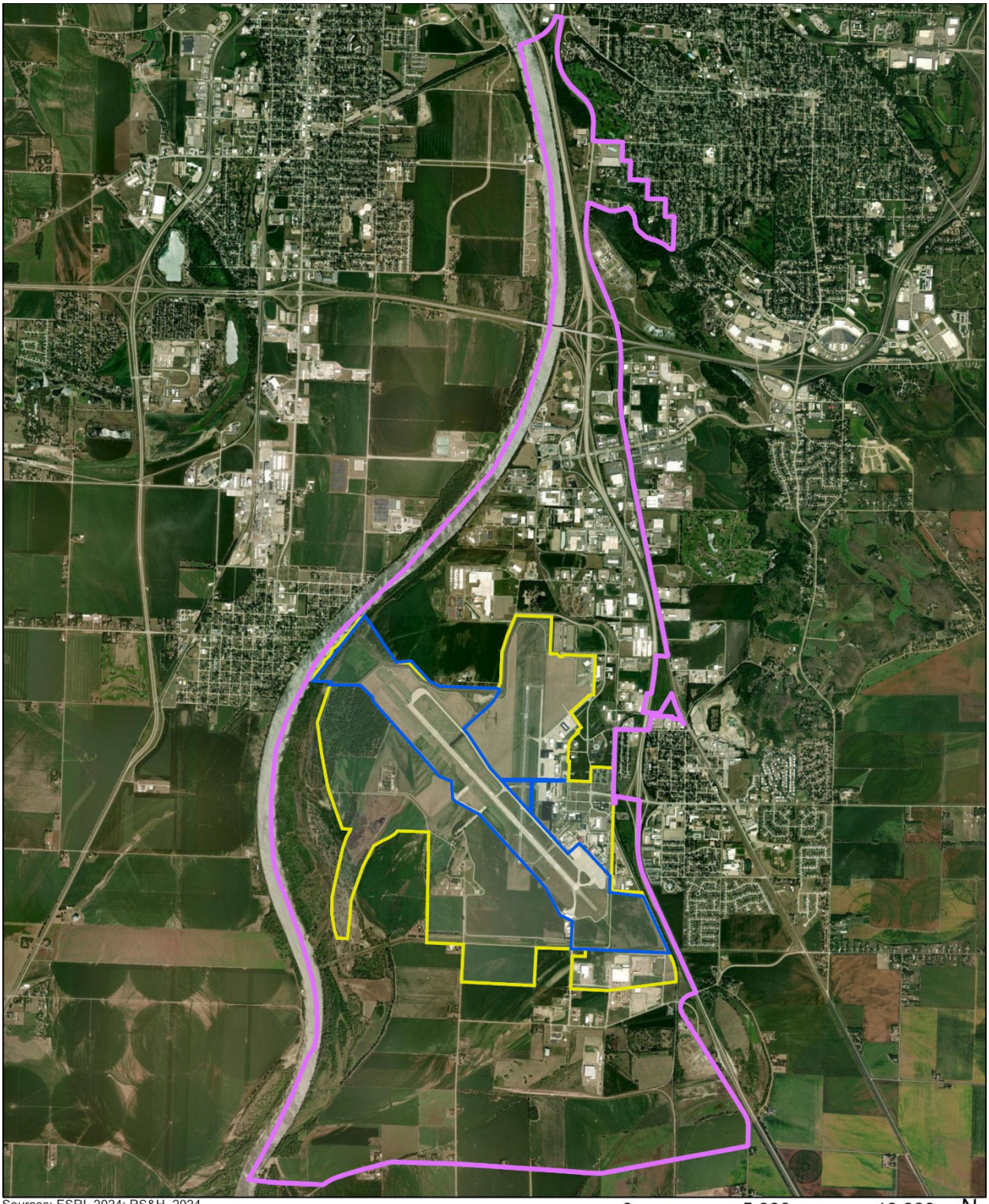
Table 3-7 shows the population and housing data for Census Tract 36, Block Group 4, and Woodbury County. Sioux City has the highest average persons per household and the block group and Sioux City have the highest percentage of occupied housing.

Table 3-7
Population and Housing Characteristics

Population and Housing Characteristics	Census Tract 36, Block Group 4	Sioux City	Woodbury County
Total Population	840[62]	85,797[63]	105,941[64]
Total Households	364[65]	34,331[66]	42,701[67]
Average Persons Per Household	2.3	2.5	2.5
Percent Housing Occupied	93.7%	93.7%	93.4%

[62] U.S. Census Bureau. (2020). Decennial Census. Retrieved January 31, 2024, from Race: https://data.census.gov/table/DECENNIALPL2020.P1?g=1500000US191930036004.
[63] U.S. Census Bureau. (2020). Decennial Census. Retrieved April 2, 2025, from Race: https://data.census.gov/table/DECENNIALPL2020.P1?g=160XX00US1973335.
[64] U.S. Census Bureau. (2020). Decennial Census. Retrieved May 6, 2024, from Race: https://data.census.gov/table/DECENNIALPL2020.P1?g=050XX00US19193.
[65] U.S. Census Bureau. (2020). Decennial Census. Retrieved January 31, 2024, from Occupancy Status: https://data.census.gov/table/DECENNIALDHC2020.H3?t=Vacancy&g=1500000US191930036004.
[66] U.S. Census Bureau. (2020). Decennial Census. Retrieved April 2, 2025, from Occupancy Status: https://data.census.gov/table/DECENNIALPL2020.H1?t=Housing&g=160XX00US1973335.
[67] U.S. Census Bureau. (2020). Decennial Census. Retrieved May 6, 2024, from Occupancy Status: https://data.census.gov/table/DECENNIALPL2020.H1?t=Vacancy&g=050XX00US19193.

Figure 3-12
Census Block Group at the Airport



Employment Characteristics

Table 3-8 shows the employment and income characteristics of Census Tract 36, Block Group 4, Sioux City, and Woodbury County. Woodbury County has the highest percentage of unemployed population and the highest median income. **Table 3-9** shows the employment classes of Census Tract 36, Block Group 4 and Woodbury County. The class with the most workers is management, business, science, and arts occupations.

Table 3-8
Employment Characteristics

Employment Characteristics	Census Tract 36, Block Group 4	Sioux City	Woodbury County
Percent Unemployed	0.0%[68]	3.2%[69]	3.4%[70]
Median Income	$61,719[71]	$62,350[72]	$67,817[73]

Table 3-9
Employment Classes

Occupation by Class	Census Tract 36, Block Group 4[74]	Sioux City[75]	Woodbury County[76]
Management, business, science, and arts occupations	205	12,592	15,910
Service occupations	53	7,589	8,388
Sales and office occupations	66	7,585	8,456
Natural resources, construction, and maintenance occupations	12	4,268	5,149
Production, transportation, and material moving occupations	73	10,597	13,023

[68] U.S. Census Bureau (2023). 2023 American Community Survey. Retrieved February 20, 2025, from Employment Status for the Population 16 Years and Over: https://data.census.gov/table/ACSDT5Y2023.B23025?t=Employment:Employment+and+Labor+Force+Status&g=1500000US191930036004.

[69] U.S. Census Bureau. (2023). 2023 American Community Survey. Retrieved April 2, 2025, from Selected Economic Characteristics: https://data.census.gov/table?t=Employment&g=160XX00US1973335.

[70] U.S. Census Bureau. (2022). 2022 American Community Survey. Retrieved May 6, 2024, from Median Income in the Past 12 Months (in 2022 Inflation-Adjusted Dollars): https://data.census.gov/table/ACSST1Y2022.S1903?t=Income%20and%20Poverty&g=050XX00US19193.

[71] U.S. Census Bureau. (2022). American Community Survey. Retrieved January 31, 2024, from Median Household Income in the Past 12 Months (in 2022 Inflation-Adjusted Dollars): https://data.census.gov/table/ACSDT5Y2022.B19013?t=Income%20and%20Earnings:Income%20and%20Poverty&g=1500000US191930036004.

[72] U.S. Census Bureau. (2023). American Community Survey. Retrieved April 2, 2025, from Median Income in the Past 12 Months (in 2023 Inflation-Adjusted Dollars): https://data.census.gov/table/ACSST1Y2023.S1903?t=Income+and+Poverty&g=160XX00US1973335.

[73] U.S. Census Bureau. (2022). 2022 American Community Survey. Retrieved May 6, 2024, from Selected Economic Characteristics: https://data.census.gov/table/ACSDP1Y2022.DP03?t=Employment&g=050XX00US19193.

[74] U.S. Census Bureau. (2022). 2022 American Community Survey. Retrieved May 6, 2024, from Sex by Occupation for the Civilian Employed Population 16 Years and Over: https://data.census.gov/table/ACSDT5Y2022.C24010?t=Occupation&g=1500000US191930036004.

[75] U.S. Census Bureau. (2023). American Community Survey. Retrieved April 2, 2025, from Industry by Occupation for the Civilian Employed Population 16 Years and Over: https://data.census.gov/table/ACSDT5Y2023.C24050?t=Occupation&g=160XX00US1973335.

[76] U.S. Census Bureau. (2022). 2022 American Community Survey. Retrieved May 6, 2024, from Occupation by Class of Worker for the Civilian Employed Population 16 Years and Over: https://data.census.gov/table/ACSST1Y2022.S2406?t=Class%20of%20Worker&g=050XX00US19193.

Public Services and Social Conditions

The ANG provides Aircraft Rescue and Fire Fighting (ARFF) services for military and civilian airside/aircraft emergencies. The Sioux City Fire Rescue services landside and terminal area emergencies at the Airport. Sioux City Fire Station #5 is located over two miles northeast of the Project Study Area.[77] The Sioux City Police Department provides police services to the Airport and surrounding community with the police station located about 5.5 miles north of the Project Study Area.[78] Emergency services are available at multiple locations in Sioux City, with the closest urgent care center located 1.5 miles north of the Airport.[79]

3.3.10.2 Socioeconomics – Significance Threshold

FAA Order 1050.1F does not provide a significance threshold for socioeconomics; however, it does provide several factors to consider in evaluating the context and intensity of potential environmental impacts. These include when the action would have the potential to:

- Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing a project in an undeveloped area);
- Disrupt or divide the physical arrangement of an established community;
- Cause extensive relocation when sufficient replacement housing is unavailable;
- Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities;
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities; or
- Produce a substantial change in the community tax base.

3.3.10.3 Socioeconomics – Environmental Consequences

No Action Alternative

Under the No Action Alternative, the Airport Sponsor would not implement the Proposed Action. There would be no change to the existing operation setting at the Airport; the land acquisition would not occur, and displacement of people and businesses would not occur. Therefore, there would be no effect on socioeconomics.

Proposed Action

Construction of the Proposed Action would result in the short-term employment of construction workers. As the construction of the Proposed Action is temporary, this would not cause a shift in population growth or change population growth patterns. In addition, it is likely construction workers would be from the county or region and would not require temporary housing or affect the housing environment in the area. Workers employed for construction of the Proposed Action would most likely be those already in the construction occupation within the county or region. As such, the construction of the Proposed Action would not affect the labor force in the area.

[77] Sioux City. (n.d.). Fire Rescue. Retrieved May 6, 2024, from https://www.sioux-city.org/government/departments-a-f/fire-rescue.
[78] Sioux City Police. (n.d.). Retrieved May 6, 2024, from http://www.siouxcitypolice.com/.
[79] Sioux City. (n.d.). Emergency Medical Services. Retrieved May 6, 2024, from //www.sioux-city.org/government/departments-a-f/fire-rescue/divisions/emergency-medical-services.

Construction-related traffic would be temporary (e.g., lasting only as long as the construction period each year) and be on Airport property, which would not cause any temporary road closures or other traffic impacts. Therefore, construction of the Proposed Action would not have a significant effect on socioeconomics.

The Proposed Action would not change the number of employees at the Airport or induce an increase in the number of operations at the Airport compared to the No Action Alternative. Therefore, implementation of the Proposed Action would not affect population growth or growth patterns, housing, or the labor force in the area.

3.3.10.4 Socioeconomics – Mitigation Measures

The Proposed Action would have no significant effect on socioeconomics; therefore, no mitigation is required or proposed.

3.3.10.5 Children's Environmental Health and Safety Risks – Affected Environment

E.O. 13045, Protection of Children from Environmental Health Risks and Safety Risks, is the primary regulation for the protection of children and requires federal agencies to analyze their policies, programs, activities, and standards for any environmental health or safety risks that may disproportionately affect children.[80]

Areas of particular concern for children's environmental health risks and safety include schools, day cares, children's health clinics, and child-friendly recreational facilities. There are no schools, day care facilities or children's health clinics in the Project Study Area.[81] **Table 3-10** shows individual and combined child age distribution of Census Tract 36, Block Group 4 compared to Woodbury County.

Table 3-10
Children's Age Groups

Child Age Group	Census Tract 36, Block Group 4[82]	Sioux City[83]	Woodbury County[84]
Population Under Age 5	61	5,221	7,447
Population Ages 5-9	181	4,366	6,565
Population Ages 10-14	148	7,937	8,748
Population Ages 15-17	31	3,992	3,422
Total	**421**	**21,516**	**26,182**

Significance Threshold

FAA Order 1050.1F does not provide a significance threshold for children's environmental health and safety risks; however, it does provide a factor to consider in evaluating the context

[80] FAA. (2023). 1050.1F Desk Reference.
[81] U.S. Environmental Protection Agency. (2023, December). NEPAssist. Retrieved January 11, 2024, from Places: https://nepassisttool.epa.gov/nepassist/nepamap.aspx.
[82] U.S. Census Bureau. (2022). American Community Survey. Retrieved January 31, 2024, from Sex by Age: https://data.census.gov/table/ACSDT5Y2022.B01001?t=Age%20and%20Sex&g=1500000US191930036004.
[83] U.S. Census Bureau. (2023). American Community Survey. Retrieved April 2, 2025, from Age and Sex: https://data.census.gov/table/ACSST1Y2023.S0101?t=Age+and+Sex&g=160XX00US1973335
[84] U.S. Census Bureau. (2022). 2022 American Community Survey. Retrieved May 10, 2023, from Age and Sex: https://data.census.gov/table/ACSST1Y2022.S0101?t=Age%20and%20Sex&g=050XX00US19193.

and intensity of potential environmental impacts. This would occur when the action has the potential to lead to a disproportionate health or safety risk to children.

3.3.10.6 Children's Environmental Health and Safety Risks – Environmental Consequences

No Action Alternative

Under the No Action Alternative, the Airport Sponsor would not implement the Proposed Action. There would be no change to the existing operation setting at the Airport. Therefore, there would be no effect on children's environmental health and safety.

Proposed Action

The construction and implementation of the Proposed Action would occur entirely on Airport property and would not require the acquisition or relocation of any schools, childcare centers, or similar facilities. The Proposed Action would not increase environmental health and safety risks or exposure of environmental contaminants to children in the studied geographic areas. Construction emissions resulting from the Proposed Action would be temporary and are not significant (see **Section 3.3.1.3**). The Proposed Action would not increase operations at the Airport or change the fleet mix operating at the Airport so there would be no significant effect from operational emissions. In addition, there would be no significant noise impact involving any children's facilities (see **Section 3.3.9.3**). The Proposed Action would not change the Airport's storage and handling of hazardous materials (see **Section 3.3.5.3**). The Proposed Action would not significantly impact water resources near the Airport (see **Section 3.3.12**). Therefore, there are no significant health and safety risks that would disproportionately affect children associated with the construction and implementation of the Proposed Action.

3.3.10.7 Children's Environmental Health and Safety Risks – Mitigation Measures

The Proposed Action would have no significant effect on children's environmental health and safety risks; therefore, no mitigation is required or proposed.

3.3.10.8 Socioeconomics and Children's Environmental Health and Safety Risks Conclusion

Construction and implementation of the Proposed Action would have no significant effect on economic activity, employment, income, housing, public services, or social conditions in the vicinity of the Airport. Likewise, the Proposed Action would not result in significant effects on air quality, climate, hazardous materials, noise, and water quality that could disproportionately affect children's populations. Therefore, the Proposed Action would have no significant effect on socioeconomics, or children's environmental health and safety risks.

3.3.11 Visual Effects

According to FAA 1050.1F Desk Reference, visual effects deal broadly with the extent to which the proposed action or alternative(s) would either: 1) produce light emissions that create annoyance or interfere with activities; or 2) contrast with, or detract from, the visual resources and/or the visual character of the existing environment. In keeping with FAA 1050.1F Desk Reference, Light Emissions, and Visual Resource and Visual Character separated into individual sections.

3.3.11.1 Light Emissions – Affected Environment

If airport-related light emissions are of particular concern if the light is directed towards a residential area or other sensitive site. Effects from lighting associated with the Proposed Action are determined by evaluating the individual lighting systems to be installed at the Airport and assessing distance and light intensity as they relate to the surrounding light-sensitive land uses compared to the No Action Alternative. These factors identify the potential for lighting to result in annoyance to residents.

The Project Study Area has airfield lighting consisting of in-ground and above ground lights required for safe operation of aircraft. There are no residences inside the Project Study Area. The closest residence is about 250 feet north of the Project Study Area and there is a tree buffer between this residence and the Project Study Area. Therefore, this residence does/does not have a direct line of sight to the Project Study Area.

3.3.11.2 Light Emissions – Significance Threshold

FAA Order 1050.1F does not provide a significance threshold for visual effects; however, it does provide factors to consider in evaluating the context and intensity of potential environmental impacts. For light emissions, these factors include the degree to which the action would have the potential to:

- Create annoyance or interfere with normal activities from light emissions; and
- Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources.

3.3.11.3 Light Emissions – Environmental Consequences

No Action Alternative

Under the No Action Alternative, no construction activities would occur that require the use of lighting, and there would be no changes to Airport configuration, buildings or infrastructure that could produce light emissions. Therefore, there would be no effect on light emissions.

Proposed Action

Construction of the Proposed Action would occur entirely on Airport property and is likely to occur during daytime hours. If construction takes place during nighttime, light emissions would be directionally focused within the Project Study Area, and temporary, lasting only during the construction months.

Implementing the Proposed Action would consist of installing Medium-Intensity Approach Lighting System with Runway Alignment Indicator (MALSR) on both runway ends and relocating the Precision Approach Path Indicator (PAPI) lights. The lights would be replacements PAPIs and MALSRs and be consistent with the existing light emissions of the Airport, even at night. There are no residences within the Project Study Area, and the closest private residence is about 250 feet north of the Project Study Area and has a direct line of sight to the Airport.

3.3.11.4 Light Emissions – Mitigation Measures

The Proposed Action would have no significant effect on light emissions within the Project Study Area. Therefore, no mitigation is required or proposed.

3.3.11.5 Visual Resources and Visual Character – Affected Environment

Potential aesthetic effects of an action are generally assessed to the extent that the development contrasts with the environmental setting and whether a jurisdictional agency considers this contrast objectionable. Effects may also include those resulting from actions that may have both beneficial and detrimental effects.

As described in **Section 3.3.7.1**, a mix of urban and rural areas describes the visual character of the Project Study Area and surrounding area. The areas north and east of the Project Study Area contain more developed, urban areas with businesses, residences, and farmlands. The areas south and west of the Project Study Area are more rural and contain farmlands with less dense residences and the Missouri River. There are no scenic resources in the Project Study Area.

3.3.11.6 Visual Resources and Visual Character – Significance Threshold

The FAA has not established a significance threshold for visual resources and character. Factors to consider include the extent to which the action would have the potential to:

- Affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources;
- Contrast with the visual resources and/or visual character in the study area; and
- Block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

3.3.11.7 Visual Resources and Visual Character – Environmental Consequences

No Action Alternative

Under the No Action Alternative, the existing conditions or operational setting at the Airport would not change. There would be no changes to the airfield's appearance. Therefore, there would be no effect on visual resources.

Proposed Action

Construction of the Proposed Action would require using large construction equipment and construction vehicles. However, the equipment and vehicles would only be at the Airport during construction and would be temporary. All project improvements would take place on existing Airport property.

After construction, operation of the Airport under the Proposed Action would present a very similar visual character to what currently exists. Overall, from the ground, the visual character of the Airport would not experience a significant change because there are no vertical project components associated with the Proposed Action. Aerially, the visual character of the Airport would change in that the new replacement lighting for the runways and taxiways would enhance safety at the Airport for pilots, Runway 13-31 and Taxiway A would be longer, the warm-up-holding pad would be in a different location, and the perimeter road would change alignment. Due to the relatively similar visual character to what currently exists, significant visual effects are not anticipated.

3.3.11.8 Visual Resources and Visual Character – Mitigation Measures

The Proposed Action would have no significant effect on visual resources within the Project Study Area. Therefore, no mitigation is required or proposed.

3.3.12 Water Resources

According to FAA Order 1050.1F, water resources include wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers. As **Section 3.2.3** describes, there are no wild and scenic rivers in or close to the Project Study Area; therefore, this section does not discuss that resource category.

3.3.12.1 Wetlands – Affected Environment

For regulatory purposes under the Clean Water Act (CWA), wetlands are *"areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."*[85]

Wetlands generally have three essential characteristics: hydrophytic vegetation, hydric soils, and wetland hydrology. The U.S. Army Corps of Engineers (USACE) regulates Wetlands and Waters of the U.S. (WUS). A Wetland and WUS Delineation occurred on May 8, 2024, to evaluate potential wetlands and WUS in the Project Study Area (see **Appendix H**).

Based on the results of the wetlands delineation, the Project Study Area contains 0.13-acre of jurisdictional wetlands and 18,265 linear feet of non-jurisdictional features that could potentially require a Section 404 permit (see **Figure 3-13**). The non-jurisdictional features are man-made ditches or swales in uplands and do not have a regular flow of water. According to USACE guidance, there are no regulations for man-made ditches that are wholly in and draining only uplands and do not carry a relatively permanent flow of water. Therefore, impacts to the identified ditches and swale should not be regulated. A jurisdictional determination request was submitted to the USACE via email on September 4, 2024 (see **Appendix H**). The USACE responded on April 21, 2025 with the determination that the one delineated wetland was assumed to be jurisdictional and that none of the delineated ditches are regulated WUS.

Table 3-11 and **Table 3-12** summarize the sizes of the jurisdictional wetland and non-jurisdictional features within the Project Study Area.

Table 3-11
Wetland Area Summary

Wetland Identification	Wetland Area (Acres)
Wetland WL-1	0.13
Total	**0.13**

Source: Foth, 2024

[85] U.S. Army Corps of Engineers. (1987, January). *Wetlands Delineation Manual*. Retrieved September 2021, from USACE: https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/4530.

Table 3-12
Non-Jurisdictional Feature Summary

Non-Jurisdictional Feature	Length (Feet)
Ditch D-1	6,040
Ditch D-2	2,080
Ditch D-3	1,060
Ditch D-4	950
Ditch D-5	3,805
Ditch D-6	2,205
Ditch D-7	740
Swale S-1	1,385
Total	**18,265**

Source: Foth, 2024

The USACE also regulates Missouri River Bank Stabilization and Navigation Project (BSNP) structures that run along the Missouri River from Sioux City to St. Louis, Missouri, and includes over 7,000 structures to maintain a self-scouring navigation channel. There are BSNP structures in the Project Study Area that could potentially require a Section 408 permit (see **Figure 3-13**).

3.3.12.2 Wetlands – Significance Threshold

FAA Order 1050.1F, Exhibit 4-1, defines the FAA's significance threshold for wetlands. In general, a significant impact would occur if the action would do any of the following:

- Adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and aquifers;
- Substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland it is;
- Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, which could affect public health, safety or welfare;
- Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands;
- Promote development of secondary activities or services that would cause the circumstances listed above to occur;
- Be inconsistent with state wetland strategies.

Figure 3-13
Wetlands in the Project Study Area

3.3.12.3 Wetlands – Environmental Consequences

No Action Alternative

Under the No Action Alternative, the Airport Sponsor would not implement the Proposed Action. The Airport Sponsor would continue to operate the Airport and serve forecast aviation demands. Airport development would be subject to review and approval under NEPA and is not assumed under this alternative. Therefore, there would be no effect to wetlands.

Proposed Action

The Proposed Action would include relocation of a fence near the delineated wetland, at the approximate location shown on **Figure 3-14**. The proposed fence is outside of the wetland area, and temporary construction fencing around the wetland would ensure the wetland is not disturbed during construction. The perimeter road relocation and fence realignment components would be designed to avoid the BSNP structures. The construction of the perimeter road and fence would be designed not to excavate to a depth that could affect the BSNP structures. Therefore, no wetland impacts would occur because of the Proposed Action. In addition, the USACE determined on April 21, 2025, that the Proposed Action would result in no impact to WUS or the one jurisdictional wetland.

The significance thresholds as described above would not be triggered due to the following reasons:

- The Proposed Action's wetland impacts within the Project Study Area would not adversely affect the wetland's ability to protect the quality or quantity of municipal water supplies as the wetland area does not play a significant role in the area's water supplies;
- the functions and values of wetlands within the Project Study Area would not be altered as the delineated wetland would remain unaffected;
- the Proposed Action would not substantially reduce the wetland's ability to retain floodwater or storm associated runoff as an appropriate drainage mitigation/design would be completed to accommodate runoff from any new impervious surfaces;
- the Proposed Action would include stormwater improvements that minimize impacts to non-jurisdictional features while providing additional stormwater detention capacity;
- adverse effects to the maintenance of natural systems supporting wildlife and fish habitat or economically-important resources would not occur as the entire wetland area would remain and no economically-important timber, food, or water resources exist;
- would not promote development of secondary activities or services that would affect the resources or functions of the wetland as the wetland would not be impacted; and
- coordination with IDNR would occur prior to implementation of this alternative to ensure consistency with state wetland strategies.

Figure 3-14
Preliminary Wetland WL-1 Impacts

3.3.12.4 Wetlands – Mitigation Measures

Because wetland impacts are not proposed, a Section 404 permit and a Section 408 permit and mitigation would not be required for the Proposed Action. However, there would be construction fencing surrounding the wetland area prior to and during construction to avoid inadvertent impacts that could occur during installation of the fence.

3.3.12.5 Floodplains – Affected Environment

The National Flood Insurance Act establishes the National Flood Insurance Program (NFIP) administered by Federal Emergency Management Agency (FEMA), which is a voluntary floodplain management program under which participating communities must adopt sound floodplain management programs in exchange for the federal government making floodplain insurance available to the community. Federal actions within a FEMA-mapped floodplain in a participating community must follow the community's floodplain management regulations.

E.O. 11988, *Floodplain Management,* and USDOT Order 5650.2, *Floodplain Management and Protection*, are governing statues for development within the floodplain.

FAA actions must avoid floodplains if a practical alternative exists; if no practical alternative exists, actions in a floodplain must be designed to minimize adverse short- and long-term impacts to the floodplain. In addition to federal requirements, state and local floodplain statutes apply to development within the floodplain.

Floodplains are flood prone areas adjacent to rivers, creeks, ditches, lakes, or other surface water features. FEMA defines floodplains according to the frequency or likelihood that a specific area will become flooded. For example, a 100-year floodplain is an area that statistically has a one percent chance of becoming flooded in any year.

The Project Study Area is in FEMA Flood Insurance Rate Map (FIRM) Panels 19193C0192E, 19193C0194E, dated July 17, 2024; and 19193C0213E, dated September 29, 2011. Existing drainage ditches within the Project Study Area lie within the 100-year (1-percent-annual-chance) floodplain, designated Zone AE, which represents a one percent-annual-chance flood event where base flood elevations (BFEs) are established using North American Vertical Datum of 1988 (NAVD88). A portion of the Project Study Area is also in the 500-year (0.2-percent-chance) floodplain. See **Figure 3-15** for FEMA-designated floodplain delineations.

3.3.12.6 Floodplains – Significance Threshold

FAA Order 1050.1F, Exhibit 4-1, defines the FAA's significance threshold for floodplains, which states the action would cause notable adverse impacts on natural and beneficial floodplain values. USDOT Order 5650.2, Floodplain Management and Protection, defines significant encroachment into the floodplain as an encroachment that results in one or more of the following impacts:

- Considerable probability of loss of human life;
- likely future damage associated with the encroachment that could be substantial in cost or extent, including interruption of service on or loss of a vital transportation facility; or
- notable adverse impacts on natural and beneficial floodplain values.

3.3.12.7 Floodplains – Environmental Consequences

The floodplain analysis considered encroachments in FEMA-designated floodplains associated with construction and operation of the Proposed Action compared to the No Action Alternative. The analysis determined whether there would be significant floodplain encroachment, as defined above in *Significance Threshold*, and its impacts on the floodplain's natural and beneficial values. Potential direct and indirect impacts to floodplains were considered including loss of floodplain area, change of floodplain capacity, and construction activities in and adjacent to floodplains. Federal, state, and local requirements for development within a floodplain were also reviewed for applicability. The analysis assessed effects on human life and transportation facilities and evaluated measures incorporated into the Proposed Action and No Action Alternative to minimize impacts and preserve natural and beneficial values of the floodplain.

No Action Alternative

The No Action Alternative is the non-development alternative and would not increase impervious surfaces, add structures or fill, or introduce new operations within the floodplain that could cause adverse impacts to natural and beneficial floodplain values. Therefore, the No Action Alternative would not result in a significant encroachment on the floodplain.

Proposed Action

FAA actions must avoid encroachment into floodplain and if encroachment is unavoidable, then effects to the floodplain must be minimized. As stated in **Chapter 1**, the 185th ARW is unable to complete its mission with the current runway length, which is representative of the No Action Alternative. As shown in **Figure 3-15**, floodplains exist at the Runway 13 end. The proposed alternatives in **Chapter 2** included extension of both ends of Runway 13-31 to meet criteria established in **Table 2-2**. Alternatives 1 and 2 included in **Section 2.2.1** both propose a 1,000-foot runway extension and 1,000-foot blast pad extension at the Runway 13 end and would result in the same level of encroachment in the 100-year floodplain. Alternative 3 proposes a 700-foot runway extension (i.e., 300-feet less on the Runway 13 end compared to Alternatives 1 and 2) and 1,000-foot blast pad, resulting in less proposed floodplain encroachment. Alternative 4 would not encroach upon the 100-year floodplain. Alternative 1 was determined not feasible due to Terminal Instrument Procedures modifications while Alternative 3 was determined not feasible due to RPZ obstructions and Terminal Instrument Procedures modifications. Alternative 4 was determined not feasible because it would not meet the purpose and need outlined in **Section 1.2**.

Figure 3-15
Existing Floodplain Conditions

In addition, preliminary design of Runway 13 end to determine floodplain impacts was required to follow current FAA runway design criteria. The proposed blast pads would tie into the existing runway elevation, which cannot be substantially changed. FAA and 185th ARW criteria for the blast pads includes a constant grade along the centerline for 300 feet, a blast pad width that matches the existing runway, and a blast pad length dependent on the type of aircraft.[86] In addition, for aircraft operational safety, the FAA specifies maximum off-pavement grades from runways and associated blast pad to a set distance away that is dependent on the aircraft using Runway 13-31. The extension of Taxiway A on the Runway 13 end also would follow similar grading and geometry criteria.[87] Although the Proposed Action (Alternative 2) would result in fill in the floodplain, this fill was minimized beyond application of FAA airfield design criteria. There is no practicable alternative to placing the proposed action in the floodplain. All measures to minimize harm will be included in the Proposed Action and will conform to all applicable state and/or local floodplain protection standards.

Construction Impacts

During construction of the Proposed Action, the construction contractor would implement construction controls for erosion and sedimentation, accidental and flood-induced spills, storage of hazardous materials, and construction waste and spoil disposal as outlined in the construction Stormwater Pollution Prevention Permit (SWPPP) developed for the Iowa National Pollutant Discharge Elimination System (NPDES) GP #2, which serves as the construction stormwater permit in the State of Iowa.[88] These construction controls would minimize impacts to natural and beneficial floodplain values, including surface water quality and groundwater, as discussed in the Construction Impacts portions of **Sections 3.3.12.3** and **3.3.12.4**, respectively. The construction contractor would provide flood hazard protection and procedures during construction to minimize damage to facilities and adverse impacts on human safety. Therefore, compliance with construction NDPES GP #2 and the construction SWPPP while constructing the Proposed Action would not result in direct or indirect adverse impacts to natural and beneficial floodplain values.

Operational Impacts

The Proposed Action would result in an encroachment into the 100-year (1-percent-annual-chance) floodplain in two locations 1) relocation of a drainageway and 2) fill placed in a drainage ditch as a result of the runway extension. See **Figure 3-16** for floodplain delineations and Proposed Action. Preliminary proposed grading includes additional floodplain storage below the 100-year BFE to provide compensatory floodplain storage for fill placed within the floodplain as a result of the Proposed Action. Preliminary proposed grading, shown in **Figure 3-16**, would include compensatory floodplain storage such that the Proposed Action would result in an additional 934 cubic yards of floodplain storage below the 100-year (1-percent-annual-chance) BFE. Therefore, the Proposed Action would not adversely affect the 100-year (1-percent-annual-chance) floodplain BFE. As a result, probable loss of human life is not anticipated as a

[86] Department of Defense. (2020, May 5). Unified Facilities Criteria 3-260-01 – Airfield and Heliport Planning and Design.
[87] FAA. (2024, August 16). Advisory Circular 150/5300-13B – Airport Design.
[88] Iowa Department of Natural Resources. (2022, December). A Brief Guide To Developing Storm Water Pollution Prevention Plans And Best Management Practices. Retrieved March 2024, from IDNR: https://www.iowadnr.gov/Portals/idnr/uploads/water/npdes/GPs%201%20-%203/Summary%20Guidance%20GP2%20(2022-12).pdf.

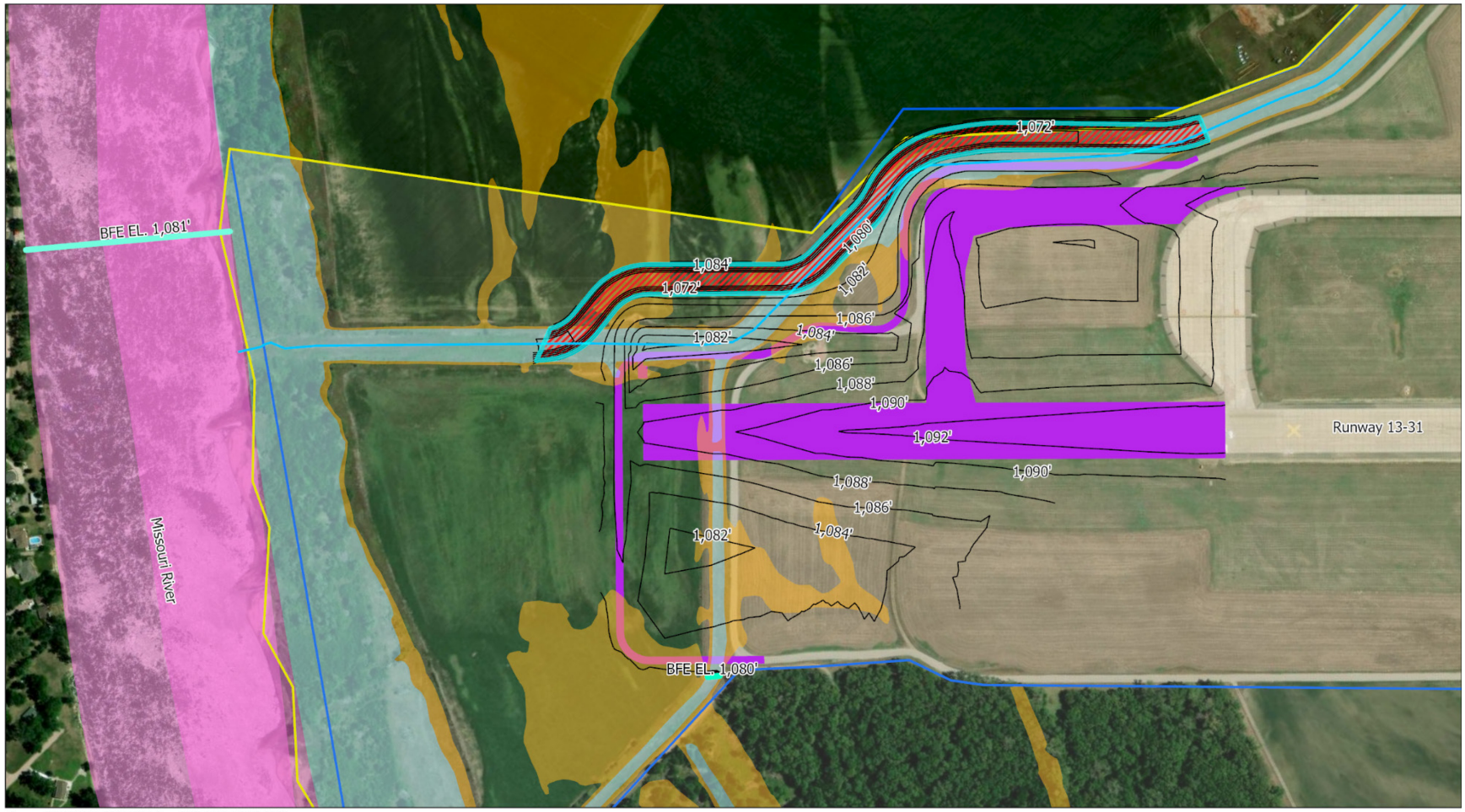
result of the Proposed Action. Prior to placement of fill within the floodplain, detailed floodplain modeling would be conducted to confirm no adverse impacts to floodplains as a result of the Proposed Action to obtain relevant permits. See **Appendix I** for detailed calculations for floodplain storage.

In addition, paved portions of the Proposed Action that would be used by aircraft would be elevated above the 100-year (1-percent-annual-chance) BFE. During a flooding event of the Missouri River, aircraft movements at the Airport would not be interrupted. Therefore, the Proposed Action would not result in interruption or loss of a vital transportation facility.

USDOT Order 5650.2, *Floodplain Management and Protection,* additionally provides policies for FAA projects that encroach into the floodplain to minimize impacts to the floodplain and to its natural and beneficial values. These values include, but are not limited to: agriculture (**Section 3.3.7**); fish, plants, wildlife (**Section 3.3.2**); groundwater recharge (**Section 3.3.12.4**); natural beauty (**Section 3.3.11.2**); natural moderation of floods (as discussed in this section); open space and outdoor recreation (**Sections 3.3.4** and **3.3.7**); and water quality (**Section 3.3.12.3**). As detailed in the relevant sections of this EA, the Proposed Action would not adversely affect these resources categories and therefore the natural and beneficial values of the floodplain would not be adversely impacted.

The Airport Sponsor would obtain relevant floodplain permits prior to the construction of the portions of the Proposed Action that would result in placement of fill in the 100-year (1-percent-annual-chance) floodplain. Construction phasing of the Proposed Action is described in **Section 1.7**. The Airport Sponsor would obtain Floodplain & Sovereign Lands Permits (Floodplain Permits) from IDNR that would document floodplain impacts. The Proposed Action would be categorized as a channel realignment, which would require the Airport Sponsor to demonstrate no change in the 100-year (1-percent-annual-chance) BFE through floodplain hydraulic modeling, that realigned channels have at least the same capacity as those in existing conditions, and that proposed channel velocities would not cause excessive erosion. In addition, the Proposed Action would include transportation (bridge and road) embankment, which for industrial projects, would be required to demonstrate no adverse impacts on floodwater backwater effects and that sufficient freeboard is maintained for transportation improvements above the 100-year (1-percent-annual-chance) BFE. IDNR may also require a Letter of Map Change (LOMC) and/or Letter of Map Revision (LOMR) to be submitted to FEMA Region 7.

Figure 3-16
Proposed Action Encroachment into Floodplain



Source: RS&H, 2024; ESRI, 2024; Iowa DNR, 2022; USGS, 2023

Legend

- Proposed Pavement
- Existing Stormwater Channel
- Base Flood Elevation (BFE)
- Floodway
- Preliminary Proposed Elevation Contour (2 foot)
- 100-year Floodplain
- 500-year Floodplain
- Proposed Floodplain Compensatory Storage
- Airport Property
- Project Study Area

0 500 1,000 Feet

Note: Proposed elevation contours shown are based on the North American Vertical Datum of 1988 (NAVD88).

IDNR also states that coordination with USACE Omaha District would also be required to obtain the IDNR Floodplain Permit. However, as the Proposed Action would not add fill to floodways, jurisdictional wetlands, nor navigable waters, permitting through USACE Omaha District is not anticipated.

Coordination with the City of Sioux City floodplain manager and with the IDNR occurred on March 4, 2025, to obtain initial feedback to the Proposed Action (see **Appendix I**). The City of Sioux City responded on April 17, 2025, that local floodplain requirements do align with FEMA's and IDNR's requirements and by meeting those floodplain requirements will also satisfactorily meet the City of Sioux City's floodplain requirements. A local floodplain development permit will be required to align with FEMA and IDNR's requirements (see **Appendix I**).

3.3.12.8 Floodplains – Mitigation Measures

As mentioned above in *Environmental Consequences*, the Proposed Action would result in an encroachment into the 100-year (1-percent-annual-chance) floodplain in two locations: 1) relocation of a drainageway; and 2) fill placed in a drainage ditch as a result of the runway extension. Additional floodplain storage would be constructed below the 100-year (1-percent-annual-chance) BFE such that the Proposed Action would not adversely affect the 100-year (1-percent-annual-chance) floodplain BFE (see **Figure 3-16**). As a result, the Proposed Action would not result in probable loss of human life nor substantial damage or interruption of vital transportation facility. The Proposed Action would also comply with relevant floodplain and other environmental regulations such that natural and beneficial floodplain values are not adversely affected. Therefore, the Proposed Action would not result in a significant floodplain encroachment.

3.3.12.9 Surface Waters – Affected Environment

The Clean Water Act (CWA) establishes the basic structure for regulating the discharge of pollutants into waters of the United States. Section 402 of the CWA establishes the NPDES permit program.

The Project Study Area is within the Bacon Creek-Missouri River watershed (Hydrologic Unit Code (HUC): 102300010305).[89] The Missouri River is located to the northwest of the Project Study Area and is listed by the IDNR as an impaired waterway under CWA Section 303(d) and 305(b). The Missouri River near the Project Study Area is listed as impaired for E. Coli, altered channel and hydrologic modifications, and habitat alterations.[90] See **Figure 3-17** for the location of impaired waterways below.

IDNR has listed designated uses, or beneficial uses, for water bodies and water body segments within Iowa. Water Quality Standards are established to protect and maintain the beneficial uses and assess the health of surface waters in the State for prevention of toxic substances entering waterways that could affect aquatic life and human health. As runoff from the Project Study Area discharges into the Missouri River, Water Quality Standards would apply to Airport

[89] USGS. (2024, March 21). Retrieved March 2024, from USGS National Map Downloader Portal: https://apps.nationalmap.gov/downloader/#/

[90] Iowa Department of Natural Resources. (n.d.). Water Quality Assessments Impaired Waters List. Retrieved from March 2024, from Iowa Department of Natural Resources: https://programs.iowadnr.gov/adbnet/Segments/1722.

development.[91] The designated uses for segments of the Missouri River nearest to the Project Study Area include primary contact recreational use (such as swimming), aquatic life, and fish routinely harvested for public consumption.[92] Portions of the Missouri River further downstream also have a designated use as a drinking water source.[93] IDNR has also enacted an antidegradation policy that is applicable to increased activity, stating that existing designated uses of surface waters shall be maintained and protected, and further degradation are prohibited.[94]

As mentioned in **Section 3.3.5.1**, PFAS is present in soils adjacent to the Project Study Area and mostly within IAANG leased property, but is also within the Missouri River.[95] The IDNR has enacted a PFAS Action Plan as discussed in **Section 3.3.5.2** to address PFAS levels in public drinking water supplies. As of August 2025, Iowa DNR has not developed standards for PFAS in surface waters or stormwater runoff, nor do stormwater permits require any monitoring for PFAS.

The Project Study Area has eight (8) primary stormwater basins with distinct outfall points, designated Basins A through H. Stormwater basins were delineated based on existing ground elevation data, existing stormwater infrastructure, and drainage divides, including Airport runways, taxiways, and roadways. In addition, an existing drainage conveyance channel is present in the northern portion of the Project Study Area that conveys stormwater runoff from upstream highways, roadways, and industrial facilities. See **Figure 3-18** for the existing conditions hydrology.

Stormwater runoff from the Project Study Area generally sheet flows off airfield pavement into vegetated infields and ditches. Runoff in some areas of the Airport is collected by ditches and conveyed via ditch or ditch and culvert systems off the site. In other cases, runoff is collected in underground storm sewers and conveyed to ditches that discharge water off site. A majority of the stormwater basins discharge to ditches that ultimately convey water to the Missouri River.

There are currently two existing deicing ponds, which detain deicer-impacted stormwater when deicing is occurring. This runoff is discharged to sanitary sewers. When deicing is not occurring, stormwater is conveyed directly to the storm sewer system via a valve, rather than being detained in the ponds. There are currently no other permanent stormwater facilities at the Airport for detention nor treatment of stormwater runoff.

[91] 567 IAC 61.3(3).
[92] Iowa Department of Natural Resources. (n.d.). Water Quality Assessments Impaired Waters List. Retrieved from March 2024, from Iowa Department of Natural Resources: https://programs.iowadnr.gov/adbnet/Segments/1722.
[93] Iowa Department of Natural Resources. (n.d.). Water Quality Assessments Impaired Waters List. Retrieved from March 2024, from Iowa Department of Natural Resources: https://programs.iowadnr.gov/adbnet/Segments/1709.
[94] Iowa Department of Natural Resources. (n.d.). Introduction to Antidegradation. Retrieved April 2024, from IDNR: https://www.iowadnr.gov/Portals/idnr/uploads/water/standards/files/antidegradation.pdf
[95] Iowa Department of Natural Resources. (n.d.). PFAS and Private Wells. Retrieved August 2025, from IDNR: https://www.iowadnr.gov/media/4619/download?inline.

Figure 3-17
Impaired Waterway Downstream of the Project Study Area

The Airport is under the jurisdiction of the Sioux City Phase II Municipal Separate Storm Sewer System (MS4) permit, which is a stormwater permit for communities with a population between 50,000 to 100,000 residents with authorized stormwater and groundwater discharges through the NPDES program.

The Airport operates under an industrial NPDES GP #1, discharge authorization number 5575-5395, active through October 31, 2025,[96] which covers stormwater discharge associated with industrial activity from vehicle maintenance, equipment cleaning, and deicing/anti-icing. The permit requires the implementation of a SWPPP and BMPs designed to limit the discharge of pollutants to surrounding surface waters and to meet all numeric effluent limits.[97]

Under the Airport industrial NPDES GP #1, aircraft deicing and anti-icing operations occur at the Airport during the winter months when frost conditions are expected, which can affect aircraft takeoffs, landings, and taxiing. The Airport experiences 1,000 or more annual non-propellor aircraft departures and, therefore, is required by industrial NPDES GP #1 to certify annually that airfield deicing products do not contain urea and that discharge at outfalls meets a maximum daily limit of 14.7 milligrams per liter (mg/l) of ammonia as nitrogen. Deicing operations take place in designated locations on the 185th ARW apron (see **Figure 3-18**) that has infrastructure for collecting and conveying any deicer-impacted stormwater runoff to containment tanks. When deicing is occurring during storm events, deicer-impacted stormwater is directed to these tanks. In the case of stormwater runoff that is not impacted by deicer, flow in these pipes is redirected to discharge to the stormwater sewer.

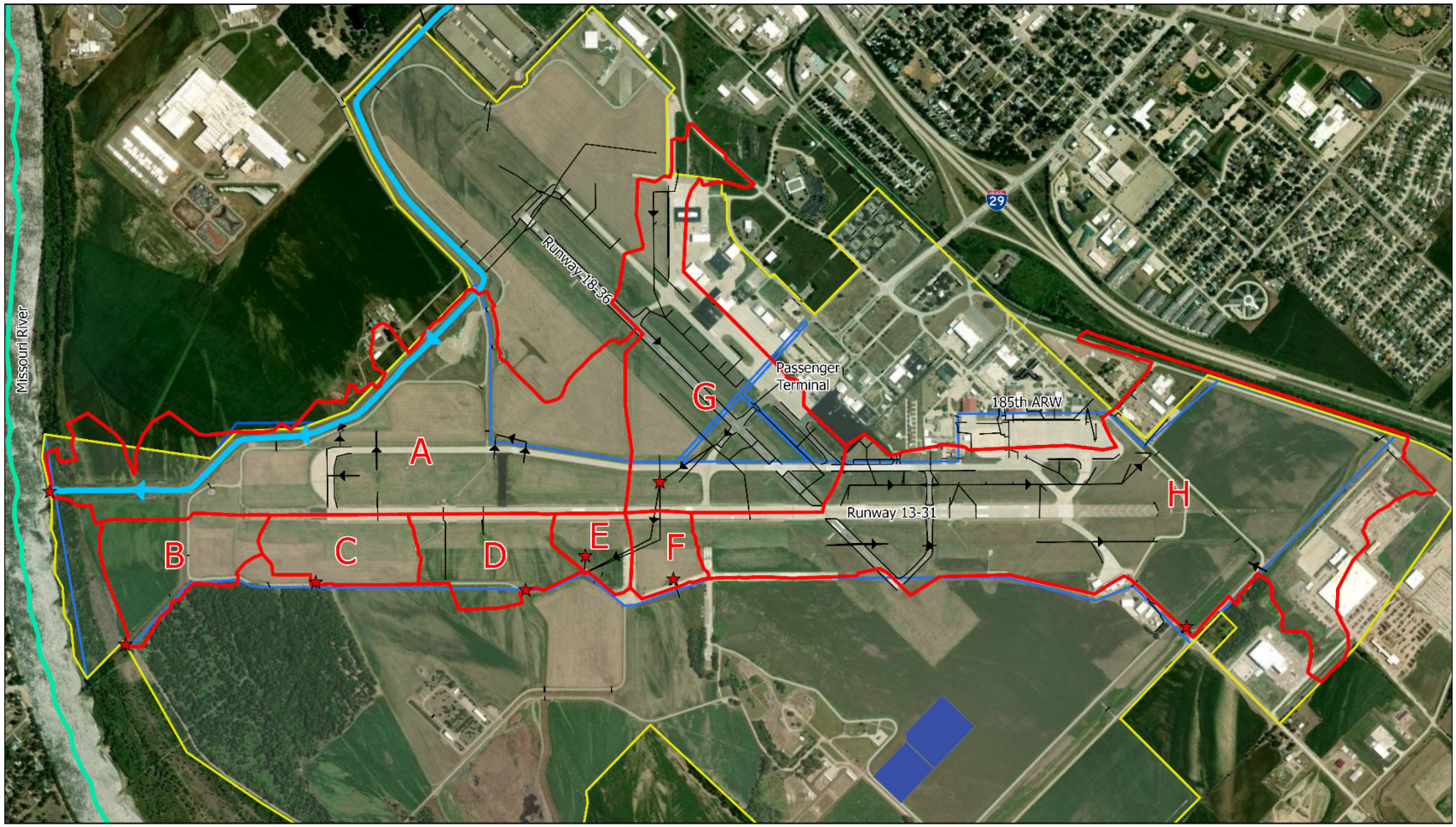
3.3.12.10 Surface Waters – Significance Threshold

FAA Order 1050.1F, Exhibit 4-1, defines the FAA's significance threshold for surface waters, which states the action would:

- Exceed water quality standards established by Federal, state, local, and tribal regulatory agencies; or
- Contaminate public drinking water supply such that the public health may be adversely affected.

[96] Iowa Department of Natural Resources. (2002, October 31). Storm Water Discharge Associated with Industrial Activity. Retrieved April 2024, from IDNR: https://programs.iowadnr.gov/stormwater/pages/report?report=rptGeneralPermit01&permitID=7560.
[97] Iowa Department of Natural Resources. (2023, March 1). NPDES General Permit No. 1 – Storm Water Discharge Associated with Industrial Activity.

Figure 3-18
Existing Hydrologic Conditions at the Airport



3.3.12.11 Surface Waters – Environmental Consequences

The surface waters analysis considered potential changes in hydrology and water quality associated with construction and operation of the Proposed Action compared to the No Action Alternative. The analysis considered changes in impervious surfaces that affect stormwater runoff and hydrology and construction activities that have the potential to affect surface waters. Federal, state, and local regulations and permitting requirements were also reviewed for applicability.

No Action Alternative

The No Action Alternative is the non-development alternative. No new impervious surface would be added at the Airport, and there would be no change in surface water runoff. No land disturbing activities would occur. Therefore, there would be no effect on surface waters at the Airport.

Proposed Action

The Proposed Action would increase impervious surfaces by approximately 25.66 acres in the Project Study Area. Stormwater runoff would continue to discharge to the same locations as in existing conditions.

Construction Impacts

Construction of the Proposed Action would generate pollutants in stormwater runoff that could cause indirect impacts to the water quality of surface waters in the absence of proper controls. Pollutants could include sand, silt, and other suspended solids; metals such as copper, lead, and zinc; nutrients (e.g., nitrogen and phosphorus); certain bacteria and viruses; and organics such as petroleum hydrocarbons and pesticides.

Construction of the Proposed Action would not directly affect surface waters of the United States because construction activities do not occur in or near surface waters. Construction NPDES GP #2 and the construction SWPPP would define requirements for erosion and sediment control practices and construction stormwater BMPs that would help prevent construction-related pollutants from discharging off-site via stormwater runoff. The construction SWPPP would follow the Iowa Stormwater Management Manual (ISWMM) Chapter 1 – Section 4, Stormwater Management Criteria, which addresses the capture, retention, and control of sediment in disturbed areas of construction. Construction stormwater BMPs that could be implemented could include, but are not limited to, inlet protection, silt fences, wattles, sediment basins, and check dams, and will be identified during final design of the project.[98] See **Figure 3-19** for limits of disturbance for the Proposed Action.

Soils disturbed by construction that contain contaminants above established national and state screening levels would be stored on Airport property. The contractor would handle this material in accordance with Department of Defense standards for handling of hazardous materials as well as methods outlined in the CMMP in **Section 3.3.5.3**. Adherence to the construction SWPPP, CMMP, and other relevant standards would prevent migration of soils containing contaminants resulting from construction in the Project Study Area into nearby surface waters.

[98] Iowa Department of Natural Resources. (2009, October 28). Iowa Stormwater Management Manual.

The IDNR enforces a statewide antidegradation policy for protection of the water quality of surface waters of the state. The policy establishes four (4) tiers of protection against degradation of water quality for surface waters. By implementing construction stormwater BMPs and outfall monitoring under the construction NPDES GP #2 and construction SWPPP, the Airport Sponsor would ensure that the level of water quality necessary for existing beneficial uses of downstream surface waters are maintained and protected, and that construction of the Proposed Action would not cause further degradation of waters of the State. Construction of the Proposed Action would not cause significant adverse effects to surface waters by exceeding water quality standards established by federal, state, and local regulatory agencies or contaminating public drinking water supply such that public health or aquatic life may be adversely affected.

Operational Impacts

Implementing the Proposed Action would alter the hydrology and impervious cover in drainage basins covering the Project Study Area. Additional stormwater runoff because of new impervious surfaces could cause indirect impacts to hydrology of nearby surface waters during runoff-producing precipitation events. All basin boundaries would remain the same between existing and future drainage conditions with the exception of Basin A, which would increase by 1.47 acres of acquired land due to realignment of an existing drainage channel. See **Figure 3-18** for existing drainage conditions and **Figure 3-20** for future drainage conditions.

Figure 3-19
Proposed Action Limits of Construction

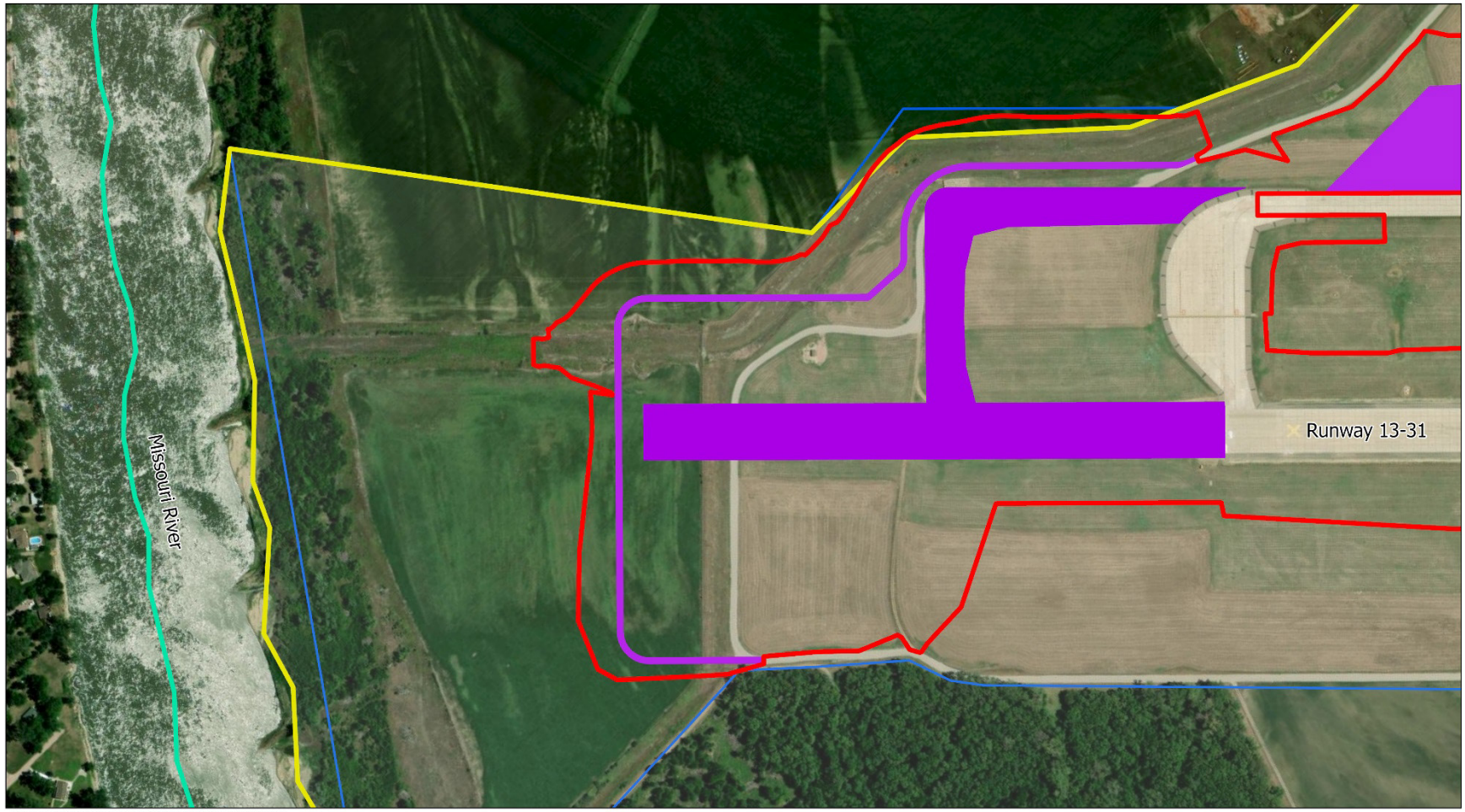


Figure 3-20
Future Hydrologic Conditions at the Airport

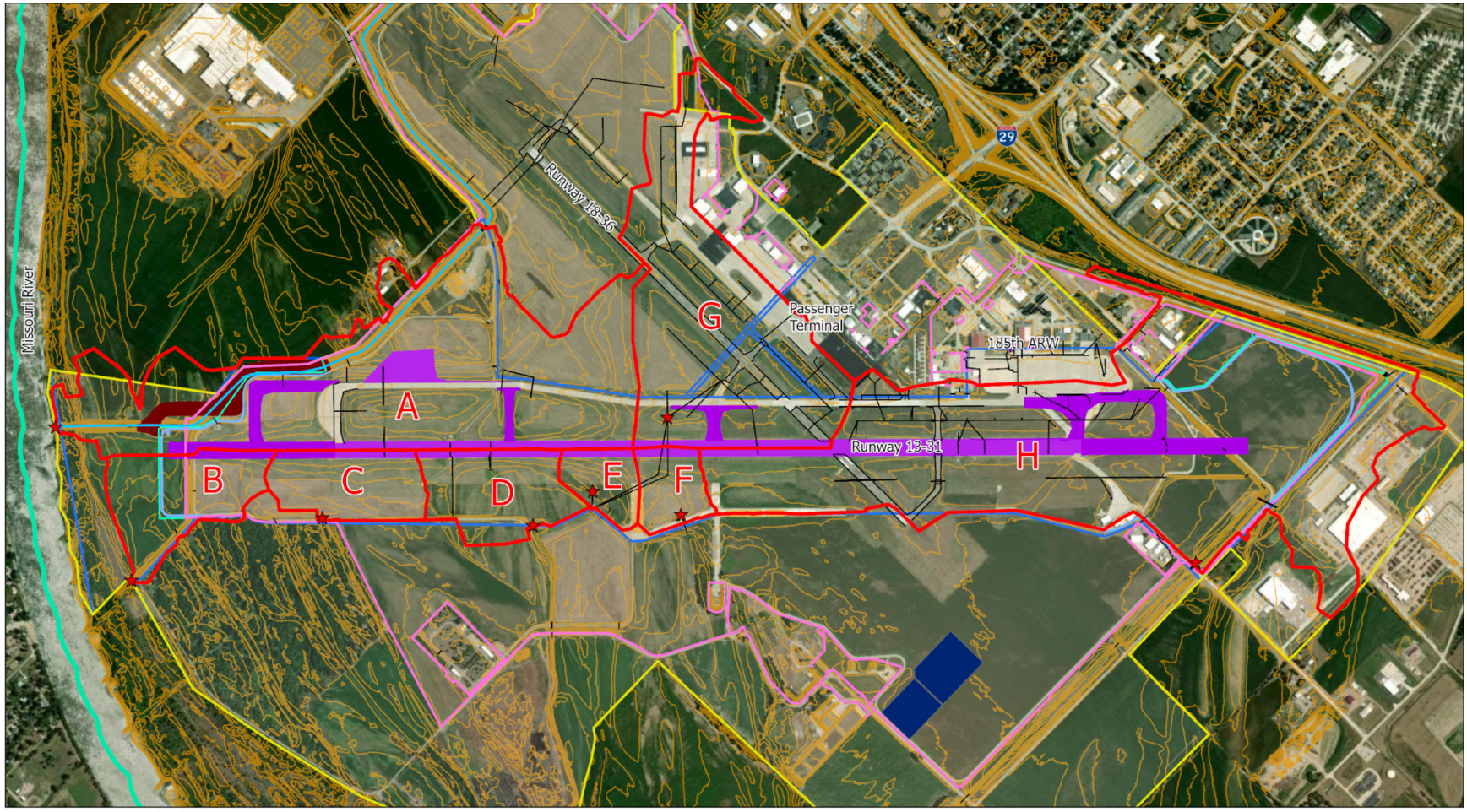


Table 3-13, **Table 3-14,** and **Table 3-15** summarize the change in Airport drainage basin conditions, peak discharge rates, and water quality treatment required as determined through the NRCS TR-55 peak runoff method. See **Appendix I** for detailed methodology and calculations.

Table 3-13
Comparison of Existing and Future Drainage Basin Impervious Cover

Basin	Existing Impervious Area (acre)	Future Impervious Area (acre)	Change in Impervious Area (acre)
A	33.20	44.99	+11.78
B	1.41	3.71	+2.30
C	3.69	4.08	+0.39
D	4.63	4.69	+0.06
E	3.42	3.42	-
F	3.91	3.91	-
G	50.39	51.68	+1.29
H	72.46	82.30	+9.84

Source: RS&H Analysis, 2025.

Table 3-14
Drainage Basin Relative Change Summary

Basin	Relative Change in Impervious Area	Relative Change in Peak Flow Rate
A	Increase	Increase
B	Increase	Increase
C	Increase	Increase
D	Increase	Increase
E	No Change	No Change
F	No Change	No Change
G	Increase	Increase
H	Increase	Increase

Source: RS&H Analysis, 2025.

Table 3-15
Proposed Action Water Quality Volume Summary

Basin	Required Water Quality Treatment Volume (acre-foot)	Required Water Quality Volume Peak Flow Rate (cubic feet per second)
A	5.49	20.06
B	0.57	3.23
C	0.56	3.75
D	0.65	3.16
E	0.40	3.65
F	0.46	3.36
G	5.65	27.85
H	9.58	30.54

Source: RS&H Analysis, 2025.

Proposed permanent stormwater facilities would be sized to provide flow attenuation to ensure that proposed peak flow rates are less than or equal to existing peak flow rates up to the 100-year storm event. Maintaining proposed peak flow rates at or below existing peak flow rates would minimize impacts to downstream properties. Therefore, the Proposed Action would not have a significant impact on surface water hydrology or the capacity of existing, off-site stormwater conveyance systems.

Stormwater runoff within the Project Study Area is expected to contain pollutants commonly found in runoff from airport sites. Pollutants generated from the airfield could include pavement and aircraft deicing and anti-icing compounds, jet fuel, engine oil, lubricants, chemical solvents, and soapy wastewater. Pollutants generated from roadways could include deicing and anti-icing compounds, solvents, paint, paint and varnish removers, and debris. Sites with stormwater runoff potentially contaminated by these pollutants are required by the ISWMM to obtain and comply with an industrial NPDES GP #1.[99, 100] The industrial NPDES GP #1 is in place to reduce chemical pollutants in stormwater runoff and includes creation of and maintaining a SWPPP. Industrial NPDES GP #1 also requires outfall monitoring for pollutant discharges from a site. As noted in **Section 3.3.12.3**, the Airport maintains an industrial NPDES GP #1 Permit, that is valid through October 31, 2025.[101]

Table 3-15 summarizes the required water quality treatment volumes and flow rate by drainage basin. The controlling water quality parameter, volume or flow rate, is determined by the type of water quality facility being used, both of which would be confirmed in final design. See **Appendix I** for additional information and detailed calculations pertaining to water quality treatment.

ISWMM establishes criteria for new development and redevelopment projects to improve post-development water quality in accordance with NPDES and MS4 permit programs. The water quality treatment goal in the ISWMM is also based on USEPA guidance. Post-construction stormwater management is also held to minimum technical requirements and operational and maintenance procedures.[102] A Stormwater Report would be submitted to IDNR during final design documenting adherence to these post-construction stormwater management requirements.

Permanent water quality facilities could include, but are not limited to, vegetated filter strips, grass channels, infiltration trenches, infiltration basins, and bioretention facilities, and Low Impact Development (LID) practices. These permanent water quality facilities would treat and/or infiltrate runoff for target pollutants identified in ISWMM for low-depth, high-frequency storm events in accordance with the permitting programs discussed above. Locations and size of water quality facilities would be determined in final design.

During operation of the Proposed Action, excess soils that contain contaminants above federal and state contaminant screening levels would be stored on Airport property and enclosed within

[99] Iowa Department of Natural Resources. (2023, March 1). NPDES General Permit No. 1 – Storm Water Discharge Associated with Industrial Activity.
[100] Iowa Department of Natural Resources. (2022, December). A Brief Guide To Developing Storm Water Pollution Prevention Plans And Best Management Practices. Retrieved March 2024, from IDNR: https://www.iowadnr.gov/media/5843/download?inline.
[101] Iowa Department of Natural Resources. (2002, October 31). Storm Water Discharge Associated with Industrial Activity. Retrieved April 2024, from IDNR: https://programs.iowadnr.gov/stormwater/pages/report?report=rptGeneralPermit01&permitID=7560.
[102] Iowa Department of Natural Resources. (2009, October 28). Iowa Stormwater Management Manual.

an impermeable liner in accordance with procedures outline in the Department of Defense standards for handling of hazardous material, the CMMP discussed in **Section 3.3.5.3**, and industry best practices. This impermeable liner would prevent migration of soils in surface runoff during precipitation events and leeching of contaminants into the underlying soil. The Airport Sponsor would be responsible for maintenance of this impermeable liner during operation of the Proposed Action in accordance with manufacturer specifications.

In addition, the Proposed Action would not change or increase the number and types of aircraft that operate at the Airport, which would result in industrial activities the same as existing conditions. As noted in **Section 3.3.12.3**, aircraft deicing occurs at the Airport but would not increase in frequency or scale and impacts to surface waters would be minimized through the existing deicing practices.

As there would be an increase in pavement under the Proposed Action, there would be an increase in pavement anti-icing. Pavement deicers are commonly environmentally benign agents in order to minimize impacts to surface water and groundwater resources. In addition, use of BMPs and permanent water quality treatment facilities would infiltrate and treat runoff from the site including the increase in pavement deicer-laden stormwater. As a result, significant impacts to surface waters as a result of increased pavement anti-icing would not occur.

By constructing permanent water quality facilities in accordance with ISWMM criteria and adhering to outfall monitoring requirements under industrial NPDES GP #1, the Proposed Action would not adversely affect surface waters, and exceedance of stormwater quality standards would not occur. The Proposed Action would not result in degradation of surface waters below established surface water and drinking water quality criteria.

3.3.12.12 Surface Waters – Mitigation Measures

Adherence to the construction SWPPP, CMMP, and other relevant standards for handling of hazardous materials would prevent migration of soils containing contaminants resulting from construction in the Project Study Area into nearby surface waters. During operation of the Proposed Action, excess soils that contain contaminants above federal and state contaminant screening levels would be stored on Airport property and enclosed within an impermeable liner to be maintained by the Airport Sponsor in accordance with manufacturer specifications.

Implementing the Proposed Action would not affect water quality in a manner that adversely affects the quality of the public drinking water supply, nor would it increase the use of public water supplies in a manner that adversely affects the overall supply of public water. Therefore, no significant impact would occur under the Proposed Action.

3.3.12.13 Groundwater – Affected Environment

The Safe Water Drinking Act is the primary statute regulating groundwater and prohibits federal agencies from funding actions that would contaminate a USEPA-designated sole source aquifer or its recharge area. See **Appendix I** for other regulations pertaining to groundwater.

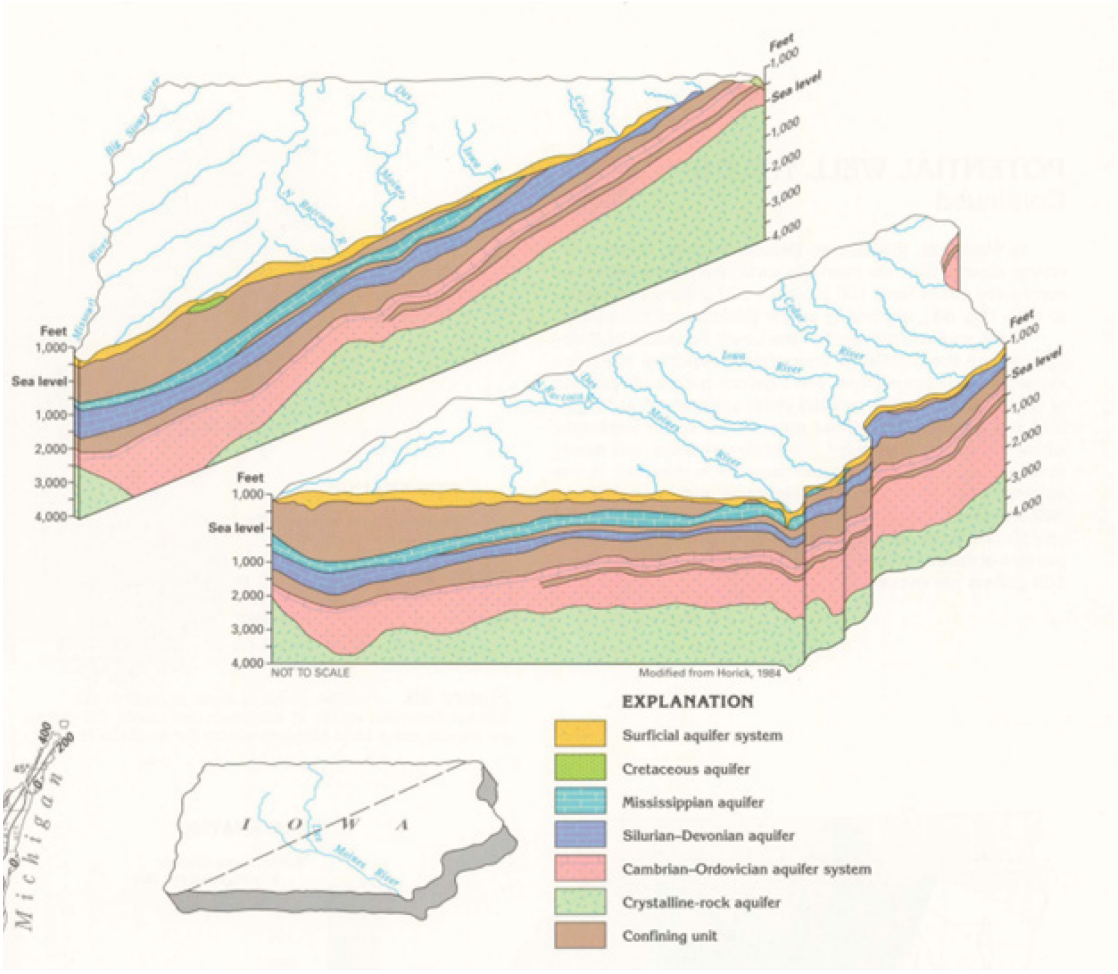
The Project Study Area is not located within any USEPA-designated sole source aquifers. [103] Average annual groundwater depth beneath the Airport property averages 4.1 feet below ground surface.[104] Groundwater depths may vary from year to year and with regard to seasonal weather impacts. In addition, monitoring wells from a 2019 study at the Airport identified groundwater depths between 9.5 to 22.5 feet below ground surface in the vicinity of the 185th ARW base property (see **Appendix E** for the PFAS Final Site Inspection Report).

The Project Study Area is located in six (6) aquifers, varying in depth below ground surface: the Surficial, Cretaceous,[105] Dakota, Mississippian, Silurian-Devonian, and Cambrian-Ordovician Aquifers.[106] The aquifers are separated by confining layers and have different groundwater quality characteristics and flow regimes. The Surficial aquifer, the uppermost aquifer, is hydraulically connected to the Missouri River.[107] As these two systems are connected and the Missouri River is typically at a lower depth than the annual average shallow groundwater below the Project Study Area,[108,109] this groundwater generally flows into the Missouri River. The Missouri River is listed as an impaired waterway as discussed in **Section 3.3.12.3**, and the groundwater could reasonably be impaired as well.

As stated in **Section 3.3.5.1**, the NGB completed testing of the groundwater beneath PRLs for PFAS in September 2018 at certain locations on 185th ARW base property, which indicated that PFAS was above screening values in the groundwater (see **Appendix E** for the Final Site Inspection Report). PFAS has been detected in a surficial aquifers across the state of Iowa.[110] The Surficial aquifer also recharges underlying aquifers.[111] There are no groundwater wells reported in the Project Study Area. See **Figure 3-21** and **Figure 3-22**.

[103] U.S. Environmental Protection Agency.(n.d). Sole Source Aquifers. Retrieved March 2024, from USEPA: https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b.
[104] Iowa State University. (2019, July 22). Iowa Depth to Water Table Maps. Retrieved March 2024, from Iowa State University: https://www.agron.iastate.edu/glsi/2019/07/22/download-iowa-depth-to-water-table-maps-gssurgo/.
[105] USGS. (1992). Ground Water Atlas of the United States – Segment 9: Iowa, Michigan, Minnesota, Wisconsin. Retrieved April 2024, from USGS: https://pubs.usgs.gov/ha/730j/report.pdf.
[106] University of Iowa. Iowa's Bedrock Aquifers. Retrieved March 2024, from University of Iowa: https://www.iihr.uiowa.edu/igs/publications/map/aquifer.html.
[107] Iowa Department of Natural Resources. (2004). Alluvial Aquifers of Iowa. Retrieved April 2024, from IDNR: https://www.iihr.uiowa.edu/igs/publications/uploads/Em-38.pdf.
[108] USGS. (n.d.). Water Data for the Nation – Missouri River at Sioux City, IA – 06486000. Retrieved June 2025, from USGS: https://waterdata.usgs.gov/monitoring-location/06486000/#dataTypeId=continuous-00065-0&period=P365D.
[109] Based on the published Airport Master Record on file with the FAA, the average airport elevation at SUX is 1098.5 NAVD88. Based on an average groundwater depth of 4.1 feet below ground would result an average groundwater elevation of 1094.4 feet NAVD88. As this elevation is less than the flood stage of the Missouri River, groundwater can be assumed to flow from higher elevation to lower elevation into the Missouri River.
[110] Iowa Department of Natural Resources. (n.d.). PFAS and Private Wells. Retrieved August 2025, from IDNR: https://www.iowadnr.gov/media/4619/download?inline.
[111] USGS. (1992). Ground Water Atlas of the United States – Segment 9: Iowa, Michigan, Minnesota, Wisconsin. Retrieved April 2024, from USGS: https://pubs.usgs.gov/ha/730j/report.pdf.

Figure 3-21
Iowa Aquifers



Source: USGS, 1992.

Figure 3-22
Groundwater Conditions

IDNR has enacted Statewide Standards (SWSs) for groundwater resources in the State of Iowa.[112] An antidegradation policy is similarly enacted for groundwater resources[113] and dewatering activities[114] to prevent contamination of groundwater to the maximum extent practicable.

Deicing of aircraft is performed on the 185th ARW apron (**Figure 3-18**). When aircraft deicing occurs, runoff from the apron is diverted into containment tanks that detain spent deicing fluid to be removed. The tanks are used to minimize infiltration and potential glycol contamination of groundwater and soil.

3.3.12.14 Groundwater – Significance Threshold

FAA Order 1050.1F, Exhibit 4-1, defines the FAA's significance threshold for groundwater, which states a significant impact would occur if the action would:

- Exceed groundwater quality standards established by federal, state, local, and tribal regulatory agencies; or
- Contaminate an aquifer used for public water supply such that public health may be adversely affected.

3.3.12.15 Groundwater – Environmental Consequences

The groundwater analysis considered potential changes in groundwater recharge and water quality conditions associated with construction and operation of the Proposed Action compared to the No Action Alternative. Like the analysis of surface waters, the groundwater analysis considered excavation, construction of structures, changes in impervious surfaces, and construction activities that would have the potential to affect groundwater.

No Action Alternative

Under the No Action Alternative, the Airport Sponsor would not implement the runway improvements. There would be no development or construction and therefore, there would be no effect on groundwater at the Airport.

Proposed Action

Implementation of the Proposed Action includes construction activities that have the potential to affect groundwater due to pollutants in stormwater runoff and could include excavation activities below the groundwater table. As stated in **Section 3.3.12.4**, the groundwater table in the Project Study Area ranges from 1.7 to 24.0 feet below ground surface. The Proposed Action would result in a net addition of 25.66 acres of impervious surface, which has the potential to affect groundwater recharge rates during operation of the Proposed Action.

[112] Iowa Department of Natural Resources. (n.d.). What are Iowa's Statewide Groundwater Standards and How are they Determined? Retrieved April 2024, from IDNR: https://www.iowadnr.gov/portals/idnr/uploads/consites/statewidegwstandards.pdf.
[113] Groundwater Protection Act, Iowa Code §455E (2022).
[114] Iowa Department of Natural Resources. (2023, July 1). NPDES General Permit No. 9 – Discharge from Dewatering and Residential Geothermal Systems.

Construction Impacts

Construction of new groundwater wells and modification of groundwater wells are not proposed as part of the Proposed Action. Permanent extraction of groundwater is also not proposed as part of the Proposed Action. Construction impacts to groundwater sources would be minimized through adherence to the construction NPDES GP #2 and construction SWPPP by the construction contractor, which contain measures for proper use, storage, and handling of construction-related chemicals and action protocols to implement in the event of a spill or release.

Direct effects to groundwater could occur if excavation activities occur below the groundwater table, which would require dewatering. Some utilities and drainage structures may be required to be installed or relocated below the groundwater table as part of the Proposed Action. The construction contractor would handle any groundwater encountered in accordance with IDNR GP #9, Discharge from Dewatering and Residential Geothermal Systems, as needed, by installing appropriate dewatering features on site. As the Airport is an industrial site and groundwater could be reasonably assumed to be above surface water quality thresholds, the construction contractor would be required to submit a Notice of Intent (NOI) and an antidegradation document to IDNR prior to dewatering activities commencing. In final design prior to dewatering commencing, IDNR may require a representative sampling of soil and groundwater on site prior to issuance of GP #9 to the contractor. Daily visual monitoring analysis of groundwater quality would also be required.

In accordance with GP #9, the construction contractor would reduce sediment from dewatering activities through the use of construction BMPs, which could include, but are not limited to, splash pads, straw bales, silt fences, and vegetated buffer strips. A dewatering pollution prevention plan (DwPPP) would be submitted to IDNR that would document procedures to minimize soil erosion, construction BMPs to minimize discharge of pollutants, and the construction SWPPP. In accordance with GP #9 and the DwPPP, the construction contractor would be authorized to discharge uncontaminated groundwater from dewatering onto the ground surface to be infiltrated on-site with additional BMPs in place to prevent contamination of any discharge with fuel, lubricants, solids, or other regulated pollutants. [115] If potentially contaminated groundwater were encountered during dewatering, the construction contractor would test and treat the water prior to discharge in accordance with GP #9. Contaminated groundwater, if encountered and unable to be treated below federal and state levels, would be handled in accordance with to BMPs in the CMMP as discussed in **Section 3.3.5.3**.

Compliance with regulatory requirements would ensure that dewatering activities, if required, would not violate groundwater recharge requirements, degrade groundwater quality to levels below established standards, degrade the existing or future beneficial use of groundwater resources as a potential drinking water source, or contaminate an aquifer such that public health is adversely affected.

By implementing construction stormwater facilities as described in the Construction Impacts section of **Section 3.3.12.3** and implementing BMPs, construction of the Proposed Action would not have an adverse effect to groundwater quality and quantity. Therefore, construction of the

[115] Iowa Department of Natural Resources. (2023, July 1). NPDES General Permit No. 9 – Discharge from Dewatering and Residential Geothermal Systems.

Proposed Action would not result in direct or indirect significant adverse effects on groundwater if contaminated groundwater is encountered or dewatering is required.

In addition, the Proposed Action would comply with all applicable federal, state, and local regulations regarding hazardous materials and waste discharge requirements reducing the potential for a release of contaminants that could infiltrate and contaminate groundwater. Therefore, construction of the Proposed Action is not expected to result in impacts to groundwater quality levels as a result of accidental spills or releases.

Operational Impacts

Once constructed, the Proposed Action would result in an increase of approximately 25.66 acres of impervious surface. No active water supply wells are within the Project Study Area as shown in **Figure 3-22**. Operation of the Proposed Action would not involve groundwater extraction or other activities that could result in direct withdrawal or depletion of groundwater resources. Therefore, the Proposed Action would not result in water usage that would cause significant direct adverse effects on groundwater resources.

ISWMM requires projects that add impervious surface to infiltrate a portion of stormwater runoff from disturbed areas to maintain groundwater recharge rates. This groundwater recharge volume is based on the size of disturbed area, amount of site impervious area, and hydraulic conductivity of the on-site native soils.[116] The required groundwater recharge volumes can be seen in **Table 3-16** and are included in the water quality volumes listed in **Table 3-15** in *Proposed Action*. Infiltration stormwater facilities, such as infiltration trenches and basins, would be required to infiltrate the groundwater recharge volumes. Locations, sizes, and types of infiltration stormwater facilities would be determined in final design to meet the required groundwater recharge volumes provided in **Table 3-16**.

Table 3-16
Future Drainage Basin Groundwater Recharge Volume Requirements

Basin	Required Groundwater Recharge Volume (acre-inch)
A	42.74
B	3.52
C	3.88
D	4.46
E	3.25
F	3.71
G	49.10
H	78.19

Source: RS&H Analysis, 2025.

The Proposed Action would not change or increase the number and types of aircraft that operate at the Airport. As a result, aircraft deicing usage would not increase and impacts to groundwater would be minimized. As there would be an increase in pavement under the Proposed Action, there would be an increase in pavement anti-icing. As stated in

[116] Iowa Department of Natural Resources. (2009, October 28). Iowa Stormwater Management Manual.

Section 0, benign deicing agents are commonly used at airports to minimize impacts to surface water and groundwater resources. Therefore, impacts to groundwater are not anticipated.

Compliance with regulatory requirements would ensure that operation of the Proposed Action would not violate groundwater recharge requirements or degrade groundwater quality to levels below established standards, degrade the existing or future beneficial use of groundwater resources as a potential drinking water source, or contaminate an aquifer such that public health is adversely affected.

3.3.12.16 Groundwater – Mitigation Measures

If encountered, dewatering water that contains PFAS above the IDNR screening values would either be treated prior to being discharged or would be transported and disposed of off-site at a licensed waste treatment facility in accordance with the CMMP. As a result, public water supplies would not be adversely affected by construction and operation of the Proposed Action and a significant impact would not occur.

3.3.13 Permit, Licenses, and Other Approvals

As discussed throughout Chapter 3, the Airport Sponsor would obtain permits, licenses, and/or other approvals or would continue operating under existing permits to comply with County, state, and federal regulations. See **Table 3-17** below for a summary of required permits licenses, and/or other approvals for implementation of the Proposed Action.

Table 3-17
Summary of Permits, Licenses, and Other Approvals

Permit Name	Agency	Permit Category	Applicant	Contents
Construction NPDES General Permit #2	IDNR	Surface Waters - Construction	Construction Contractor	Develop construction SWPPP; implement sediment, erosion, pollution-prevention control measures
General Permit #9	IDNR	Groundwater	Construction Contractor	Develop DwPPP; implement construction dewatering BMPs to reduce transport of sediment and other pollutants
Stormwater Report	IDNR	Surface Waters - Operational	Airport Sponsor	Adherence to the ISWMM for proposed hydrology and water quality treatment
Floodplain Management – Bridge and Road Embankments	IDNR	Floodplains	Airport Sponsor	Conformance to IDNR requirements for development in the floodplain
Floodplain Management – Channel Changes	IDNR	Floodplains	Airport Sponsor	Conformance to IDNR requirements for changes in floodplain conveyance

Permit Name	Agency	Permit Category	Applicant	Contents
LOMR/LOMC	FEMA Region 7	Floodplains	Airport Sponsor	Summary of existing and proposed floodplain conditions including modeled 100-year BFEs, revised 100-year floodplain extents, supporting design documentation and modeling
Local Floodplain Development Permit	City of Sioux City	Floodplains	Airport Sponsor	Conformance to FEMA and IDNR requirements for development in the floodplain

Source: RS&H, 2025.

3.3.14 Summary of Resource Category Determination and Mitigation

Table 3-18
Summary of Resource Category Determination and Mitigation

Resource Category	Proposed Action Impacts	Proposed Action Mitigation	No Action Alternative Impacts	No Action Alternative Mitigation
Air Quality	Not Significant	None	None	None
Biological Resources	No Effect	None	None	None
GHG Emissions	Not Significant	None	None	None
Department of Transportation, Section 4(f)	No Adverse Effect	None	None	None
Hazardous Materials, Solid Waste, & Pollution Prevention	Not Significant	CMMP and adherence to local and state permit requirements	None	None
Historical, Architectural, Archaeological, and Cultural Resources	No Adverse Effect	None	None	None
Land Use	Not Significant	None	None	None
Natural Resources and Energy Supply	Not Significant	None	None	None
Noise and Noise-Compatible Land Use	Not Significant	None	None	None
Socioeconomics and Children's Health and Safety Risks	Socioeconomics: Not Significant Children's Health and Safety Risks: Not Significant	Socioeconomics: None Children's Health and Safety Risks: None	None	None
Visual Effects	Light Emissions: No effect Visual Resources and Visual Character: Not significant	Light Emissions: None Visual Resources and Visual Character: None	None	None

Resource Category	Proposed Action Impacts	Proposed Action Mitigation	No Action Alternative Impacts	No Action Alternative Mitigation
Water Resources	Wetlands: Not significant Floodplains: Not significant Surface Waters: Not significant Groundwater: Not significant	Wetlands: construction fencing surrounding the wetland area prior to and during construction to avoid inadvertent impacts that could occur during installation of the fence. Floodplains: Compensatory floodplain storage and adherence to applicable floodplains permits. Surface Waters: Proper handling of excess contaminated soils during construction and post-construction storage of these soils within an impermeable liner Groundwater: Contaminated dewatering water, if encountered, would either be treated prior to discharge or would be transported and disposed of off-site	None	None

Source: RS&H, 2025.

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4 Agency Coordination and Public Involvement

The Environmental Assessment (EA) coordination process described in this chapter provided interested agencies and the public the opportunity to comment on potential effects of the construction and operation of the Proposed Action.

This process provided the opportunity for public and agency input regarding the Proposed Action analyzed in this EA. The public and agency involvement process was initiated to:

- Provide information about the Proposed Action's purpose and need and the alternatives the EA discusses.
- Obtain feedback about the above information from the public and agencies interested in and affected by the Proposed Action (i.e., interested parties).
- Inform those interested parties that the EA will provide a full and fair discussion of project-related environmental effects.
- Provide timely public notices to interested parties so that they may submit comments and participate in public open meetings concerning the Proposed Action.
- Record comments received from interested parties.

4.1 Scoping

A scoping meeting is not required by the National Environmental Policy Act (NEPA) or the Federal Aviation Administration (FAA) for an EA. Therefore, the Airport Sponsor did not hold a scoping meeting for agencies and the public. Rather, the Airport Sponsor sent a scoping information packet to agencies on April 25, 2024. The agency scoping information packet included information about the Proposed Action, the NEPA process, the environmental resource categories to be analyzed in the EA, and a request for comments (see **Appendix J**). The Airport Sponsor also posted a public scoping information packet on their website on April 25, 2024. The public scoping information packet included information about the NEPA Process, the Proposed Action, and a request for comments (see **Appendix J**). A total of five agency comments were received and no public comments were received during the scoping process (see **Appendix J**).

4.2 Distribution of the Draft EA

The Draft EA is being made available for a 30-day review period (30 days after the notice of availability advertisement) at the Airport Sponsor's Administration office during normal business hours, on the Airport Sponsor's website, and at a local library (see **Table 4-1**).

Electronic copies of the Draft EA were emailed to agencies who requested a copy of the Draft EA for review. The Airport Sponsor will hold a public meeting during the 30-day Draft EA review period, which will be held on November 19, 2025, from 6:00 pm to 7:30 pm Central Standard Time (CST) at the Airport terminal on the 1st Floor. Comments on the Draft EA will be addressed, as appropriate, in the Final EA.

Table 4-1
Draft EA Available Locations

Location Name	Address	Draft EA Format
Sioux City Public Library	529 Pierce St, Sioux City, IA 51101	Hard Copy
Sioux Gateway Airport Administration Offices	3rd Floor Administration Offices, 2403 Aviation Blvd Sioux City, IA 51111	Hard Copy
Sioux Gateway Airport Website	https://flysux.com/contact-us	Electronic

Source: RS&H, 2025.

4.3 Final EA

Once agency and public comments have been collected during the 30-day Draft EA review period, the Final EA will be prepared and made available at the Airport Sponsor's Administration office and on the Airport Sponsor's website.

5 List of Preparers

The following sections present the list of agencies, firms, and individuals that were primarily responsible for the preparation of this Environmental Assessment (EA).

5.1 Lead Agency

The Federal Aviation Administration (FAA) is the lead agency for the preparation of this EA. Responsibility for review and approval of this EA rests with the FAA. The following FAA Staff Members were involved in the preparation of this EA.

5.1.1 Federal Aviation Administration

Scott Tener. Environmental Program Manager.

Amy Walter. Airport Land Specialist.

Junior Lindsay, C.M. Airport Planner, Iowa.

5.2 Principal Planners

Responsibility for preparation of this EA rests with Sioux Gateway Airport. Listed below are the people responsible for the preparation of this EA.

5.2.1 Sioux Gateway Airport

Mike Collett. Interim City Manager, City of Sioux City.

Alvin Lorenzo, ASC, CM, ACE OPS. Airport Manager.

5.2.2 RS&H Iowa, P.C.

Julie Barrow. M.S., Environmental Science. Project Manager. Responsible for oversight of the EA preparation, and client/subconsultant coordination.

Dave Full, AICP. Master of Urban Planning. Deputy Project Manager. Responsible for quality assurance/quality control of the EA, and client coordination.

Alex Philipson. M.S., Geology, Environmental Specialist. Responsible for research and technical writing.

Nick Gentile, PE. M.S., Civil Engineering, B.S. Civil Engineering. Responsible for development of Floodplains, Groundwater, and Surface Waters sections and Water Resources appendix.

Joshua Kleinschmidt. B.S. Civil Engineering. Responsible for development of Floodplains, Groundwater, and Surface Waters sections and Water Resources appendix.

Lindsey Maron, PE, CFM. M.E. Civil Engineering, B.S. Civil Engineering. Responsible for quality assurance/quality control of Floodplains, Groundwater, and Surface Waters sections and the Water Resources appendix.

Dan Carroll PE. B.S. Civil Engineering. Responsible for coordination of floodplain permitting requirements with state and local agencies.

5.2.3 Tallgrass Archaeology LLC

Cindy L. Nagel. M.S. Cultural Resources Management-Archaeology. Project Manager. Responsible for oversight of project timelines and budgets and client coordination.

James McGrath-Seegmiller. Ph.D., Anthropology. Principal Investigator. Responsible for conducting the archaeological fieldwork, research and report preparation.

Ray J. Werner. M.A., History. Principal Investigator. Responsible for conducting the architectural/historical fieldwork, research and report preparation, and oversight of project timelines.

Jacob Noble. M.A., Heritage Studies and Public History. Architectural Historian. Responsible for conducting the architectural/historical fieldwork, research and report preparation

Elyse C. Nurenberg. M.A., Museum Studies. Research Historian. Responsible for conducting the architectural/historical fieldwork, research and report preparation

5.2.4 Foth Infrastructure & Environment, LLC.

Eva Moritz, P.E. B.S. Agricultural Engineering. Responsible for Wetland & Waters of the United States Delineation and Biological Resources Reports.

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