

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

The potential environmental effects resulting from implementation of the Proposed Action, the No Action Alternative, and other reasonable alternatives are presented in this chapter of the Environmental Impact Statement (EIS).¹ The analysis presented in this chapter includes considerations of direct, indirect, and cumulative impacts and their significance and possible conflicts with the objectives of federal, regional, state, tribal, and local land use plans, policies, and controls for the area concerned. This chapter also presents a discussion of mitigation measures, where applicable, that the Federal Aviation Administration (FAA) would consider to avoid and minimize potential adverse environmental impacts of the Proposed Action.

4.1 ANALYSIS YEARS

The following analysis discloses the impacts for the projected future conditions in 2023 and 2028. The FAA uses 2023 as a basis for analysis because 2023 is the projected implementation year of the Proposed Action. In addition, 2028 is used as a basis for analysis, most notably for air quality and noise and noise-compatible land use, because it represents a condition five years beyond the opening year.

4.2 ENVIRONMENTAL RESOURCES NOT AFFECTED

As discussed in Section 3.3, *Environmental Resources Not Affected*, the following environmental resources are not present within the project area and would not be affected by the Proposed Action, No Action, or other reasonable alternatives:

- Coastal resources: There are no coastal zones in the state of Arizona.
- Prime and unique farmlands: The Proposed Action does not include the conversion of any important farmlands to non-agricultural use.
- Wild and scenic rivers: A review of the Wild and Scenic Rivers System list² indicated that there are no designated State or National Scenic Rivers within Pima County. The nearest Wild and Scenic River to the Airport is a segment of the Verde River and Fossil Creek located north of Phoenix, both approximately 150 miles from Tucson International Airport (TUS).

¹ FAA, 2015, Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Paragraph 7-1-1(g).

² Department of the Interior, 2017, *National Wild and Scenic Rivers System*. Available on-line at: <https://www.rivers.gov/arizona.php> Accessed March 2017.

4.3 ENVIRONMENTAL RESOURCES POTENTIALLY AFFECTED

The remaining portion of this chapter is focused on those environmental resources that may potentially be affected by the Proposed Action, No Action, or other reasonable alternatives. These resources are evaluated in detail in this chapter of the EIS. Construction impacts are analyzed within each applicable environmental resource category.

This chapter of the EIS is organized to address the following topics:

- Section 4.4: Air Quality
- Section 4.5: Biological Resources
- Section 4.6: Climate
- Section 4.7: Department of Transportation, Section 4(f) Resources and Land and Water Conservation Act, Section 6(f) Resources
- Section 4.8: Hazardous Materials, Solid Waste, and Pollution Prevention
- Section 4.9: Historical, Architectural, Archeological, and Cultural Resources
- Section 4.10: Land Use
- Section 4.11: Natural Resources and Energy Supply
- Section 4.12: Noise and Noise-Compatible Land Use
- Section 4.13: Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
- Section 4.14: Visual Effects
- Section 4.15: Water Resources
- Section 4.16: Irreversible and Irretrievable Commitment of Resources
- Section 4.17: Cumulative Impacts
- Section 4.18: Identification of the Environmentally Preferred Alternative

4.4 AIR QUALITY

This section presents the analysis of potential for significant adverse air quality impacts resulting from the No Action Alternative and the Proposed Action. The analysis of significant adverse air quality impacts was prepared using the latest version of the *Aviation Environmental Design Tool (AEDT)*, Version 2d to develop emissions inventories.

As discussed in Section 3.4.2, Affected Environment, the Tucson area of Pima County operates under a maintenance plan for carbon monoxide. Therefore, General Conformity regulations apply. The General Conformity Rule under the Clean Air Act of 1970 (CAA) establishes minimum values, referred to as the *de minimis* thresholds, for the criteria and precursor pollutants³ for the purpose of:

- Identifying federal actions with project-related emissions that are clearly negligible (*de minimis*);
- Avoiding unreasonable administrative burdens on the sponsoring agency, and;
- Focusing efforts on key actions that would have potential for significant air quality impacts.

The *de minimis* rates vary depending on the severity of the nonattainment area and further depend on whether the general federal action is located inside an ozone transport region.⁴ EPA defines *de minimis* as emissions that are so low as to be considered insignificant and negligible. An evaluation relative to the General Conformity Rule (the Rule), published under 40 Code of Federal Regulations (C.F.R.) Part 93,⁵ is required only for general federal actions that would cause emissions of the criteria or precursor pollutants, and are:

- Federally-funded or federally-approved;
- Not a highway or transit project⁶;
- Not identified as an exempt project⁷ under the CAA;

³ Precursor pollutants are pollutants that are involved in the chemical reactions that form the resultant pollutant. Ozone precursor pollutants are NO_x and VOC, whereas PM_{2.5} precursor pollutants include NO_x, VOC, SO₂, and ammonia (NH₃).

⁴ The ozone transport region is a single transport region for ozone (within the meaning of Section 176A(a) of the CAA), comprised of the States of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and the Consolidated Metropolitan Statistical Area that includes the District of Columbia, as given at Section 184 of the CAA.

⁵ EPA, 40 C.F.R. Part 93, Subpart B, *Determining Conformity of General Federal Actions to State or Federal Implementation Plans*, July 1, 2006.

⁶ Highway and transit projects are defined under Title 23 United States Code and the Federal Transit Act.

⁷ The Proposed Project is not listed as an action exempt from a conformity determination pursuant to 40 C.F.R. § 93.153(c). An exempt project is one that the EPA has determined would clearly have no impact on air quality at the facility, and any net increase in emissions would be so small as to be considered negligible.

- Not a project identified on the approving federal agency's Presumed to Conform list;⁸ and,
- Located within a nonattainment or maintenance area.

When the action requires evaluation under the General Conformity regulations, the net total direct and indirect emissions due to the federal action may not equal or exceed the relevant *de minimis* thresholds unless:

- An analytical demonstration is provided that shows the emissions would not exceed the National Ambient Air Quality Standards (NAAQS); or
- Net emissions are accounted for in the State Implementation Plan (SIP) planning emissions budget; or
- Net emissions are otherwise accounted for by applying a solution prescribed under 40 C.F.R. § 93.158.

The federal *de minimis* thresholds established under the CAA are given in **Table 4-1**. Conformity to the *de minimis* thresholds is relevant only with regard to those pollutants and the precursor pollutants for which the area is nonattainment or maintenance. There are no precursor pollutants for carbon monoxide. Therefore, only emissions of carbon monoxide on a project level are evaluated in the General Conformity evaluation.

In addition to the federal *de minimis* thresholds, Pima County has established local *de minimis* thresholds found in Pima County Code (PCC) 17.04.340A.212. These *de minimis* thresholds are more restrictive than the Federal thresholds.⁹

If the General Conformity evaluation for this air quality assessment were to show that any of the applicable thresholds were equaled or exceeded due to the Proposed Action, further, more detailed analysis to demonstrate conformity would be required, which is referred to as a General Conformity Determination.¹⁰ Conversely, if the General Conformity evaluation were to show that none of the relevant thresholds were equaled or exceeded, the Proposed Action at TUS would be presumed to conform to the applicable Arizona SIPs and no further analysis would be required under the CAA.

⁸ The provisions of the CAA allow a Federal agency to submit a list of actions demonstrated to have low emissions that would have no potential to cause an exceedence of the NAAQS and are presumed to conform to the CAA conformity regulations. This list would be referred to as the "Presumed to Conform" list. The FAA Presumed to Conform list was published in the Federal Register on February 12, 2007 (72 FR 6641-6656) and includes airport projects that would not require evaluation under the General Conformity regulations.

⁹ Pima County *de minimis* thresholds are as follows: CO is 100 tons per year, NO_x is 40 tons per year, SO₂ is 40 tons per year, VOCs is 40 tons per year, particulate matter is 25 tons per year, and PM₁₀ is 15 tons per year.

¹⁰ 40 C.F.R. § 93.153.

**Table 4-1
DE MINIMIS THRESHOLDS
Tucson International Airport**

CRITERIA AND PRECURSOR POLLUTANTS	TYPE AND SEVERITY OF NONATTAINMENT AREA	TONS PER YEAR THRESHOLD
Ozone (VOC or NO _x) ¹	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NO _x) ¹	Marginal and moderate nonattainment inside an ozone transport regions (OTR) ²	100
	Maintenance	100
Ozone (VOC) ¹	Marginal and moderate nonattainment inside an ozone transport region ²	50
	Maintenance within an ozone transport region ²	50
	Maintenance outside an ozone transport region ²	100
Carbon monoxide (CO)	All nonattainment & maintenance	100
Sulfur dioxide (SO ₂)	All nonattainment & maintenance	100
Nitrogen dioxide (NO ₂)	All nonattainment & maintenance	100
Coarse particulate matter (PM ₁₀)	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
Fine particulate matter (PM _{2.5}) (VOC, NO _x , NH ₃ , and SO _x) ³	All nonattainment and maintenance	100
Lead (Pb)	All nonattainment and maintenance	25

¹ The rate of increase of ozone emissions is not evaluated for a project-level environmental review because the formation of ozone occurs on a regional level and is the result of the photochemical reaction of NO_x and VOC in the presence of abundant sunlight and heat. Therefore, EPA considers the increasing rates of NO_x and VOC emissions to reflect the likelihood of ozone formation on a project level.

² An OTR is a single transport region for ozone, comprised of the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and the Consolidated Metropolitan Statistical Area that includes the District of Columbia.

³ For the purposes of General Conformity applicability, VOC's and NH₃ emissions are only considered PM_{2.5} precursors in nonattainment areas where either a State or EPA has made a finding that the pollutants significantly contribute to the PM_{2.5} problem in the area. In addition, NO_x emissions are always considered a PM_{2.5} precursor unless the State and EPA make a finding that NO_x emissions from sources in the State do not significantly contribute to PM_{2.5} in the area. Refer to 74 FR 17003, April 5, 2006.

Sources: 40 C.F.R. § 93.153(b)(1) & (2).

4.4.1 NO ACTION ALTERNATIVE

4.4.1.1 Future (2023) No Action Alternative

This section discusses the methodology and the emission inventory for the Future (2023) No Action Alternative.

Aircraft Activity Levels and Fleet Mix

The number and type of aircraft operations directly affects emissions. The total aircraft operation counts include passenger, all-cargo, on-demand/limited service air taxi, general aviation, and military aircraft operations. For further discussion of the number and type of aircraft operations at TUS and the FAA Terminal Area Forecast see **Appendix B**. There are a total of 151,350 aircraft operations forecast for 2023 at TUS. **Table 4-2** provides the aircraft operations for the Future (2023) No Action Alternative.

Table 4-2
TOTAL AIRCRAFT OPERATIONS – FUTURE (2023) NO ACTION
ALTERNATIVE
Tucson International Airport

FISCAL YEAR	PASSENGER	ALL-CARGO	AIR TAXI	GENERAL AVIATION	MILITARY	TOTAL
2023	41,880	2,220	12,150	63,100	32,000	151,350

Sources: Tucson Airport Authority, Monthly Activity Overview; OAG Aviation Worldwide Ltd, OAG Schedules Analyser; Arizona Air National Guard, and Landrum & Brown analysis.

In the following table, the total aircraft operations at Tucson are broken down to show the types of aircraft operating at TUS. A representative aircraft for each type was determined based on the data obtained and JP Fleets¹¹ was used to assign engine types for each operation. **Table 4-3** provides the representative aircraft and engine combinations for the operations for the Future (2023) No Action Alternative.

Aircraft Average Taxi Time

An AEDT default taxi-in time of four minutes and 55 seconds was applied to all arriving operations while an AEDT default taxi-out time of 10 minutes and 42 seconds was applied to all departing operations. AEDT default taxi times are based on airport averages and are applied to every aircraft operation.

Construction Emissions

There is no construction activity proposed for the Future (2023) No Action Alternative.

¹¹ Flightglobal, 2013, *JP Airline-Fleets International, World Airline Fleet Directory 2013/14*, 4th edition.

**Table 4-3
TOTAL AIRCRAFT OPERATIONS WITH REPRESENTATIVE AIRCRAFT AND
ENGINE COMBINATIONS – FUTURE (2023) NO ACTION ALTERNATIVE
Tucson International Airport**

OPERATION TYPE	REPRESENTATIVE AIRCRAFT	REPRESENTATIVE ENGINE	AEDT ENGINE CODE	2023 OPERATIONS
Passenger	Airbus A321-200 Series	CFM56-5B3/P	3CM025	122
Passenger	Boeing 737-900 MAX	CFM56-7B26E/F	11CM075	48
Passenger	Boeing 757-200 Series	PW2037	4PW072	42
Passenger	Boeing 737-800 MAX	CFM56-7B26E/F	11CM075	530
Passenger	Boeing 737-900 Series	CFM56-7B24	3CM032	710
Passenger	Boeing 737-800 with winglets	CFM56-7B26	3CM033	6,548
Passenger	Boeing MD-90	V2525-D5	1IA002	1,620
Passenger	Airbus A320-200 Series	CFM56-5B4/P	3CM026	100
Passenger	Boeing 737-700 MAX	CFM56-7B26E/F	11CM075	244
Passenger	Boeing 737-700 Series	CFM56-7B22	3CM031	8,386
Passenger	Airbus A319-100 Series	V2522-A5	3IA006	1,888
Passenger	Bombardier CS-100	CFM56-5B7/3	8CM058	122
Passenger	Bombardier CRJ-900-ER	CF34-8C5	6GE092	4,992
Passenger	Embraer ERJ175-LR	CF34-8E5	6GE094	3,616
Passenger	Mitsubishi MRJ90	CF34-10E5	10GE129	552
Passenger	Bombardier CRJ-700-ER	CF34-8C1	5GE083	11,940
Passenger	ATR 72-200	PW127C	PW127C	420
Cargo	Boeing 767-300 ER Freighter	CF6-80C2B6	1GE029	1,020
Cargo	Raytheon Beech 1900-C	PT6A-65B	PT6A6B	64
Cargo	Piper PA-31 Navajo	TIO-540-J2B2	TIO540	522
Cargo	Embraer EMB120 Brasilia	PW118A	PW118A	574
Cargo	Fairchild SA-227-AC Metro III	TPE331-10	TPE10	40

Table 4-3, Continued

**TOTAL AIRCRAFT OPERATIONS WITH REPRESENTATIVE AIRCRAFT AND
ENGINE COMBINATIONS – FUTURE (2023) NO ACTION ALTERNATIVE
Tucson International Airport**

OPERATION TYPE	REPRESENTATIVE AIRCRAFT	REPRESENTATIVE ENGINE	AEDT ENGINE CODE	2023 OPERATIONS
On Demand Air Carrier	Boeing 737-200 Series	JT8D-15A	1PW011	1,150
Air Taxi/Commuter	Bombardier Challenger 600	ALF 502L-2	1TL001	8,150
Air Taxi/Commuter	Pilatus PC-12	PT6A-67	PT6A67	1,670
Air Taxi/Commuter	Cessna 172 Skyhawk	TSIO-360C	TSIO36	1,180
GA	Cessna 525 CitationJet	BIZLIGHTJET_F	BIZLIGHTJET_F	14,150
GA	Raytheon Super King Air 200	PT6A-61	PT6A61	11,150
GA	Cessna 172 Skyhawk	TSIO-360C	TSIO36	34,600
GA	Bell 206 JetRanger	250B17B	250B17	3,200
Military	Lockheed Martin F-16 Fighting Falcon	F100-PW-220 (w/AB)	F1022A	31,723
Military	Fairchild A-10A Thunderbolt II	TF34-GE-100-100A	TF3410	277
Total Operations				151,350

Sources: Tucson Airport Authority, Monthly Activity Overview; OAG Aviation Worldwide Ltd, OAG Schedules Analyser; Arizona Air National Guard, and Landrum & Brown analysis.

Emissions Inventory

Table 4-4 shows the annual air pollutant emissions for the Future (2023) No Action Alternative.

**Table 4-4
ANNUAL AIR POLLUTANT EMISSIONS – FUTURE (2023) NO ACTION
ALTERNATIVE
Tucson International Airport**

EMISSION SOURCE	TONS OF POLLUTANTS					
	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}
Aircraft	433.5	81.3	227.7	25.7	2.9	2.9

Source: Landrum & Brown analysis, 2018.

Carbon monoxide and oxides of nitrogen provide the greatest overall emissions contribution. These pollutants are produced from the incomplete combustion of aircraft engines.

4.4.1.2 Future (2028) No Action Alternative

This section discusses the methodology and the emission inventory for the Future (2028) No Action Alternative.

Aircraft Activity Levels and Fleet Mix

There are a total of 157,510 aircraft operations forecast for 2028 at TUS. **Table 4-5** provides the aircraft operations for the Future (2028) No Action Alternative.

**Table 4-5
TOTAL AIRCRAFT OPERATIONS – FUTURE (2028) NO ACTION
ALTERNATIVE
Tucson International Airport**

FISCAL YEAR	PASSENGER	ALL-CARGO	AIR TAXI	GENERAL AVIATION	MILITARY	TOTAL
2028	45,120	2,230	14,090	64,070	32,000	157,510

Sources: Tucson Airport Authority, Monthly Activity Overview; OAG Aviation Worldwide Ltd, OAG Schedules Analyser; Arizona Air National Guard, and Landrum & Brown analysis.

Aircraft Average Taxi Time

Aircraft Average Taxi Time for the Future (2028) No Action Alternative is expected to remain the same as the Future (2023) No Action Alternative.

In the following table, the total aircraft operations at Tucson are broken down to show the types of aircraft operating at TUS. A representative aircraft for each type was determined based on the data obtained and JP Fleets¹² was used to assign engine types for each operation. **Table 4-6** provides the representative aircraft and engine combinations for the operations for the Future (2028) No Action Alternative.

**Table 4-6
TOTAL AIRCRAFT OPERATIONS WITH REPRESENTATIVE AIRCRAFT AND
ENGINE COMBINATIONS – FUTURE (2028) NO ACTION ALTERNATIVE
Tucson International Airport**

OPERATION TYPE	REPRESENTATIVE AIRCRAFT	REPRESENTATIVE ENGINE	AEDT ENGINE CODE	2028 OPERATIONS
Passenger	Airbus A321-200 Series	CFM56-5B3/P	3CM025	178
Passenger	Boeing 737-900 MAX	CFM56-7B26E/F	11CM075	52
Passenger	Boeing 737-800 MAX	CFM56-7B26E/F	11CM075	752
Passenger	Boeing 737-900 Series	CFM56-7B24	3CM032	772
Passenger	Boeing 737-800 with winglets	CFM56-7B26	3CM033	6,934
Passenger	Boeing MD-90	V2525-D5	1IA002	1,716
Passenger	Airbus A320-200 Series	CFM56-5B4/P	3CM026	108
Passenger	Boeing 737-700 MAX	CFM56-7B26E/F	11CM075	442
Passenger	Boeing 737-700 Series	CFM56-7B22	3CM031	8,940
Passenger	Airbus A319-100 Series	V2522-A5	3IA006	2,048
Passenger	Bombardier CS-100	CFM56-5B7/3	8CM058	178
Passenger	Bombardier CRJ-900- ER	CF34-8C5	6GE092	5,336
Passenger	Embraer ERJ175-LR	CF34-8E5	6GE094	3,866
Passenger	Mitsubishi MRJ90	CF34-10E5	10GE129	592
Passenger	Bombardier CRJ-700- ER	CF34-8C1	5GE083	12,786
Passenger	ATR 72-200	PW127C	PW127C	420

¹² Flightglobal, 2013, *JP Airline-Fleets International, World Airline Fleet Directory 2013/14*, 4th edition.

Table 4-6, Continued

**TOTAL AIRCRAFT OPERATIONS WITH REPRESENTATIVE AIRCRAFT AND
ENGINE COMBINATIONS – FUTURE (2028) NO ACTION ALTERNATIVE
Tucson International Airport**

OPERATION TYPE	REPRESENTATIVE AIRCRAFT	REPRESENTATIVE ENGINE	AEDT ENGINE CODE	2028 OPERATIONS
Cargo	Boeing 767-300 ER Freighter	CF6-80C2B6	1GE029	1,024
Cargo	Raytheon Beech 1900-C	PT6A-65B	PT6A6B	66
Cargo	Piper PA-31 Navajo	TIO-540-J2B2	TIO540	524
Cargo	Embraer EMB120 Brasilia	PW118A	PW118A	576
Cargo	Fairchild SA-227-AC Metro III	TPE331-10	TPE10	40
On Demand Air Carrier	Boeing 737-200 Series	JT8D-15A	1PW011	1,340
Air Taxi/ Commuter	Bombardier Challenger 600	ALF 502L-2	1TL001	9,860
Air Taxi/ Commuter	Pilatus PC-12	PT6A-67	PT6A67	1,750
Air Taxi/ Commuter	Cessna 172 Skyhawk	TSIO-360C	TSIO36	1,140
GA	Cessna 525 CitationJet	BIZLIGHTJET_F	BIZLIGHTJET_F	15,820
GA	Raytheon Super King Air 200	PT6A-61	PT6A61	11,450
GA	Cessna 172 Skyhawk	TSIO-360C	TSIO36	33,360
GA	Bell 206 JetRanger	250B17B	250B17	3,440
Military	Lockheed Martin F-16 Fighting Falcon	F100-PW-220 (w/AB)	F1022A	31,723
Military	Fairchild A-10A Thunderbolt II	TF34-GE-100-100A	TF3410	277
Total Operations				157,510

Sources: Tucson Airport Authority, Monthly Activity Overview; OAG Aviation Worldwide Ltd, OAG Schedules Analyser; Arizona Air National Guard, and Landrum & Brown analysis.

Construction Emissions

There is no construction activity proposed for the Future (2028) No Action.

Emissions Inventory

Table 4-7 shows the annual air pollutant emissions for the Future (2028) No Action Alternative.

Table 4-7
ANNUAL AIR POLLUTANT EMISSIONS – FUTURE (2028) NO ACTION
ALTERNATIVE
Tucson International Airport

EMISSION SOURCE	TONS OF POLLUTANTS					
	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}
Aircraft	441.4	83.2	244.4	27.2	3.0	3.0

Note: Numbers may not appear to sum as reported due to rounding:

Source: Landrum & Brown analysis, 2018.

Carbon monoxide and oxides of nitrogen provide the greatest overall emissions contribution. These pollutants are produced from the incomplete combustion of aircraft engines.

4.4.2 PROPOSED ACTION

4.4.2.1 Future (2023) Proposed Action

This section discusses the methodology and the emission inventory for the Future (2023) Proposed Action.

Aircraft Activity Levels and Fleet Mix

No change to the number of aircraft operations or fleet mix would occur as a result of implementing the Proposed Action because the Proposed Action is a safety enhancement project, not an airfield capacity enhancement project. Therefore, the number of operations and fleet mix for the Future (2023) No Action Alternative would remain the same for the Future (2023) Proposed Action.

Aircraft Average Taxi Time

As a result of implementing the Proposed Action, proposed airfield improvements would be constructed that may cause a portion of aircraft operations to taxi a farther distance than they would with the No Action Alternative. This is because the distribution of aircraft operating in the 11/29 direction is expected to be more evenly distributed between the two runways. The proposed replacement runway would be constructed approximately 94 feet further from the existing terminal, general aviation, and AANG facilities, which would cause a slight overall increase in average aircraft taxi distance.

To account for the increase in aircraft taxiing emissions, an increase in taxi times was determined and applied to every aircraft operation. Aircraft was assumed to travel at a taxiing speed of 10 knots. The runway relocation would increase taxiing distance from the southeast end to the terminal by approximately 2,650 feet. The runway relocation would increase taxiing distance from the northwest end to the terminal by approximately 100 feet. An average increase in taxiing distance of 1,375 feet was assumed. To estimate the maximum potential taxiing emissions, it was assumed that up to 50 percent of aircraft operations would experience an increase in taxi time. The Proposed Action would result in an average taxi-in time of 5 minutes and 36 seconds and an average taxi-out time of 11 minutes and 22 seconds.

Construction Emissions

Construction impacts are commonly short-term and temporary in nature. Final engineering for the Proposed Action is not complete. Therefore, the analysis of construction emissions was based on phasing and estimates included in a preliminary report prepared for Tucson Airport Authority (TAA).¹³ Additional information on the phasing and emissions factors used to develop the emissions inventory is provided in **Appendix C**. The construction emission inventory for the Proposed Action is shown in **Table 4-8**.

Table 4-8
CONSTRUCTION EMISSION INVENTORY – FUTURE (2023) PROPOSED ACTION
Tucson International Airport

CONSTRUCTION EQUIPMENT TYPE	TONS OF POLLUTANTS					
	CO	VOC	NOx	SOx	PM ₁₀	PM _{2.5}
2020						
On-Road	2.43	0.19	2.71	0.01	0.09	0.08
Non-Road	1.68	0.74	3.10	0.01	0.26	0.25
<i>2020 Construction Subtotal:</i>	<i>4.12</i>	<i>0.93</i>	<i>5.81</i>	<i>0.02</i>	<i>0.35</i>	<i>0.33</i>
2021						
On-Road	15.38	1.27	17.85	0.06	0.61	0.56
Non-Road	11.28	5.64	20.43	0.07	1.42	1.37
<i>2021 Construction Subtotal:</i>	<i>26.66</i>	<i>6.90</i>	<i>38.29</i>	<i>0.13</i>	<i>2.02</i>	<i>1.93</i>
2022						
On-Road	0.82	0.08	1.26	0.004	0.04	0.04
Non-Road	0.87	0.46	1.59	0.01	0.11	0.10
<i>2022 Construction Subtotal:</i>	<i>1.70</i>	<i>0.54</i>	<i>2.85</i>	<i>0.01</i>	<i>0.15</i>	<i>0.14</i>
2023						
On-Road	1.56	0.08	0.97	0.00	0.03	0.03
Non-Road	5.56	4.97	13.41	0.08	0.58	0.56
<i>2023 Construction Subtotal:</i>	<i>7.12</i>	<i>5.06</i>	<i>14.38</i>	<i>0.09</i>	<i>0.61</i>	<i>0.59</i>

Note: Numbers may not appear to sum as reported due to rounding

Source: Landrum & Brown analysis, 2018.

¹³ Tucson Airport Authority, 2015, Airfield Safety Enhancement Implementation Study Final Report, Tucson International Airport.

Emissions Inventory

Table 4-9 shows the annual air pollutant emissions for the Future (2023) Proposed Action.

**Table 4-9
ANNUAL AIR POLLUTANT EMISSIONS – FUTURE (2023) PROPOSED ACTION
Tucson International Airport**

EMISSION SOURCE	TONS OF POLLUTANTS					
	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}
Aircraft	456.2	86.1	231.3	26.6	3.0	3.0

Source: Landrum & Brown analysis, 2018.

Based on the analysis presented, implementing the Future (2023) Proposed Action would result in an increase in emissions when compared to the Future (2023) No Action Alternative.

4.4.2.2 Future (2028) Proposed Action

This section discusses the methodology and the emission inventory for the Future (2028) Proposed Action.

Aircraft Activity Levels and Fleet Mix

No change to the number of aircraft operations or fleet mix would occur as a result of implementing the Proposed Action because the Proposed Action is a safety enhancement project, not an airfield capacity enhancement project. Therefore, the number of operations and fleet mix for the Future (2028) No Action Alternative would remain the same for the Future (2028) Proposed Action.

Aircraft Average Taxi Time

Aircraft Average Taxi Time for the Future (2028) Proposed Action is expected to remain the same as the Future (2023) Proposed Action.

Construction Emissions

There is no construction activity proposed for the Future (2028) Proposed Action.

Emissions Inventory

Table 4-10 shows the annual air pollutant emissions for the Future (2028) Proposed Action.

**Table 4-10
ANNUAL AIR POLLUTANT EMISSIONS – FUTURE (2028) PROPOSED ACTION
Tucson International Airport**

EMISSION SOURCE	TONS OF POLLUTANTS					
	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}
Aircraft	465.0	88.1	248.1	28.2	3.1	3.1

Source: Landrum & Brown analysis, 2018.

Based on the analysis presented, implementing the Future (2028) Proposed Action would result in an increase in emissions when compared to the Future (2028) No Action Alternative.

The results of the emission inventory prepared for the Proposed Action were compared to the results of the No Action Alternative of the same future year to disclose the potential increase in emissions caused by the Proposed Action. The comparison of the emission inventories, which included an inventory of construction emissions, were used for the evaluation of General Conformity as required under the CAA (including the 1990 Amendments). **Table 4-11** shows that none of the relevant Federal or County thresholds were equaled or exceeded for the Future (2023) Proposed Action or the Future (2028) Proposed Action.

The air quality assessment demonstrates that the Proposed Action would not cause an increase in air emissions above the applicable federal *de minimis* thresholds. In addition, the Proposed Action must comply with Pima County codes. The table demonstrates no local threshold identified in PCC Title 17.04.340A.212 would be exceeded. Therefore, the Proposed Action conforms to the SIP and the CAA and would not create any new violation of the NAAQS, delay the attainment of any NAAQS, nor increase the frequency or severity of any existing violations of the NAAQS. As a result, no adverse impact on local or regional air quality is expected by construction of the Proposed Action. No further analysis or reporting is required under the CAA or NEPA.

**Table 4-11
EMISSION INVENTORY – TOTAL EMISSIONS
Tucson International Airport**

EMISSION SOURCE	TONS OF POLLUTANTS					
	CO	VOC	NOx	SOx	PM ₁₀	PM _{2.5}
NAAQS Threshold	100	N/A	N/A	N/A	N/A	N/A
Pima County Threshold	100	40	40	40	15	25
2020						
Proposed Action – Construction	4.1	0.9	5.8	0.0	0.4	0.3
<i>2020 Proposed Action Subtotal:</i>	4.1	0.9	5.8	0.0	0.4	0.3
2020 Proposed Action Net Emissions:	4.1	0.9	5.8	0.0	0.4	0.3
2021						
Proposed Action – Construction	26.7	6.9	38.3	0.1	2.0	1.9
<i>2021 Proposed Action Subtotal:</i>	26.7	6.9	38.3	0.1	2.0	1.9
2021 Proposed Action Net Emissions:	26.7	6.9	38.3	0.1	2.0	1.9
2022						
Proposed Action – Construction	1.7	0.5	2.8	0.0	0.1	0.1
<i>2022 Proposed Action Subtotal:</i>	1.7	0.5	2.8	0.0	0.1	0.1
2022 Proposed Action Net Emissions:	1.7	0.5	2.8	0.0	0.1	0.1
2023						
No Action – Aircraft	433.5	81.3	227.7	25.7	2.9	2.9
<i>2023 No Action Subtotal:</i>	433.5	81.3	227.7	25.7	2.9	2.9
Proposed Action – Aircraft	456.2	86.1	231.3	26.6	3.0	3.0
Proposed Action – Construction	7.1	5.1	14.4	0.1	0.6	0.6
<i>2023 Proposed Action Subtotal:</i>	463.3	91.2	245.7	26.7	3.6	3.6
2023 Proposed Action Net Emissions:	29.8	9.9	17.9	1.0	0.7	0.7
2028						
No Action – Aircraft	441.4	83.2	244.4	27.2	3.0	3.0
<i>2028 No Action Subtotal:</i>	441.4	83.2	244.4	27.2	3.0	3.0
Proposed Action – Aircraft	465.0	88.1	248.1	28.2	3.1	3.1
<i>2028 Proposed Action Subtotal:</i>	465.0	88.1	248.1	28.2	3.1	3.1
2028 Proposed Action Net Emissions:	23.6	4.9	3.7	1.0	0.1	0.1

Note: Emissions of VOCs, NOx, SOx, and PM were provided for disclosure purposes. NAAQS thresholds are not applicable because the Airport is considered attainment and not under a maintenance plan for all of these criteria pollutants.

Source: Landrum & Brown analysis, 2018.

4.4.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The Proposed Action does not exceed the applicable thresholds of significance for any pollutants in; therefore, no mitigation measures are required. However, the following minimization measures and best management practices are being provided to further minimize air quality impacts from the Proposed Action.

While the Proposed Action would not exceed the applicable threshold of significant for particulate matter, construction of the Proposed Action would result in a short-term increase of particulate matter (airborne fugitive dust) emissions from vehicle movement and soil excavation in and around the construction site. TAA would ensure that all possible measures would be taken to reduce fugitive dust emissions by adhering to guidelines included in FAA Advisory Circular (AC), *Standards for Specifying Construction of Airports*.¹⁴

Methods of controlling dust and other airborne particles will be implemented to the maximum possible extent and may include, but not limited to, the following:

- Exposing the minimum area of erodible earth;
- Applying temporary mulch with or without seeding;
- Using water sprinkler trucks;
- Using covered haul trucks;
- Using dust palliatives or penetration asphalt on haul roads; and,
- Using plastic sheet coverings.

In addition, TAA would follow PCC Title 17 Air Quality Control Section 17.14.040 *Fugitive Dust Activity Permit* and obtain a fugitive dust activity permit for construction of the Proposed Action. The permit requires the permittee to control windblown dust, dust from haul roads, and dust emitted from land clearing, earthmoving, demolition, trenching, blasting, and road construction.

¹⁴ FAA AC, 2014, *Standards for Specifying Construction of Airports*, Item P-156, *Temporary Air and Water Pollution, Soil Erosion, and Siltation Control*, AC 150/5370-10G.

4.5 BIOLOGICAL RESOURCES

This section presents the analysis of potential impacts to Endangered Species Act (ESA)-listed species, Migratory Bird Treaty Act species, and Special Status Species as a result of the No Action Alternative and the Proposed Action.

4.5.1 NO ACTION ALTERNATIVE

4.5.1.1 Future (2023) No Action Alternative

Federally Listed (ESA) Species

No physical development or land transfers would occur for the Future (2023) No Action Alternative. Therefore, no impacts to federally listed species would occur.

Migratory Bird Treaty Act Species

No physical development or land transfers would occur for the Future (2023) No Action Alternative. Therefore, no impacts to migratory birds would occur.

Special Status Species

No physical development or land transfers would occur for the Future (2023) No Action Alternative. Therefore, no impacts to special status species would occur.

4.5.1.2 Future (2028) No Action Alternative

Federally Listed (ESA) Species

No physical development or land transfers would occur for the Future (2028) No Action Alternative. Therefore, no impacts to federally listed species would occur.

Migratory Bird Treaty Act Species

No physical development or land transfers would occur for the Future (2028) No Action Alternative. Therefore, no impacts to migratory birds would occur.

Special Status Species

No physical development or land transfers would occur for the Future (2028) No Action Alternative. Therefore, no impacts to special status species would occur.

4.5.2 PROPOSED ACTION

4.5.2.1 Future (2023) Proposed Action

Federally Listed (ESA) Species

Section 7(a)(2) of the ESA requires federal agencies to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species or result in the destruction or adverse modification of critical habitat.

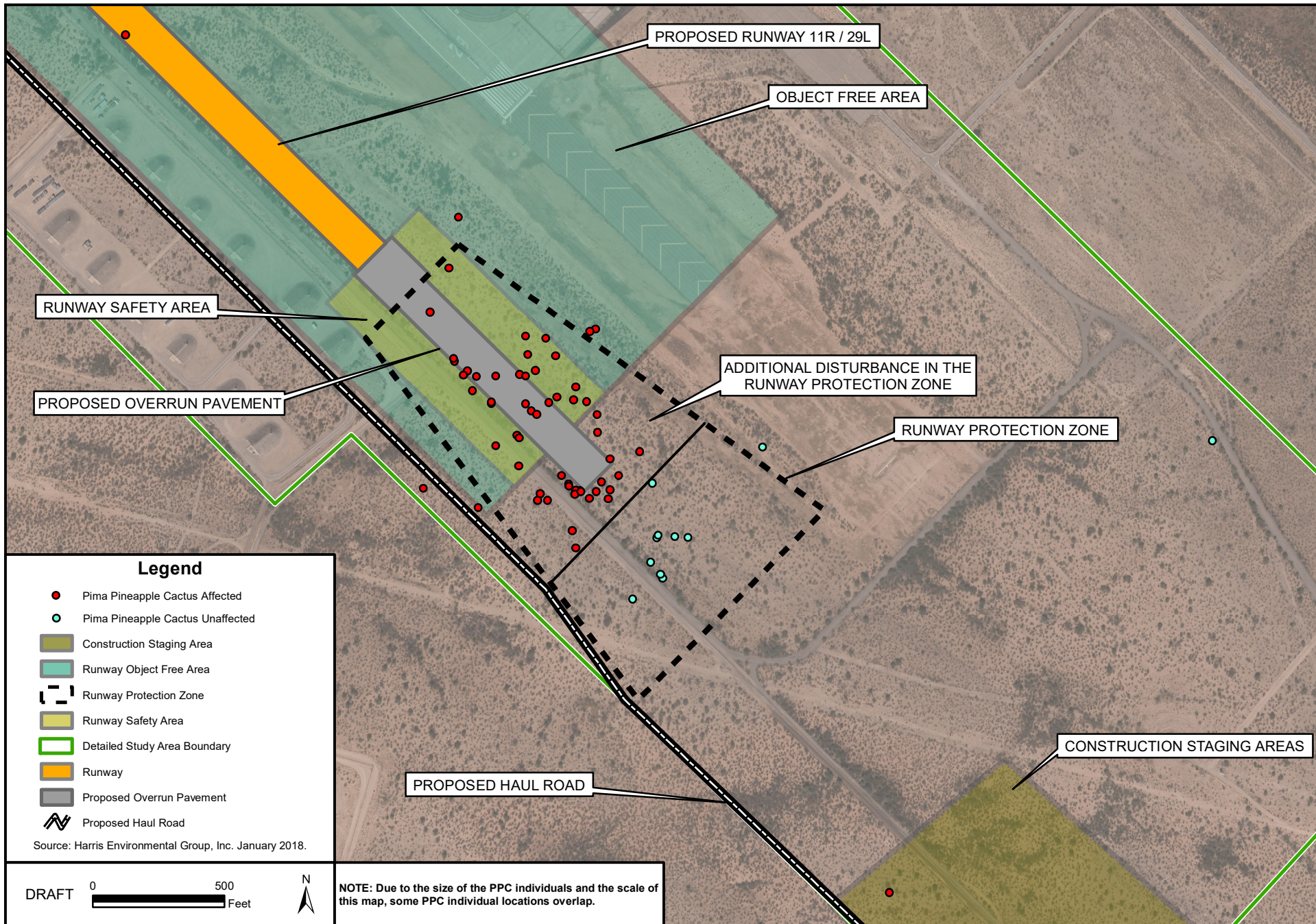
Lesser Long-Nosed Bat

No day-roosting habitat occurs in the Detailed Study Area, and no major maternity roosts have been recently documented within 30 miles of the Detailed Study Area. The Detailed Study Area does not contain vegetation composition or structure, or geologic features that provide day-roosting or foraging habitat to support a viable lesser long-nosed bat population. The FAA has determined the Proposed Action **may affect, but is not likely to adversely affect** the lesser long-nosed bat. The United States Fish and Wildlife Service (USFWS) has concurred with FAA's determination in its Biological Opinion dated March 19, 2018 (see Appendix D).

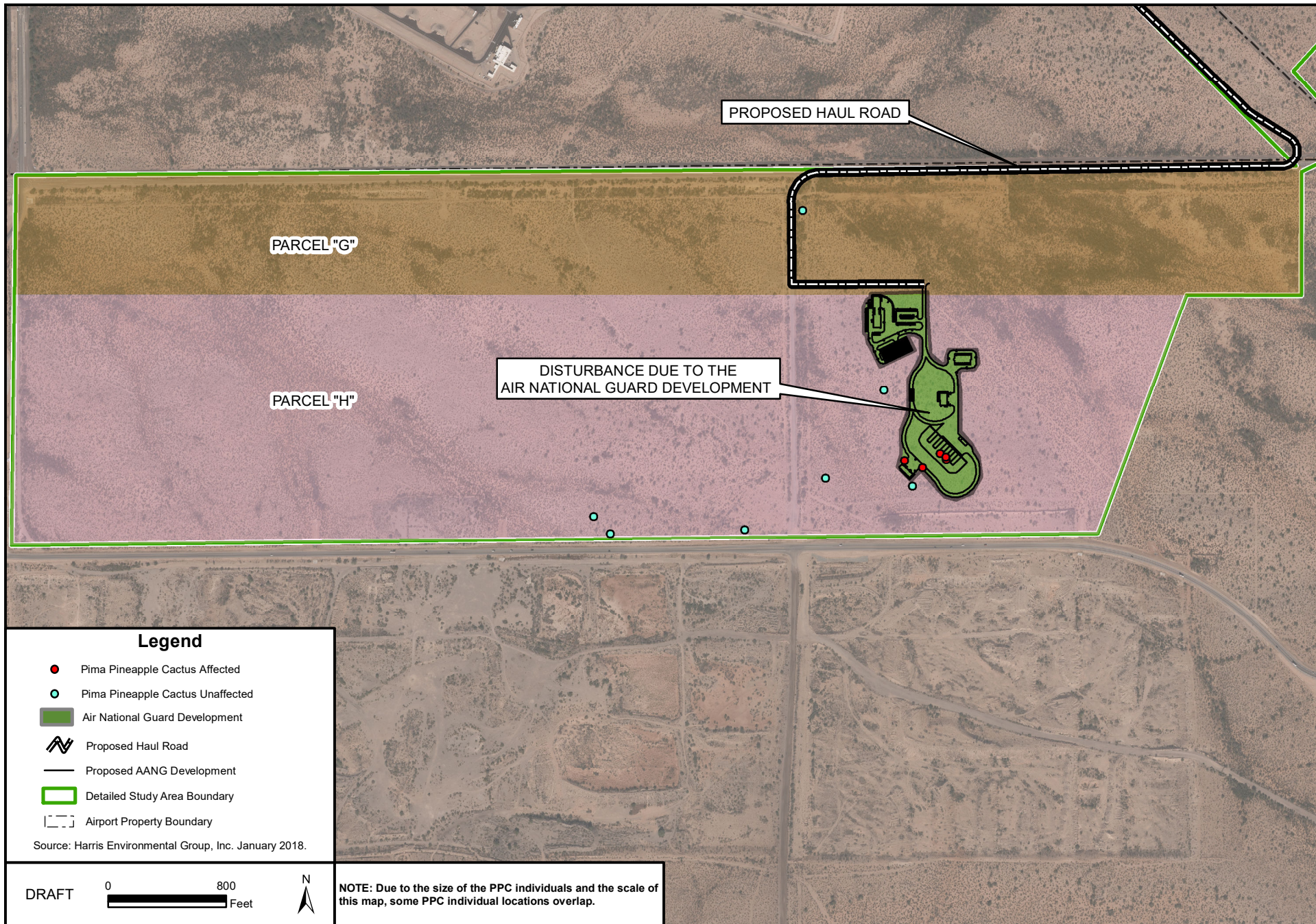
Pima Pineapple Cactus (PPC)

The Proposed Action would be expected to include direct disturbance to PPC individuals, habitat loss, and disturbance of suitable habitat. Of the 82 PPC individuals within the Detailed Study Area, 11 PPC individuals could be avoided in the airfield area and seven could be avoided in Parcel "G" and Parcel "H". Therefore, 18 total PPC would be avoided. 59 PPC individuals would be affected in the airfield due to clearing, grading, and paving for the proposed new runway and FAA required safety areas including the Runway Safety Area (RSA), Object Free Area (OFA), and Runway Protection Zone (RPZ). This also includes PPC affected where construction vehicles may traverse and by the location of the proposed construction staging area. An additional five PPC individuals would be affected by the proposed Air National Guard development on Parcel "G" and "Parcel H". Therefore, a total of 64 individual PPC could be affected directly. **Exhibit 4-1** and **Exhibit 4-2** show PPC individuals that would be impacted due to construction activities.

Approximately 11 acres of PPC habitat would be removed in the airfield area. An additional 13 acres would be affected by the proposed Air National Guard development on Parcel "G" and "Parcel H". Therefore, 24 acres as shown on **Exhibit 4-3** would be affected by the Proposed Action. Mitigation bank credits would be purchased to compensate for the loss of PPC habitat at a 1:1 ratio of area of modified habitat. Therefore, mitigation credits for 24 acres would be purchased from the Palo Alto PPC Conservation Bank. Mitigation bank credits are the only mitigation action acceptable to USFWS for this type of adverse effect on PPC.



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Legend

- Pima Pineapple Cactus Affected
- Pima Pineapple Cactus Unaffected
- Air National Guard Development
- Proposed Haul Road
- Proposed AANG Development
- Detailed Study Area Boundary
- Airport Property Boundary

Source: Harris Environmental Group, Inc. January 2018.

DRAFT

0 800
Feet



NOTE: Due to the size of the PPC individuals and the scale of this map, some PPC individual locations overlap.

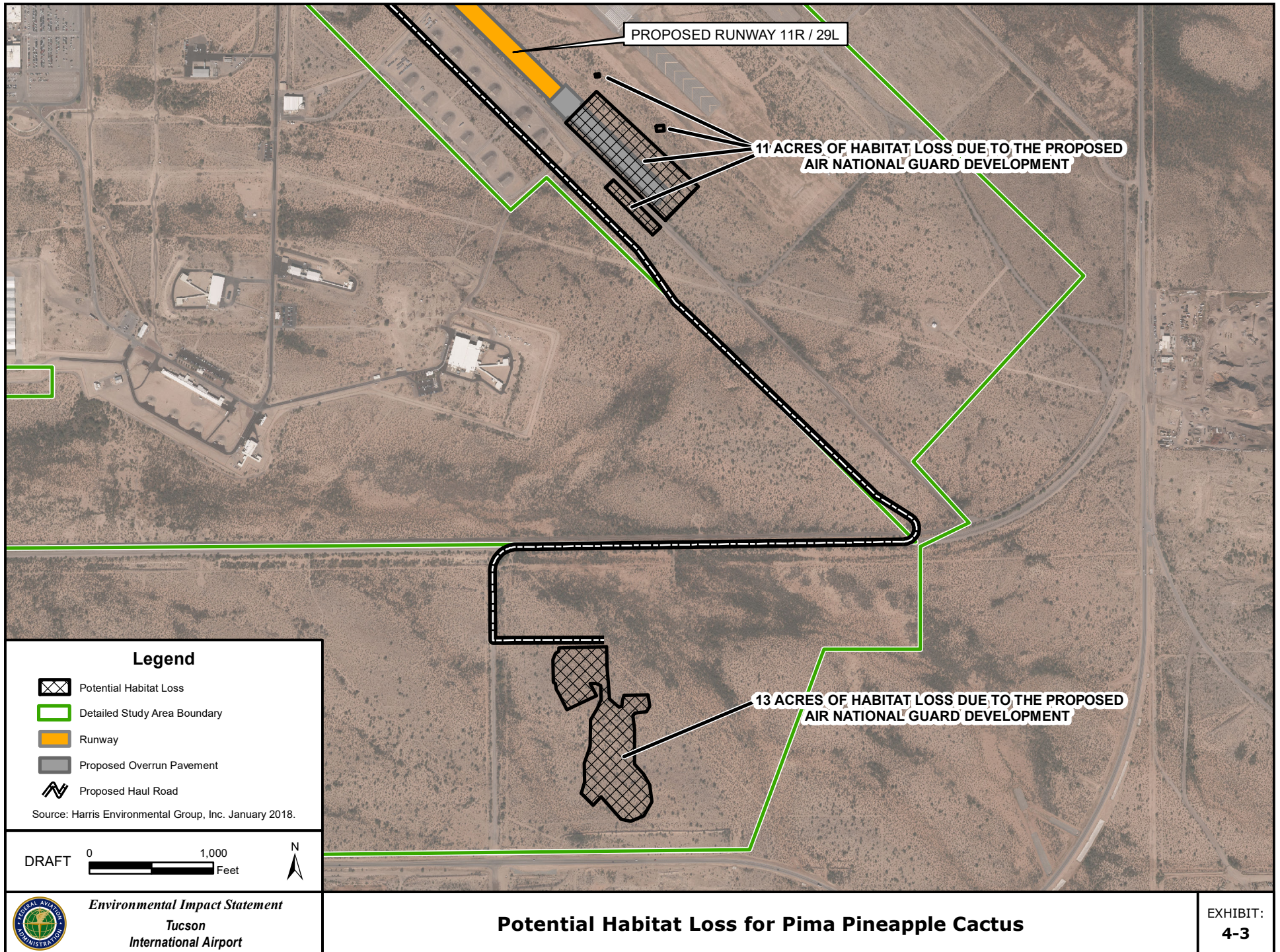


Environmental Impact Statement
Tucson
International Airport

Potential Impacts to Pima Pineapple Cactus on Parcel "G" and "H"

EXHIBIT:
4-2

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The FAA has determined the Proposed Action ***may affect, is likely to adversely affect*** the PPC. The USFWS has concurred with FAA's determination in its Biological Opinion dated March 19, 2018 (see Appendix D). **Exhibit 4-4** shows the location of the potential PPC transplant area, which encompass approximately 11 acres primarily in the unaffected RPZ area. Mitigation measures are identified in Section 4.5.3 for the PPC.

Migratory Bird Treaty Act Species

Pedestrian surveys were conducted in the spring and summer of 2017 and in November 2017 within the Detailed Study Area. While none of the Migratory Bird Treaty Act Species except the western burrowing owl were observed within the Detailed Study Area, the presence of suitable habitat for these species was identified. TAA will implement Pima County Native Plant Preservation (PCC §18.72) and the Watercourse and Riparian Habitat Protection ordinances (PCC §16.30) to mitigate the adverse effects of the Proposed Action on the habitat for these species.

Cactus Ferruginous Pygmy-Owl

Large saguaros and mesquites, paloverdes, and ironwoods are primary constituents of suitable nesting, foraging, resting, and dispersal habitat. Four saguaros occur in the Detailed Study Area that are large enough to contain nest cavities. No breeding owls occur at the Airport. Although the pygmy-owl was not observed during the pedestrian survey, the presence of suitable habitat makes it possible that pygmy-owl occurs in the Detailed Study Area. The Pima County Native Plant Preservation (PCC §18.72) and the Watercourse and Riparian Habitat Protection ordinances (PCC §16.30) would be implemented to mitigate impacts on habitat. In addition, saguaros and large trees would be avoided to the extent practicable or otherwise salvaged on site where feasible. Therefore, the Proposed Action would not reduce the viability of the cactus ferruginous pygmy-owl's population.

Western Burrowing Owl

Suitable habitat exists in the Detailed Study Area for the western burrowing owl. No western burrowing owls were directly observed at the pedestrian survey conducted in the spring and summer of 2017. However, at the request of the USFWS an additional pedestrian survey was conducted in November 2017. At that time one western burrowing owl was observed and documented in the Detailed Study Area. The Proposed Action would be anticipated to impact the location of this burrow. An additional survey for western burrowing owls would be conducted prior to the immediate start of construction activities, generally within 30 days of the start. If mitigation measures identified in Section 4.5.3 are implemented, direct and indirect impacts are unlikely to reduce the viability of the local western burrowing owl population.

Rufous-Winged Sparrow

The pedestrian survey indicated that the Detailed Study Area contains suitable habitat along many of the abundant washes and in desert scrub uplands. Although the rufous-winged sparrow was not observed during the pedestrian survey, the presence of suitable habitat makes it possible that rufous-winged sparrow occurs in the Detailed Study Area. The construction of the Proposed Action may affect the habitat for the Tucson shovel-nosed snake. The Pima County Native Plant Preservation (PCC §18.72) and the Watercourse and Riparian Habitat Protection ordinances (PCC §16.30) would be implemented to mitigate impacts on habitat. Therefore, the Proposed Action would not reduce the viability of the rufous-winged sparrow's population.

Special Status Species

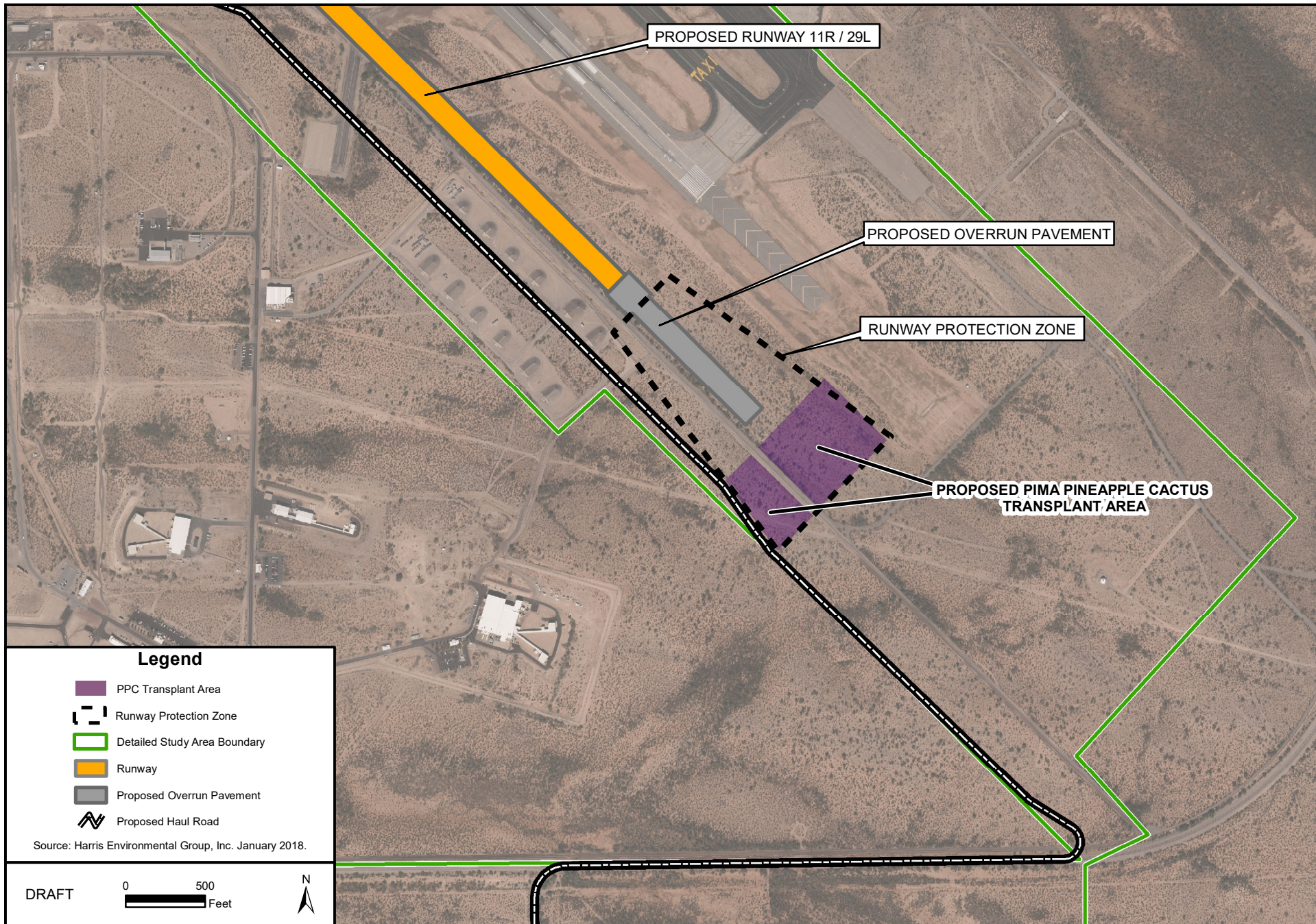
Pedestrian surveys were conducted in the spring and summer of 2017 and in November 2017 within the Detailed Study Area. While none of the Special Status Species were observed within the Detailed Study Area, the presence of suitable habitat for these species was identified. TAA will implement Pima County Native Plant Preservation (PCC §18.72) and the Watercourse and Riparian Habitat Protection ordinances (PCC §16.30) to mitigate the adverse effects of the Proposed Action on the habitat for these species.

Merriam's Mouse

Patches of woodland capable of supporting a small Merriam's mouse population exist within the Detailed Study Area. Although the Merriam's mouse was not observed during the pedestrian survey, the presence of suitable habitat makes it possible that Merriam's mouse occurs in the Detailed Study Area. The construction of the Proposed Action may impact perennial and intermittent riparian watercourses and adjacent desert scrub vegetation identified as habitat for the Merriam's mouse. The Pima County Native Plant Preservation (PCC §18.72) and the Watercourse and Riparian Habitat Protection ordinances (PCC §16.30) would be implemented to mitigate impacts on habitat. Therefore, the Proposed Action would not reduce the viability of the Merriam's mouse population.

Western Red Bat

Habitat for western red bat includes broadleaf riparian woodlands (primarily cottonwood) and other wooded areas such as fruit orchards. Roost sites in the Detailed Study Area are limited to four saguaros large enough to form boots, and a few scattered patches of dense xeroriparian foliage. Although the western red bat was not observed during the pedestrian survey, the presence of suitable habitat and prey species makes it possible that western red bat occurs in the Detailed Study Area. The Pima County Native Plant Preservation (PCC §18.72) and the Watercourse and Riparian Habitat Protection ordinances (PCC §16.30) would be implemented to mitigate impacts on habitat. Therefore, the Proposed Action would not reduce the viability of the western red bat's population.



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Western Yellow Bat

Available roost sites in the Detailed Study Area are primarily palm trees used as ornamental vegetation around buildings. Although the western yellow bat was not observed during the pedestrian survey, the presence of suitable habitat and prey species makes it possible that western yellow bat occurs in the Detailed Study Area. The Proposed Action would not impact palm trees used as ornamental vegetation around buildings. However, the Pima County Native Plant Preservation (PCC §18.72) and the Watercourse and Riparian Habitat Protection ordinances (PCC §16.30) would be implemented to mitigate impacts on the western yellow bat prey species habitat. Therefore, the Proposed Action would not reduce the viability of the western yellow bat's population.

Tucson Shovel-Nosed Snake

The Tucson shovel-nosed snake generally occurs west of the Detailed Study Area. However, creosote flats on valley floors in the southern portion of the Detailed Study Area, and xeroriparian washes throughout the Detailed Study Area provide suitable habitat for this snake. Although the shovel-nosed snake was not observed during the pedestrian field survey, the presence of habitat makes it possible that Tucson shovel-nosed snake could occur in the Detailed Study Area. The construction of the Proposed Action may affect the habitat for the Tucson shovel-nosed snake. The Pima County Native Plant Preservation (PCC §18.72) and the Watercourse and Riparian Habitat Protection ordinances (PCC §16.30) would be implemented to mitigate impacts on habitat. Therefore, the Proposed Action would not reduce the viability of the Tucson shovel-nosed snake's population.

Tumamoc Globeberry

No Tumamoc globeberry plants were observed during the pedestrian surveys. It is unlikely that the Tumamoc globeberry plant occurs in the Detailed Study Area. However, the Pima County Native Plant Preservation (PCC §18.72) and the Watercourse and Riparian Habitat Protection ordinances (PCC §16.30) would be implemented to mitigate impacts on habitat. Potential impacts to washes and immediate adjacent areas would also be minimized to the extent practicable. Therefore, the Proposed Action would not reduce the viability of the Tumamoc globeberry plant's population.

Determination of Effects

A Biological Assessment (BA) was prepared to be used by the FAA in its consultation with the USFWS. The analysis included an evaluation of the Detailed Study Area for potential impacts to ESA-listed threatened and endangered species and associated critical habitat under the jurisdiction of the USFWS. Based on the analysis, the FAA has made the following findings.

- The Proposed Action "*May affect, but is not likely to adversely affect*" the lesser long-nosed bat.

- The Proposed Action "*May affect, is likely to adversely affect*" the PPC, as there are PPC individuals within the proposed construction areas.

FAA's finding was submitted to the USFWS on February 8, 2018. The USFWS concurred with the FAA's finding on March 19, 2018. (See **Appendix D** for the BA and Section 7 consultation).

4.5.2.2 Future (2028) Proposed Action

The Future (2028) Proposed Action would have the same effects upon biological resources as described for the Future (2023) Proposed Action.

4.5.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The following mitigation measure would be required for the Proposed Action:

Federally Listed (ESA) Species

Lesser Long-Nosed Bat

While FAA has determined the Proposed Action ***may affect, but is not likely to adversely affect*** the lesser long-nosed bat, the following mitigation measures will be implemented to minimize the impact to the lesser long-nosed bat species:

- Grading activities at night would be suspended from 15 April to 15 September to the extent practicable to avoid impacts to potential foraging lesser long-nosed bats. However, recent monitoring of this species determined that migrants remain within the Tucson Basin into late October. Thus, suspension window for construction activities for this species would be confirmed with USFWS.

Pima Pineapple Cactus (PPC)

The following mitigation measures would be implemented to minimize the impact to the PPC:

Avoidance – Eleven (11) PPC individuals could be avoided in airfield area and seven could be avoided in Parcel "G" and Parcel "H". Therefore, 18 total PPC would be avoided. During the construction process, all PPC in the Detailed Study Area that can be avoided near the project limits would be marked and protected from traffic and equipment. Bright PPC markers (e.g., orange construction fence), and education and coordination with all construction workers would prevent direct impacts to those existing PPC that do not have to be directly affected by construction activities.

Conservation Banking – Conservation banks as defined by the USFWS service are permanently protected lands that contain natural resource values. These lands are conserved and permanently managed for species that are endangered, threatened, candidates for listing as endangered or threatened, or are otherwise species-at-risk.

Conservation banks function to offset adverse impacts to these species that occurred elsewhere, sometimes referred to as off-site mitigation. In exchange for permanently protecting the land and managing it for these species, the USFWS approves a specified number of habitat or species credits that bank owners may sell.¹⁵

A fundamental component of the PPC recovery strategy is to preserve and restore quality habitat to protect individuals and their seedbanks. Conservation bank credits would be purchased from the Palo Alto PPC Conservation Bank to compensate for the loss of PPC habitat at a 1:1 ratio of area of modified habitat. Credits are defined by the USFWS as a unit of trade related to habitat or species or interest at the bank site. A credit may be equivalent to an acre of habitat for a particular species; the amount of habitat required to support a breeding pair; a wetland unit along with its supporting uplands; or some other measure of habitat or its value to the listed species.¹⁶ Approximately 11 acres of PPC habitat would be removed in the airfield area. An additional 13 acres would be affected by the proposed Air National Guard development on Parcel "G" and "Parcel "H". Therefore, 24 acres would be affected by the Proposed Action. Mitigation credits would be purchased for this amount from the Palo Alto PPC Conservation Bank.

Transplant and Monitoring – For the PPC that would be directly affected by the Proposed Action, a transplanting and monitoring program would be implemented. PPC removal, salvage, and restoration would follow the ANPL and Pima County Native Plant Preservation ordinance (PCC §18.72) to salvage PPC specimens. PPC would be transplanted according to the guidelines that were used during the relocation of PPC individuals removed during the construction of the East Hughes Access Road Relocation Project. The only exception for this Proposed Action would be that all PPC would be transplanted onto existing Airport property that is restricted from access by the general public so the PPC will not be stolen or otherwise disturbed. The potential PPC transplant area encompasses approximately 11 acres primarily in the unaffected RPZ area. These mitigation measures conform with one or more factors as described in FAA Order 1050.1F Desk Reference, pp. 2-20 – 2-21.

- Move the PPC between March and April. Planting pits shall be pre-dug prior to any salvage operations and equal to the root ball width and depth.
- Backfill planting pit with a six inches layer of soil. Use soil from where the plant was originally growing if possible. Compact to 95% to remove all air pockets.
- Screen backfill soil before backfilling the plant pit. The intent of screening backfill is to eliminate soil clods or chunks that can create air pockets.
- Clearly mark the solar orientation of each cactus prior to salvaging operations. Cacti shall be replanted with a solar orientation that matches original solar orientation.

¹⁵ USFWS, 2012, Conservation Banking, Incentives for Stewardship.

¹⁶ USFWS, 2012, Conservation Banking, Incentives for Stewardship.

- Salvage cacti so that no or minimal damage occurs to the basal and lateral roots. Root balls would be dug on a case-by-case basis for each plant based on professional judgment, but usually the minimum being 12 inches wide (six inches from each edge of plant).
- Use pruning clippers to trim any roots damaged during the transplant process.
- Plant each cactus at the same planting depth that it was originally grown.
- Create a small mound around the base of the cacti after planting, backfilling and compaction of the plant pit.
- Replant each cactus at the designated transplant area immediately after it is removed from the original site. Do not harden off the roots and do not add sulfur in the planting hole or on the roots.
- Take notes of each PPC before starting a transplant. Observe and take notes of the environment and nearest plant neighbors for future reporting and monitoring efforts.
- Replant PPC away from any tree canopies, large shrubs, dense stands of perennial grasses or non-native grasses, steep slopes or wash bottoms, and not within 15 feet of a saguaro unless the PPC was under or on the edge of similar canopy, grassland, or steep slopes in its original location.
- Provide all transplanted PPC with gel water irrigation supplement time-release containers per manufacturer's instructions at the time of transplant and for a minimum of one year after transplant.
- Provide GPS locations and a location map of the transplanted cacti for future monitoring efforts.
- Topsoil from disturbed areas would be stockpiled and replaced from where it was taken to the extent practicable during restoration to retain the potential seed bank.

TAA would record data on each PPC for a period of five years following the transplant. Monitoring of the individual transplanted PPC would be conducted to document positive and negative changes in the PPC from year to year. This will inform future efforts to transplant this species and ultimately benefit PPC recovery. TAA will provide this data to FAA and to USFWS.

USAF and the Airport are conservation stewards of PPC. PPC surveys and monitoring is conducted every five years on AFP 44 and all PPC individuals are marked. Furthermore, at least one area containing a dense cluster of PPC is enclosed by protective fencing on AFP 44. These conservation stewardship activities will likely continue in perpetuity.

Migratory Bird Treaty Act Species

The following mitigation measures would be implemented to minimize the impact to the Cactus Ferruginous Pygmy-Owl and the Rufous-Winged Sparrow migratory bird species:

If vegetation clearing will occur during the migratory bird breeding season (March 1 - August 31), the contractor shall avoid any new active bird nests. If the active nest cannot be avoided, the contractor shall notify a qualified wildlife biologist and construction engineers to evaluate the specific situation. During the non-breeding season (September 1 - February 28) vegetation removal is not subject to this restriction.

Western Burrowing Owl

An additional survey for western burrowing owls would be conducted prior to the immediate start of construction activities, generally within 30 days of the start. If any western burrowing owls are found, the Arizona Game and Fish Department (AGFD) and USFWS would be consulted to determine the appropriate action to remove any burrowing owls from the detailed study area before construction. Such action may include flushing owls prior to grading, removal of owls from the project site, and/or deferment of grading until artificial burrows can be constructed. Owl removal and artificial burrow construction can be facilitated through Wild at Heart, the Burrowing Owl Project, and Partners in Flight.

Special Status Species

While no specific Special Status Species were observed in the Detailed Study Area, mitigation measures to minimize impacts to Special Status Species habitat include vegetation salvage and restoration following the Pima County Native Plant Preservation (PCC §18.72) and the Watercourse and Riparian Habitat Protection ordinances (PCC §16.30).

4.6 CLIMATE

This section provides the estimate of Greenhouse Gas (GHG) emissions attributable to aircraft operations and construction-related emissions as a result of the No Action Alternative and the Proposed Action. This estimate is provided for information only as the FAA has not identified specific factors to consider in making a significance determination for GHG emissions. There are currently no accepted methods for determining significance applicable to aviation or commercial space launch projects given the small amount of emissions they contribute. GHG emissions for an FAA National Environmental Policy Act of 1969 (NEPA) review should follow the basic procedure of considering the potential incremental change in carbon dioxide (CO₂) emissions that would result from the Proposed Action compared to the No Action alternative for the same timeframe, and discussing the context for interpreting and understanding the potential changes.

4.6.1 NO ACTION ALTERNATIVE

4.6.1.1 Future (2023) No Action Alternative

The GHG emissions inventory for the Future (2023) No Action Alternative was prepared using the same sources and methodology as described in Section 4.4, *Air Quality* for aircraft activity. AEDT was used to determine CO₂ from aircraft operating during the landing take-off cycles (LTOs) at the Airport. GHG emissions from aircraft operating during cruise operations were not included in this analysis.

Due to the nature of the Proposed Action, neither the No Action Alternative nor the Proposed Action would affect ground support equipment (GSE), ground access vehicles, or auxiliary power units. No physical development or land transfers would occur for the Future (2023) No Action Alternative. Therefore, there would be no construction-related GHG emissions to report for the years 2020 through 2022 for the No Action Alternative because no construction activity would occur. **Table 4-12** shows the annual GHG emissions from aircraft operations for the Future (2023) No Action Alternative. GHG emission are provided in metric tons.

**Table 4-12
ANNUAL GHG EMISSIONS – FUTURE (2023) NO ACTION ALTERNATIVE
Tucson International Airport**

EMISSION SOURCE	METRIC TONS OF POLLUTANTS		
	CO ₂	CH ₄	CO ₂ E
Aircraft	62,727.10	0.00	62,727.10

CO₂: Carbon Dioxide

CH₄: Methane

CO₂E: Carbon Dioxide equivalent

Note: Global Warming Potential (GWP) for CO₂=1; CH₄= 28

Source: Landrum & Brown analysis, 2018.

4.6.1.2 Future (2028) No Action Alternative

The GHG emissions inventory for the Future (2028) No Action Alternative was prepared using the same sources and methodology as described in Section 4.4, *Air Quality* for aircraft activity. With or without the Proposed Action, aircraft operations are forecast to increase as compared to the Future (2023) No Action Alternative. There would be no construction-related GHG emissions for the Future (2028) No Action Alternative because no construction activity would occur. **Table 4-13** shows the annual GHG emissions from aircraft operations for the Future (2028) No Action Alternative.

Table 4-13
ANNUAL GHG EMISSIONS – FUTURE (2028) NO ACTION ALTERNATIVE
Tucson International Airport

EMISSION SOURCE	METRIC TONS OF POLLUTANTS		
	CO ₂	CH ₄	CO ₂ E
Aircraft	66,522.27	0.00	66,522.27

CO₂: Carbon Dioxide

CH₄: Methane

CO₂E: Carbon Dioxide equivalent

Note: Global Warming Potential (GWP) for CO₂=1; CH₄= 28

Source: Landrum & Brown analysis, 2018.

4.6.2 PROPOSED ACTION

4.6.2.1 Future (2023) Proposed Action

No change to the number of aircraft operations or fleet mix would occur as a result of implementing the Proposed Action because the Proposed Action is a safety enhancement project, not an airfield capacity enhancement project. Therefore, the number of operations and fleet mix for the Future (2023) No Action Alternative would remain the same for the Future (2023) Proposed Action. Given the design of the proposed new runway and taxiways and given that aircraft will most likely use runways 11/29L and 11/29R evenly, some aircraft will have to taxi a farther distance when compared to the No Action Alternative. The proposed replacement runway would be constructed approximately 94 feet farther from the existing terminal, general aviation, and Arizona Air National Guard Base (AANG) facilities, which would cause a slight overall increase in average aircraft taxi distance.

GHG emissions would also be anticipated to occur for the years 2020 through 2023 for the Proposed Action because of the additional proposed construction activity. **Table 4-14** shows the annual GHG emissions from construction activities and aircraft operations for the Future (2023) Proposed Action.

**Table 4-14
ANNUAL GHG EMISSIONS – FUTURE (2023) PROPOSED ACTION
Tucson International Airport**

SCENARIO	METRIC TONS OF POLLUTANTS		
	CO ₂	CH ₄	CO ₂ E
2020			
Proposed Action - Construction	2,449.30	0.04	2,450.50
2021			
Proposed Action - Construction	19,241.94	0.35	19,251.65
2022			
Proposed Action - Construction	1,512.32	0.03	1,513.12
2023			
Proposed Action - Construction	33,297.07	0.37	33,307.45
Proposed Action - Aircraft	64,980.36	0.00	64,980.36
<i>2023 Proposed Action Total:</i>	<i>98,277.43</i>	<i>0.37</i>	<i>98,287.81</i>

CO₂: Carbon Dioxide

CH₄: Methane

CO₂E: Carbon Dioxide equivalent

Note: Global Warming Potential (GWP) for CO₂=1; CH₄= 28

Source: Landrum & Brown analysis, 2018.

Table 4-15 provides a comparison of Future (2023) Proposed Action and the Future (2023) No Action Alternative. Based on the analysis presented with the implementation of the Proposed Action there would be an increase in GHG emissions due to construction activity and an increase in GHG emissions due to slightly longer taxi distances for aircraft using the new south end of Runway 11R/29L. This increase would comprise an extremely minor percentage of United States based GHG emissions, therefore, the Proposed Action would not have an adverse impact to climate change nor would the potential changes in climate have an impact on the Proposed Action.

**Table 4-15
ANNUAL GHG EMISSIONS INVENTORY SUMMARY – FUTURE (2023)
Tucson International Airport**

SCENARIO	METRIC TONS OF POLLUTANTS		
	CO ₂	CH ₄	CO ₂ E
2020			
Proposed Action - Construction	2,449.30	0.04	2,450.50
2020 Proposed Action Net Emissions:	2,449.30	0.04	2,450.50
2021			
Proposed Action - Construction	19,241.94	0.35	19,251.65
2021 Proposed Action Net Emissions:	19,241.94	0.35	19,251.65
2022			
Proposed Action - Construction	1,512.32	0.03	1,513.12
2022 Proposed Action Net Emissions:	1,512.32	0.03	1,513.12
2023			
No Action Alternative - Aircraft	62,727.10	0.00	62,727.10
<i>2023 No Action Alternative Subtotal:</i>	<i>62,727.10</i>	<i>0.00</i>	<i>62,727.10</i>
Proposed Action - Construction	33,297.07	0.37	33,307.45
Proposed Action - Aircraft	64,980.36	0.00	64,980.36
<i>2023 Proposed Action Subtotal:</i>	<i>98,277.43</i>	<i>0.37</i>	<i>98,287.81</i>
2023 Proposed Action Net Emissions:	35,550.33	0.37	35,560.71

CO₂: Carbon Dioxide

CH₄: Methane

CO₂E: Carbon Dioxide equivalent

Note: Global Warming Potential (GWP) for CO₂=1; CH₄= 28

Source: Landrum & Brown analysis, 2018.

4.6.2.2 Future (2028) Proposed Action

No change to the number of aircraft operations or fleet mix would occur as a result of implementing the Proposed Action because the Proposed Action is a safety enhancement project, not an airfield capacity enhancement project. Therefore, the number of operations and fleet mix for the Future (2028) No Action Alternative would remain the same for the Future (2028) Proposed Action. Given the design of the proposed new runway and taxiways and given that aircraft will most likely use runways 11/29L and 11/29R evenly, some aircraft will have to taxi a farther distance when compared to the No Action Alternative. **Table 4-16** shows the annual GHG emissions from aircraft operations for the Future (2028) Proposed Action. There would be no GHG emissions from construction activities anticipated to occur for the Future (2028) Proposed Action because all construction would be completed.

Table 4-16
ANNUAL GHG EMISSIONS – FUTURE (2028) PROPOSED ACTION
Tucson International Airport

EMISSION SOURCE	METRIC TONS OF POLLUTANTS		
	CO ₂	CH ₄	CO ₂ E
Aircraft	68,889.2	0.00	68,889.2

CO₂: Carbon Dioxide

CH₄: Methane

CO₂E: Carbon Dioxide equivalent

Note: Global Warming Potential (GWP) for CO₂=1; CH₄= 28

Source: Landrum & Brown analysis, 2018.

Table 4-17 provides a comparison of Future (2028) Proposed Action and the Future (2028) No Action Alternative. Based on the analysis presented with the implementation of the Proposed Action there would be an increase over the No Action alternative of approximately 2,367 metric tons in GHG emissions due to slightly longer taxi distances for aircraft using the new south end of Runway 11R/29L. This increase would comprise less than 3.47×10^{-7} percent of United States based GHG emissions.¹⁷ Therefore, the Proposed Action would not have an adverse impact to climate change nor would the potential changes in climate have an impact on the Proposed Action.

**Table 4-17
GHG EMISSIONS INVENTORY SUMMARY – FUTURE (2028)
Tucson International Airport**

SCENARIO	METRIC TONS OF POLLUTANTS		
	CO ₂	CH ₄	CO ₂ E
2028			
No Action Alternative - Aircraft	66,522.3	0.00	66,522.3
<i>2028 No Action Alternative Subtotal:</i>	<i>66,522.3</i>	<i>0.00</i>	<i>66,522.3</i>
Proposed Action - Aircraft	68,889.2	0.00	68,889.2
<i>2028 Proposed Action Subtotal:</i>	<i>68,889.2</i>	<i>0.00</i>	<i>68,889.2</i>
2028 Proposed Action Net Emissions:	2,366.9	0.00	2,366.9

CO₂: Carbon Dioxide

CH₄: Methane

CO₂E: Carbon Dioxide equivalent

Note: Global Warming Potential (GWP) for CO₂=1; CH₄= 28

Source: Landrum & Brown analysis, 2018.

4.6.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The FAA has not identified specific factors to consider in making a significance determination for GHG emissions; therefore, no mitigation measures are required to mitigate the potential increase in GHGs attributed to the Proposed Action. However, for NEPA reviews of proposed FAA actions that would result in increased emissions of GHGs, consideration should be given to whether there are areas within the scope of a project where such emissions could be reduced. GHG emissions reduction can come from measures such as changes to more fuel efficient equipment, delay reductions, use of renewable fuels, and operational changes. TAA will continue to ensure that the Airport and its tenants are operating in an environmentally responsible and sustainable way.

¹⁷ United States based GHG emission estimated at 6,821.8 million metric tons CO₂E in Inventory of United States Greenhouse Gas Emissions and Sinks: 1990-2010.

4.7 DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(f)

This section presents the analysis of potential impacts to the United States Department of Transportation (USDOT) Act, Section 4(f) resources as a result of the No Action Alternative and the Proposed Action. Section 4(f) of the USDOT Act of 1966 (49 United States Code (U.S.C.) § 303) 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 (Secretary) may approve a transportation project requiring the use of publicly owned land off a public park, recreation area, or land of an historic site of national, state, or local significance, only if there is no feasible and prudent alternative to using that land and the project includes all possible planning to minimize harm resulting from the use.

Section 6(f) of the National Park Service (NPS) Land and Water Conservation Fund (LWCF) Act contains provisions for the protection of federal investments in land and water resources. The LWCF Act discourages the conversion of parks or recreational facilities to other uses. As stated in Section 3.7.2.2 of this Draft EIS, **there are no LWCF lands within the General Study Area for this EIS**, thus there are no LWCF lands that would be affected by the Proposed Action.

Two types of impacts to a Section 4(f) resource, physical or constructive use, can occur from a Proposed Action.¹⁸ As described in FAA Order 5050.4B, a determination is made by the FAA if the Proposed Action or a reasonable alternative would eliminate or severely degrade the intended use of the Section 4(f) resource. That is, would the Proposed Action or alternative physically or constructively use (i.e., substantially impair the use) that resource? The responsible FAA official should determine if mitigation is satisfactory to the agency having jurisdiction over the protected resource. If mitigation is unsatisfactory, more detailed, impact analysis is likely needed.

A physical use would occur if the Proposed Action or alternative(s) would involve an actual physical taking of Section 4(f) property through purchase of land or a permanent easement, physical occupation of a portion or all of the property, or alteration of structures or facilities on the property.

¹⁸ FAA, 2006, Order 5050.4B, National Environmental Policy Act Implementing Instructions for Airport Actions, Table 7-1, page 7.1-2.

With respect to a physical use of historic sites, the Secretary may make a finding of *de minimis* impact only if—

- A. the Secretary has determined, in accordance with the consultation process required under Section 106 of the National Historic Preservation Act (16 U.S.C. 470f), that—
 - the transportation program or project will have no adverse effect on the historic site; or
 - there will be no historic properties affected by the transportation program or project;
- B. the finding of the Secretary has received written concurrence from the applicable State historic preservation officer or tribal historic preservation officer (and from the Advisory Council on Historic Preservation if the Council is participating in the consultation process); and
- C. the finding of the Secretary has been developed in consultation with parties consulting as part of the Section 106 process.

With respect to physical use of parks, recreation areas, or wildlife or waterfowl refuges, the Secretary may make a finding of *de minimis* impact only if—

- A. the Secretary has determined, after public notice and opportunity for public review and comment, that the transportation program or project will not adversely affect the activities, features, and attributes of the park, recreation area, or wildlife or waterfowl refuge eligible for protection under this section; and
- B. the finding of the Secretary has received concurrence from the officials with jurisdiction over the park, recreation area, or wildlife or waterfowl refuge.¹⁹

The concept of constructive use is that a project that does not physically use land in a park, for example, may still, by means of noise, air pollution, water pollution, or other impacts, dissipate its aesthetic value, harm its wildlife, restrict its access, and take it in every practical sense. Constructive use occurs when the impacts of a project on a Section 4(f) property are so severe that the activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. A *de minimis* impact determination is not appropriate for constructive use of a Section 4(f) property because constructive use is defined as substantial impairment, and substantial impairment cannot be considered a *de minimis* impact. The analysis in this EIS uses the DNL noise levels from Section 4.12 to determine if a constructive use of the property would occur from the Proposed Action.

¹⁹ USDOT Act of 1966 (49 U.S.C. § 303).

4.7.1 NO ACTION ALTERNATIVE

4.7.1.1 Future (2023) No Action Alternative

In the Future (2023) No Action Alternative noise exposure contour, the Triple Hangars would be exposed to noise levels of 65-70 DNL. In addition, the Manuel Herrera Jr. Park would be exposed to noise levels of 65-70 DNL in the Future (2023) No Action Alternative. As no physical changes to the Airport would occur under this alternative, implementation of the Future (2023) No Action Alternative would not result in a direct or constructive use of Section 4(f) resources.

4.7.1.2 Future (2028) No Action Alternative

In the Future (2028) No Action Alternative noise exposure contour, the Triple Hangars would be exposed to noise levels of 65-70 DNL. In addition, the Manuel Herrera Jr. Park would be exposed to noise levels of 65-70 DNL in the Future (2028) No Action Alternative. As no physical changes to the Airport would occur under this alternative, implementation of the Future (2028) No Action Alternative would not result in a direct or constructive use of Section 4(f) resources.

4.7.2 PROPOSED ACTION

4.7.2.1 Future (2023) Proposed Action

Physical Use

Implementation of the Future (2023) Proposed Action would not result in the physical use of any Section 4(f) resource to other purposes.

Constructive Use

Triple Hangars

The Triple Hangars are currently mostly vacant buildings located on Airport property, in an active airport environment. Thus, the sound of aircraft at the Airport is a common feature associated with an aircraft hangar building. Under the Future (2023) Proposed Action, the Triple Hangars would be exposed to 65-70 DNL noise levels. These structures were previously recommended as historically significant for architecture and are eligible for listing in the NRHP under Criterion A (Association with Events) and Criterion C (Embodiment of Distinctive Architectural Characteristics). However, these noise levels would not substantially impair the property because the activities, features, and attributes that qualify the property for protection under Section 4(f) would not be affected by the implementation of the Proposed Action. In addition, the Future (2023) Proposed Action would not cause significant air pollutant emissions, water pollutants, or other environmental impacts that could affect the property. Therefore, the Future (2023) Proposed Action would not result in a constructive use of the property.

Manuel Herrera Jr. Park

As a result of the Future (2023) Proposed Action, the property would experience a decrease in noise levels and would no longer be exposed to 65-70 DNL noise levels. This is a result of the aircraft shifting to the south, away from the park, due to the extended runway to the south. In addition, the Future (2023) Proposed Action would not cause significant air pollutant emissions, water pollutants, or other environmental impacts that could affect the property. Therefore, the Future (2023) Proposed Action would not result in a constructive use of the property.

Sunnyside Pool

The Sunnyside Pool is located outside of the 65+ DNL noise contours for the Future (2023) Proposed Action. This property would not experience significant noise impacts, air pollutant emissions, water pollutants, or other environmental impacts from the Future (2023) Proposed Action, as discussed in Section 4.12, Section 4.4, and Section 4.15, respectively. Therefore, the Future (2023) Proposed Action would not result in a constructive use of the property.

4.7.2.2 Future (2028) Proposed Action

Physical Use

Implementation of the Future (2028) Proposed Action would not result in the physical use of any Section 4(f) resource to other purposes.

Constructive Use

Triple Hangars

Under the Future (2028) Proposed Action, the Triple Hangars would continue to be exposed to 65-70 DNL noise levels. These structures were previously recommended as historically significant for architecture and are eligible for listing in the NRHP under Criterion A (Association with Events) and Criterion C (Embodiment of Distinctive Architectural Characteristics). However, these noise levels would not substantially impair the property because the activities, features, and attributes that qualify the property for protection under Section 4(f) would not be affected by the implementation of the Proposed Action. In addition, the Future (2028) Proposed Action would not cause significant air pollutant emissions, water pollutants, or other environmental impacts that could affect the property. Therefore, the Future (2028) Proposed Action would not result in a constructive use of the property.

Manuel Herrera Jr. Park

Under the Future (2028) Proposed Action, the property would experience a decrease in noise levels and would no longer be exposed to 65-70 DNL noise levels. This is a result of the aircraft shifting to the south, away from the park, due to the extended runway to the south. In addition, the Future (2028) Proposed Action would not cause significant air pollutant emissions, water pollutants, or other environmental impacts that could affect the property. Therefore, the Future (2028) Proposed Action would not result in a constructive use of the property.

Sunnyside Pool

The Sunnyside Pool is located outside of the 65+ DNL noise contours for the Future (2028) Proposed Action. This property would not experience significant noise impacts, air pollutant emissions, water pollutants, or other environmental impacts from the Future (2028) Proposed Action, as discussed in Section 4.12, Section 4.4, and Section 4.15, respectively. Therefore, the Future (2028) Proposed Action would not result in a constructive use of the property.

4.7.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The Proposed Action does not exceed the applicable thresholds of significance. No DOT Act Section 4(f) protected resource would experience a physical or constructive use resulting from implementation of the Proposed Action for the future years 2023 or 2028. Therefore, no mitigation measures are required.

4.8 HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

This section assesses the potential exposure to hazardous materials, pollution prevention measures, and solid waste that would occur as a result of the No Action Alternative and Proposed Action.

4.8.1 NO ACTION ALTERNATIVE

4.8.1.1 Future (2023) No Action Alternative

Hazardous Materials

There would be no change to hazardous materials described in Chapter 3 Section 3.8 for the Future (2023) No Action Alternative.

Pollution Prevention

There would be no change to existing pollution prevention measures described in Chapter 3 Section 3.8 for the Future (2023) No Action Alternative.

Solid Waste

There would be no change to the quantity or type of solid waste described in Chapter 3 Section 3.8 for the Future (2023) No Action Alternative.

Recycling

There would be no change to the Airport's current recycling program for the Future (2023) No Action Alternative.

4.8.1.2 Future (2028) No Action Alternative

Hazardous Materials

There would be no change to hazardous materials described in Chapter 3 Section 3.8 for the Future (2028) No Action Alternative.

Pollution Prevention

There would be no change to existing pollution prevention measures described in Chapter 3 Section 3.8 for the Future (2028) No Action Alternative.

Solid Waste

There would be no change to the quantity or type of solid waste described in Chapter 3 Section 3.8 for the Future (2028) No Action Alternative.

Recycling

There would be no change to the Airport's current recycling program for the Future (2028) No Action Alternative.

4.8.2 PROPOSED ACTION

4.8.2.1 Future (2023) Proposed Action

Hazardous Materials

Aboveground Storage Tanks, Underground Storage Tanks, Leaking Underground Storage Tanks, and Hazardous Material Storage Areas

The Proposed Action would require the removal of the following aboveground storage tank and underground storage tanks including:

- One aboveground storage tank in a concrete containment located near the Triple Hangars containing oil.
- Two subgrade vaults and a wash pad with a drain to an oil-water separator and a manhole near the former fire station.
- A fenced hazardous material storage area on a curbed concrete pad covered by a canopy located in the area of the former fire station. Material is typically from maintenance activities, such as paints, motor and engine oil, solvents, film forming foam for firefighting, and related materials.

The contents of these sites would be disposed of as part of their closure in coordination with the Arizona Department of Environmental Quality's (ADEQ) Underground Storage Tank Program.²⁰

The paints, motor and engine oil, solvents, film forming foam for firefighting contents would be removed and disposed of per guidance from the ADEQ's Waste Programs Division requirements to ensure potential hazardous materials are safely managed and properly disposed.²¹

These recommendations would ensure that no impacts would occur as a result of the closure process.

²⁰ Arizona Department of Environmental Quality, 2017, Underground Storage Tank (UST) Program. Available on-line: <http://www.azdeq.gov/node/2271> Accessed December 20, 2017.

²¹ Arizona Department of Environmental Quality, 2017, Waste Programs Division: Hazardous Waste Management. Available on-line: <http://legacy.azdeq.gov/enviro/waste/hazwaste/index.html> Accessed December 20, 2017.

Earth Covered Magazines (ECMs)

The Proposed Action would require the demolition of 12 ECMs used for storage of explosives and other materials at AFP-44. The bunkers consist of concrete structures overlain by soil and capped by asphalt that has degraded over time. Soil surveys and lead based paint (LBP) investigations on the exteriors of the ECMs led to the conclusion that the waste stream generated by demolition and removal of the sampled structures is not expected to result in a release of hazardous materials. However, because the ECMs were still in use a complete survey of potential LBP sources on the interior of the ECMs and soil sampling directly underneath the ECMs could not be conducted.

Pollution Prevention

National Priorities List Sites

Several remediation activities for groundwater and soil cleanup initiated by the EPA 1988 Record of Decision (ROD) remain in operation in the Tucson International Airport Area (TIAA) Superfund Sites.²² Groundwater cleanup efforts continue in Superfund Site Area A and Superfund Site Area B with additional cleanup systems scheduled for the future.²³ Additionally, soils remediation efforts are ongoing in the AFP-44 that focuses on testing for in-place treatment of subsurface soils that may be contaminating groundwater and the improvement in the efficiency of older extraction wells. The Airport continues to monitor soil, water, and air quality.

The Proposed Action would occur within surface boundaries of a contaminated site, the TIAA Superfund Site Areas A and B. However, the construction and implementation of the Proposed Action would not impact the ongoing remediation of existing contaminated sites because of the depth below the surface of the groundwater contamination. There would be no known ground disturbance of contaminated soil. The USAF and the Airport's existing soil, water, and air quality remediation efforts would remain in place.

Wells

Potential impacts by the Proposed Action construction activities are evaluated for the 22 wells located within the Detailed Study Area, shown in Exhibit 3-6.

- Five of the well listings (ADWR #55-214445, 55-214446, 55-214447, 55-214448, and 55-218146) owned by the AANG are located at 1000 and 1070 East Valencia Road.
 - No construction activity would occur near these wells. Existing access to these wells would be maintained.

²² EPA Region IX, 1988, Tucson International Airport Area Record of Decision for Groundwater Remediation North of Los Reales Road.

²³ EPA, 2017, Tucson International Airport Area, Superfund Site Area A North of Los Reales Road, Tucson Arizona.

- Five of the well listings (ADWR #55-540974, 55-619931, 55-209879, 55-524217, and 55-512173) are located within the runway and taxiway areas. *However, ADWR files reported that well listing ADWR #55-619931 could not be located and was assumed to be abandoned beneath asphalt.*
 - Construction activities would occur in the surrounding area of these wells. Although the surrounding area of the wells would be disturbed and/or paved, the wells would be avoided and their existing accessibility would be maintained. During the construction process, all of these wells would be marked and protected from construction traffic and construction equipment to prevent direct impacts to those wells.
- Two of the well listings (ADWR #55-524218 and 55-525522) are located at the former fire training facility that is east of the current fire station and south of the contractors' yard.
 - No construction activity would occur near these wells. Existing access to these wells would be maintained.
- Five of the well listings (ADWR #55-204855, 55-204856, 55-204865, 55-204866, and 55-204867) are located at the AANG Test Stand (a.k.a. Test Cell or Test Pad), which is the pavement area located north of the runway area, south of the former fire training facility. These wells are used for groundwater monitoring.
 - No construction activity would occur near these wells. Existing access to these wells would be maintained.
- Three of the well listings (ADWR #55-513727, 55-809549, and 55-482463) are located near the 12 ECMs at AFP-44. The USAF does not own these wells. *Two of the wells were listed as abandoned.*
 - These wells are located near the 12 ECMs proposed for demolition. The wells would be avoided during demolition activities. Although the surrounding area would be disturbed, the wells would be avoided and their existing accessibility would be maintained.
- Two of the well listings (ADWR #55-545386 and 55-556448) are located in Parcel G and H, south of Hughes Access Road. These wells were associated with the investigations at AFP-44. *Both wells are listed as abandoned.*
 - No construction activity would occur near these wells. Existing access to these wells would be maintained.

The Proposed Action's construction activities would avoid the wells and maintain their existing accessibility to their continued use, including groundwater monitoring. Therefore, it is anticipated that construction activities included in the Proposed Action would not contribute to the existing contamination of the TIAA Superfund Site.

Solid Waste

The Proposed Action would not disturb or require the removal of the solid waste on the illegal/wildcat dumping sites south of the Old Hughes Access Road and north of Aerospace Parkway.

The Proposed Action would increase the volume of solid waste generated on Airport property during construction. There would be no change to solid waste for operational activities because the Proposed Action is a safety enhancement project, not an airfield capacity enhancement project. TAA and its construction contractor would have the responsibility of arranging transportation and disposal of waste generated during construction. It is anticipated that solid waste generated by construction activities would use the existing disposal measures, including sending solid and semi-solid waste to Los Reales Landfill and Arizona Waste Oils Services in Tucson.

Recycling

The Proposed Action would increase the volume of solid waste generated on Airport property during construction. The Airport would be able to recycle solid waste generated by construction activities, including materials like cardboard, aluminum, landscape waste material, concrete, and asphalt. Copper would be recycled at Desert Metal Recycling, metal at SA Recycling, and paper waste would be recycled by Republic Services at Re-Community Recycling in Tucson.²⁴

4.8.2.2 Future (2028) Proposed Action

Hazardous Materials

The Future (2028) Proposed Action would have the same effects upon hazardous materials as described for the Future (2023) Proposed Action.

Pollution Prevention

The Future (2028) Proposed Action would have the same effects upon pollution prevention measures as described for the Future (2023) Proposed Action.

Solid Waste

The Future (2028) Proposed Action would have the same effects upon solid waste as described for the Future (2023) Proposed Action.

Recycling

There would be no change to the Airport's current recycling program.

²⁴ Eric Roudebush, TAA, August 24, 2017, RE: TUS EIS solid waste.

4.8.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The Proposed Action would involve transport, use, and disposal of hazardous materials, including those resulting from the removal of above ground storage tanks, underground storage tanks, leaking underground storage tanks, and hazardous material storage areas. However, the materials would be safely managed and properly disposed of per guidance from the ADEQ. In addition, the ongoing remediation of existing contaminated sites would remain in place. Therefore, the Proposed Action does not exceed the applicable thresholds of significance; therefore, no mitigation measures are required.

However, because the ECMs are still in use, a complete survey of potential LBP sources on the interior of the ECMs and soil sampling directly underneath the ECMs could not be conducted. If any LBP or asbestos is found at the time of the additional surveys, it would be properly disposed of in accordance with USAF policy and per guidance from the ADEQ's Waste Program Division.

The following surveys will be conducted prior to and following demolition of the ECMs.

- Prior to the demolition of the 12 ECM sites, a LBP survey should be performed for any painted or similarly coated surfaces inside each structure. It is recommended that this survey be performed during cooler weather in order to optimize the performance of the XRF analyzer. Paint chips could also be collected as a confirmation for the results.

Based on the relatively low test results for lead detected during the site testing of the exterior of the 12 ECMs, it is likely that the waste stream generated by demolition and removal of the sampled structures will not exhibit the lead toxicity characteristic of hazardous waste. However, the presence of lead in the paint should be taken into account with regard to worker safety during demolition.

- Prior to the demolition of the 12 ECM sites, an asbestos survey would need to be performed for each structure. An Asbestos Hazards Emergency Response Act (AHERA)-certified Building Inspector should perform a visual inspection and sampling of suspect materials to identify the presence of asbestos-containing materials (ACMs) in specified locations in the structures as required for National Emissions Standards for Hazardous Air Pollutants (NESHAP) compliance prior to demolition.
- Following demolition of the 12 ECM structures, a minimum of three soil samples should be collected from the soil directly beneath the former location of each ECM. The soil samples should be analyzed for herbicides, pesticides, priority pollutant metals, and PAHs using EPA Methods 8154, 8141 and 8081, 6010/7471, and 8270, respectively. Additionally, the soil samples should also be analyzed for explosive residues (using EPA Method 8330) and for nitrates (EPA Method 9056).

In addition, the following avoidance and minimization measures are being provided to further minimize impacts from the Proposed Action.

Four of the well listings (ADWR #55-540974, 55-209879, 55-524217, and 55-512173) are located within the runway and taxiway areas. Although the surrounding area of the wells would be disturbed and/or paved, the wells would be avoided and their existing accessibility would be maintained. During the construction process, all of these wells would be marked and protected from traffic and equipment to prevent direct impacts to those wells.

The Airport would recycle solid waste generated by construction activities, including materials like cardboard, aluminum, landscape waste material, concrete, and asphalt. TAA plans to recycle and reuse existing pavement materials (i.e., “old pavement”) for subgrade and base course for the Proposed Action to the maximum extent allowed by FAA standards.²⁵

4.9 HISTORICAL, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

This section presents the analysis of potential impacts to Historical, Architectural, Archaeological, and Cultural Resources as a result of the No Action Alternative and the Proposed Action. The FAA conducted the required consultation with the Arizona State Historic Preservation Officer (SHPO) under the National Historic Preservation Act of 1966, as amended (NHPA). FAA initiated consultation on June 6, 2017, with the Arizona SHPO to inform them of the scope of the project and to provide ongoing opportunities for informal and formal review of the project’s potential effect on historic resources. The APE for direct and indirect impacts is described in Section 3.9, *Historical, Architectural, Archaeological, and Cultural Resources*, and shown on Exhibit 3-8. The Arizona SHPO concurred with FAA’s delineation of the Areas of Potential Effects (APE) via letter on June 19, 2017 (See **Appendix F** for coordination letters).

In addition, a government-to-government²⁶ consultation process for the EIS was initiated by FAA in April 2017 by notifying federally recognized Native American tribes, in writing, including the Gila River Indian Community, the Hopi Tribe of Arizona, the Pascua Yaqui Tribe of Arizona, the Tohono O’odham Nation, and the Yavapai-Apache Nation of Camp Verde Indian Reservation. Copies of the letters sent to the tribal officials are available in **Appendix J**. The Hopi Tribe responded requesting continued consultation if the Proposed Action has the potential to adversely affect prehistoric sites. A copy of the letter received by the Hopi Tribe is included in **Appendix J**. The FAA made follow up telephone calls and sent emails to the federally recognized tribes that had not earlier responded in March 2018 prior to the issuance of this Draft EIS. No additional issues were identified at that time. Each of the federally recognized tribes are being provided notice of the availability of the Draft EIS and the opportunity to provide comments.

²⁵ Eric Roudebush, TAA, November 21, 2017, RE: Recycling of old pavements for new runway project at TUS.

²⁶ Government-to-Government communication was accomplished in accordance with FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*, dated January 28, 2004.

4.9.1 NO ACTION ALTERNATIVE

4.9.1.1 Future (2023) No Action Alternative

No physical development or land transfers would occur for the Future (2023) No Action Alternative. Therefore, no impacts to historical, architectural, archeological, or cultural resources would occur.

4.9.1.2 Future (2028) No Action Alternative

No physical development or land transfers would occur for the Future (2028) No Action Alternative. Therefore, no impacts to historical, architectural, archeological, or cultural resources would occur.

4.9.2 PROPOSED ACTION

4.9.2.1 Future (2023) Proposed Action

This section describes the potential impacts, including direct and indirect effects, upon historical, architectural, archeological, and cultural resources due to the Proposed Action. Exhibit 3-8, in Chapter 3 of this EIS, depicts the Direct and Indirect APEs.

Direct Effects

As discussed in, Section 3.9, *Historical, Architectural, Archaeological, and Cultural Resources*, a Class III Cultural Resources Investigation was conducted for the proposed undertaking in compliance with Section 106 of the NHPA and guidelines set forth by the Arizona State Museum (ASM) and the Arizona SHPO. The purpose of the investigation was to identify any historic properties located within the Direct APE that are listed or eligible for listing in the NRHP. 36 C.F.R. § 800.16(l)(1) defines the term **Historic property** as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.”²⁷

In total, there are 21 known sites within the Direct APE for direct effects. The FAA has determined that 19 of these sites are not eligible for inclusion in the NRHP. Two of these archaeological sites (AZ BB:13:839[ASM] and AZ BB:13:851[ASM]) were not evaluated for listing in or eligible for inclusion in the NRHP. These two sites are located in Parcel “G” in an area that would not be disturbed by the Proposed Action.

²⁷ 36 C.F.R. § 800.16(l)(1) Definition – Historic Property.

Seventeen (17) structures have been identified within the Direct APE including 12 ECMs used for storage of explosives and other materials are located at AFP-44.²⁸ The FAA has determined that the 12 ECMs are not listed or eligible for listing on the NRHP, neither as separate structures, nor as a contributor to a potential historic district because they were not associated with a significant event, were not the product of any master designer or builder, or any way a distinctive example of this type of utilitarian structure. In addition to the 12 ECMs, there are five structures used for storage, office space, and maintenance areas in the northwest portion of the Direct APE near the Triple Hangars. The FAA has determined that these five structures within the Direct APE are not listed or eligible for listing in the NRHP.

Based on the analysis presented, the FAA determined there are no historic properties located within the Direct Effects APE. FAA made the following finding: **No historic properties affected** by the proposed undertaking within the Direct Effects APE. The SHPO concurred with the FAA's determination and finding on February 15, 2018. (See **Appendix F**).

Indirect Effects

FAA also designated an Indirect Effects APE that includes areas around TUS that experience airport noise from aircraft over flights. FAA has determined there is one historic property within the Indirect Effects APE known as the Triple Hangars, which are eligible for listing on the NRHP. These structures were previously recommended as historically significant for architecture and are eligible for listing in the NRHP under Criterion A (Association with Events) and Criterion C (Embodiment of Distinctive Architectural Characteristics).²⁹

In the Future (2023) No Action Alternative noise exposure contour, the Triple Hangars would be exposed to noise levels of 65-70 DNL. Under the Future (2023) Proposed Action, the Triple Hangars would continue to be exposed to 65-70 DNL noise levels (See Section 4.12 *Noise and Noise-Compatible Land Use* for additional information). These noise levels would not significantly change the property's setting or diminish the integrity of the property's significant features because they would maintain their existing architecture and they would maintain their use as historic aviation hangars in close proximity to the airfield. In addition, the Future (2023) Proposed Action would not cause significant air pollutant emissions or water pollutants that could affect these structures (See Section 4.4 *Air Quality* and Section 4.15 *Water Resources* for additional information). Therefore, the FAA finds **No Adverse Effect** from the proposed undertaking on the Triple Hangars within the Indirect Effects APE.

²⁸ A buildings and structures inventory and evaluation of AFP 44 including the 12 ECMs was completed in 1996 by Earth Tech. The 12 ECMs were recommended as ineligible for inclusion in the National Register and the Arizona SHPO concurred. The FAA reviewed the previous determination and is providing a current determination.

²⁹ Harris Environmental Group, Inc., 2007, *A Class III Cultural Resources Investigation of 704 Acres at the Tucson International Airport in Support of Proposed Runway 11R/29L Relocation*.

4.9.2.2 Future (2028) Proposed Action

The Future (2028) Proposed Action would have the same effect on historical, architectural, archeological, or cultural resources as described for the Future (2023) Proposed Action.

4.9.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The Proposed Action does not exceed the applicable thresholds of significance; therefore, no mitigation measures are required. However, the FAA did not make a finding of significance on Archaeological sites (AZ BB:13:839[ASM] and AZ BB:13:851[ASM]). Archaeological sites (AZ BB:13:839[ASM] and AZ BB:13:851[ASM]) must be avoided by the Proposed Action, until such time as they can be evaluated. Due to the distance of these sites to the location of the proposed AANG MSA and roadway to be constructed as part of the Proposed Action, these two sites would be avoided and not disturbed. It will be the responsibility of the AANG to make sure these sites are avoided during construction activities for the proposed MSA.

Unanticipated Discovery Plan

If previously undocumented buried cultural resources are identified by TAA's contractors or by AANG's contractors during ground-disturbing activities, all work in the immediate vicinity of the discovery would stop until the find can be confirmed by a professional archaeologist and evaluated for its significance. It will be TAA and/or the AANG's responsibility to notify the FAA, SHPO, and tribal officer if undocumented resources are found. If human remains and/or funerary items are found on TAA property, Arizona Revised Statutes (ARS) Sections 41-865 and ARS 41-844 require that the ASM be notified of the discovery, so that cultural groups who claim cultural or religious affinity to them can make appropriate arrangements for the repatriation and reburial of the remains.

If human remains, funerary items, sacred objects, or objects of cultural patrimony are found on USAF lands, the appropriate USAF official would be notified of the discovery in order to follow guidelines pursuant to the Native American Graves Protection and Repatriation Act (43 C.F.R. § 10.4) and the "*Unanticipated Discoveries Plan for Archaeological Resources at AFP 44, Pima County, Arizona*".

4.10 LAND USE

This section presents the analysis of potential land use incompatibility of the No Action Alternative and the Proposed Action, including potential conflicts with surrounding land uses and zoning with the comprehensive plans of the surrounding communities.

The determination that significant impacts exist in the land use impact category is normally dependent on the significance of other impacts. Potential impacts on noise compatible land use are discussed in Section 4.12, *Noise and Noise Compatible Land Use*. Potential impacts related to potential for disruptions to communities or relocation of residences or businesses is discussed in Section 4.13, *Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks*. Regarding consistency with state and/or local plans, an inconsistency with surrounding land uses and zoning by itself does not automatically result in a significant impact.

4.10.1 NO ACTION ALTERNATIVE

4.10.1.1 Future (2023) No Action Alternative

No physical development or land transfers would occur under the Future (2023) No Action Alternative. Therefore, no impacts to land use would occur.

4.10.1.2 Future (2028) No Action Alternative

No physical development or land transfers would occur under the Future (2028) No Action Alternative. Therefore, no impacts to land use would occur.

4.10.2 PROPOSED ACTION

4.10.2.1 Future (2023) Proposed Action

Implementation of the Proposed Action would include the replacement of Runway 11R/29L with a full-length parallel runway. The distance between the parallel runways would be expanded to 800 feet. A center parallel taxiway would be constructed to allow aircraft to queue prior to crossing the other parallel runway. An additional parallel taxiway west of the relocated Runway 11R/29L would limit direct access from aircraft approaching the runway from the west. Various other taxiways improvements are proposed to promote pilot awareness on the airfield, most importantly the removal of the taxiways leading to the north ends of Runway 11L and 11R. Parallel Runways 11R/29L and 11L/29R would both measure 10,996 feet by 150 feet and have parallel thresholds at both ends to enhance visual acquisition of the runway end by pilots in the air.

The USAF owns land, known as AFP 44, adjacent to the Airport. The USAF currently leases this land to Raytheon Missile Systems, which operates AFP 44 for the manufacture of various military defense systems. The boundaries of AFP 44 have not changed since 1986 when the USAF deeded approximately 940 acres of land east/northeast of the current plant to the City of Tucson.

Impacts Due to Loss of USAF Property

As a result of implementing the Proposed Action, 12 ECMs located on AFP 44 would have to be demolished to prevent munitions storage safety arcs from extending onto the TUS airfield after relocation of Runway 11R/29L and to remove the ECMs from the relocated runway's safety areas. In order to demolish these 12 ECMS, which are currently owned by USAF, land identified as Parcel "F" would need to be acquired by TAA. This would provide TUS with sufficient land to maintain the necessary FAA required safety areas associated with the relocated runway. The value of Parcel "F" to the USAF is more than the direct acreage to be acquired by TAA. The loss of this land also includes the loss of land for use as AFP 44 safety arcs and future development area, as described below.

- Loss of approximately 58 acres conveyed from USAF to TAA valued at 100%
- Loss of ability to cast explosive arcs on 79 acres of TAA property per 1959 easement with deed restriction property interest valued at 50% (39.5 acres)
- Loss development capability on 115 acres of USAF property valued at 50% decrement (57.5 acres)
- Total loss to USAF of 155 acres of land use

This land transfer would result in a change to the Airport Layout Plan and a change to the existing property boundaries. The purpose of the land exchange would be to comply with FAA Airport Design Standards. Therefore, the Proposed Action would have an adverse impact on land use at AFP 44.

In order to mitigate the potential impacts to land use, TAA would transfer a parcel of land identified as Parcel "G" totaling 160 acres to the USAF for AFP 44. In addition, TAA would make available a parcel of land identified as Parcel "H" totaling 290 acres to the USAF for AFP 44 as needed, and to the Arizona Air National Guard for development of a new Munitions Storage Area (MSA) for Tucson Air National Guard Base. The FAA, TAA, and the USAF have agreed as described in a Memorandum of Understanding³⁰ that the mitigation is appropriate. The Proposed Action land transfers would also be consistent with future land use plans for Pima County and the City of Tucson as well as USAF and TAA.

³⁰ Tucson Airport Authority, Federal Aviation Administration, and United States Air Force, Effective date June 10, 2016 *Memorandum of Understanding for Real Property Transactions Related to Tucson International Airport Expansion*.

Impacts Due to Loss of USAF Operational Capabilities

The Proposed Action includes the demolition of six ECMs from Parcel "F". These six ECMs on Parcel "F" would be considered a direct loss to the USAF because their acquisition is required for FAA safety areas, including the RSA, OFA, and RPZ. The remaining six ECMs directly adjacent to Parcel "F" would be demolished also because they cannot be used for their designed purpose because they would no longer meet USAF explosives safety arc requirements. With the demolition of the 12 ECMs, USAF would lose approximately 177,000 cubic feet of storage capacity for AFP 44. Therefore, the Proposed Action would have an adverse impact on land use at AFP 44.

These ECMs are currently in use by the USAF for munitions storage. In order to maintain the existing munitions storage capacity of AFP 44 and mitigate the potential impacts to land use, replacement storage facilities would be constructed elsewhere on AFP 44 that would provide the same munitions storage capacity currently allowed to be stored in the 12 ECMs. These new ECMs would replace the 12 ECMs to be demolished on Parcel "F" and adjacent to Parcel "F".

Land Use Assurance

The FAA has received the required Land Use Assurance letter that TAA would continue to work closely with the City of Tucson and Pima County to ensure appropriate land use regulations are adopted and enforced in accordance with 49 U.S.C. § 47107(a)(10) to ensure land uses are compatible with airport operations. A copy of the land use assurance letter signed by the TAA on December 4, 2017 is included in **Appendix I**.

4.10.2.2 Future (2028) Proposed Action

The Future (2028) Proposed Action would have the same effects upon land use as described for the Future (2023) Proposed Action.

4.10.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

Mitigation for land use impacts include the exchange of land parcels that would provide for potential future economic growth and safety area protections for one of the region's major employers, and would help to ensure continued operational capabilities and safety buffers for AFP 44. In order to mitigate the adverse effects of the Proposed Action on USAF real property and operational capability at AFP 44, the following mitigation measures are built into the Proposed Action. These include actions to ensure that TUS operates in the safest manner possible, while maintaining the operational capability of AFP 44 and Tucson Air National Guard Base. The Proposed Action land transfers would be consistent with future land use plans for Pima County and the City of Tucson as well as USAF and TAA.

TAA, as the Project Sponsor, would apply for federal assistance to provide for the following mitigation measures:

- Provide funding to construct replacement ECMs with the same munitions storage capacity elsewhere on AFP 44 to maintain the capability and capacity of AFP-44, in accordance with FAA regulations and eligibility guidelines for reimbursable project expenses;
- Acquire Parcel "F" at fair market value from USAF;
- Transfer Parcel "G" to USAF for fair market value in exchange for Parcel "F";
- Transfer Parcel "H" ultimately to USAF at fair market value as needed; and,
- Terminate the 1959 easement over Airport property near the existing 12 ECMs.

4.11 NATURAL RESOURCES AND ENERGY SUPPLY

This section presents the analysis of potential impacts to natural resources and energy supplies as a result of the No Action Alternative and the Proposed Action. Natural resources may be impacted by a construction project and may require dirt, rock, or gravel that could diminish or deplete a supply of those and other natural resources. In addition, the operation of an airport requires energy supplies in the form of electricity, natural gas, aviation fuel, diesel fuel, and gasoline. There are two primary sources of energy consumption at an airport – stationary facilities and aircraft operations. Stationary facilities use utility energy (electricity and natural gas) to provide lighting, cooling, heat, and hot water to buildings, the airfield, and parking areas. Aircraft operations and GSE consume fuel energy including jet fuel (Jet A), low-lead aviation gasoline (AvGas), unleaded gasoline, and diesel fuel to operate the aircraft and power GSE.

The primary sources of electrical and natural gas energy consumption at TUS include the terminal building, airfield lighting, and lighting in the parking lots and garage. Electrical power is provided to TUS by Tucson Electric Power (TEP) and natural gas service is provided by Southwest Gas.³¹ The Airport does also generate electrically power from a solar canopy that is fed into the terminal complex central plant electrical system.

³¹ City of Tucson, 2017, Public and Private Utilities. Available on-line: <https://www.tucsonaz.gov/neighborhoods/utilities/> Accessed on October 23, 2017.

4.11.1 NO ACTION ALTERNATIVE

4.11.1.1 Future (2023) No Action Alternative

Electricity

There would be no increase in demand for electricity not occurring or anticipated to occur for the Future (2023) No Action Alternative. No facilities or lighting would be constructed due to this alternative. Electricity usage would continue to power the existing facilities and accommodate the forecast demand for travelers and aircraft operations.

Natural Gas

There would be no increase in demand for natural gas not occurring or anticipated to occur for the Future (2023) No Action Alternative. No new facilities would be constructed that would require natural gas due to this alternative. Natural gas consumption would continue to power the existing facilities and accommodate the forecast demand for travelers and aircraft operations at TUS.

Fuel Consumption

Aviation fuel demand at the Airport is a function of the number of operations at TUS and how they operate, including the length of time the aircraft are operating while on the ground and during takeoff and climb out, and the fuel required for the aircraft to reach the flight destination. Aircraft fuel, typically Jet-A or AvGas is provided to airport users by various suppliers that obtain and sell fuel through existing contracts and on an as-needed basis. No new facilities would be constructed that would increase the demand for fuel for the Future (2023) No Action Alternative. Current forecasts project growth in aircraft operations at TUS and additional aircraft movements would likely increase fuel consumption. In addition to aircraft fuel, diesel fuel and gasoline are used to power GSE and other service vehicles at TUS. The fuel requirement for GSE is roughly related to the number of aircraft operations that are serviced, which affects the number of GSE units and the amount of time in which they operate. As aircraft operations are projected to increase for the Future (2023) No Action Alternative, so is fuel usage for GSE.

Natural Resources

Resources such as sand, gravel, stone, concrete, asphalt water, wood, metals, plastic, and other resources are used for airport construction and maintenance. No new facilities would be constructed that would consume natural resources or other construction materials for the Future (2023) No Action Alternative. It is expected that small amounts of these materials would be used for general maintenance activities.

4.11.1.2 Future (2028) No Action Alternative

No physical development or land transfers would occur for the Future (2028) No Action Alternative. Therefore, there would be no impacts to natural resources and energy supply not occurring or anticipated to occur.

4.11.2 PROPOSED ACTION

4.11.2.1 Future (2023) Proposed Action

The objective of the assessment is to determine whether the Proposed Action would have the potential to exceed the local energy supply as compared to the No Action Alternative. The FAA has not established a significance threshold for natural resources and energy supply; however, per FAA Order 1050.1F, the analysis should consider situations in which the proposed action or alternative(s) would have the potential to cause demand to exceed available or future supplies of these resources. The analysis includes a discussion of the future demands for energy and natural resources, including changes in demand for utility services, fuel consumption, and consumable materials for operation and construction activities. The assessment also determined whether there would be a requirement for the use of rare natural resources that could potentially deplete the supply of natural resources in the area.

Electricity

Additional airfield lighting would be installed for the proposed new runway and taxiways as required for safe operations as a result of implementing the Proposed Action. This proposed additional lighting would cause an increase in demand for electricity. The increase in runway length and additional taxiway pavement as described in Chapter 2, *Alternatives* would require additional lighting to be installed and operated.

Estimates of electricity usage was based on the number of lights needed for the proposed new runway and new taxiways using similar lighting and spacing with similar electricity demand as the existing airfield. The estimates did not include the use of LED lighting in order to present the maximum potential demand for electricity. It is estimated that proposed new runway and taxiway lighting would require approximately 254,000 kilowatt hours (kWh) per year.

In addition, the Proposed Action includes proposed facilities for the replacement magazines on AFP 44 and the MSA for the AANG in Parcel "H." The operation of these proposed facilities would result in a minimal increase in demand for electricity. Energy usage calculations were based on lighting and cooling requirements for similar sized facilities. It is estimated that the proposed new buildings and replacement magazines would require approximately 77,000 kWh per year for lighting and cooling.

The estimated increase in energy demand that would occur as a result of the Proposed Action is presented in **Table 4-18**.

**Table 4-18
PROJECTED ANNUAL INCREASE IN ENERGY DEMAND FROM THE PROPOSED ACTION
Tucson International Airport**

	ELECTRICITY
Proposed Action	331,000 kWh per year

Notes: kWh is kilowatt hours.

Source: Landrum & Brown analysis, 2018.

While implementing the Proposed Action would potentially increase the demand for electricity, the potential demand would not exceed the existing and future supplies due to the Airport's increase in solar power production and TEP's existing and future electric generation capacity. The electric utility, TEP, was contacted to determine if the utility has the capacity to meet the estimated increase in demand. TEP confirmed they have sufficient capacity to supply the potential increase in electricity demand due to implementing the Proposed Action.³²

Natural Gas

As a result of implementing the Proposed Action, additional natural gas would be needed to provide for the proposed MSA for the AANG in Parcel "H." These facilities are anticipated to be less than 50,000 square feet for potential storage facilities, guard buildings, etc.; therefore, the potential increase in demand for natural gas would be minimal due to the small size of the proposed facilities. During construction, it is not anticipated there would be any additional need for natural gas. The estimated increase in natural gas demand due to the Proposed Action is presented in **Table 4-19**.

**Table 4-19
PROJECTED ANNUAL INCREASE IN NATURAL GAS DEMAND FROM THE PROPOSED ACTION
Tucson International Airport**

	NATURAL GAS
Proposed Action	3,980 MMBTUs per year

Notes: MMBTU is million BTU (British thermal unit). One BTU of heat is equal to 1/180 of the heat required to raise the temperature of one pound of water from 32 degrees Fahrenheit to 212 degrees Fahrenheit at a constant pressure of one atmosphere.

Source: Landrum & Brown analysis, 2018

³² Erik Reed, Tucson Electric Power, 2018, RE: Tucson International Airport-Proposed Project Electricity Requirements, Email dated January 23.

While implementing the Proposed Action would potentially increase the demand for natural gas, the potential demand would not exceed the existing and future supplies due to Southwest Gas's existing and future natural gas capacity. The natural gas utility, Southwest Gas was contacted to determine if the utility has the capacity to meet the estimated increase in demand.

Southwest Gas stated they have sufficient capacity to supply the potential increase in natural gas demand due to implementing the Proposed Action.³³ Additionally, Southwest Gas stated they are in the process of installing a new natural gas main line along Aerospace Parkway from Nogales Highway to South Raytheon Parkway, which is west of Parcel "H". It may be necessary when final design of the proposed AANG facilities are determined to extend the line along Aerospace Parkway to the proposed new buildings.

Fuel Consumption

As a result of implementing the Proposed Action, proposed airfield improvements would be constructed that may cause a portion of aircraft operations to taxi a farther distance than they would with the No Action Alternative. The proposed replacement runway would be constructed approximately 94 feet farther from the existing terminal, general aviation, and AANG facilities, which would cause a slight overall increase in average aircraft taxi distance. Due to the short proposed taxi distance and the availability of fuel in the region, any increase in demand is expected to be minimal and would not exceed the existing supplies.

During construction, it is anticipated there would be increased demand for diesel fuel for construction vehicles. While the operation of the Proposed Action would potentially increase in the demand for Jet A, AvGas, unleaded gasoline, and diesel fuel due to the potential slight increase in taxi times, any increase in demand for fuel is expected to be minimal and would not exceed the existing and future supplies.

Natural Resources

There would be no increased demand for natural resources due to the Proposed Action as compared to the No Action Alternative for operational purposes. However, as a result of implementing the Proposed Action, proposed construction activities would require the use of typical paving and construction materials such as sand, gravel, concrete, and asphalt. Metal wiring and plastic insulation would be used for new lighting. These materials are not in short supply and construction of the Proposed Action would not exceed the available supply of these materials. Construction activities may require natural resources such as dirt for fill material, asphalt, water, wood, or gravel. The Airport has a stockpile of dirt for fill material southeast of the terminal area on Airport property. Asphalt, sand, and gravel can be found six miles east of the Airport at the Swann Road Plant and at other vendor locations in Pima County.

³³ Michael Gomez, Southwest Gas, 2017, RE: Tucson International Airport-Southwest Gas Contact Info, Email dated December 19.

4.11.2.2 Future (2028) Proposed Action

The Future (2028) Proposed Action would have the same effects upon natural resources and energy supply as described for the Future (2023) Proposed Action.

4.11.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

No demand for energy or natural resources has been identified due to the Proposed Action that would exceed current or future supplies. The Proposed Action does not exceed the applicable thresholds of significance; therefore, no mitigation measures are required. However, the following minimization measures are being provided to further minimize impacts from the Proposed Action. TAA would incorporate energy efficiency and sustainable measures to the extent possible. TAA plans to recycle and reuse existing pavement materials (i.e., "old pavement") for subgrade and base course for the Proposed Action to the maximum extent allowed by FAA standards.³⁴

4.12 NOISE AND NOISE-COMPATIBLE LAND USE

This section presents the analysis of aircraft noise exposure to surrounding communities as a result of the No Action Alternative and the Proposed Action. Additional information on the background and characteristics of noise are provided in **Appendix G**. The impact of airport-related noise levels upon the surrounding area is presented in terms of the number and type of noise-sensitive land uses located within the noise contours for the Proposed Action and the No Action Alternative for both 2023 and 2028. This is in accordance with FAA Order 1050.1F guidance, which specifies that an operational impact analysis should be prepared for the year of anticipated project implementation and five years after implementation.³⁵

The analysis of noise exposure around TUS was prepared using the latest version of the *Aviation Environmental Design Tool (AEDT)*, Version 2d. Inputs to the AEDT include number of aircraft operations during the time period evaluated, the types of aircraft flown, time of day aircraft operations occur, runway definition, how frequently each runway is used for arriving and departing aircraft, the routes of flight used when arriving to and departing from the runways, the proportional use of those flight routes, and the length of the trips. The AEDT calculates noise exposure for the area around the airport and outputs contours of equal noise exposure using the Day-Night Average Sound Level (DNL) metric. For this EIS, equal noise contours for the levels of DNL 65, 70, and 75 dB were calculated and represent average-annual day conditions.

³⁴ Eric Roudebush, TAA, November 21, 2017, RE: Recycling of old pavements for new runway project at TUS.

³⁵ FAA, 2015, 1050.1F Desk Reference, *Environmental Impacts: Policies and Procedures*, 11. Noise and Noise-Compatible Land Use, 11.3 Environmental Consequences.

4.12.1 NO ACTION ALTERNATIVE

4.12.1.1 Future (2023) No Action Alternative

This section discusses the methodology and results of the analysis and the noise contours for the Future (2023) No Action Alternative.

Aircraft Activity Levels and Fleet Mix

The average daily number of aircraft arrivals and departures for the Future (2023) No Action Alternative noise contour are calculated by determining the total annual operations and dividing by 365 (days in a year). **Table 4-20** provides the number of average daily operations for the four categories of users operating at the Airport. **Table 4-21** shows the total number of operations by detailed aircraft type and by time of day (daytime or nighttime). The Future (2023) No Action Alternative annual average day included 414.65 total operations, 7.0 percent of which occurred during the nighttime hours of 10:00 p.m. to 6:59 a.m.

Similar to the existing conditions, approximately 47 percent of the F-16 Fighting Falcon operations flown by the AANG are expected to use afterburners in the Future (2023) No Action Alternative. Of the 11,919 total F-16 departures (32.7 average-annual day), 5,602 (15.34 average-annual day) were modeled using afterburners.

Table 4-20
SUMMARY OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY –
FUTURE (2023) NO ACTION ALTERNATIVE
Tucson International Airport

	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY	TOTAL
NUMBER OF OPERATIONS	119.53	60.46	146.99	86.92	414.65

Source: Landrum & Brown, September 2017, Aviation Activity Forecast.

**Table 4-21
AVERAGE DAILY OPERATIONS BY AIRCRAFT TYPE – FUTURE (2023) NO
ACTION ALTERNATIVE
Tucson International Airport**

AIRCRAFT TYPE	ARRIVALS		DEPARTURES		TOTAL OPERATIONS
	DAYTIME	NIGHTTIME	DAYTIME	NIGHTTIME	
Air Carrier / Cargo					
Airbus A319-100 Series	2.59	0.00	2.50	0.08	5.17
Airbus A320-200 Series	0.14	0.00	0.11	0.03	0.27
Airbus A321-200 Series	0.14	0.03	0.11	0.06	0.33
Boeing 737-200 Series	1.58	0.00	0.96	0.61	3.15
Boeing 737-700 MAX	0.29	0.04	0.29	0.05	0.67
Boeing 737-700 Series	8.18	3.31	8.59	2.89	22.98
Boeing 737-800 MAX	0.63	0.09	0.62	0.11	1.45
Boeing 737-800 with winglets	7.82	1.15	7.66	1.31	17.94
Boeing 737-900 MAX	0.06	0.01	0.06	0.01	0.13
Boeing 737-900 Series	0.96	0.02	0.93	0.04	1.95
Boeing 757-200 Series	0.06	0.00	0.03	0.03	0.11
Boeing 767-300 ER Freighter	0.63	0.77	0.97	0.43	2.79
Boeing MD-90	2.19	0.02	1.56	0.66	4.44
Bombardier CRJ-700-ER	16.36	0.00	13.08	3.27	32.71
Bombardier CRJ-900-ER	4.21	2.63	5.70	1.14	13.68
Bombardier CS-100	0.12	0.05	0.12	0.04	0.33
Embraer ERJ175-LR	4.75	0.20	4.75	0.20	9.91
Mitsubishi MRJ-90	0.67	0.09	0.74	0.02	1.51
Air Carrier / Cargo Subtotal	51.35	8.41	48.78	10.98	119.53
Air Taxi / Commuter					
Avions de Transport Regional ATR 72-200	0.56	0.02	0.58	0.00	1.15
Bombardier Challenger 600	9.80	1.37	9.42	1.75	22.33
Embraer EMB120 Brasilia	0.79	0.00	0.47	0.31	1.57
Fairchild SA-227-AC Metro III	0.05	0.00	0.04	0.01	0.11
Pilatus PC-12	2.08	0.21	2.03	0.25	4.58
Raytheon Beech 1900-C	0.09	0.00	0.09	0.00	0.17
Raytheon Super King Air 200	14.78	0.49	14.22	1.05	30.55
Air Taxi/Commuter Subtotal	28.14	2.09	26.85	3.37	60.46

Table 4-21, Continued
AVERAGE DAILY OPERATIONS BY AIRCRAFT TYPE – FUTURE (2023) NO ACTION ALTERNATIVE
Tucson International Airport

AIRCRAFT TYPE	ARRIVALS		DEPARTURES		TOTAL OPERATIONS
	DAYTIME	NIGHTTIME	DAYTIME	NIGHTTIME	
General Aviation					
Cessna 172 Skyhawk	47.75	1.26	47.70	1.32	98.03
Cessna 525 CitationJet	18.35	1.03	18.81	0.58	38.77
Piper PA-31 Navajo	0.67	0.04	0.63	0.09	1.43
Bell 206 JetRanger	4.38	0.00	4.38	0.00	8.77
GA Subtotal	71.16	2.34	71.52	1.98	146.99
Military					
Fairchild A-10A Thunderbolt II	0.38	0.00	0.38	0.00	0.76
Lockheed Martin F-16 Fighting Falcon	32.65	0.00	32.65	0.00	65.31
Military Closed Pattern					
Lockheed Martin F-16 Fighting Falcon	10.8	0.00	10.8	0.00	21.61*
Military Subtotal	43.84	0.00	43.84	0.00	87.67
Total	194.49	12.83	190.99	16.33	414.65

Notes: Daytime = 7:00 am – 9:59 pm, Nighttime = 10:00 pm – 6:59 am.

* Includes touch-and-go/closed pattern operations, which are counted as one arrival and one departure.

Source: Landrum & Brown, September 2017, Aviation Activity Forecast.

Runway Definition

Under the Future (2023) No Action Alternative, no runway relocation or other airfield changes would occur. Therefore, the runway definition discussed for the existing conditions in Section 3.12, *Noise and Noise-Compatible Land Use*, would remain the same for the Future (2023) No Action Alternative.

Runway End Utilization

Fixed Wing Operations

Runway end utilization for the Future (2023) No Action Alternative is expected to remain similar to the existing conditions. Minor differences in the percent use by runway end would occur due to some differences in the distribution of aircraft types within a category. Runway use percentages modeled for the Future (2023) No Action Alternative noise contour are shown in **Table 4-22**.

**Table 4-22
RUNWAY UTILIZATION – FUTURE (2023) NO ACTION ALTERNATIVE
Tucson International Airport**

AIRCRAFT CATEGORY	RUNWAY END						
	11L	29R	11R	29L	3	21	Total
Daytime Arrivals							
Air Carrier / Cargo	69.8%	29.9%	0.0%	0.0%	0.1%	0.2%	100.0%
Air Taxi / Commuter	66.7%	20.8%	0.9%	0.5%	7.6%	3.6%	100.0%
General Aviation	65.6%	13.2%	11.2%	3.4%	2.1%	4.4%	100.0%
Military	76.0%	24.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Total	69.9%	21.8%	3.3%	1.1%	1.9%	2.0%	100.0%
Nighttime Arrivals							
Air Carrier / Cargo	96.4%	3.4%	0.0%	0.0%	0.0%	0.2%	100.0%
Air Taxi / Commuter	79.9%	16.7%	0.0%	0.0%	0.2%	3.2%	100.0%
General Aviation	61.7%	13.9%	8.2%	2.2%	0.0%	14.0%	100.0%
Military	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	88.6%	7.2%	1.2%	0.3%	0.0%	2.7%	100.0%
Daytime Departures							
Air Carrier / Cargo	72.4%	27.0%	0.1%	0.1%	0.3%	0.1%	100.0%
Air Taxi / Commuter	65.3%	11.8%	3.7%	1.4%	0.5%	17.3%	100.0%
General Aviation	65.8%	7.2%	14.1%	3.9%	0.9%	8.1%	100.0%
Military	76.0%	24.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Total	68.6%	19.4%	4.8%	1.4%	0.4%	5.3%	100.0%
Nighttime Departures							
Air Carrier / Cargo	65.4%	34.2%	0.1%	0.0%	0.1%	0.2%	100.0%
Air Taxi / Commuter	90.4%	0.8%	0.0%	0.0%	0.0%	8.8%	100.0%
General Aviation	81.3%	0.0%	11.3%	2.5%	3.0%	1.9%	100.0%
Military	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	72.2%	24.0%	1.1%	0.2%	0.3%	2.2%	100.0%

Source: FAA Radar Data, Landrum & Brown, 2018.

Helicopter Operations

Similar to the existing conditions, helicopters were modeled for the Future (2023) No Action Alternative noise contour at the helipad located to the east of Runway 21.

Flight Tracks

Flight track locations for the Future (2023) No Action Alternative are expected to be the same as the existing conditions. Flight track utilization percentages were determined for each aircraft type from existing radar data. Those same percentages by aircraft type were used to model the Future (2023) No Action Alternative noise contour. Due to some differences in the distribution of aircraft types within a category between existing and Future (2023) No Action Alternative some minor differences in percent flight track utilization occurs when summarized by aircraft category. The percent utilization modeled for each track in the Future (2023) No Action Alternative is provided in **Table 4-23 through Table 4-25**.

**Table 4-23
ARRIVAL FLIGHT TRACK UTILIZATION – FUTURE (2023) NO ACTION
ALTERNATIVE
Tucson International Airport**

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
11L	AXC2	0.3%	0.1%	0.1%	0.0%
	AXC3	0.7%	0.3%	0.3%	0.0%
	AXC40	0.7%	9.1%	8.3%	0.0%
	AXC41	0.3%	5.6%	5.1%	0.0%
	AXC5	0.7%	1.0%	1.0%	0.0%
	AXC70	14.7%	12.4%	12.1%	0.0%
	AXC71	22.4%	19.4%	18.8%	0.0%
	AXC72	7.4%	7.9%	7.5%	0.0%
	AXC80	10.2%	4.3%	4.4%	0.0%
	AXC81	6.8%	2.9%	3.0%	0.0%
	AXC82	6.8%	2.9%	3.0%	0.0%
	AXC83	1.5%	1.4%	1.3%	0.0%
	AXC9	1.0%	0.4%	0.4%	0.0%
	AXM1	0.0%	0.0%	0.0%	17.0%
	AXO1	0.0%	0.0%	0.0%	2.1%
	AXO2	0.0%	0.0%	0.0%	0.0%
	AXO3	0.0%	0.0%	0.0%	2.1%
	AXO4	0.0%	0.0%	0.0%	4.8%
	AXO5	0.0%	0.0%	0.0%	1.9%
	AXO6	0.0%	0.0%	0.0%	1.9%
	AXO7	0.0%	0.0%	0.0%	4.8%
	11LSFO	0.0%	0.0%	0.0%	3.4%

Table 4-23, Continued
ARRIVAL FLIGHT TRACK UTILIZATION – FUTURE (2023) NO ACTION
ALTERNATIVE
Tucson International Airport

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
29R	29RSFO	0.0%	0.0%	0.0%	1.1%
	AYC15	1.2%	0.4%	0.3%	0.0%
	AYC2	2.6%	6.5%	4.0%	0.0%
	AYC4	0.4%	0.1%	0.1%	0.0%
	AYC5	1.4%	0.5%	0.3%	0.0%
	AYC60	4.1%	4.3%	2.7%	0.0%
	AYC61	2.6%	0.9%	0.7%	0.0%
	AYC62	1.6%	0.6%	0.4%	0.0%
	AYC70	4.6%	4.4%	2.8%	0.0%
	AYC71	4.8%	1.7%	1.2%	0.0%
	AYC72	2.9%	1.0%	0.7%	0.0%
	AYM1	0.0%	0.0%	0.0%	5.4%
	AYO1	0.0%	0.0%	0.0%	3.0%
	AYO2	0.0%	0.0%	0.0%	2.6%
11R	AZC1	0.0%	0.0%	0.1%	0.0%
	AZC11	0.0%	0.1%	0.2%	0.0%
	AZC6	0.0%	0.2%	0.7%	0.0%
	AZC7	0.0%	0.3%	0.8%	0.0%
	AZC8	0.0%	0.2%	0.4%	0.0%
	AZC9	0.0%	0.0%	0.3%	0.0%
	11RSFO	0.0%	0.0%	0.0%	3.4%
	AXM1F	0.0%	0.0%	0.0%	17.0%
	AXO1F	0.0%	0.0%	0.0%	2.1%
	AXO3F	0.0%	0.0%	0.0%	2.1%
	AXO4F	0.0%	0.0%	0.0%	4.8%
	AXO5F	0.0%	0.0%	0.0%	1.9%
	AXO6F	0.0%	0.0%	0.0%	1.9%
	AXO7F	0.0%	0.0%	0.0%	4.8%
	TNGA11R	0.0%	0.0%	8.7%	0.0%
29L	AWC2	0.0%	0.1%	0.2%	0.0%
	AWC5	0.0%	0.3%	0.5%	0.0%
	AWM1	0.0%	0.0%	0.0%	0.0%
	29RSFOF	0.0%	0.0%	0.0%	1.1%
	AYM1F	0.0%	0.0%	0.0%	5.4%
	AYO1F	0.0%	0.0%	0.0%	3.0%
	AYO2F	0.0%	0.0%	0.0%	2.6%
	TNGA29L	0.0%	0.0%	2.7%	0.0%

Table 4-23, Continued
ARRIVAL FLIGHT TRACK UTILIZATION – FUTURE (2023) NO ACTION
ALTERNATIVE
Tucson International Airport

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
3	AVC1	0.0%	1.8%	0.5%	0.0%
	AVC2	0.0%	1.7%	0.4%	0.0%
	AVC5	0.0%	1.7%	0.4%	0.0%
	AVC7	0.0%	1.8%	0.5%	0.0%
	AVC8	0.0%	0.1%	0.1%	0.0%
21	AQC1	0.1%	0.5%	0.7%	0.0%
	AQC10	0.0%	0.6%	0.8%	0.0%
	AQC2	0.0%	0.3%	0.4%	0.0%
	AQC3	0.0%	1.4%	1.9%	0.0%
	AQC4	0.0%	0.3%	0.4%	0.0%
	AQC7	0.1%	0.5%	0.7%	0.0%
Total		100.0%	100.0%	100.0%	100.0%

Source: FAA, 2017, Radar Data; Landrum & Brown analysis, 2018.

**Table 4-24
DEPARTURE FLIGHT TRACK UTILIZATION – FUTURE (2023) NO ACTION
ALTERNATIVE
Tucson International Airport**

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
11L	DXC1	0.0%	13.0%	13.4%	0.0%
	DXC100	0.1%	0.0%	0.0%	0.0%
	DXC101	0.1%	0.0%	0.0%	0.0%
	DXC102	0.4%	0.2%	0.2%	0.0%
	DXC103	0.1%	0.5%	0.5%	0.0%
	DXC104	1.0%	0.5%	0.5%	0.0%
	DXC11	3.9%	7.2%	7.2%	0.0%
	DXC120	10.5%	9.4%	9.1%	0.0%
	DXC121	2.1%	3.4%	3.4%	0.0%
	DXC122	6.0%	5.3%	5.2%	0.0%
	DXC13	1.4%	1.2%	1.1%	0.0%
	DXC140	6.8%	3.8%	3.6%	0.0%
	DXC141	5.7%	3.3%	3.1%	0.0%
	DXC142	5.0%	2.5%	2.3%	0.0%
	DXC15	2.0%	1.0%	0.9%	0.0%
	DXC16	2.5%	1.7%	1.6%	0.0%
	DXC17	2.3%	1.2%	1.1%	0.0%
	DXC2	0.2%	1.0%	1.0%	0.0%
	DXC3	0.1%	0.0%	0.0%	0.0%
	DXC4	0.1%	0.5%	0.5%	0.0%
	DXC5	5.3%	2.6%	2.4%	0.0%
	DXC60	5.0%	2.5%	2.3%	0.0%
	DXC61	2.6%	1.8%	1.7%	0.0%
	DXC62	3.6%	2.7%	2.6%	0.0%
	DXC7	0.6%	0.3%	0.3%	0.0%
	DXC8	2.0%	1.0%	0.9%	0.0%
	DXC9	1.3%	1.1%	1.1%	0.0%
	DXM10	0.0%	0.0%	0.0%	6.1%
	DXM11	0.0%	0.0%	0.0%	3.0%
	DXM12	0.0%	0.0%	0.0%	3.0%
	DXM20	0.0%	0.0%	0.0%	6.5%
	DXM21	0.0%	0.0%	0.0%	3.0%
	DXM22	0.0%	0.0%	0.0%	3.0%
	DXM3	0.2%	0.1%	0.1%	0.0%
	DXM40	0.0%	0.0%	0.0%	4.2%
	DXM41	0.0%	0.0%	0.0%	3.0%
	DXM42	0.0%	0.0%	0.0%	4.2%

**Table 4-24, Continued
DEPARTURE FLIGHT TRACK UTILIZATION – FUTURE (2023) NO ACTION
ALTERNATIVE
Tucson International Airport**

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
11L (Cont.)	DXM50	0.0%	0.0%	0.0%	0.4%
	DXM51	0.0%	0.0%	0.0%	0.4%
	DXM6	0.5%	0.2%	0.2%	0.4%
	DXM7	0.1%	0.0%	0.0%	0.8%
29R	DYC1	0.4%	0.1%	0.0%	0.0%
	DYC10	1.1%	0.2%	0.1%	0.0%
	DYC11	1.7%	0.3%	0.2%	0.0%
	DYC12	2.3%	0.4%	0.2%	0.0%
	DYC13	0.6%	0.7%	0.5%	0.0%
	DYC14	3.8%	0.7%	0.4%	0.0%
	DYC20	0.8%	0.4%	0.3%	0.0%
	DYC21	2.3%	0.7%	0.4%	0.0%
	DYC22	0.8%	0.4%	0.3%	0.0%
	DYC3	2.4%	0.5%	0.2%	4.0%
	DYC4	1.3%	1.1%	0.8%	0.0%
	DYC5	0.6%	0.7%	0.5%	0.0%
	DYC60	2.3%	0.7%	0.4%	0.0%
	DYC61	1.6%	1.4%	1.0%	0.0%
	DYC62	2.3%	1.5%	1.1%	0.0%
	DYC8	2.4%	0.5%	0.2%	4.0%
	DYC9	1.7%	0.3%	0.2%	0.0%
	YM1	0.0%	0.0%	0.0%	4.1%
11R	DXM10F	0.0%	0.0%	0.0%	6.1%
	DXM11F	0.0%	0.0%	0.0%	3.0%
	DXM12F	0.0%	0.0%	0.0%	3.0%
	DXM20F	0.0%	0.0%	0.0%	6.5%
	DXM21F	0.0%	0.0%	0.0%	3.0%
	DXM22F	0.0%	0.0%	0.0%	3.0%
	DXM40F	0.0%	0.0%	0.0%	4.2%
	DXM41F	0.0%	0.0%	0.0%	3.0%
	DXM42F	0.0%	0.0%	0.0%	4.2%
	DXM50F	0.0%	0.0%	0.0%	0.4%
	DXM51F	0.0%	0.0%	0.0%	0.4%
	DXM6F	0.0%	0.0%	0.0%	0.4%
	DXM7F	0.0%	0.0%	0.0%	0.8%
	DZC1	0.0%	0.3%	0.6%	0.0%
	DZC10	0.1%	0.1%	0.6%	0.0%
	DZC12	0.0%	0.2%	0.3%	0.0%

**Table 4-24, Continued
DEPARTURE FLIGHT TRACK UTILIZATION – FUTURE (2023) NO ACTION
ALTERNATIVE
Tucson International Airport**

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
11R (Cont.)	DZC3	0.0%	0.2%	0.5%	0.0%
	DZC4	0.0%	0.4%	0.5%	0.0%
	DZC5	0.0%	0.9%	1.2%	0.0%
	DZC7	0.0%	1.1%	1.5%	0.0%
	DZC9	0.0%	0.1%	0.2%	0.0%
	TNGD11R	0.0%	0.0%	8.7%	0.0%
29L	DWC1	0.0%	0.4%	0.6%	0.0%
	DWC2	0.0%	0.3%	0.4%	0.0%
	DWC6	0.0%	0.1%	0.0%	0.0%
	DWC8	0.1%	0.2%	0.0%	0.0%
	DWM1	0.0%	0.1%	0.2%	0.0%
	DYC3F	0.0%	0.0%	0.0%	4.0%
	DYC8F	0.0%	0.0%	0.0%	4.0%
	YM1F	0.0%	0.0%	0.0%	4.1%
	TNGD29L	0.0%	0.0%	2.7%	0.0%
3	DVC20	0.0%	0.2%	0.5%	0.0%
	DVC21	0.0%	0.1%	0.3%	0.0%
	DVC22	0.0%	0.1%	0.3%	0.0%
	DVC4	0.2%	0.0%	0.0%	0.0%
21	DQC10	0.0%	2.0%	1.2%	0.0%
	DQC11	0.0%	4.1%	1.7%	0.0%
	DQC2	0.0%	5.3%	1.5%	0.0%
	DQC3	0.0%	0.0%	0.9%	0.0%
	DQC6	0.1%	0.0%	0.0%	0.0%
	DQC7	0.0%	3.2%	1.3%	0.0%
	DQC8	0.1%	0.1%	0.9%	0.0%
	DQC9	0.0%	1.6%	0.4%	0.0%
Total		100.0%	100.0%	100.0%	100.0%

Source: FAA, 2017, Radar Data; Landrum & Brown analysis, 2018.

**Table 4-25
TOUCH-AND-GO FLIGHT TRACK UTILIZATION – FUTURE (2023) NO ACTION
ALTERNATIVE
Tucson International Airport**

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
11L	FTNG11L1	0.0%	19.0%	0.0%	15.2%
	FTNG11L2	0.0%	19.0%	0.0%	11.4%
	FTNG11L3	0.0%	19.0%	0.0%	11.4%
	FTNG11L4	0.0%	19.0%	0.0%	0.0%
29R	FTNG29R	0.0%	12.0%	0.0%	6.0%
	FTNG29R2	0.0%	12.0%	0.0%	6.0%
11R	FTNG11R1	0.0%	0.0%	0.0%	15.2%
	FTNG11R2	0.0%	0.0%	0.0%	11.4%
	FTNG11R3	0.0%	0.0%	0.0%	11.4%
	TZ1	76.0%	0.0%	0.0%	0.0%
29L	FTNG29L	0.0%	0.0%	0.0%	6.0%
	FTNG29L2	0.0%	0.0%	0.0%	6.0%
	TW1	24.0%	0.0%	0.0%	0.0%
Total		100.0%	100.0%	0.0%	0.0%

Source: FAA, 2017, Radar Data; Landrum & Brown analysis, 2018.

Aircraft Trip Length and Operational Profiles

Civil Operations

The trip lengths flown from TUS for the Future (2023) No Action Alternative are not expected to change from existing conditions because the Proposed Action is an airfield safety enhancement project, not an airfield capacity enhancement project. **Table 4-26** indicates the proportion of the operations that fell within each of the nine trip length categories for the Future (2023) No Action Alternative.

Table 4-26
DEPARTURE TRIP LENGTH DISTRIBUTION – FUTURE (2023) NO ACTION
ALTERNATIVE
Tucson International Airport

STAGE LENGTH	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
1	51.5%	100.0%	100%	100%
2	31.9%	-	-	-
3	16.3%	-	-	-
4	0.2%	-	-	-
5	-	-	-	-
6	-	-	-	-
7	-	-	-	-
8	-	-	-	-
9	-	-	-	-

Source: Official Airline Guide; FAA, 2017, Radar Data; Landrum & Brown, 2018.

Military Operations

It is expected that military profiles described for the existing conditions would remain the same for the Future (2023) No Action Alternative because the mission of the F-16s at TUS is for specific training purposes.

Table 4-27 provides the number of operations for the F-16 departure and arrival profiles modeled for the Future (2023) No Action Alternative noise contour.

Table 4-27
F-16 OPERATIONAL PROFILES – FUTURE (2023) NO ACTION ALTERNATIVE
Tucson International Airport

PROCEDURE	NUMBER OF DEPARTURES	NUMBER OF ARRIVALS	TOTAL
Military Power	6,317	-	6,317
Afterburner Power	5,590	-	5,590
Afterburner Power – Flight Check	12		12
Instrument Procedure	-	5,245	5,245
Initial 1*	-	3,024	3,024
Initial 2*	-	1,342	1,342
Initial 3*	-	1,235	1,235
Simulated Flame Out	-	1,073	1,073
Closed Pattern	3,943	3,943	7,886
Total	15,862	15,862	31,724

* The INITIAL Profile varied in length to simulate the different turning points on arrival.

Source: Landrum & Brown, 2018.

4.12.1.2 Future (2023) No Action Alternative Noise Contours

Exhibit 4-5 reflects the Future (2023) No Action Alternative average-annual noise contours at TUS. Noise contours are presented for the 65, 70, and 75 DNL. The DNL 65 dB Future (2023) No Action Alternative noise contour extends approximately 4.41 miles to the southeast beyond Runway 29R end and extends approximately 4.83 miles to the southeast beyond Runway 29L end. This area is mostly vacant/undeveloped land with some commercial/industrial uses located within Pima County.

To the northwest of the Airport, the noise contour primarily reflects usage by aircraft arriving from the northwest and, to a lesser degree, aircraft departing to the northwest. The DNL 65 dB noise contour extends approximately 2.11 miles to the northwest from Runway 11L end and extends approximately 1.76 miles to the northwest beyond Runway 11R. The area northwest of TUS within the DNL 65 dB contour is comprised of residential and commercial land uses within the City of Tucson. There are no public schools, churches, nursing homes, hospitals, or libraries within any of the contours.

Summaries of the residential population and housing units affected by noise levels exceeding DNL 65 dB for the Future (2023) No Action Alternative noise contours are provided in **Table 4-28**.

**Table 4-28
HOUSING AND POPULATION FOR FUTURE (2023) NO ACTION
ALTERNATIVE NOISE CONTOURS
Tucson International Airport**

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	DNL 65+ dB
Housing Units				
Single-Family Residential	388	0	0	388
Multi-Family Residential	35	0	0	35
Manufactured Housing	195	0	0	198
Total Housing Units	618	0	0	618
Population				
Single-Family Residential	1,305	0	0	1,305
Multi-Family Residential	121	0	0	121
Manufactured Housing	675	0	0	675
Total Population	2,101	0	0	2,101

Notes: Population numbers are estimates based on the 2000 United States Census average household size per number of housing units.

Source: Landrum & Brown, 2018.

4.12.1.3 Future (2028) No Action Alternative

This section discusses the methodology and results of the analysis and the noise contours for the Future (2028) No Action Alternative.

Aircraft Activity Levels and Fleet Mix

The average daily number of aircraft arrivals and departures for the Future (2028) No Action Alternative noise contour are calculated by determining the total annual operations and dividing by 365 (days in a year). **Table 4-29** provides the number of average daily operations for the four categories of users operating at the Airport. **Table 4-30** shows the total number of operations by detailed aircraft type and by time of day (daytime or nighttime). The Future (2028) No Action Alternative annual average day included 431.53 total operations, 7.3 percent of which occurred during the nighttime hours of 10:00 p.m. to 6:59 a.m.

Similar to the existing conditions and Future (2023) No Action Alternative, approximately 47 percent of the F-16 Fighting Falcon operations flown by the AANG are expected to use afterburners in the Future (2028) No Action Alternative for takeoff.

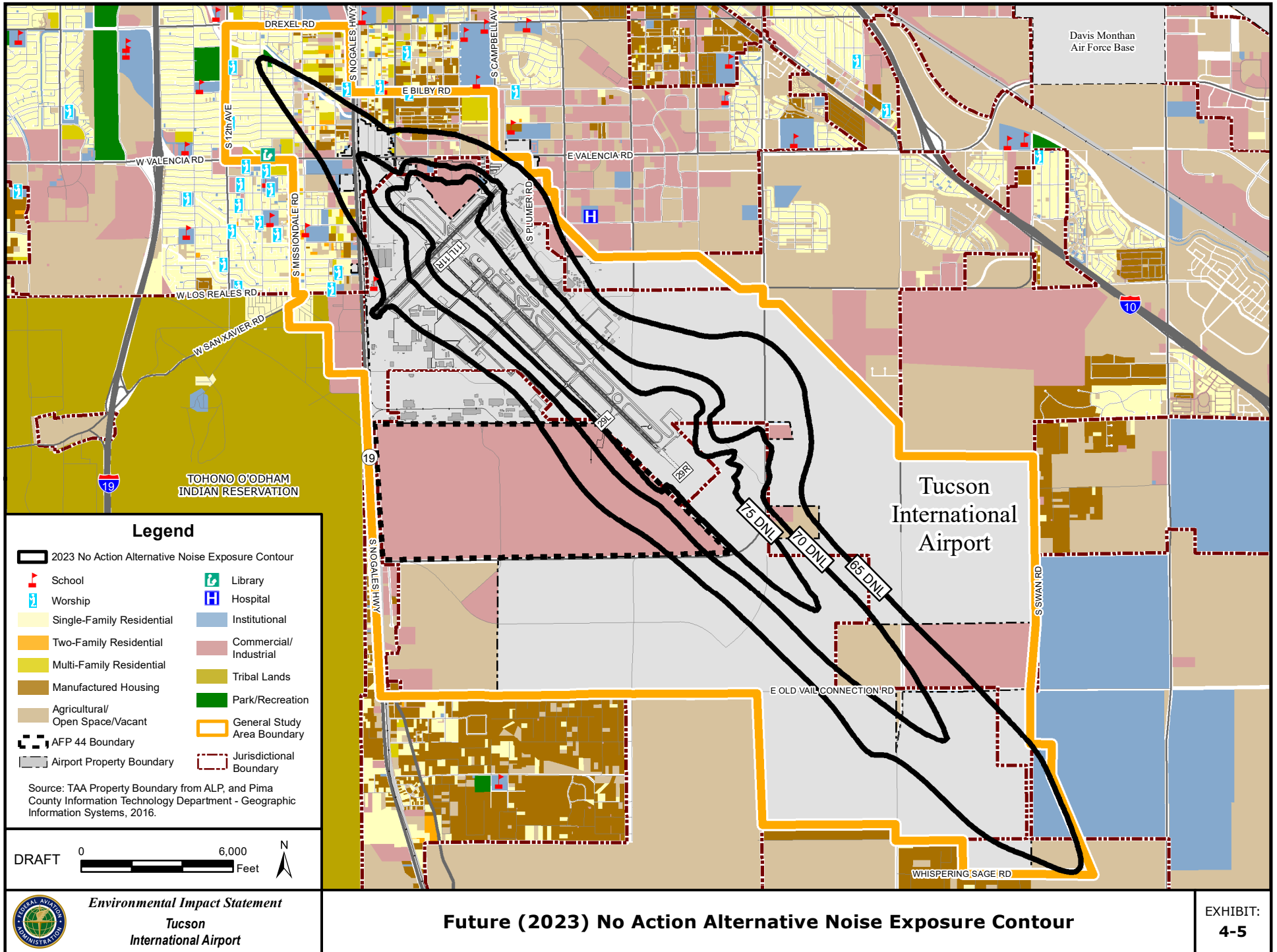
Table 4-29
SUMMARY OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY –
FUTURE (2028) NO ACTION ALTERNATIVE
Tucson International Airport

	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY	TOTAL
Number of Operations	128.94	66.20	148.72	86.92	431.53

Source: Landrum & Brown, September 2017, Aviation Activity Forecast.

Runway Definition

Under the Future (2028) No Action Alternative, no runway relocation or other airfield changes would occur. Therefore, the runway definition discussed for the existing conditions in Section 3.12, *Noise and Noise-Compatible Land Use* would remain the same for the Future (2028) No Action Alternative.



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**Table 4-30
AVERAGE DAILY OPERATIONS BY AIRCRAFT TYPE – FUTURE (2028) NO ACTION ALTERNATIVE
Tucson International Airport**

AIRCRAFT TYPE	ARRIVALS		DEPARTURES		TOTAL OPERATIONS
	DAYTIME	NIGHTTIME	DAYTIME	NIGHTTIME	
Air Carrier / Cargo					
Airbus A319-100 Series	2.81	0.00	2.71	0.09	5.61
Airbus A320-200 Series	0.15	0.00	0.12	0.03	0.30
Airbus A321-200 Series	0.20	0.04	0.16	0.09	0.49
Boeing 737-200 Series	1.84	0.00	1.12	0.71	3.67
Boeing 737-700 MAX	0.53	0.08	0.52	0.09	1.21
Boeing 737-700 Series	8.72	3.53	9.16	3.08	24.49
Boeing 737-800 MAX	0.90	0.13	0.88	0.15	2.06
Boeing 737-800 with winglets	8.28	1.22	8.11	1.39	19.00
Boeing 737-900 MAX	0.06	0.01	0.06	0.01	0.14
Boeing 737-900 Series	1.04	0.02	1.01	0.04	2.12
Boeing 767-300 ER Freighter	0.63	0.78	0.97	0.43	2.81
Boeing MD-90	2.32	0.03	1.65	0.70	4.70
Bombardier CRJ-700-ER	17.52	0.00	14.01	3.50	35.03
Bombardier CRJ-900-ER	4.50	2.81	6.09	1.22	14.62
Bombardier CS-100	0.17	0.07	0.18	0.06	0.49
Embraer ERJ175-LR	5.08	0.22	5.08	0.22	10.59
Mitsubishi MRJ-90	0.72	0.10	0.79	0.02	1.62
Air Carrier/Cargo Subtotal	55.45	9.02	52.64	11.83	128.94

Table 4-30, Continued
AVERAGE DAILY OPERATIONS BY AIRCRAFT TYPE – FUTURE (2028) NO ACTION ALTERNATIVE
Tucson International Airport

AIRCRAFT TYPE	ARRIVALS		DEPARTURES		TOTAL OPERATIONS
	DAYTIME	NIGHTTIME	DAYTIME	NIGHTTIME	
Air Taxi / Commuter					
Avions de Transport Regional ATR 72-200	0.56	0.02	0.58	0.00	1.15
Bombardier Challenger 600	11.85	1.65	11.39	2.11	27.01
Embraer EMB120 Brasilia	0.79	0.00	0.47	0.32	1.58
Fairchild SA-227-AC Metro III	0.05	0.00	0.04	0.01	0.11
Pilatus PC-12	2.18	0.22	2.13	0.27	4.79
Raytheon Beech 1900-C	0.09	0.00	0.09	0.00	0.18
Raytheon Super King Air 200	15.18	0.51	14.61	1.08	31.37
Air Taxi/ Commuter Subtotal	30.70	2.40	29.32	3.78	66.20
General Aviation					
Cessna 172 Skyhawk	46.04	1.22	45.99	1.27	94.52
Cessna 525 CitationJet	20.52	1.15	21.03	0.64	43.34
Piper PA-31 Navajo	0.68	0.04	0.63	0.09	1.44
Bell 206 JetRanger	4.71	0.00	4.71	0.00	9.42
GA Subtotal	71.95	2.41	72.36	2.00	148.72
Military					
Fairchild A-10A Thunderbolt II	0.38	0.00	0.38	0.00	0.76
Lockheed Martin F-16 Fighting Falcon	32.65	0.00	32.65	0.00	65.31
Military Closed Pattern					
Lockheed Martin F-16 Fighting Falcon	10.8	0.00	10.8	0.00	21.61*
Subtotal	43.84	0.00	43.84	0.00	87.67
Total	201.94	13.83	198.15	17.61	431.53

Notes: Daytime = 7:00 am – 9:59 pm, Nighttime = 10:00 pm – 6:59 am.
* Includes touch-and-go operations which are counted as one arrival and one departure.

Source: Landrum & Brown, September 2017, Aviation Activity Forecast.

Runway End Utilization

Fixed Wing Operations

Runway end utilization as a result of implementing the Proposed Action is expected to remain similar to the Future (2023) No Action Alternative. Minor differences in the percent use by runway end would occur due to some differences in the distribution of aircraft types within a category. Runway use percentages modeled for the Future (2028) No Action Alternative noise contour are shown in **Table 4-31**.

Helicopter Operations

Similar to the existing conditions, helicopters were modeled for the Future (2028) No Action Alternative noise contour at the helipad located to the east of Runway 21.

**Table 4-31
RUNWAY UTILIZATION – FUTURE (2028) NO ACTION ALTERNATIVE
Tucson International Airport**

AIRCRAFT CATEGORY	RUNWAY END						
	11L	29R	11R	29L	3	21	TOTAL
Daytime Arrivals							
Air Carrier / Cargo	58.0%	17.0%	19.3%	5.7%	0.0%	0.0%	100.0%
Air Taxi / Commuter	66.9%	21.1%	1.2%	0.5%	7.2%	3.1%	100.0%
General Aviation	66.4%	13.4%	10.6%	3.2%	2.0%	4.3%	100.0%
Military	38.6%	11.4%	38.6%	11.4%	0.0%	0.0%	100.0%
Total	57.8%	15.6%	17.7%	5.3%	1.9%	1.8%	100.0%
Nighttime Arrivals							
Air Carrier / Cargo	76.7%	22.3%	0.8%	0.2%	0.0%	0.0%	100.0%
Air Taxi / Commuter	80.9%	15.8%	0.0%	0.0%	0.2%	3.0%	100.0%
General Aviation	61.6%	14.4%	7.5%	2.0%	0.0%	14.5%	100.0%
Military	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	75.3%	20.1%	1.6%	0.4%	0.0%	2.6%	100.0%
Daytime Departures							
Air Carrier / Cargo	58.1%	17.0%	19.3%	5.7%	0.0%	0.0%	100.0%
Air Taxi / Commuter	65.5%	12.3%	3.9%	1.5%	0.4%	16.3%	100.0%
General Aviation	66.6%	7.2%	13.4%	3.7%	0.9%	8.2%	100.0%
Military	38.6%	11.4%	38.6%	11.4%	0.0%	0.0%	100.0%
Total	57.6%	12.2%	19.1%	5.6%	0.3%	5.2%	100.0%
Nighttime Departures							
Air Carrier / Cargo	76.6%	22.4%	0.8%	0.2%	0.0%	0.0%	100.0%
Air Taxi / Commuter	91.1%	0.8%	0.0%	0.0%	0.0%	8.1%	100.0%
General Aviation	82.5%	0.0%	10.6%	2.3%	2.8%	1.8%	100.0%
Military	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	80.3%	15.7%	1.4%	0.4%	0.2%	1.9%	100.0%

Source: FAA, 2017, Radar Data; Landrum & Brown, 2018.

Flight Tracks

Flight track locations and percent utilization for the Future (2028) No Action Alternative is expected to remain similar to the existing conditions and the Future (2023) No Action Alternative.

Aircraft Trip Length and Operational Profiles

Civil Operations

The trip lengths flown from TUS for the Future (2028) No Action Alternative are not expected to change from the Future (2023) No Action Alternative.

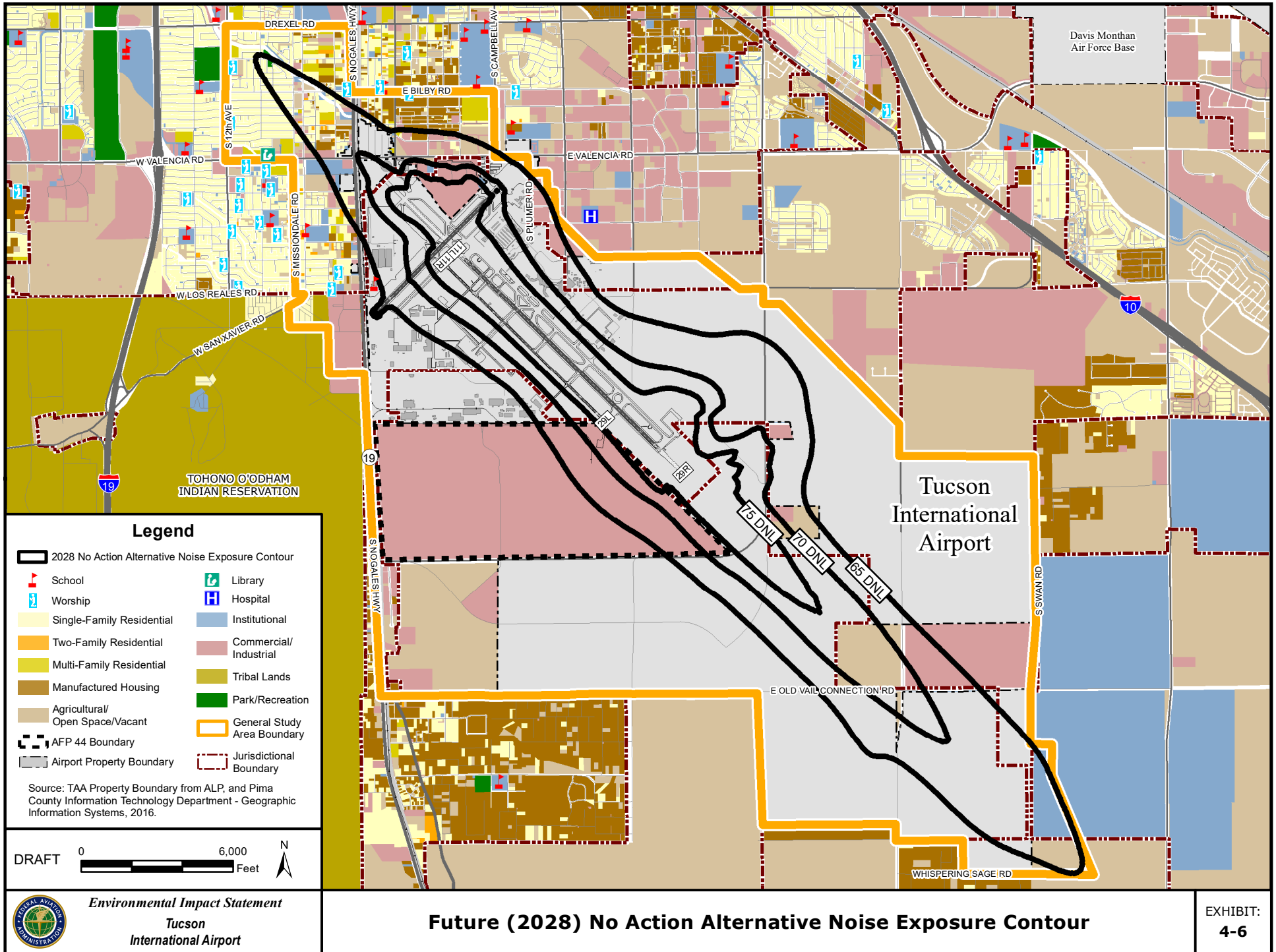
Military Operations

It is expected that military profile descriptions and profile usage for the Future (2023) No Action Alternative would remain the same for the Future (2028) No Action Alternative.

4.12.1.4 Future (2028) No Action Alternative Noise Contours

Exhibit 4-6 reflects the Future (2028) No Action Alternative average-annual noise contours at TUS. Noise contours are presented for the DNL 65, 70, and 75 db. The DNL 65 dB Future (2028) No Action Alternative noise contour extends approximately 4.42 miles to the southeast beyond Runway 29R end and extends approximately 4.84 miles to the southeast beyond Runway 29L end. This area is mostly vacant/undeveloped land with some commercial/industrial uses located within Pima County.

To the northwest of the Airport, the noise contour primarily reflects usage by aircraft arriving from the northwest and to a lesser degree aircraft departing to the northwest. The DNL 65 dB noise contour extends approximately 2.14 miles to the northwest from Runway 11L end and extends approximately 1.79 miles to the northwest beyond Runway 11R. The area northwest of TUS within the DNL 65 dB contour is comprised of residential and commercial land uses within the City of Tucson. There are no public schools, churches, nursing homes, hospitals, or libraries within any of the contours.



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Summaries of the residential population and housing units affected by noise levels exceeding DNL 65 dB for the Future (2028) No Action Alternative noise contours are provided in **Table 4-32**.

**Table 4-32
HOUSING AND POPULATION FOR FUTURE (2028) NO ACTION
ALTERNATIVE NOISE CONTOURS
Tucson International Airport**

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	DNL 65+ dB
Housing Units				
Single-Family Residential	408	0	0	408
Multi-Family Residential	36	0	0	36
Manufactured Housing	198	0	0	198
Total Housing Units	642	0	0	642
Population				
Single-Family Residential	1,371	0	0	1,371
Multi-Family Residential	124	0	0	124
Manufactured Housing	686	0	0	686
Total Population	2,181	0	0	2,181

Notes: Population numbers are estimates based on the 2000 United States Census average household size per number of housing units.

Source: Landrum & Brown, 2018.

4.12.2 PROPOSED ACTION

Operations during Construction

A preliminary construction phasing plan was developed by TAA with the intent to minimize impacts to airport operations and ensure a minimum of two runways are always operational.³⁶ During construction, various runway closures could introduce additional aircraft overflights and potential noise impacts to areas around the Airport. However due to the preliminary phasing plan to construct the Proposed Action, the potential for noise impacts are not anticipated to be long-term or introduce a significant change to noise sensitive facilities. Runway 11R/29L (the existing General Aviation Runway) is anticipated to be closed up to 12 months. However, this runway is not used by commercial or military operations due to the size of the runway and the aircraft operations from this runway are not a major contributor to the size or shape of the noise contours. After the relocation and approval of use of 11R/29L, Runway 11L/29R would be closed for approximate five months to complete the Proposed Action construction. This would not result in long-term condition and is not expected to cause a significant change the noise environment. TAA will be

³⁶ Tucson Airport Authority, 2015, Airfield Safety Enhancement Implementation Study Final Report, Tucson International Airport.

responsible to submit a formal Construction Safety and Phasing Plan to the FAA to maintain aviation and airfield safety during construction pursuant to FAA AC 150/5370-2G, *Operational Safety on Airports During Construction*.

4.12.2.1 Future (2023) Proposed Action

The following sections summarize the assumptions and input data for the noise contour modeling for the Future (2023) Proposed Action.

Aircraft Activity Levels and Fleet Mix

No change to the number of aircraft operations or fleet mix would occur as a result of implementing the Proposed Action. Therefore, the number of operations and fleet mix for the Future (2023) No Action Alternative would remain the same for the Future (2023) Proposed Action.

Runway Definition

As a result of implementing the Proposed Action, existing Runway 11R/29L would be replaced with a parallel runway that is the same length as Runway 11L/29R as shown on Exhibit 1-11 in Section 1.4, *Description of Proposed Action*. The distance between the parallel runways would be expanded to 800 feet. A centerline parallel taxiway would be constructed to allow aircraft to queue prior to crossing the other parallel runway. An additional parallel taxiway west of the relocated Runway 11R/29L would limit direct access from aircraft approaching the runway from the west. Various other taxiways improvements are proposed to promote pilot awareness on the airfield, most importantly the removal of the taxiways leading to the north ends of Runway 11L and 11R.

Runway End Utilization

Fixed Wing Operations

Runway end utilization as a result of implementing the Proposed Action is expected to change due to the relocation and lengthening of Runway 11R/29L. In general, the distribution of aircraft operating in the 11/29 direction is expected to be more evenly distributed between the two runways resulting in an increased use of Runway 11R/29L by large jet and military operations, and a corresponding decrease in use of Runway 11L/29R. Runway use percentages modeled for the Future (2023) Proposed Action noise contour are shown in **Table 4-33**.

Helicopter Operations

No change to helicopter operations are anticipated as a result of implementing the Proposed Action.

**Table 4-33
RUNWAY UTILIZATION – FUTURE (2023) PROPOSED ACTION
Tucson International Airport**

AIRCRAFT CATEGORY	RUNWAY END						
	11L	29R	11R	29L	3	21	Total
Daytime Arrivals							
Air Carrier / Cargo	58.0%	17.0%	19.3%	5.7%	0.0%	0.0%	100.0%
Air Taxi / Commuter	66.4%	21.0%	1.3%	0.6%	7.6%	3.3%	100.0%
General Aviation	65.6%	13.2%	11.2%	3.4%	2.1%	4.4%	100.0%
Military	38.0%	12.0%	38.0%	12.0%	0.0%	0.0%	100.0%
Total	57.3%	15.4%	18.2%	5.4%	1.9%	1.8%	100.0%
Nighttime Arrivals							
Air Carrier / Cargo	76.6%	22.4%	0.8%	0.2%	0.0%	0.0%	100.0%
Air Taxi / Commuter	79.7%	16.9%	0.0%	0.0%	0.2%	3.2%	100.0%
General Aviation	61.7%	13.9%	8.2%	2.2%	0.0%	14.0%	100.0%
Military	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	75.0%	20.2%	1.7%	0.5%	0.0%	2.6%	100.0%
Daytime Departures							
Air Carrier / Cargo	58.0%	17.0%	19.3%	5.7%	0.0%	0.0%	100.0%
Air Taxi / Commuter	64.5%	12.2%	4.2%	1.5%	0.5%	17.2%	100.0%
General Aviation	65.8%	7.2%	14.1%	3.9%	0.9%	8.1%	100.0%
Military	38.0%	12.0%	38.0%	12.0%	0.0%	0.0%	100.0%
Total	56.9%	12.0%	19.6%	5.8%	0.4%	5.3%	100.0%
Nighttime Departures							
Air Carrier / Cargo	76.6%	22.4%	0.8%	0.2%	0.0%	0.0%	100.0%
Air Taxi / Commuter	90.4%	0.8%	0.0%	0.0%	0.0%	8.8%	100.0%
General Aviation	81.3%	0.0%	11.3%	2.5%	3.0%	1.9%	100.0%
Military	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	80.0%	15.8%	1.5%	0.4%	0.3%	2.1%	100.0%

Source: FAA, 2017, Radar Data; Landrum & Brown, 2018.

Flight Tracks

Flight track locations and percent utilization as a result of implementing the Proposed Action is expected to change due to the relocation and lengthening of Runway 11R/29L. No changes to flight tracks to and from Runway 11L/29R or Runway 3/21 are expected. However, flight tracks to and from the relocated Runway 11R/29L would change. These tracks would shift approximately 600 feet to the southwest in relocation to the runway relocation. It is also expected that a greater number of westbound turning departures would occur and a greater number of touch-and-go operations would occur on Runway 11R/29L operating in a circuit pattern to the southwest of TUS. Therefore, additional flight tracks were created in the AEDT model to represent these changes. Flight tracks modeled for the Future (2023) Proposed Action are shown in **Exhibit 4-7** through **Exhibit 4-10**. The percent utilization modeled for each track is provided in **Table 4-34** through **Table 4-36**.

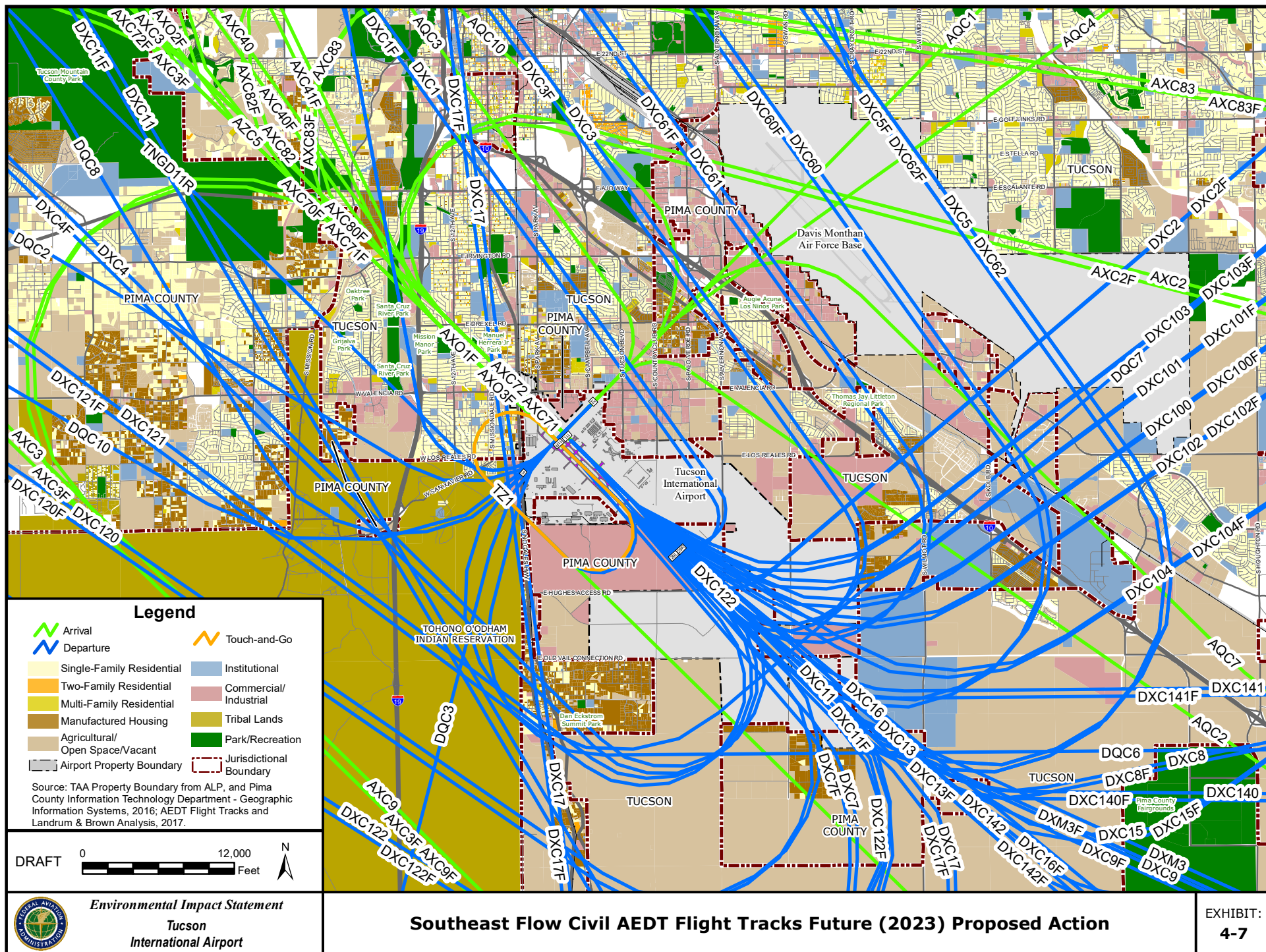
Aircraft Trip Length and Operational Profiles

Civil Operations

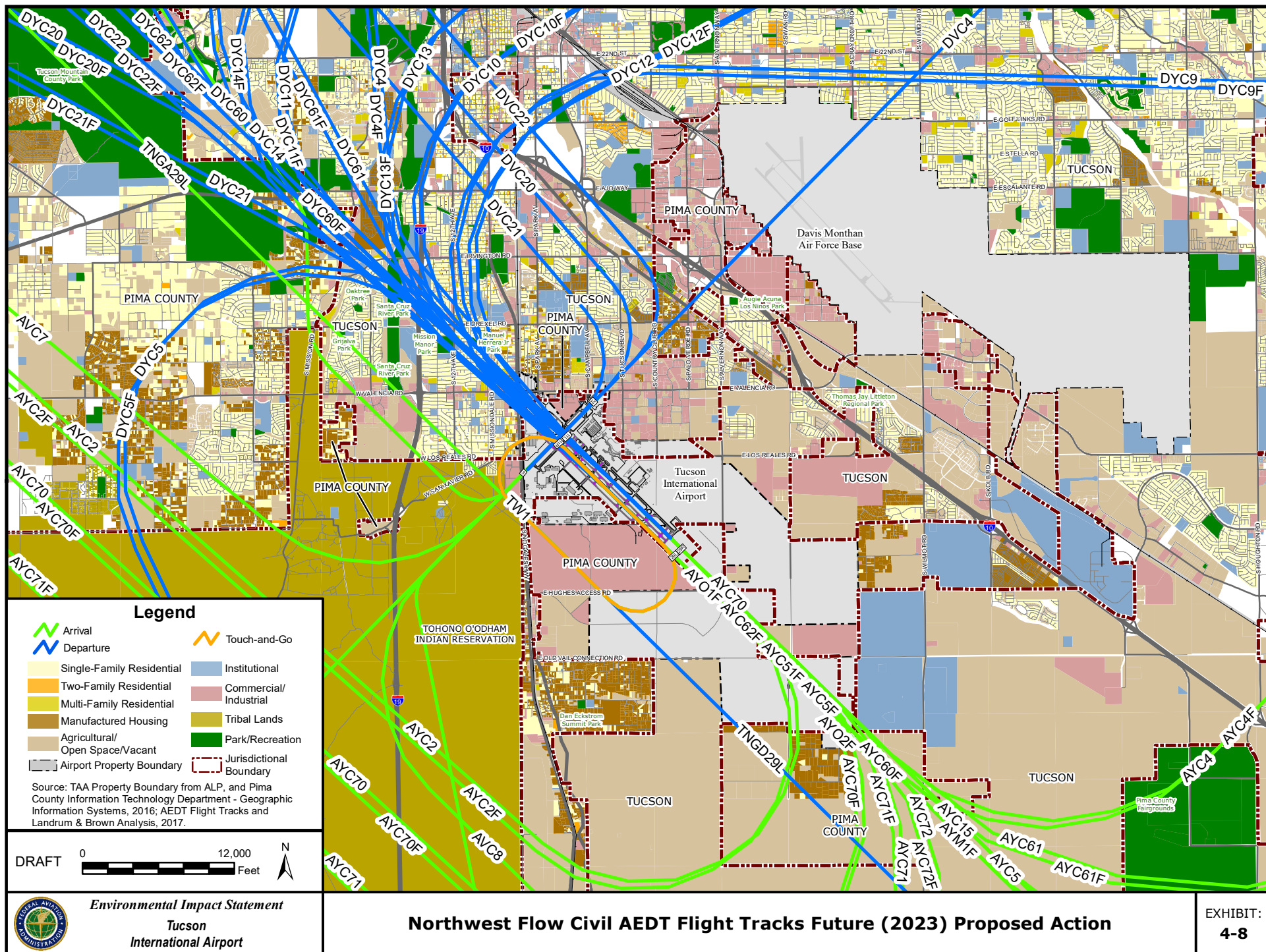
No change to trip lengths flown from TUS are anticipated as a result of implementing the Proposed Action because the proposed project is an airfield safety enhancement project and would not induce increased aircraft operations into or out of the Airport

Military Operations

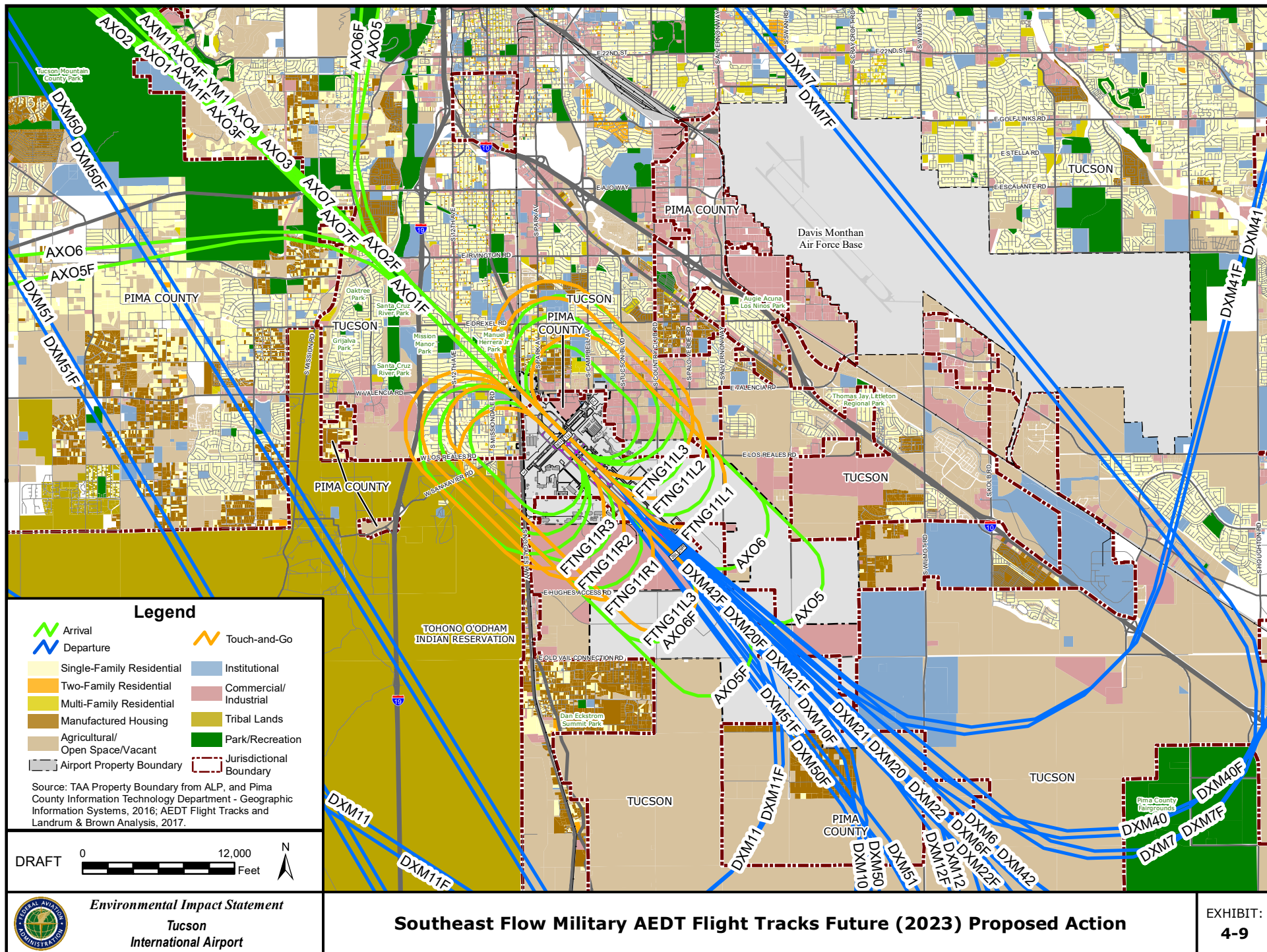
It is expected that military profile descriptions and profile usage for the Future (2023) Proposed Action would remain the same for the Future (2023) No Action Alternative due to the nature of the training operation for F-16s at TUS.



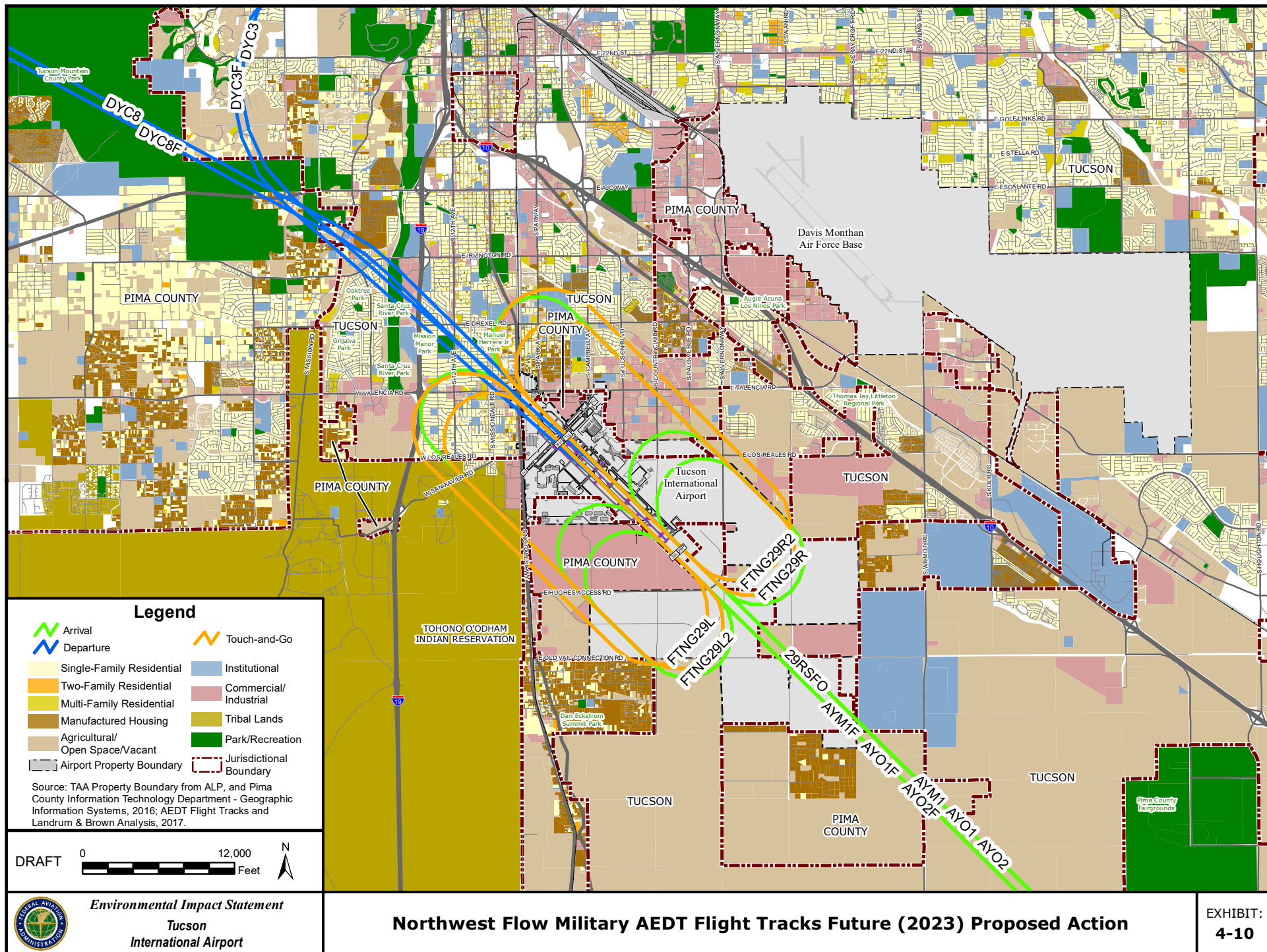
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**Table 4-34
ARRIVAL FLIGHT TRACK UTILIZATION – FUTURE (2023) PROPOSED
ACTION
Tucson International Airport**

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
11L	AXC2	0.2%	0.1%	0.1%	0.0%
	AXC3	0.6%	0.3%	0.3%	0.0%
	AXC40	0.6%	8.6%	7.9%	0.0%
	AXC41	0.2%	5.3%	4.8%	0.0%
	AXC5	0.5%	1.0%	0.9%	0.0%
	AXC70	12.1%	12.5%	12.3%	0.0%
	AXC71	18.5%	19.5%	19.1%	0.0%
	AXC72	6.1%	7.8%	7.6%	0.0%
	AXC80	8.4%	4.6%	4.8%	0.0%
	AXC81	5.6%	3.1%	3.3%	0.0%
	AXC82	5.6%	3.1%	3.3%	0.0%
	AXC83	1.3%	1.4%	1.2%	0.0%
	AXC9	0.8%	0.4%	0.5%	0.0%
	AXM1	0.0%	0.0%	0.0%	17.0%
	AXO1	0.0%	0.0%	0.0%	2.1%
	AXO2	0.0%	0.0%	0.0%	0.0%
	AXO3	0.0%	0.0%	0.0%	2.1%
	AXO4	0.0%	0.0%	0.0%	4.8%
	AXO5	0.0%	0.0%	0.0%	1.9%
	AXO6	0.0%	0.0%	0.0%	1.9%
	AXO7	0.0%	0.0%	0.0%	4.8%
	11LSFO	0.0%	0.0%	0.0%	3.4%
29R	29RSFO	0.0%	0.0%	0.0%	1.1%
	AYC15	0.8%	0.5%	0.3%	0.0%
	AYC2	1.8%	6.3%	3.9%	0.0%
	AYC4	0.3%	0.2%	0.1%	0.0%
	AYC5	0.9%	0.5%	0.4%	0.0%
	AYC60	2.8%	4.2%	2.7%	0.0%
	AYC61	1.8%	1.0%	0.7%	0.0%
	AYC62	1.1%	0.6%	0.4%	0.0%
	AYC70	3.1%	4.4%	2.8%	0.0%
	AYC71	3.2%	1.9%	1.3%	0.0%
	AYC72	2.0%	1.1%	0.8%	0.0%
	AYM1	0.0%	0.0%	0.0%	5.4%
	AYO1	0.0%	0.0%	0.0%	3.0%
	AYO2	0.0%	0.0%	0.0%	2.6%

Table 4-34, Continued
ARRIVAL FLIGHT TRACK UTILIZATION – FUTURE (2023) PROPOSED ACTION
Tucson International Airport

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
11R	TNGA11R	0.0%	0.0%	8.1%	0.0%
	AXC2F	0.1%	0.0%	0.0%	0.0%
	AXC3F	0.2%	0.0%	0.0%	0.0%
	AXC40F	0.2%	0.2%	0.5%	0.0%
	AXC41F	0.1%	0.1%	0.3%	0.0%
	AXC5F	0.2%	0.0%	0.0%	0.0%
	AXC70F	3.3%	0.2%	0.4%	0.0%
	AXC71F	5.1%	0.3%	0.7%	0.0%
	AXC72F	1.7%	0.1%	0.3%	0.0%
	AXC80F	2.3%	0.1%	0.1%	0.0%
	AXC81F	1.6%	0.0%	0.0%	0.0%
	AXC82F	1.6%	0.0%	0.0%	0.0%
	AXC83F	0.4%	0.0%	0.0%	0.0%
	AXC9F	0.2%	0.0%	0.0%	0.0%
	AXM1F	0.0%	0.0%	0.0%	17.0%
	AXO1F	0.0%	0.0%	0.0%	2.1%
	AXO2F	0.0%	0.0%	0.0%	0.0%
	AXO3F	0.0%	0.0%	0.0%	2.1%
	AXO4F	0.0%	0.0%	0.0%	4.8%
	AXO5F	0.0%	0.0%	0.0%	1.9%
	AXO6F	0.0%	0.0%	0.0%	1.9%
	AXO7F	0.0%	0.0%	0.0%	4.8%
	11RSFO	0.0%	0.0%	0.0%	3.4%
29L	TNGA29L	0.0%	0.0%	2.6%	0.0%
	AYC15F	0.2%	0.0%	0.0%	0.0%
	AYC2F	0.5%	0.2%	0.3%	0.0%
	AYC4F	0.1%	0.0%	0.0%	0.0%
	AYC5F	0.3%	0.0%	0.0%	0.0%
	AYC60F	0.8%	0.1%	0.1%	0.0%
	AYC61F	0.5%	0.0%	0.0%	0.0%
	AYC62F	0.3%	0.0%	0.0%	0.0%
	AYC70F	0.9%	0.1%	0.1%	0.0%
	AYC71F	0.9%	0.0%	0.0%	0.0%
	AYC72F	0.5%	0.0%	0.0%	0.0%
	AYM1F	0.0%	0.0%	0.0%	5.4%
	29RSFOF	0.0%	0.0%	0.0%	1.1%
	AYO1F	0.0%	0.0%	0.0%	3.0%
	AYO2F	0.0%	0.0%	0.0%	2.6%

Table 4-34, Continued
ARRIVAL FLIGHT TRACK UTILIZATION – FUTURE (2023) PROPOSED ACTION
Tucson International Airport

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
3	AVC1	0.0%	1.7%	0.5%	0.0%
	AVC2	0.0%	1.6%	0.4%	0.0%
	AVC5	0.0%	1.6%	0.4%	0.0%
	AVC7	0.0%	1.7%	0.5%	0.0%
	AVC8	0.0%	0.1%	0.2%	0.0%
21	AQC1	0.0%	0.4%	0.7%	0.0%
	AQC10	0.0%	0.5%	0.7%	0.0%
	AQC2	0.0%	0.3%	0.4%	0.0%
	AQC3	0.0%	1.3%	1.8%	0.0%
	AQC4	0.0%	0.3%	0.4%	0.0%
	AQC7	0.0%	0.4%	0.7%	0.0%
Total		100.0%	100.0%	100.0%	100.0%

Source: FAA, 2017, Radar Data; Landrum & Brown analysis, 2018.

**Table 4-35
DEPARTURE FLIGHT TRACK UTILIZATION – FUTURE (2023) PROPOSED
ACTION
Tucson International Airport**

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
11L	DXC1	0.0%	13.0%	13.4%	0.0%
	DXC100	0.1%	0.0%	0.0%	0.0%
	DXC101	0.1%	0.0%	0.0%	0.0%
	DXC102	0.3%	0.2%	0.2%	0.0%
	DXC103	0.1%	0.5%	0.5%	0.0%
	DXC104	0.9%	0.5%	0.5%	0.0%
	DXC11	3.4%	7.2%	7.2%	0.0%
	DXC120	9.1%	9.3%	9.1%	0.0%
	DXC121	1.8%	3.3%	3.4%	0.0%
	DXC122	5.2%	5.3%	5.2%	0.0%
	DXC13	1.2%	1.2%	1.1%	0.0%
	DXC140	5.8%	3.8%	3.6%	0.0%
	DXC141	4.9%	3.3%	3.1%	0.0%
	DXC142	4.3%	2.4%	2.3%	0.0%
	DXC15	1.7%	1.0%	0.9%	0.0%
	DXC16	2.2%	1.7%	1.6%	0.0%
	DXC17	2.0%	1.1%	1.1%	0.0%
	DXC2	0.2%	1.0%	1.0%	0.0%
	DXC3	0.1%	0.0%	0.0%	0.0%
	DXC4	0.1%	0.5%	0.5%	0.0%
	DXC5	4.5%	2.6%	2.4%	0.0%
	DXC60	4.3%	2.4%	2.3%	0.0%
	DXC61	2.3%	1.7%	1.7%	0.0%
	DXC62	3.1%	2.7%	2.6%	0.0%
	DXC7	0.5%	0.3%	0.3%	0.0%
	DXC8	1.7%	1.0%	0.9%	0.0%
	DXC9	1.1%	1.1%	1.1%	0.0%
	DXM10	0.0%	0.0%	0.0%	6.1%
	DXM11	0.0%	0.0%	0.0%	3.0%
	DXM12	0.0%	0.0%	0.0%	3.0%
	DXM20	0.0%	0.0%	0.0%	6.5%
	DXM21	0.0%	0.0%	0.0%	3.0%
	DXM22	0.0%	0.0%	0.0%	3.0%
	DXM3	0.2%	0.1%	0.1%	0.0%
	DXM40	0.0%	0.0%	0.0%	4.2%
	DXM41	0.0%	0.0%	0.0%	3.0%
	DXM42	0.0%	0.0%	0.0%	4.2%

**Table 4-35, Continued
DEPARTURE FLIGHT TRACK UTILIZATION – FUTURE (2023) PROPOSED
ACTION
Tucson International Airport**

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
11L (Cont.)	DXM50	0.0%	0.0%	0.0%	0.4%
	DXM51	0.0%	0.0%	0.0%	0.4%
	DXM6	0.4%	0.2%	0.2%	0.4%
	DXM7	0.1%	0.0%	0.0%	0.8%
29R	DYC1	0.3%	0.1%	0.0%	0.0%
	DYC10	0.7%	0.2%	0.1%	0.0%
	DYC11	1.1%	0.3%	0.2%	0.0%
	DYC12	1.4%	0.5%	0.2%	0.0%
	DYC13	0.4%	0.7%	0.5%	0.0%
	DYC14	2.4%	0.8%	0.4%	0.0%
	DYC20	0.5%	0.4%	0.3%	0.0%
	DYC21	1.4%	0.7%	0.4%	0.0%
	DYC22	0.5%	0.4%	0.3%	0.0%
	DYC3	1.5%	0.5%	0.2%	4.0%
	DYC4	0.8%	1.1%	0.8%	0.0%
	DYC5	0.4%	0.7%	0.5%	0.0%
	DYC60	1.4%	0.7%	0.4%	0.0%
	DYC61	1.0%	1.4%	1.0%	0.0%
	DYC62	1.4%	1.6%	1.1%	0.0%
	DYC8	1.5%	0.5%	0.2%	4.0%
	DYC9	1.1%	0.3%	0.2%	0.0%
	YM1	0.0%	0.0%	0.0%	4.1%
11R	TNGD11R	0.0%	0.0%	8.7%	0.0%
	DXC100F	0.0%	0.0%	0.0%	0.0%
	DXC101F	0.0%	0.0%	0.0%	0.0%
	DXC102F	0.1%	0.0%	0.0%	0.0%
	DXC103F	0.0%	0.0%	0.1%	0.0%
	DXC104F	0.2%	0.0%	0.0%	0.0%
	DXC11F	0.9%	0.5%	0.7%	0.0%
	DXC120F	2.3%	0.5%	0.7%	0.0%
	DXC121F	0.5%	0.2%	0.3%	0.0%
	DXC122F	1.3%	0.3%	0.4%	0.0%
	DXC13F	0.3%	0.1%	0.1%	0.0%
	DXC140F	1.5%	0.1%	0.2%	0.0%
	DXC141F	1.3%	0.1%	0.2%	0.0%
	DXC142F	1.1%	0.0%	0.1%	0.0%

**Table 4-35, Continued
DEPARTURE FLIGHT TRACK UTILIZATION – FUTURE (2023) PROPOSED
ACTION
Tucson International Airport**

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
11R (Cont.)	DXC15F	0.4%	0.0%	0.0%	0.0%
	DXC16F	0.6%	0.1%	0.1%	0.0%
	DXC17F	0.5%	0.0%	0.0%	0.0%
	DXC2F	0.0%	0.1%	0.1%	0.0%
	DXC3F	0.0%	0.0%	0.0%	0.0%
	DXC4F	0.0%	0.0%	0.1%	0.0%
	DXC5F	1.2%	0.0%	0.1%	0.0%
	DXC60F	1.1%	0.0%	0.1%	0.0%
	DXC61F	0.6%	0.1%	0.1%	0.0%
	DXC62F	0.8%	0.1%	0.2%	0.0%
	DXC7F	0.1%	0.0%	0.0%	0.0%
	DXC8F	0.4%	0.0%	0.0%	0.0%
	DXC9F	0.3%	0.1%	0.1%	0.0%
	DXM10F	0.0%	0.0%	0.0%	6.1%
	DXM11F	0.0%	0.0%	0.0%	3.0%
	DXM12F	0.0%	0.0%	0.0%	3.0%
	DXM20F	0.0%	0.0%	0.0%	6.5%
	DXM21F	0.0%	0.0%	0.0%	3.0%
	DXM22F	0.0%	0.0%	0.0%	3.0%
	DXM3F	0.0%	0.0%	0.0%	0.0%
	DXM40F	0.0%	0.0%	0.0%	4.2%
	DXM41F	0.0%	0.0%	0.0%	3.0%
	DXM42F	0.0%	0.0%	0.0%	4.2%
	DXM50F	0.0%	0.0%	0.0%	0.4%
	DXM51F	0.0%	0.0%	0.0%	0.4%
	DXM6F	0.1%	0.0%	0.0%	0.4%
	DXM7F	0.0%	0.0%	0.0%	0.8%
	TNGD11R	0.0%	0.0%	8.7%	0.0%
29L	DYC10F	0.2%	0.0%	0.0%	0.0%
	DYC11F	0.3%	0.0%	0.0%	0.0%
	DYC12F	0.4%	0.0%	0.0%	0.0%
	DYC13F	0.1%	0.1%	0.1%	0.0%
	DYC14F	0.6%	0.1%	0.0%	0.0%
	DYC1F	0.1%	0.0%	0.0%	0.0%
	DYC20F	0.1%	0.1%	0.1%	0.0%
	DYC21F	0.4%	0.1%	0.1%	0.0%
	DYC22F	0.1%	0.1%	0.1%	0.0%

**Table 4-35, Continued
DEPARTURE FLIGHT TRACK UTILIZATION – FUTURE (2023) PROPOSED
ACTION
Tucson International Airport**

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
29L (Cont.)	DYC3F	0.4%	0.0%	0.0%	4.0%
	DYC4F	0.2%	0.2%	0.2%	0.0%
	DYC5F	0.1%	0.1%	0.1%	0.0%
	DYC60F	0.4%	0.1%	0.1%	0.0%
	DYC61F	0.3%	0.2%	0.2%	0.0%
	DYC62F	0.4%	0.2%	0.2%	0.0%
	DYC8F	0.4%	0.0%	0.0%	4.0%
	DYC9F	0.3%	0.0%	0.0%	0.0%
	TNGD29L	0.0%	0.0%	2.7%	0.0%
	YM1F	0.0%	0.0%	0.0%	4.1%
3	DVC20	0.0%	0.2%	0.5%	0.0%
	DVC21	0.0%	0.1%	0.3%	0.0%
	DVC22	0.0%	0.1%	0.3%	0.0%
	DVC4	0.0%	0.0%	0.0%	0.0%
21	DQC10	0.0%	2.0%	1.2%	0.0%
	DQC11	0.0%	4.1%	1.7%	0.0%
	DQC2	0.0%	5.3%	1.5%	0.0%
	DQC3	0.0%	0.0%	0.9%	0.0%
	DQC6	0.0%	0.0%	0.0%	0.0%
	DQC7	0.0%	3.2%	1.3%	0.0%
	DQC8	0.0%	0.0%	0.9%	0.0%
	DQC9	0.0%	1.6%	0.4%	0.0%
Total		100.0%	100.0%	100.0%	100.0%

Source: FAA, 2017, Radar Data; Landrum & Brown analysis, 2018.

**Table 4-36
TOUCH-AND-GO FLIGHT TRACK UTILIZATION – FUTURE (2023) PROPOSED
ACTION
Tucson International Airport**

RUNWAY	TRACK ID	AIR CARRIER/ CARGO	COMMUTER/ AIR TAXI	GENERAL AVIATION	MILITARY
11L	FTNG11L1	0.0%	9.5%	0.0%	15.2%
	FTNG11L2	0.0%	9.5%	0.0%	11.4%
	FTNG11L3	0.0%	9.5%	0.0%	11.4%
	FTNG11L4	0.0%	9.5%	0.0%	0.0%
29R	FTNG29R	0.0%	6.0%	0.0%	6.0%
	FTNG29R2	0.0%	6.0%	0.0%	6.0%
11R	TZ1	76.0%	0.0%	0.0%	0.0%
	FTNG11R1	0.0%	9.5%	0.0%	15.2%
	FTNG11R2	0.0%	9.5%	0.0%	11.4%
	FTNG11R3	0.0%	9.5%	0.0%	11.4%
	FTNG11R4	0.0%	9.5%	0.0%	0.0%
29L	TW1	24.0%	0.0%	0.0%	0.0%
	FTNG29L	0.0%	6.0%	0.0%	6.0%
	FTNG29L2	0.0%	6.0%	0.0%	6.0%
Total		100.0%	100.0%	0.0%	100.0%

Source: FAA, 2017, Radar Data; Landrum & Brown analysis, 2018.

4.12.2.2 Future (2023) Proposed Action Noise Contours

Exhibit 4-11 reflects the Future (2023) Proposed Action average-annual noise contours at TUS. Noise contours are presented for the DNL 65, 70, and 75 dB. The DNL 65 dB Future (2023) Proposed Action noise contour extends approximately 4.29 miles to the southeast beyond Runway 29R end and extends approximately 4.86 miles to the southeast beyond Runway 29L end. This area is mostly vacant/undeveloped land with some commercial/industrial uses located within Pima County.

To the northwest of the Airport, the noise contour primarily reflects usage by aircraft arriving from the northwest and to a lesser degree aircraft departing to the northwest. The DNL 65 dB noise contour extends approximately 1.92 miles to the northwest from Runway 11L end and extends approximately 1.85 miles to the northwest beyond Runway 11R. The area northwest of TUS within the DNL 65 dB contour is comprised of residential and commercial land uses within the City of Tucson.

The Future (2023) Proposed Action noise contour does not extend as far to the northwest as compared to the Future (2023) No Action Alternative, but is generally shifted farther west consistent with the shift of the proposed relocated runway. The FAA expects the new runway to be used more than the existing one is today due to a more even distribution of aircraft operating to the north and south at TUS. There are no churches, nursing homes, hospitals, or libraries within any of the contours. There is one school, the Pima Community College-Aviation Technology Center located in the DNL 65 dB noise contour. However, this facility, which is located on airport property, would be considered a compatible land use due to its function dealing with aircraft mechanics and structural repair.

Exhibit 4-12 provides a comparison of Future (2023) Proposed Action and the Future (2023) No Action Alternative. Summaries of the residential population and housing units affected by noise levels exceeding DNL 65 dB for the Future (2023) Proposed Action are provided in **Table 4-37**.

Based on the analysis presented, implementing the Future (2023) Proposed Action would result in a reduction in the total number of housing units exposed to DNL 65+ dB noise levels when compared to the Future (2023) No Action Alternative.

A significant noise impact would occur if analysis shows that the Proposed Action would result in noise-sensitive areas to experience an increase in noise of DNL 1.5 dB or more, at or above DNL 65 dB noise exposure when compared to the No Action alternative for the same timeframe. For example, an increase in noise exposure over a noise sensitive land use from 65 DNL to 66.5 DNL is considered a significant impact. Similarly, if a noise-sensitive area that receives less than 65 DNL under the No Action alternative would receive noise exposure of 65 DNL as a result of the Proposed Action, then those areas are also considered significantly impacted.

**Table 4-37
HOUSING AND POPULATION FOR FUTURE (2023) PROPOSED ACTION
NOISE CONTOURS
Tucson International Airport**

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	DNL 65+ dB
Housing Units				
Single-Family Residential	346	0	0	346
Multi-Family Residential	51	0	0	51
Manufactured Housing	195	0	0	195
Total Housing Units	592	0	0	592
Population				
Single-Family Residential	1,169	0	0	1,169
Multi-Family Residential	176	0	0	176
Manufactured Housing	676	0	0	676
Total Population	2,021	0	0	2,021

Notes: Population numbers are estimates based on the 2000 United States Census average household size per number of housing units.

Source: Landrum & Brown, 2018.

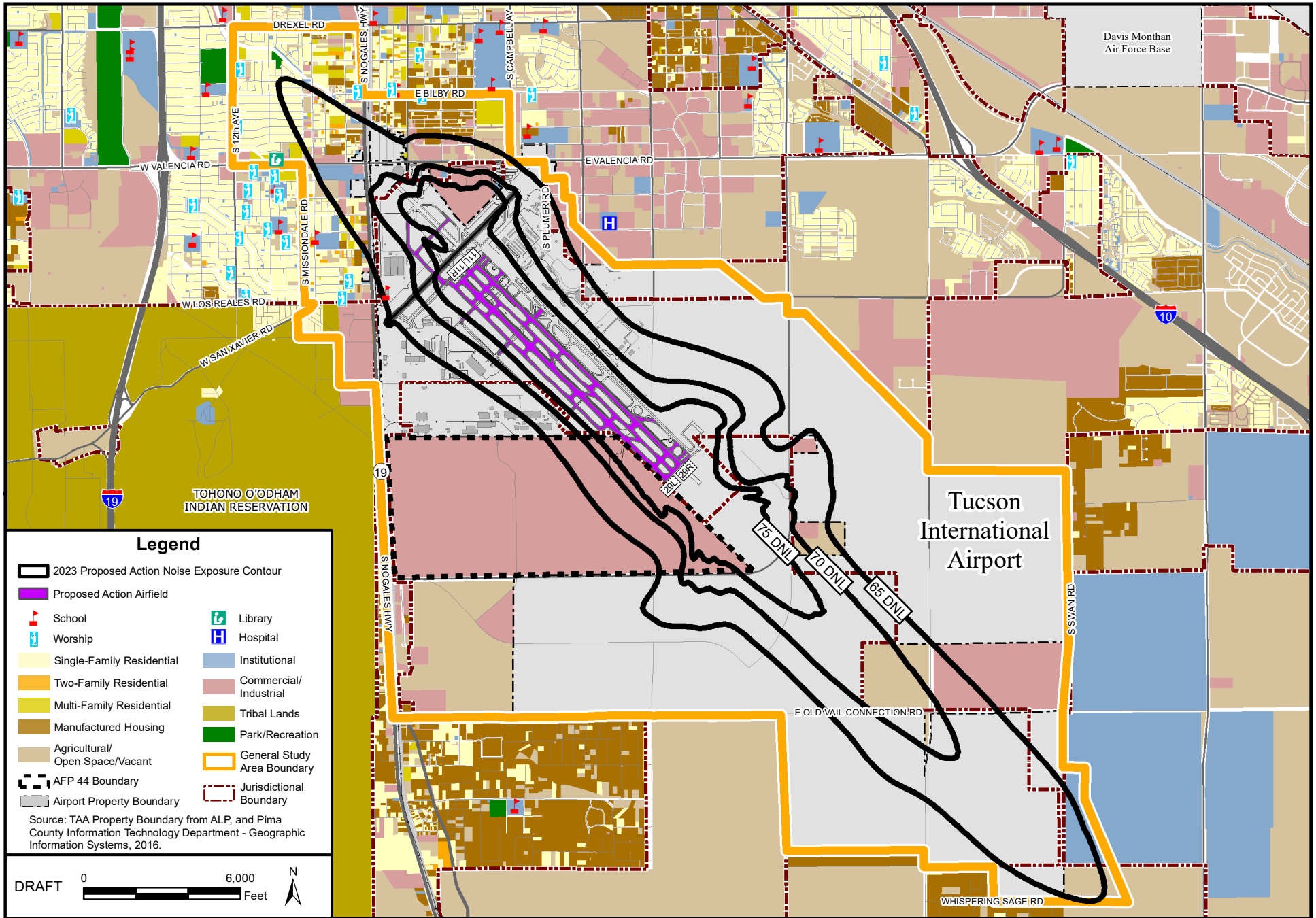
The analysis concluded that a 1.5 dB increase would occur within the 65 DNL or greater noise contour for Future (2023) Proposed Action when compared to the Future (2023) No Action Alternative. **Exhibit 4-13** shows the area of significant increase within the DNL 65 dB of the Future (2023) Proposed Action. There would be 65 housing units and 227 people located within the 1.5 dB increase area. **Table 4-38** shows the total number of housing units and estimated population by housing type within the area of 1.5 dB increase within the 65 DNL of the Future (2023) Proposed Action noise contour.

**Table 4-38
HOUSING AND POPULATION WITHIN THE AREA OF 1.5 DB INCREASE
WITHIN 65 DNL OF THE FUTURE (2023) PROPOSED ACTION NOISE
CONTOURS
Tucson International Airport**

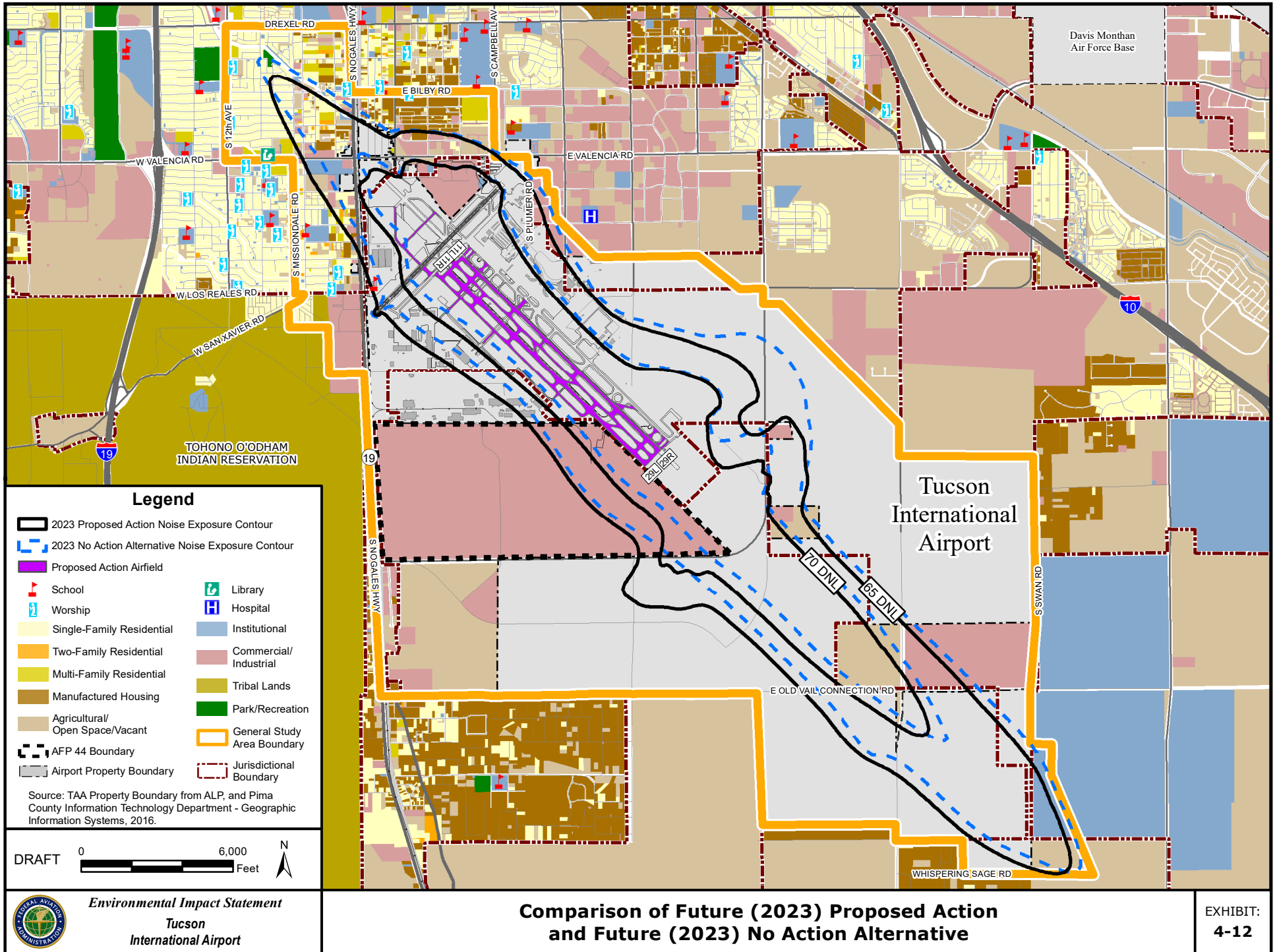
HOUSING TYPE	HOUSING UNITS	ESTIMATED POPULATION
Single-Family Residential	26	91
Two Family Residential	2	7
Multi-Family Residential	17	59
Manufactured Housing	20	70
Total	65	227

Note: Five (5) of the single family residences have participated in a previous noise mitigation program.

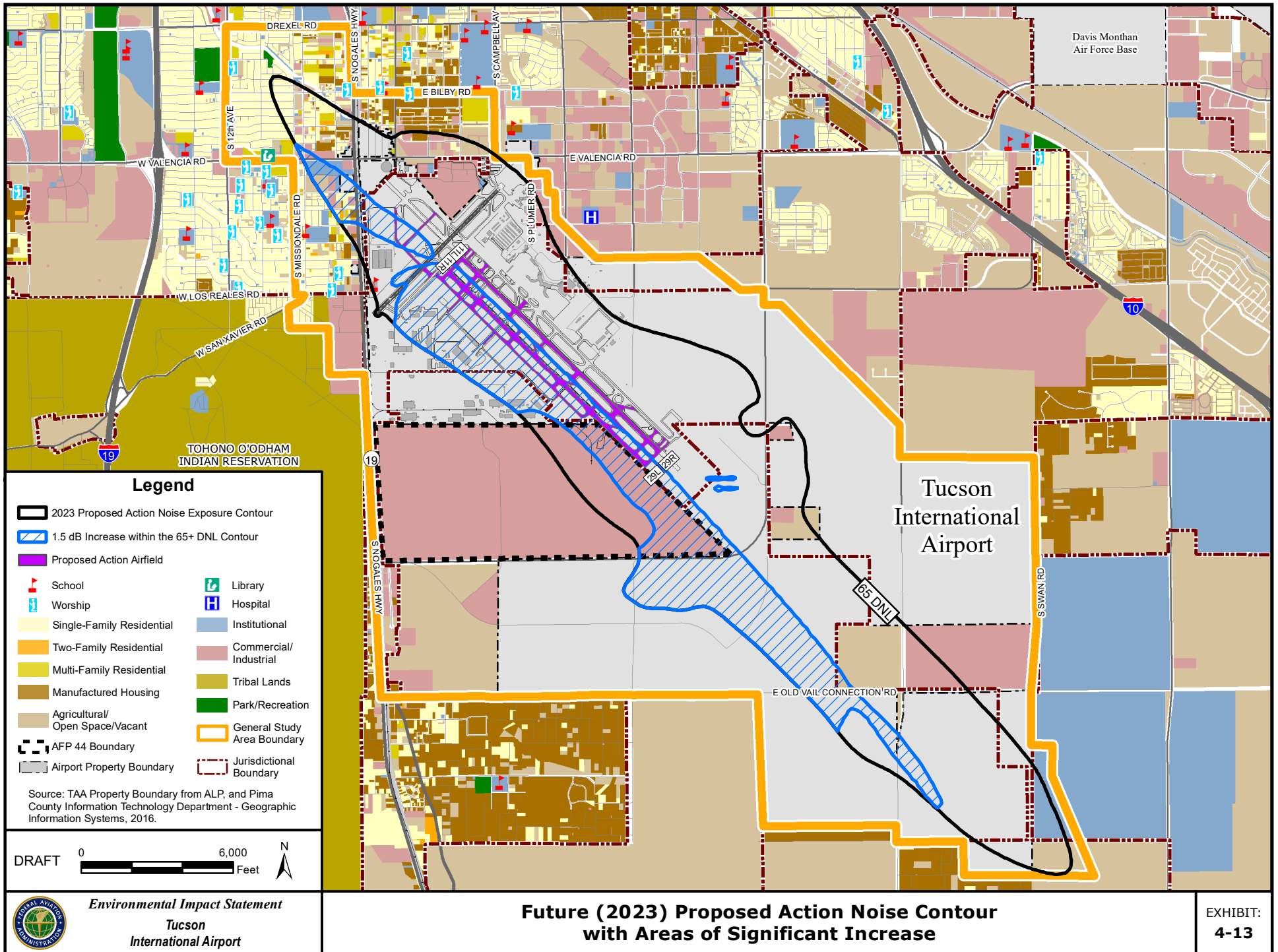
Source: Landrum & Brown, 2018



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Per the 1990 Federal Interagency Committee on Noise (FICON) report, if screening analysis shows that noise-sensitive areas will be at or above DNL 65 dB and will have an increase of DNL 1.5 dB or more, further analysis should be conducted of noise-sensitive areas between DNL 60-65 dB having an increase of DNL 3 dB or more due to the proposed airport noise exposure. An analysis was conducted later in this section to assess the potential noise impacts to housing units and the population located between the 60 and 65 DNL noise contours due to changes in airspace and air traffic procedures.

4.12.2.3 Future (2028) Proposed Action

Aircraft Activity Levels and Fleet Mix

No change to the number of aircraft operations or fleet mix would occur as a result of implementing the Proposed Action. Therefore, the number of operations and fleet mix for the Future (2028) Proposed Action would remain the same for the Future (2028) No Action Alternative.

Runway Definition

As a result of implementing the Proposed Action, Runway 11R/29L would be replaced with a parallel runway the same length as Runway 11L/29R as described for the Future (2023) Proposed Action. No additional airfield modifications are expected to occur between 2023 and 2028.

Runway End Utilization

Fixed Wing Operations

Runway end utilization as a result of implementing the Proposed Action is expected to change due to the relocation and lengthening of Runway 11R/29L. Runway use percentages modeled for the Future (2028) Proposed Action noise contour are shown in **Table 4-39**.

Helicopter Operations

No change to helicopter operations are anticipated as a result of implementing the Proposed Action.

Flight Tracks

Flight track locations and percent utilization for the Future (2028) Proposed Action are expected to remain the same as described for the Future (2023) Proposed Action.

**Table 4-39
RUNWAY UTILIZATION – FUTURE (2028) PROPOSED ACTION
Tucson International Airport**

AIRCRAFT CATEGORY	RUNWAY END						
	11L	29R	11R	29L	3	21	Total
Daytime Arrivals							
Air Carrier / Cargo	58.0%	17.0%	19.3%	5.7%	0.0%	0.0%	100.0%
Air Taxi / Commuter	66.9%	21.1%	1.2%	0.5%	7.2%	3.1%	100.0%
General Aviation	66.4%	13.4%	10.6%	3.2%	2.0%	4.3%	100.0%
Military	38.0%	12.0%	38.0%	12.0%	0.0%	0.0%	100.0%
Total	57.8%	15.6%	17.7%	5.3%	1.9%	1.8%	100.0%
Nighttime Arrivals							
Air Carrier / Cargo	76.7%	22.3%	0.8%	0.2%	0.0%	0.0%	100.0%
Air Taxi / Commuter	80.9%	15.8%	0.0%	0.0%	0.2%	3.0%	100.0%
General Aviation	61.6%	14.4%	7.5%	2.0%	0.0%	14.5%	100.0%
Military	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	75.3%	20.1%	1.6%	0.4%	0.0%	2.6%	100.0%
Daytime Departures							
Air Carrier / Cargo	58.1%	17.0%	19.3%	5.7%	0.0%	0.0%	100.0%
Air Taxi / Commuter	65.5%	12.3%	3.9%	1.5%	0.4%	16.3%	100.0%
General Aviation	66.6%	7.2%	13.4%	3.7%	0.9%	8.2%	100.0%
Military	38.0%	12.0%	38.0%	12.0%	0.0%	0.0%	100.0%
Total	57.6%	12.2%	19.1%	5.6%	0.3%	5.2%	100.0%
Nighttime Departures							
Air Carrier / Cargo	76.6%	22.4%	0.8%	0.2%	0.0%	0.0%	100.0%
Air Taxi / Commuter	91.1%	0.8%	0.0%	0.0%	0.0%	8.1%	100.0%
General Aviation	82.5%	0.0%	10.6%	2.3%	2.8%	1.8%	100.0%
Military	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	80.3%	15.7%	1.4%	0.4%	0.2%	1.9%	100.0%

Source: FAA, 2017, Radar Data; Landrum & Brown, 2018.

Aircraft Trip Length and Operational Profiles

Civil Operations

The trip lengths flown from TUS for the Future (2028) Proposed Action are not expected to change from Future (2028) No Action Alternative.

Military Operations

It is expected that military profile descriptions and profile usage for the Future (2023) No Action Alternative shown would remain the same for the Future (2028) Proposed Action.

4.12.2.4 Future (2028) Proposed Action Noise Contours

Exhibit 4-14 reflects the Future (2028) Proposed Action average-annual noise contours at TUS. Noise contours are presented for the DNL 65, 70, and 75 db. The DNL 65 dB Future (2028) Proposed Action noise contour extends approximately 4.30 miles to the southeast beyond Runway 29R end and extends approximately 4.87 miles to the southeast beyond Runway 29L end. This area is mostly vacant/undeveloped land with some commercial/industrial uses located within Pima County.

To the northwest of the Airport, the noise contour primarily reflects usage by aircraft arriving from the northwest and to a lesser degree aircraft departing to the northwest. The DNL 65 dB noise contour extends approximately 1.95 miles to the northwest from Runway 11L end and extends approximately 1.87 miles to the northwest beyond Runway 11R. The area northwest of TUS within the DNL 65 dB contour is comprised of residential and commercial land uses within the City of Tucson.

The Future (2028) Proposed Action noise contour does not extend as far to the northwest as compared to the Future (2028) No Action Alternative but is generally shifted farther southwest as the new proposed is anticipated to be used more than it is today due to a more even distribution of aircraft operations between the two parallel runways.

There are no, churches, nursing homes, hospitals, or libraries within any of the contours. There is one school, the Pima Community College-Aviation Technology Center located in the DNL 65 dB noise contour. However, this facility, which is located on airport property, would be considered a compatible land use due to its function dealing with aircraft mechanics and structural repair.

Exhibit 4-15 provides a comparison of Future (2028) Proposed Action and the Future (2028) No Action Alternative. Summaries of the residential population and housing units affected by noise levels exceeding DNL 65 dB for the Future (2028) Proposed Action noise contours are provided in **Table 4-40**.

Based on the analysis presented, implementing the Future (2028) Proposed Action would result one (1) fewer housing units exposed to DNL 65+ dB noise levels as compared to the Future (2028) No Action Alternative. However, because of the type of housing units impacted, there would be in minor increase in population exposed to DNL 65+ dB as compared to the Future (2028) No Action Alternative. The determination of whether the Proposed Action would result in a significant impact is whether there is an increase in noise of +1.5 dB or more in the DNL 65 dB over noise sensitive land uses. The analysis presented in the following sections concluded that a 1.5 dB increase would occur within the 65 DNL or greater noise contour for Future (2028) Proposed Action.

**Table 4-40
HOUSING AND POPULATION FOR FUTURE (2028) PROPOSED ACTION
NOISE CONTOURS
Tucson International Airport**

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	DNL 65+ dB
Housing Units				
Single-Family Residential	384	0	0	384
Multi-Family Residential	55	0	0	55
Manufactured Housing	202	0	0	202
Total Housing Units	641	0	0	641
Population				
Single-Family Residential	1,295	0	0	1,295
Multi-Family Residential	190	0	0	190
Manufactured Housing	700	0	0	700
Total Population	2,185	0	0	2,185

Notes: Population numbers are estimates based on the 2000 United States Census average household size per number of housing units.

Source: Landrum & Brown, 2018.

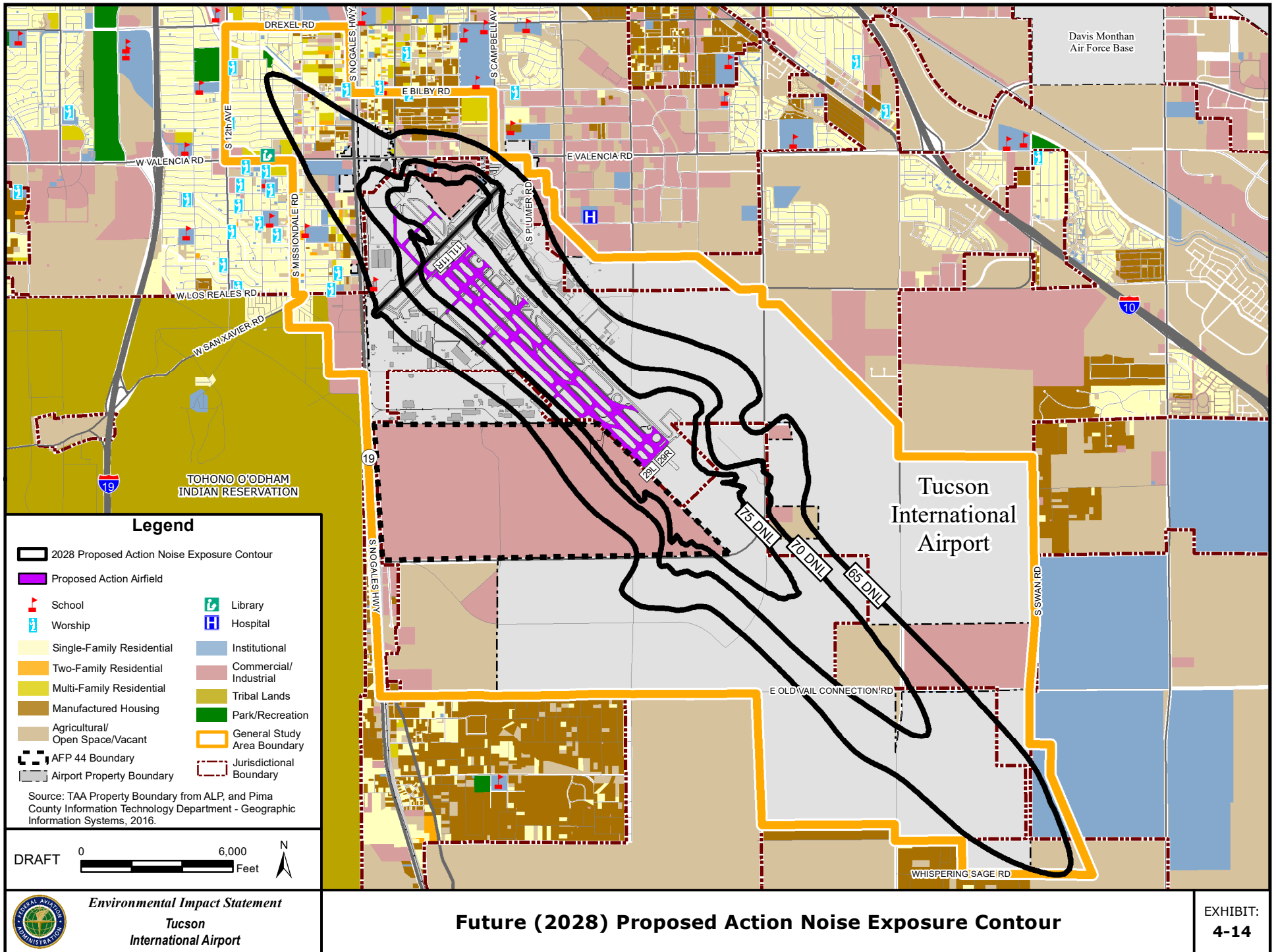
The analysis concluded that a 1.5 dB increase would occur within the 65 DNL or greater noise contour for Future (2028) Proposed Action when compared to the Future (2028) No Action Alternative. **Exhibit 4-16** shows the area of significant increase within the DNL 65 dB of the Future (2023) Proposed Action. **Table 4-41** shows the total number of housing units and estimated population within the area of 1.5 dB increase within the 65 DNL of the Future (2028) Proposed Action noise contour. Housing units and population are classified by type (single-family, two-family, multi-family, manufactured mobile (home)) and by location within the previous Noise Compatibility Program mitigation boundary.

**Table 4-41
HOUSING AND POPULATION WITHIN THE AREA OF 1.5 DB INCREASE
WITHIN 65 DNL OF THE FUTURE (2028) PROPOSED ACTION NOISE
CONTOURS
Tucson International Airport**

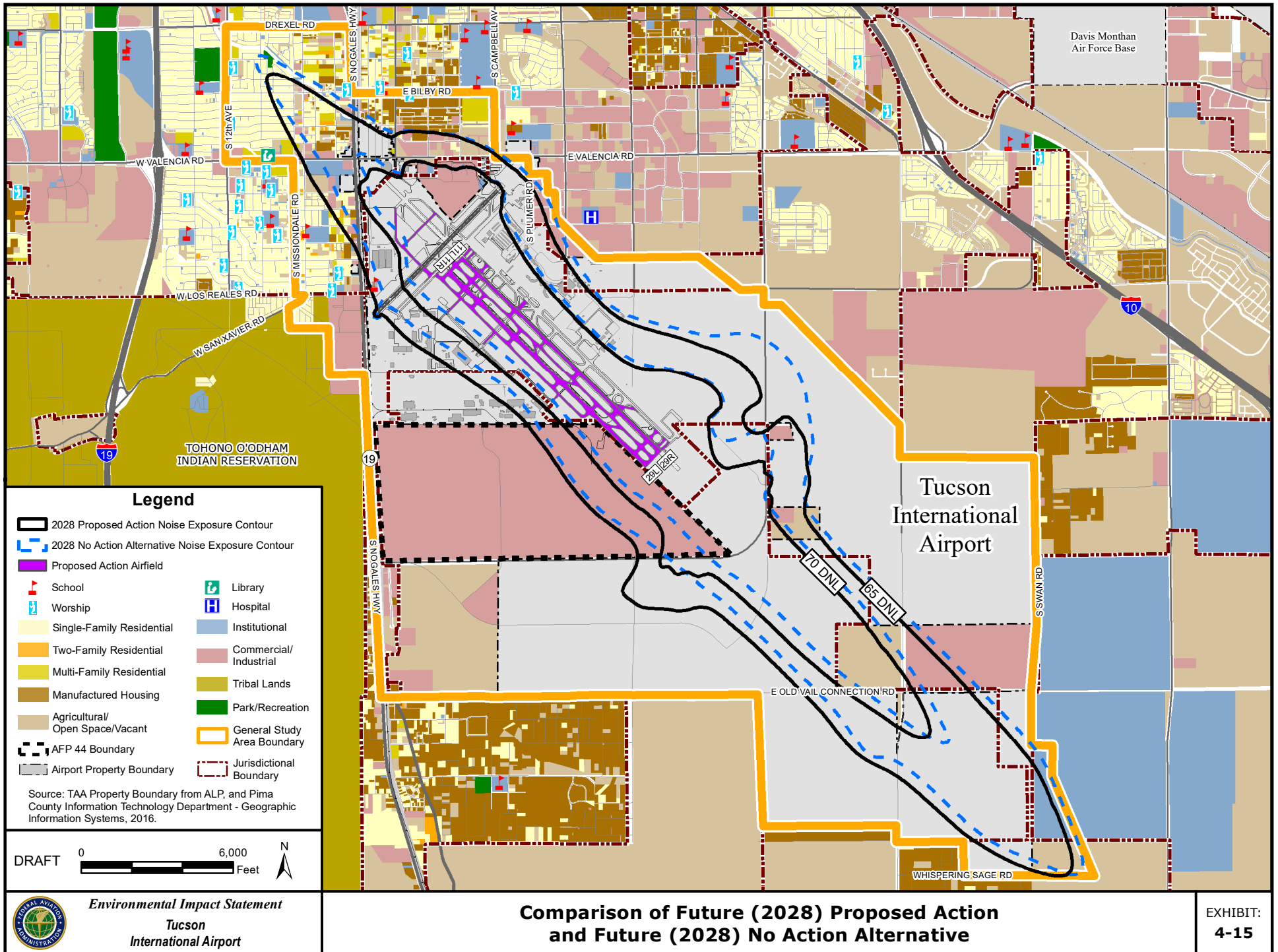
HOUSING TYPE	HOUSING UNITS	ESTIMATED POPULATION
Single-Family Residential	31	108
Two Family Residential	2	7
Multi-Family Residential	21	73
Manufactured Housing	20	70
Total	74	258

Note: Five (5) of the single family residences have participated in a previous noise mitigation program.

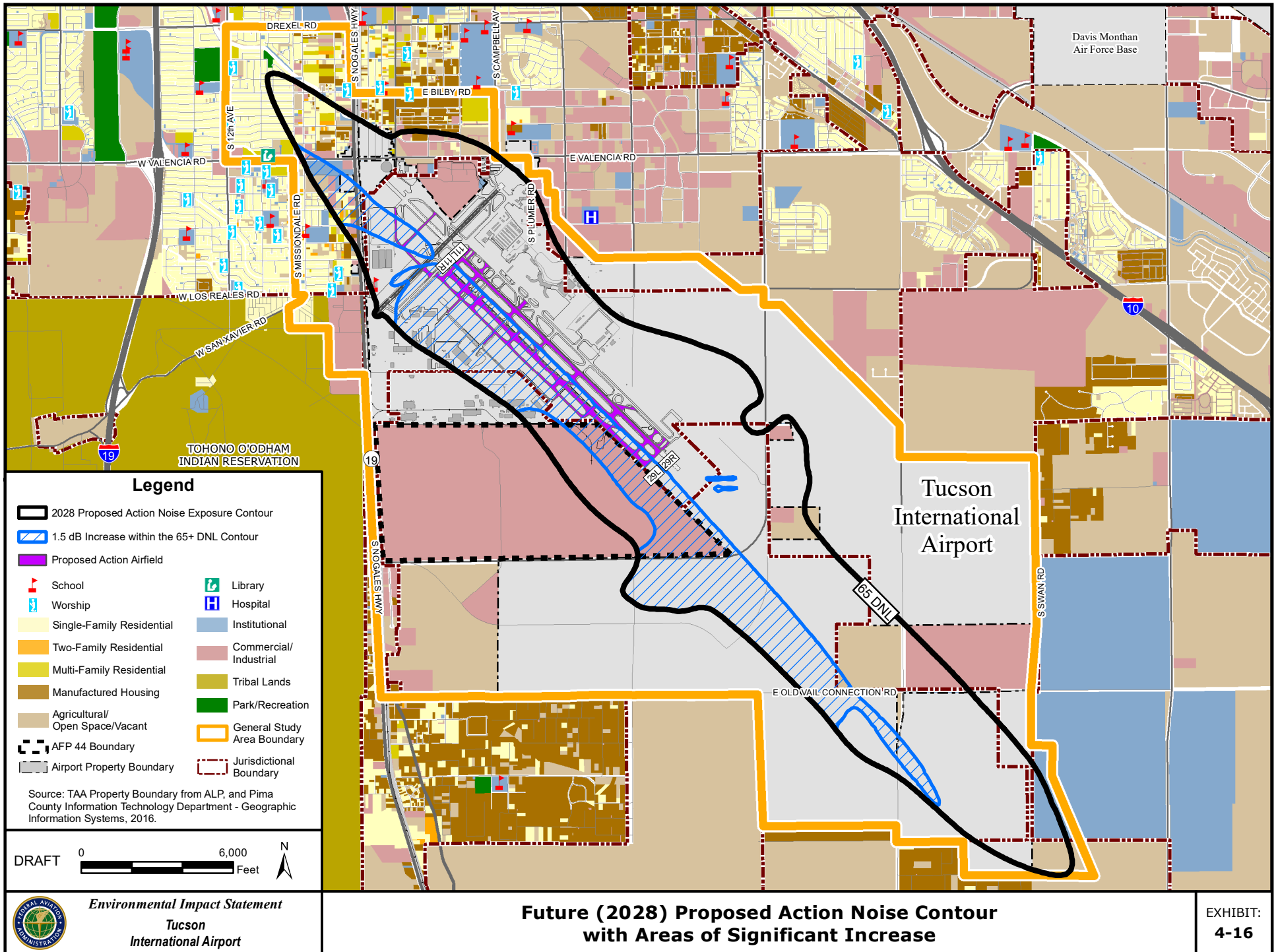
Source: Landrum & Brown, 2018



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Reportable Noise Changes

For air traffic airspace and procedure actions where the study area is larger than the immediate vicinity of an airport, the noise analysis focuses on a change-in-exposure analysis. This analysis examines the change in noise levels as compared to population and demographic information. Per FAA Order 1050.1F Section 11.3 Environmental Consequences, this analysis may be conducted using noise contours.

Analysis was conducted to assess the potential noise impacts to housing units and the population located between the 60 and 65 DNL noise contours due to changes in airspace and air traffic procedures. The analysis was conducted using the recommendations of the FICON³⁷, which the FAA has incorporated into FAA Order 1050.1F. The FICON was formed to review and make recommendations on federal policies that govern the assessment of airport noise impacts. Under one of its policy recommendations, FICON concluded that it is prudent to provide for a systematic analysis of noise levels below DNL 65 dB in NEPA documents using the following screening procedures:

1. Determine if a 1.5 dB increase occurs at noise-sensitive sites within the 65 DNL or greater noise contour. If a 1.5 dB increase does not occur, then it is likely that a 3.0 dB increase would not be found within the 60 to 65 DNL noise contour, and no further screening would be necessary.
2. If a 1.5 dB increase does occur at noise-sensitive sites within the 65 DNL or greater noise contour, then determine the areas where a 3 dB increase occurs within the 60 to 65 DNL noise contour.

According to the policy recommendations of the FICON, when areas of a 3 dB increase in noise exposure within the 60 to 65 DNL noise contour and 5 dB increase in the 45 to 60 DNL noise contour are identified in a NEPA analysis, the consideration of appropriate mitigation should include the potential for mitigating noise in these areas.³⁸ The FAA refers to noise changes meeting these criteria as “reportable.” Although they are not significant (see Exhibit 4-1 of Order 1050.1F), they may cause a proposed action to be highly controversial on environmental grounds. The same range of currently approved mitigation options that are potentially available at 65 DNL or greater should be considered, including eligibility for federal funding. The FICON further acknowledges that there is no commitment by either the FAA or the airport sponsor for funding potential land use mitigation within a 60 to 65 DNL noise contour, because it is generally expected that federal priority would be given to mitigating noise at higher levels.

Exhibit 4-17 and **Exhibit 4-18** depicts the reportable areas of noise increase associated with the Future (2023) Proposed Action and Future (2028) Proposed Action Noise Contours. There are no housing units or estimated population within

³⁷ Federal Interagency Committee on Noise (FICON), August 1992, Federal Agency Review of Selected Airport Noise Analysis Issues.

³⁸ Per FAA Order 1050.1F, AEDT was used to identify where the 5 dB increase within the DNL 45 to 60 dB occurs. This was conducted to evaluate the potential noise impacts as a result of changes in airport arrivals and departures and determine whether there is the potential to increase noise levels over communities beneath the aircraft route.

the areas of 3 dB increase within the 60-65 DNL and the 5 dB increase within the 45-60 DNL for either the Future (2023) Proposed Action or the Future (2028) Proposed Action.

4.12.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The Future (2023) Proposed Action would result in a significant impact to 65 housing units within the DNL 65 dB. Similarly, the Future (2028) Proposed Action would result in a significant impact to 74 housing units within the DNL 65 dB. Since the Future (2028) Proposed Action includes all of the homes in the Future (2023) Proposed Action, the area of significant increase associated with Future (2028) Proposed Action will be used to identify mitigation boundaries. **Exhibit 4-19** shows the housing units in the potential areas of significant noise impact.

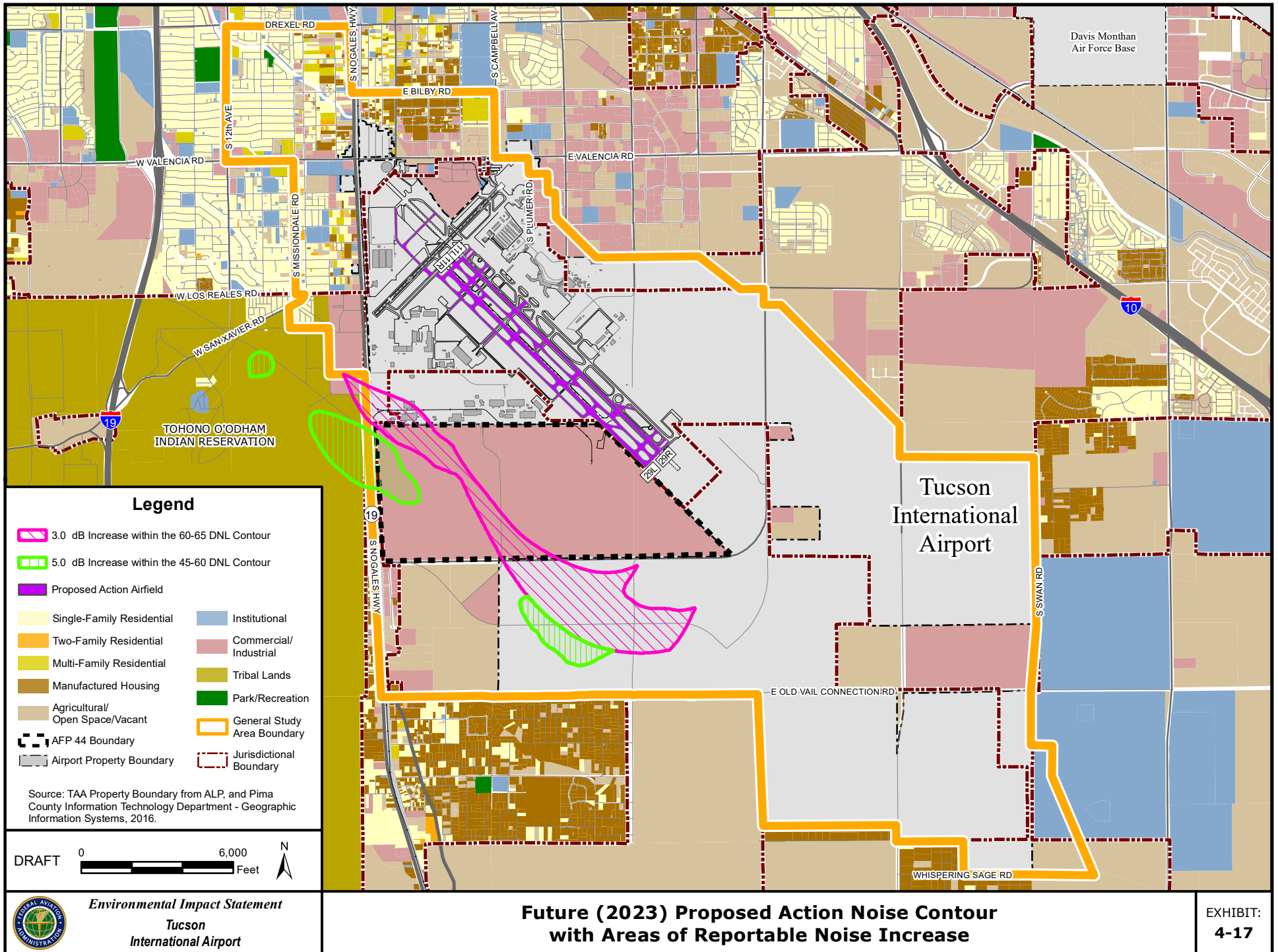
Consistent with Section 3.5 of the 1992 FICON Report, the FAA considers mitigation outside the DNL 65 dB on a case-by-case basis. Since the demand for federal funding of airport noise mitigation is greater than the supply, FAA policy is to mitigate the areas affected by DNL 65 dB and greater first before considering areas impacted by lower airport noise levels for mitigation. Generally, normal building construction provides a 20 dB noise level reduction to achieve an interior sound level of 45 dB.

The mitigation included sound insulation for eligible single-family and multi-family housing units, as well as acquisition of manufactured/mobile home parks within the previous DNL 65 dB noise contour³⁹.

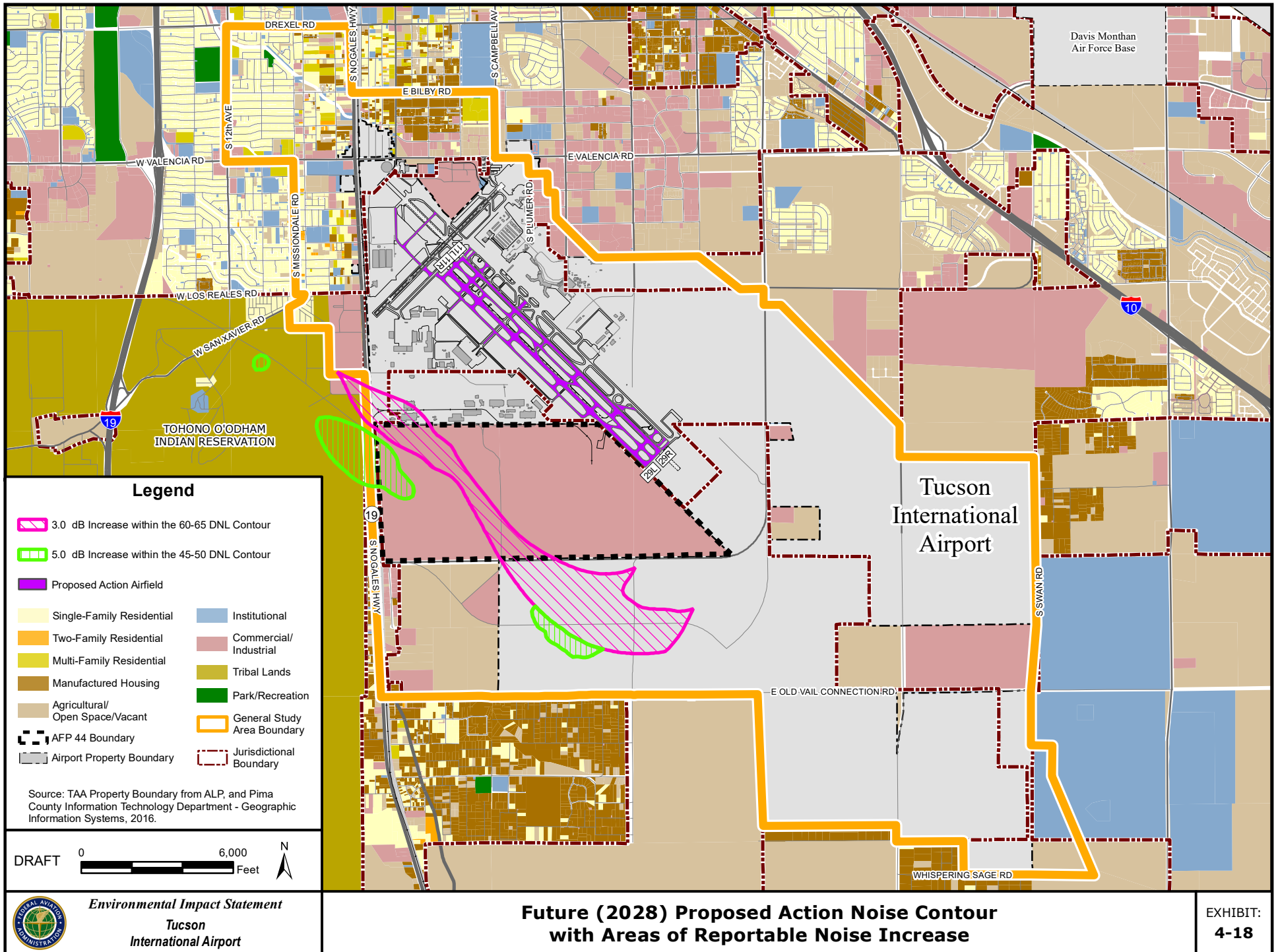
Of the 74 housing units in the significant increase area of the Future (2028) Proposed Action noise contour, five single-family units have been previously sound insulated. This leaves 69 dwelling units that are to be mitigated in the following manner. In order to be eligible for sound insulation the interior noise levels must be at DNL 45 dB or above. For the purposes of mitigating the significant noise increases, the following actions would occur:

- Offer to sound insulate 26 single-family housing units
- Offer to sound insulate two two-family housing units
- Offer to sound insulate 21 multi-family housing units
- Offer 20 manufactured/mobile housing units acquisition. Since mobile homes cannot be effectively sound insulated because of the nature of the home to be able to be moved from place to place, the owners of the 20 mobile homes within the area of 1.5 dB increase within the DNL 65 dB noise contour for the Future (2028) Proposed Action would be given an offer for acquisition and residents would be offered relocation assistance per the Uniform Relocation Assistance and Real Property Acquisition Act. TAA has effectively relocated other mobile home parks in the past under 14 C.F.R. Part 150.

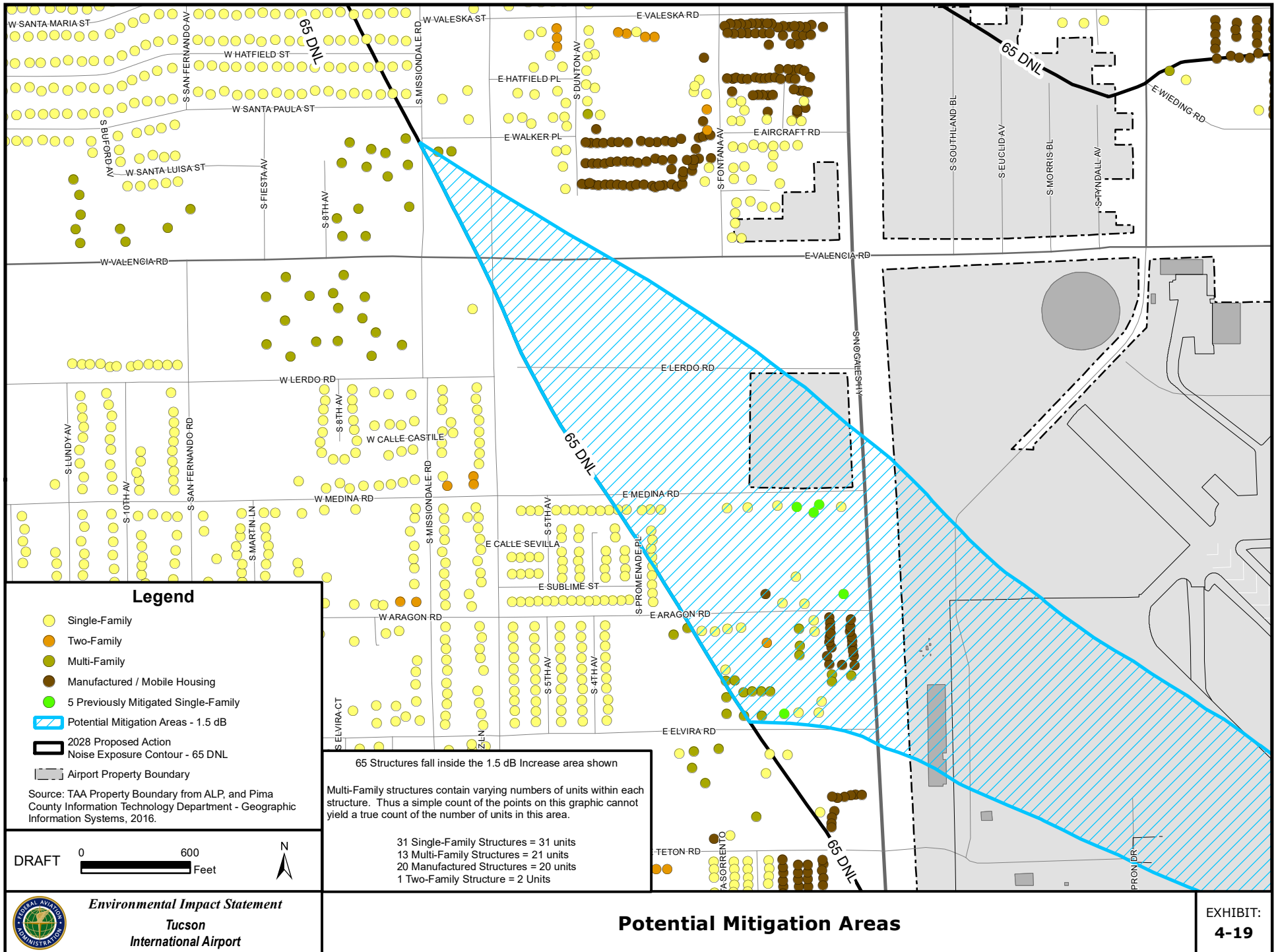
³⁹ The TAA has offered noise mitigation to homeowners through its previous Part 150 Noise Compatibility Programs.



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4.13 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S HEALTH AND SAFETY RISKS

This section presents the analysis of potential impacts to socioeconomic impacts, environmental justice impacts, and children's environmental health and safety risks that would occur as a result of the No Action Alternative and the Proposed Action.

4.13.1 NO ACTION ALTERNATIVE

4.13.1.1 Future (2023) No Action Alternative

Socioeconomic Impacts

Socioeconomic impacts are assessed to determine the effect that the proposed airport development would have on human environment such as population, employment, housing, and public services. The types of socioeconomic impacts that typically arise from airport development are:

- Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects 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.

Induced Growth

The Future (2023) No Action Alternative would not result in economic growth for the area near the Airport because no construction activity would occur. Therefore, no impacts to socioeconomic resources would occur.

Divide Communities

The Future (2023) No Action Alternative would not result in the division of established communities near the Airport. No construction activities would occur on the Airport, the proposed land exchanges would not occur, and the NGB would not construct the proposed MSA on Parcel "H". Therefore, no impacts to socioeconomic resources would occur.

Relocation of Residences

The Future (2023) No Action Alternative would not result in the acquisition or the conversion of residential properties to Airport property. There are no residential land uses on existing TAA or USAF land at AFP 44. Therefore, no impacts to socioeconomic resources would occur.

Relocation of Businesses

The Future (2023) No Action Alternative would not result in impacts to businesses located on or off-Airport. No relocation of the existing 12 ECMs on AFP 44 property would occur. Therefore, no impacts to socioeconomic resources would occur.

Disruptions of Local Traffic Patterns

The Future (2023) No Action Alternative would not result in modifications to off-Airport roadways or increase surface traffic. Therefore, no impacts to socioeconomic resources would occur.

Substantial Loss in Community Tax Base

The Future (2023) No Action Alternative would not result in a substantial loss in community tax base. Therefore, no impacts to socioeconomic resources would occur.

Environmental Justice

As previously described in the regulatory setting in Chapter 3, Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, requires all federal agencies to address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The EO also directs federal agencies to incorporate environmental justice as part of their overall mission by conducting their programs and activities in a manner that provides minority and low-income populations an opportunity to participate in agency programs and activities.

The USDOT Order 5610.2(a) provides definitions for minority and low income populations:

- a. Low-Income means a person whose median household income is at or below the Department of Health and Human Services poverty guidelines.
- b. Minority means a person who is:
 - (1) Black: a person having origins in any of the black racial groups of Africa;
 - (2) Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;
 - (3) Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent;

- (4) American Indian and Alaskan Native: a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through tribal affiliation or community recognition; or
- (5) Native Hawaiian and Other Pacific Islander: people having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- c. Low-Income Population means any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy or activity.
- d. Minority Population means any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy or activity.

The EO relates to requirements in Title VI of the *Civil Rights Act of 1964* (Title VI), the *National Environmental Policy Act* (NEPA), the *Uniform Relocation Assistance and Real Property Acquisition Policies Act* (Title 49 C.F.R. § 24), and other applicable statutes and regulations. Title VI provides that no person will, on the grounds of race, color, religion, sex, national origin, marital status, disability, or family composition, be excluded from participation in, be denied the benefits of, or be otherwise subject to discrimination under any program of the Federal, state, or local government. Title VIII of the *1968 Civil Rights Act* guarantees each person equal opportunity in housing.

FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, provides guidance for the preparation of environmental justice analysis in support of an EIS. The action would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population, i.e., a low-income or minority population, due to:

- Significant impacts in other environmental impact categories; or
- Impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA determines are unique to the environmental justice population and significant to that population.

Disproportionately high and adverse effect on minority and low-income populations means an adverse effect that:

1. Is predominately borne by a minority population and/or a low-income population; or
2. Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the nonminority population and/or non-low-income population.

Based on a review of the direct and indirect effects and the population characteristics of the area around the Airport, there was one impact category (airport noise) where significant impacts would occur. The significant noise impacts will be assessed to determine whether a disproportionately high and adverse effect on minority and low-income populations and whether those populations will suffer more than and the noise impact is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority and non-low income populations. For purposes of assessing potential environmental justice impacts related to significant noise impacts, the following criteria will be used to identify census block groups where minority and low-income population will be counted:

- Census block groups that have noise sensitive land uses in the area that intersects the 65 Day-Night Average Sound Level (DNL) noise contour for the Proposed Action and No Action Alternative; and
- Census block groups that intersect the area within the DNL 65 dB of the Proposed Action where 1.5 dB increases occur over noise sensitive land uses.

In order to quantify the potential environmental justice impacts associated with the Future (2023) No Action Alternative, a demographic breakdown of the potentially affected population was prepared.⁴⁰ There was a total population of 2,101 within the DNL 65 dB noise contour of the Future (2023) No Action Alternative. Approximately 89.9 percent of the population is minority, consisting of 82.4 percent Hispanic and the remaining 7.5 percent American Indian, African American, Asian, and other races.

Of the 618 housing units within the DNL 65 dB noise contour of the Future (2023) No Action Alternative, 388 were single-family residences, 35 multi-family residences, and 195 manufactured homes. See Section 4.12 for the DNL 65 dB noise contour for the Future (2023) No Action Alternative.

Two of the census block groups that have noise sensitive land uses in the area that intersects the DNL 65 dB noise contour for the Future (2023) No Action Alternative are identified as low-income. Therefore, the Future (2023) No Action Alternative would impact minority and low-income populations.

Children's Environmental Health and Safety Risks

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires all Federal agencies to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

No physical development or land transfers would occur for the Future (2023) No Action Alternative. Therefore, no impacts to children's environmental health and safety risks would occur.

⁴⁰ USCB, 2016, American Community Survey 2010-2014 5-Year Estimate. Available on-line: https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml Accessed August 2017.

4.13.1.2 Future (2028) No Action Alternative

Socioeconomic Impacts

Induced Growth

The Future (2028) No Action Alternative would not result in economic growth for the area near the Airport because no construction activity would occur. Therefore, no impacts to socioeconomic resources would occur.

Divide Communities

The Future (2028) No Action Alternative would not result in the division of established communities near the Airport. No construction activities would occur on the Airport, the proposed land exchanges would not occur, and the NGB would not construct the proposed MSA on Parcel "H". Therefore, no impacts to socioeconomic resources would occur.

Relocation of Residences

The Future (2028) No Action Alternative would not result in the acquisition or the conversion of residential properties to Airport property. There are no residential land uses on existing TAA or USAF land at AFP 44. Therefore, no impacts to socioeconomic resources would occur.

Relocation of Businesses

The Future (2028) No Action Alternative would not result in impacts to businesses located on or off-Airport. No relocation of the existing ECMs on AFP 44 property would occur. Therefore, no impacts to socioeconomic resources would occur.

Disruptions of Local Traffic Patterns

The Future (2028) No Action Alternative would not result in modifications to off-Airport roadways or increase surface traffic. Therefore, no impacts to socioeconomic resources would occur.

Substantial Loss in Community Tax Base

The Future (2028) No Action Alternative would not result in a substantial loss in community tax base. Therefore, no impacts to socioeconomic resources would occur.

Environmental Justice

In order to quantify the potential environmental justice impacts associated with the Future (2028) No Action Alternative, a demographic breakdown of the potentially affected population was prepared.⁴¹ There was a total population of 2,181 within the DNL 65 dB noise contour of the Future (2028) No Action Alternative. Approximately 89.9 percent of the population is minority, consisting of 82.4 percent Hispanic and the remaining 7.5 percent American Indian, African American, Asian, and other races.

Of the 642 housing units within the DNL 65 dB noise contour of the Future (2028) No Action Alternative, 408 were single-family residences, 36 multi-family residences, and 198 manufactured homes. See Section 4.12 for the DNL 65 dB noise contour for the Future (2028) No Action Alternative.

Similar to the Future (2023) No Action Alternative, two of the census block groups that have noise sensitive land uses in the area that intersects the DNL 65 dB noise contour for the Future (2028) No Action Alternative are identified as low-income. Therefore, the Future (2028) No Action Alternative would impact minority and low-income populations.

Children's Environmental Health and Safety Risks

No physical development or land transfers would occur for the Future (2028) No Action Alternative. Therefore, no impacts to children's environmental health and safety risks would occur.

4.13.2 PROPOSED ACTION

4.13.2.1 Future (2023) Proposed Action

Socioeconomic Impacts

Induced Growth

The construction and implementation of the Future (2023) Proposed Action would not result in long-term economic growth for the area near the Airport. Temporary growth in economic activity from the creation of construction jobs is likely to occur during construction. Therefore, no adverse impacts to socioeconomic resources would occur.

Divide Communities

The construction and implementation of the Future (2023) Proposed Action would occur on existing Airport property or existing AFP 44 property. The Proposed Action would not result in the division of established communities near the Airport. Therefore, no impacts to socioeconomic resources would occur.

⁴¹ USCB, 2016, American Community Survey 2010-2014 5-Year Estimate. Available on-line: https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml Accessed August 2017.

Relocation of Residences

The construction and implementation of the Future (2023) Proposed Action would not result in mandatory acquisition or the conversion of any residential properties to Airport property. Residents of housing units in significant noise increase areas would be given an offer for acquisition and residents would be offered relocation assistance per the Uniform Relocation Assistance and Real Property Acquisition Act. Potential acquisition would be voluntary. See Section 4.12 for additional information. Therefore, no adverse impacts due to the relocation of residences would occur.

Relocation of Businesses

The construction and implementation of the Proposed Action would require the transfer of approximately 58 acres of land referred to as Parcel "F" from the USAF to the TAA. Parcel "F" is currently used by the USAF to store explosives in ECMs. The Proposed Action includes the demolition of the ECMs in Parcel "F" and adjacent to Parcel "F" to maintain the necessary FAA and USAF required safety areas. Therefore, the ECMs would be relocated to a site near other existing ECMs on AFP 44 and no significant impact to their operation would occur. The USAF would be reimbursed for the fair market value of the ECMs and compensated for any temporary disruption in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970. The USAF would ultimately receive land south of their current southern boundary (commonly referred to as parcels "G" and "H"). See **Exhibit 4-20** for a map of the land transfers and the relocation of the ECMs. Because the USAF would be made whole from a land and business operation perspective, no significant impacts to socioeconomic resources would occur.

Disruptions of Local Traffic Patterns

The construction and implementation of the Future (2023) Proposed Action does not include proposed modifications to public roadways. The Proposed Action does include construction and implementation of a new haul road. The proposed new haul road would connect the Airport to the proposed new AANG development. However, this new haul road would not be available to the public for security reasons. The Future (2023) Proposed Action would not result in an increase in surface traffic other than a temporary increase during construction. Depending on the origin and destination of the vehicles, roadways likely to be used would include South Nogales Highway north and south, Aerospace Parkway east and west, and Alvernon Way north and south. Given the capacity of those roads, it is concluded that they are sufficient to handle this temporary increase during construction. Therefore, there would be no significant disruption of local traffic patterns as a result of implementing the Future (2023) Proposed Action.

Substantial Loss in Community Tax Base

Neither the TAA nor the USAF are subject to local property taxes; therefore, would be no change in local tax base as a result of implementing the Future (2023) Proposed Action. As noted in the preceding sections, the implementation of the Future (2023) Proposed Action would result in a land transactions/conveyance between the USAF and the TAA, as well as the relocation of ECMs on AFP 44.

Environmental Justice

In order to quantify the potential environmental justice impacts associated with the Future (2023) Proposed Action, a demographic breakdown of the potentially affected population was prepared.⁴² There was a total population of 2,021 within the DNL 65 dB noise contour of the Future (2023) Proposed Action. Approximately 89.3 percent of the population is minority, consisting of 81.6 percent Hispanic and the remaining 7.8 percent American Indian, African American, Asian, and other races.

Table 4-42 summarizes the percentage of minority population within the DNL 65 dB and the areas of significant noise increase for the Future (2023) Proposed Action compared to the Future (2023) No Action Alternative.

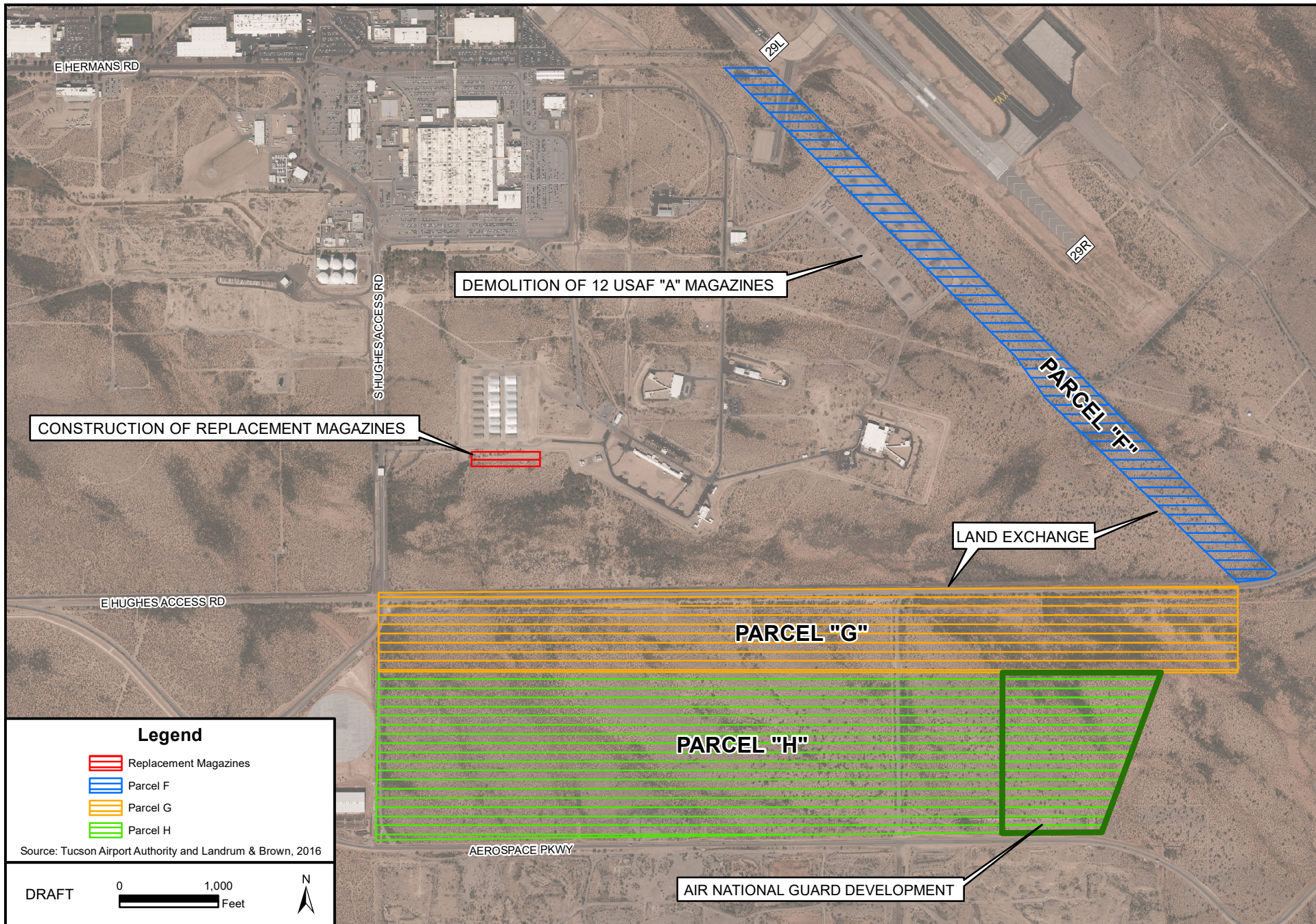
Table 4-42
PERCENTAGE OF MINORITY RESIDENTS – FUTURE (2023)
Tucson International Airport

RACE	FUTURE (2023) NO ACTION ALTERNATIVE DNL 65 DB %	FUTURE (2023) PROPOSED ACTION DNL 65 DB %	FUTURE (2023) PROPOSED ACTION SIGNIFICANT INCREASE AREA %
White	10.2%	10.7%	12.2%
Hispanic	82.1%	81.6%	86.9%
Black/ African American	1.3%	1.3%	0.0%
American Indian	5.0%	5.0%	0.0%
Asian	1.3%	1.5%	0.9%
Other	0.0%	0.0%	0.0%
Total Minority	89.8%	89.3%	87.8%

Note: Table reports percent Hispanic population and percent of non-Hispanic White, Black, American Indian, Asian, and other races.

Sources: United States Census Bureau (USCB), 2016, American Community Survey 2010-2014 5-Year Estimate; Landrum & Brown, 2018.

⁴² United States Census Bureau (USCB), 2016, American Community Survey 2010-2014 5-Year Estimate. Available on-line: https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml Accessed August 2017.



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Environmental Justice Outreach

Local outreach to minority and low-income community groups, organizations, and community leaders was conducted as part of the EIS process. Representatives of the Tohono O’odham Nation were sent invitations to the EIS agency scoping meeting. Notification of the public scoping meeting and the request for comments determining the scope of issues to be addressed and for identifying the significant issues related to the Proposed Action was advertised in *La Estrella*, the local weekly Spanish language publication. The notification was also published in the Sunnyside Neighborhood Association Newsletter. FAA published a Purpose, Need, and Alternatives Working Paper, which was made available for public review and comment in local libraries and on the FAA’s website for this EIS in April 2017. In addition, a Public Workshop was held in September 2017, as part of a continued effort to engage the public prior to the release of this Draft EIS. The FAA was available to answer questions on the Proposed Action, the various alternatives considered, and the affected environment. Notification of the public workshop was also advertised in *La Estrella*. The notification was provided to the Sunnyside Neighborhood Association, the Barrio Nopal Neighborhood Association, the City of Tucson Ward 1, and the City of Tucson Ward 5.

Public involvement for the EIS to communities identified as minority and/or low income will continue to be conducted pursuant to the National Environmental Policy Act of 1969 and in accordance with FAA regulations and policies for implementing NEPA including FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*. Specific outreach to environmental justice populations is continuing as the notice of availability of the Draft EIS and the opportunity to comment and attend a public hearing was published in the local Spanish language publication. In addition, direct contact to community groups, organizations, and community leaders in the form of email notifications and follow up telephone calls were made in an effort to notify specific neighborhoods, such as Sunnyside, to provide meaningful involvement in the EIS process.

Housing Units

Of the 592 housing units within the DNL 65+ dB noise contour of the Future (2023) Proposed Action, 346 were single-family residences, 51 multi-family residences, and 194 manufactured homes. See Section 4.12, *Noise and Noise-Compatible Land Use* for the DNL 65+ dB noise contour for the Future (2023) Proposed Action. Based on the analysis, there were 26 fewer total housing units impacted as compared to the Future (2023) No Action Alternative because the noise contour shifts to the southwest, as shown in **Exhibit 4-21**.

While the Future (2023) Proposed Action would cause an impact to housing units in areas considered to be environmental justice communities, there would be fewer total housing units affected as compared to the Future (2023) No Action Alternative. Therefore, the Future (2023) Proposed Action would **not** have a disproportionate adverse human health impact on low income and minority populations.

Population Areas

Based on the analysis presented in Section 4.12, *Noise and Noise-Compatible Land Use*, the Future (2023) Proposed Action noise contours shifts to the southwest as compared to the Future (2023) No Action Alternative noise contours. However, **Exhibit 4-22** shows that the DNL 65 dB noise contour remains in the same block groups and census tracts. Low-income populations that exceed the 50 percent threshold, are identified by the dark blue color and minority populations that exceed the 50 percent threshold are identified by the tan color on Exhibit 4-22.

While the Future (2023) Proposed Action Alternative would cause an impact to environmental justice populations, there would be 80 fewer total people affected as compared to the Future (2023) No Action Alternative. Therefore, the Future (2023) Proposed Action would not have a disproportionately high and adverse effect on minority populations and low income populations. Implementation of the Future (2023) Proposed Action would not cause those populations to suffer more than and the noise impact would not be appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the non-minority and non-low income populations.

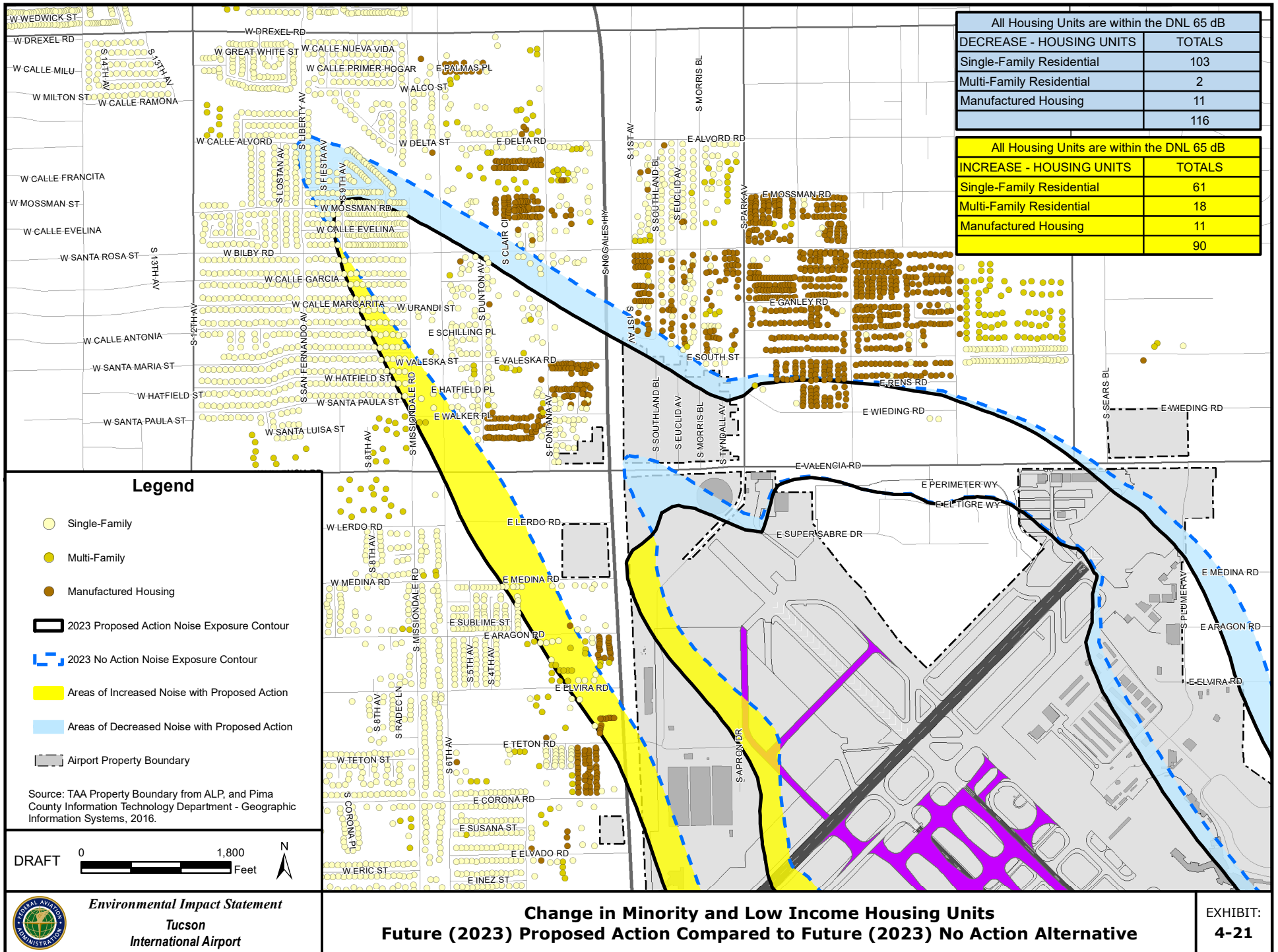
Children's Environmental Health and Safety Risks

In order to determine whether the Proposed Action would result in an elevated risk related to health or safety concerns of children Section 4.4, *Air Quality* and Section 4.15, *Water Resources*, were examined. According to the analysis in Section 4.4, the Proposed Action would not create air quality conditions that would worsen breathing conditions for children because the Proposed Action would exceed the applicable standards and would not result in an adverse impact on local or regional air quality. According to the analysis in Section 4.15, the Proposed Action would not result in the release of harmful agents into surface or groundwater resources above levels permitted by the local, state, and/or federal regulations.

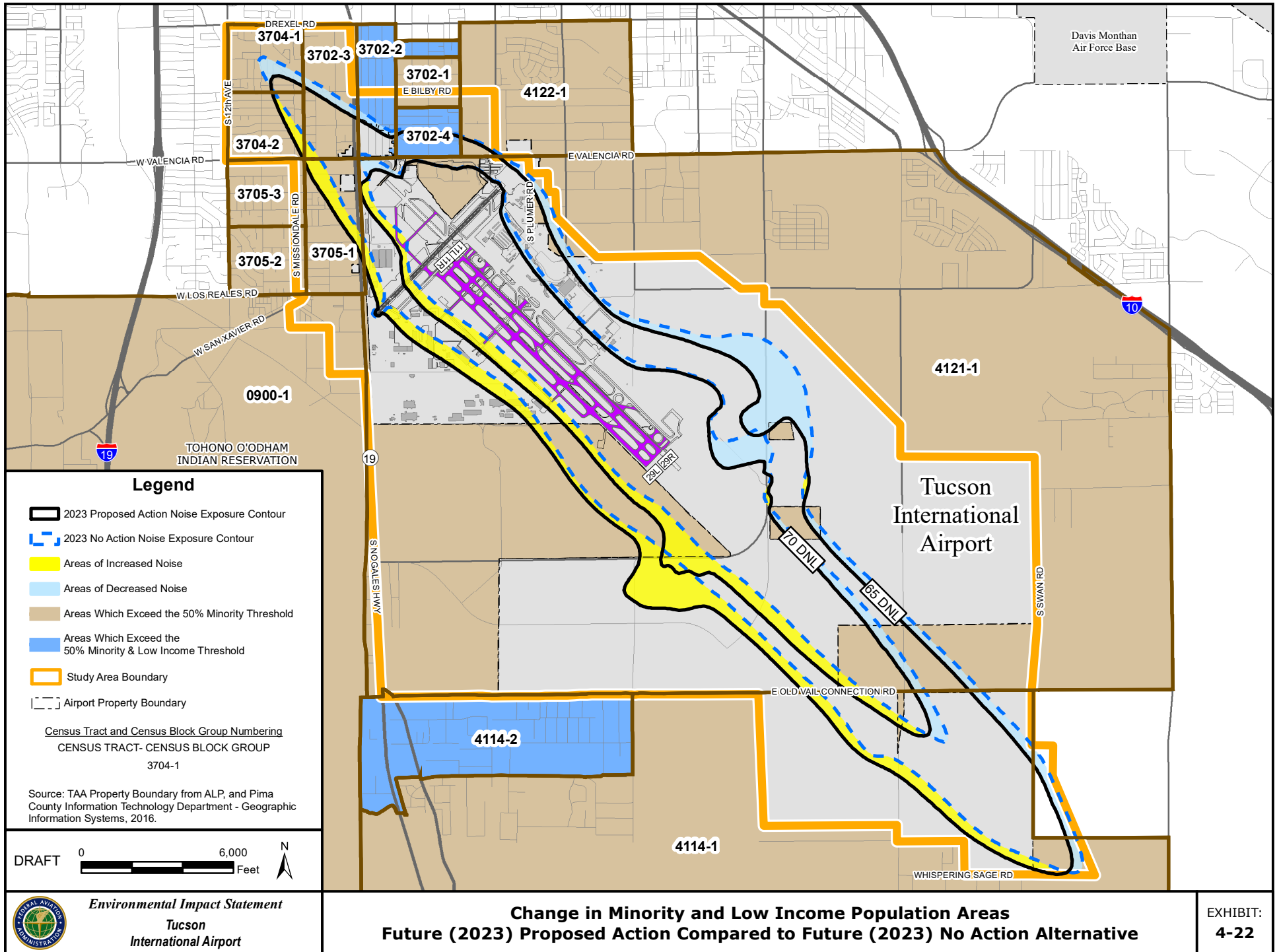
No change to the number of aircraft operations or fleet mix would occur as a result of implementing the Proposed Action because the Proposed Action is a safety enhancement project, not an airfield capacity enhancement project. Therefore, the number of operations and fleet mix for the Future (2023) No Action Alternative would remain the same for the Future (2023) Proposed Action.

The nearest school where children are congregated is approximately 3,000 feet to the west of the Detailed Study Area where construction activities are anticipated from the Proposed Action. The construction site would be fenced off to prevent access to the site by children or other unauthorized personnel. There would be no problems unique to children due to the construction or implementation of the Proposed Action.

Therefore, the Proposed Action would not result in the release of, or exposure to, significant levels of harmful agents in the water, air, or soil that would affect children's health or safety or result in an elevated risk related to health or safety concerns for children.



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4.13.2.2 Future (2028) Proposed Action

Socioeconomic Impacts

Induced Growth

The Future (2028) Proposed Action would have the same effects upon induced growth as described for the Future (2023) Proposed Action.

Divide Communities

The Future (2028) Proposed Action would have the same effects upon socioeconomic resources as described for the Future (2023) Proposed Action.

Relocation of Residences

The Future (2028) Proposed Action would have the same effects upon socioeconomic resources as described for the Future (2023) Proposed Action.

Relocation of Businesses

The Future (2028) Proposed Action would have the same effects upon socioeconomic resources as described for the Future (2023) Proposed Action.

Disruptions of Local Traffic Patterns

The Future (2028) Proposed Action would have the same effects upon socioeconomic resources as described for the Future (2023) Proposed Action.

Substantial Loss in Community Tax Base

The Future (2028) Proposed Action would have the same effects upon socioeconomic resources as described for the Future (2023) Proposed Action.

Environmental Justice

There was a total population of 2,185 within the DNL 65 dB noise contour of the Future (2028) Proposed Action. Approximately 90.2 percent of the population is minority, consisting of 82.9 percent Hispanic and the remaining 7.3 percent American Indian, African American, Asian, and other races.

Table 4-43 summarizes the percentage of minority population within the DNL 65 dB and the areas of significant noise increase for the Future (2028) Proposed Action compared to the Future (2028) No Action Alternative.

**Table 4-43
PERCENTAGE OF MINORITY RESIDENTS – FUTURE (2028)
Tucson International Airport**

RACE	FUTURE (2028) NO ACTION ALTERNATIVE DNL 65 dB %	FUTURE (2028) PROPOSED ACTION DNL 65 dB %	FUTURE (2028) PROPOSED ACTION SIGNIFICANT INCREASE AREA %
White	9.8%	9.8%	12.2%
Hispanic	82.9%	82.9%	86.9%
Black/ African American	1.5%	1.5%	0.0%
American Indian	4.4%	4.4%	0.0%
Asian	1.4%	1.4%	0.9%
Other	0.0%	0.0%	0.0%
Total Minority	90.2%	90.2%	87.8%

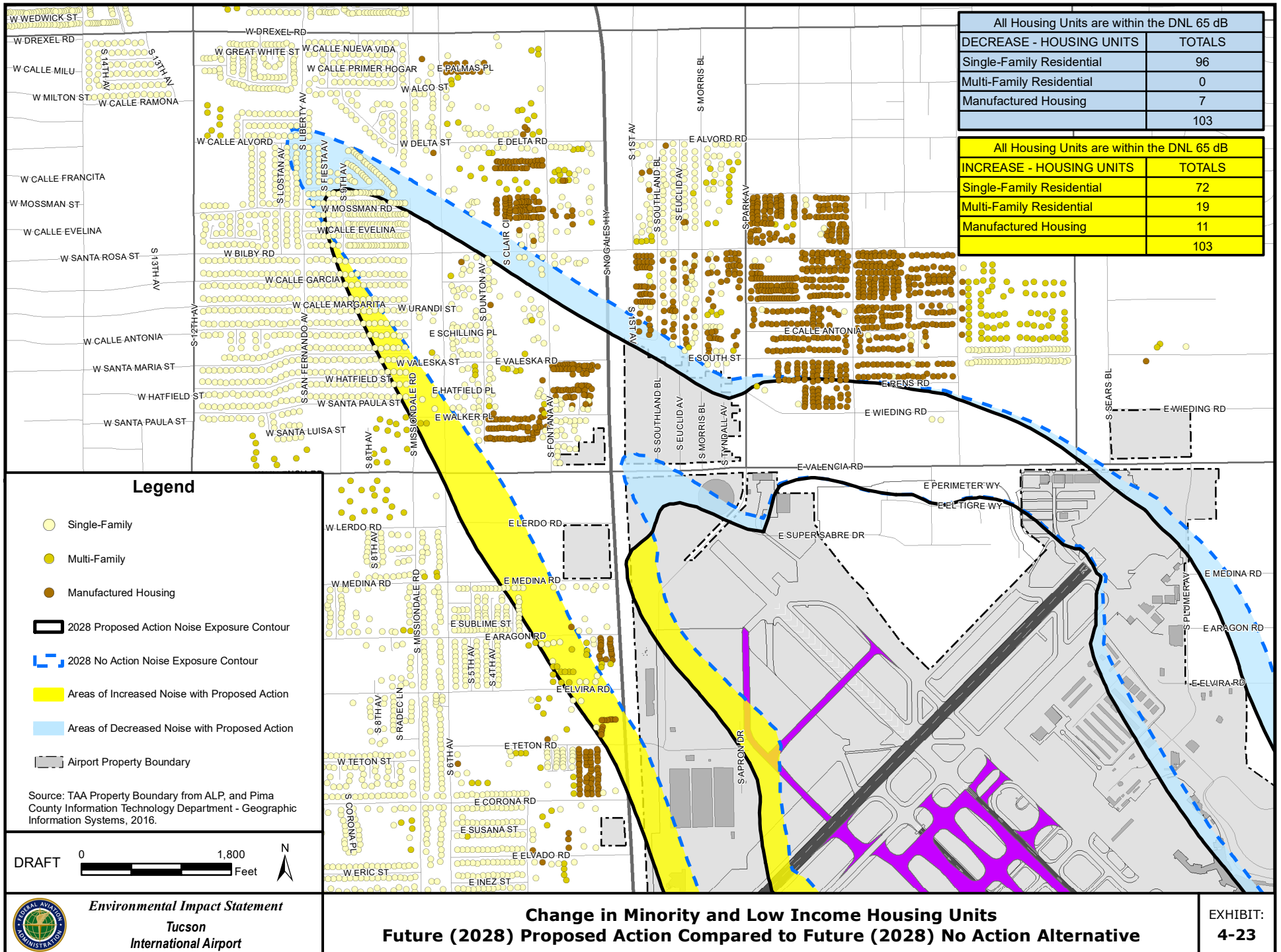
Note: Table reports percent Hispanic population and percent of non-Hispanic White, Black, American Indian, Asian, and other races.

Sources: USCB, 2016, American Community Survey 2010-2014 5-Year Estimate; Landrum & Brown, 2018.

Housing Units

Of the 641 housing units within the DNL 65+ dB noise contour of the Future (2028) Proposed Action, 384 were single-family residences, 55 multi-family residences, and 202 manufactured homes. See Section 4.12, *Noise and Noise-Compatible Land Use* for the DNL 65+ dB noise contour for the Future (2028) Proposed Action. Based on the analysis, there was one (1) fewer total housing units impacted as compared to the Future (2028) No Action Alternative even as the noise contour shifts to the southwest, as shown in **Exhibit 4-23**.

While the Future (2028) Proposed Action would cause an impact to housing units in areas considered to be environmental justice communities, there would be fewer total housing units affected as compared to the Future (2028) No Action Alternative. Therefore, the Future (2028) Proposed Action would not have a disproportionate adverse human health impact on low income and minority populations. Implementation of the Future (2028) Proposed Action would not cause those populations to suffer more than and the noise impact would not be appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the non-minority and non-low income populations.



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Population Areas

Based on the analysis presented in Section 4.12, *Noise and Noise-Compatible Land Use*, the Future (2028) Proposed Action noise contours shifts to the southwest as compared to the Future (2028) No Action Alternative noise contours. However, **Exhibit 4-24** shows that the DNL 65 dB noise contour remains in the same block groups and census tracts. Low-income populations that exceed the 50 percent threshold are identified by the dark blue color and minority populations that exceed the 50 percent threshold are identified by the tan color on Exhibit 4-24.

Due to the change in the types of housing impacted there would be four additional people impacted as compared to the Future (2028) No Action Alternative. However, the Future (2028) Proposed Action would not have a disproportionately high and adverse effect on minority populations and low-income populations because, it would not cause those populations to suffer more of a noise impact or a noise impact greater in magnitude than would be suffered by the non-minority and non-low income populations, and, because it would not cause those populations to suffer more of a noise impact or a noise impact greater in magnitude than would be suffered by the non-minority and non-low income populations.

Children's Environmental Health and Safety Risks

The Future (2028) Proposed Action would have the same effects upon children's environmental health and safety risks as described for the Future (2028) Proposed Action.

4.13.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

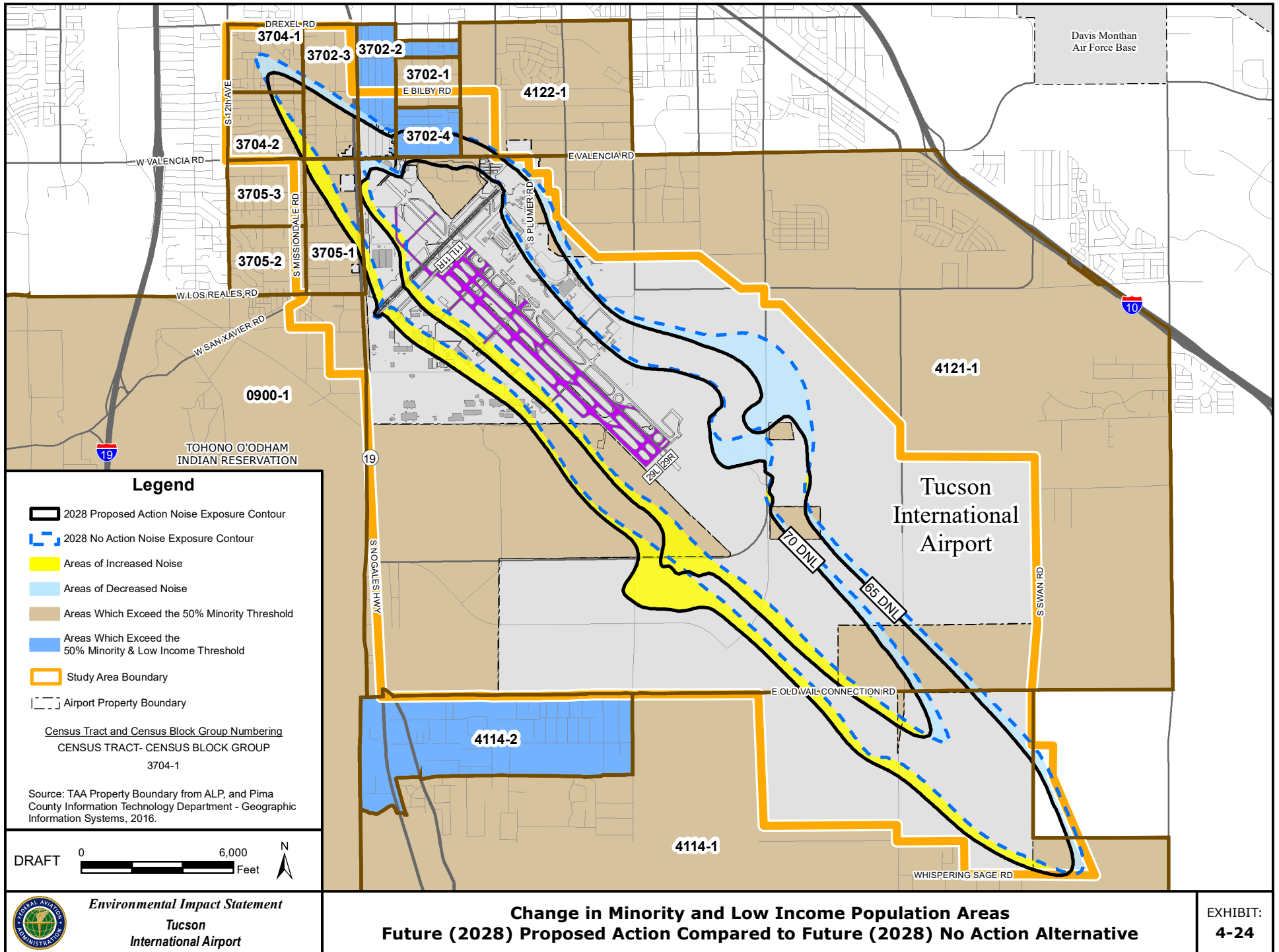
The Proposed Action would require mitigation measures. Based on the socioeconomic impact analysis, the construction and implementation of the Proposed Action would require the transfer of approximately 58 acres of land referred to as Parcel "F" from the USAF to the TAA. Parcel "F" is currently used by the USAF to store explosives in 12 ECMs. The Proposed Action includes the demolition of the 12 ECMs in Parcel "F" and adjacent to Parcel "F" to maintain the necessary FAA and USAF required safety areas.

Mitigation for the socioeconomic impact includes relocated the ECMs elsewhere on AFP 44 in order to maintain USAF capabilities. The USAF would be reimbursed for the fair market value of the 12 ECMs and compensated for any temporary disruption in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970. In addition, the USAF would ultimately receive land south of their current southern boundary (commonly referred to as parcels "G" and "H"). Because of these measures, the USAF would be made whole from a land and business operation perspective, and no significant impacts to socioeconomic resources would occur.

Based on the environmental justice impact analysis, there were fewer total housing units and total population impacted in the Future (2023) Proposed Action as compared to the Future (2023) No Action Alternative. In addition, based on the environmental justice impact analysis, there were fewer total housing units but more total population impacted in the Future (2028) Proposed Action as compared to the Future (2028) No Action Alternative. As discussed in Section 4.12, *Noise and Noise-Compatible Land Use*, there would be a significant noise impact to 74 housing units within the area of 1.5 dB increase within the DNL 65 dB of the Future (2028) Proposed Action noise contour. FAA notes that there is **no** adverse Environmental Justice impact resulting from the Proposed Action. However, to ensure housing units that are newly exposed to noise of DNL 65 dB or greater the following mitigation will be offered.

Of the 74 housing units in the significant increase area of the Future (2028) Proposed Action noise contour, five single-family units have been previously sound insulated. This leaves 69 dwelling units that are to be mitigated in the following manner. In order to be eligible for sound insulation, the interior noise levels must be at DNL 45 dB or above. For the purposes of mitigating the significant noise increases, the following actions would occur:

- Offer to sound insulate 26 single-family housing units
- Offer to sound insulate two two-family housing units
- Offer to sound insulate 21 multi-family housing units
- Offer 20 manufactured/mobile housing units acquisition. Since mobile homes cannot be effectively sound insulated because of the nature of the home to be able to be moved from place to place, the owners of the 20 mobile homes within the area of 1.5 dB increase within the DNL 65 dB noise contour for the Future (2028) Proposed Action would be given an offer for acquisition and residents would be offered relocation assistance per the Uniform Relocation Assistance and Real Property Acquisition Act. TAA has effectively relocated other mobile home parks in the past under 14 C.F.R. § Part 150.



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4.14 VISUAL EFFECTS

This section presents the analysis of potential visual effects, including impacts related to light emissions and visual resources and visual character, as a result of the No Action Alternative and the Proposed Action. Visual effects include the extent to which a proposed action would produce light emissions that create annoyance or interfere with activities, contrast with, or detract from, the visual resources and/or the visual character of the existing environment.

Per FAA Order 1050.1F, light emission impacts are typically related to the extent to which any lighting or glare associated with the proposed action or alternative(s) would create an annoyance for people in the vicinity, would interfere with their normal activities including work and recreation; or would contrast with, or detract from, the visual resources and/or the visual character of the existing environment. Visual resources include buildings, sites, traditional cultural properties, and other natural or manmade landscape features that are visually important or have unique characteristics. Visual character refers to the overall aesthetics of the existing landscape.

There are no federal special purpose laws or requirements specific to light emissions and visual effects; although, other special purpose laws, such as the NHPA or Section 4(f) of the DOT Act have specific provisions for visual impacts to protected resources. In order to determine the potential visual effects, the Proposed Action conditions are compared to the No Action conditions to determine if there is a potential for annoyance and adverse impacts.

4.14.1 NO ACTION ALTERNATIVE

4.14.1.2 Future (2023) No Action Alternative

Light Emissions

There would be no change to light emissions for the Future (2023) No Action Alternative.

Visual Resources and Visual Character

There would be no change to the existing visual resources or visual character for the Future (2023) No Action Alternative.

4.14.1.3 Future (2028) No Action Alternative

No physical development or land transfers would occur for the Future (2028) No Action Alternative. Therefore, no impacts to light emissions, visual resources, or visual character would occur.

4.14.2 PROPOSED ACTION

4.14.2.1 Future (2023) Proposed Action

Light Emissions

As part of the proposed Runway 11R/29L relocation, the arrival threshold on Runway 11L would be shifted 921 feet to match Runway 11R. The Runway 11L medium intensity approach lights with runway alignment indicator lights (MALSR) would need to be reconfiguring by shifting the light stations to correspond to the new displaced threshold and installing in-pavement approach lights in the displaced threshold. The existing precision approach path indicator (PAPI) and glideslope antenna would also be relocated to accommodate the Runway 11L arrival threshold shift. The nearest residential land uses to the Airport property boundary are located approximately 700 feet to the north. The relocation of the MALSR light stations would actually be moved farther from existing residences than they are today and therefore, the proposed change in lighting for Runway 11L/29R from the Proposed Action when compared to the No Action Alternative would not significantly increase the overall light emissions.

As a result of implementing the Proposed Action, the existing Runway 11R/29L would be replaced with a full-length parallel runway. The distance between the parallel runways centerline to centerline would be increased from 706 feet to 800 feet. The proposed airfield changes would require relocation of existing runway centerline lighting and runway end lighting, relocation of the existing PAPI and existing runway end identifier lights (REILS), and installation of new lighting on the proposed new taxiway. Other nearby residential areas are located approximately 1,500 feet to the west on South Nogales Highway.

The relocation of the lights associated with relocated 11R/29L would cause light emissions similar to the existing lights, which are currently used to conduct safe airport operations. The residences south of the Airport would not be able to see the relocated REILS, because of the existing terrain and the distance and the additional lights coming from existing man-made structures such as the Worldview building along Aerospace Parkway.

The Proposed Action also includes additional lighting for the replacement magazines on AFP 44 and the MSA for the AANG in Parcel "H". The lighting for these buildings would consist of potential roof perimeter lights, lights affixed to poles, and lighting from the interior of the structures for safety and security purposes. The specific type and strength of the exterior lighting systems for the AANG facilities would be developed pursuant to the Ammunition and Explosives Storage Magazines Unified Facilities Criteria (UFC 4-420-01) recommendations for lighting.⁴³ In addition,

⁴³ United States Department of Defense, 2015, Ammunition and Explosives Storage Magazines Unified Facilities Criteria (UFC 4-420-01), May 1, Exterior lighting Photocell-controlled for security lighting (0.2 foot-candles, 2 lux). Switched for loading activities (5 foot-candles, 50 lux).

potential lighting for the replacement magazines on AFP 44 would be Pima County night sky compliant.⁴⁴

Due to the distance to these existing residences, which are approximately 6,800 feet to the proposed new MSA on AFP 44 and 3,800 feet to the proposed AANG development it is expected that the proposed lighting would not significantly increase the overall light emissions. In addition, there is a lot of vegetation along Aerospace Parkway that obscures the view from these residences to the Proposed Action.

The new or relocated lighting would not produce light emissions that are noticeably different from the Airport's or AFP 44's existing lighting and would not cause annoyance or disrupt normal activities of the surrounding community. Therefore, lighting from the Proposed Action when compared to the No Action Alternative would not significantly increase the overall light emissions due to their type, intensity, and distance from residential areas.

Visual Resources and Visual Character

The Proposed Action would not include any significant vertical development and would not obstruct any view. The Proposed Action would not contrast with, or detract from, the visual resources and/or the visual character of the airport. The nearest residential land uses to the Airport property boundary are located approximately 700 feet to the north. Other nearby residential areas are located approximately 1,500 feet to the west on South Nogales Highway. The Proposed Action would not significantly alter, contrast, or obstruct the existing views due to the distance from residential areas and the obstacles in the way and because the relocated runway is similar in character to the existing airfield. Therefore, no noticeable change to the visual resources and visual character would occur.

4.14.2.2 Future (2028) Proposed Action

The Future (2028) Proposed Action would have the same effects upon light emissions, visual resources, and visual character as described for the Future (2023) Proposed Action.

4.14.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The Proposed Action does not exceed the applicable thresholds of significance for light emissions, visual resources, or visual character; therefore, no mitigation measures are required.

⁴⁴ Preliminary design of the replacement magazines on AFP 44 indicate lighting would include 150-watt LED pole mounted fixture with 15,000 lumens each fixture. There would be 150 foot spacing between fixtures resulting in parking lot level lighting of about one foot-candle.

4.15 WATER RESOURCES

This section presents the analysis of potential impacts to water resources as a result of the No Action Alternative and the Proposed Action.

4.15.1 NO ACTION ALTERNATIVE

4.15.1.1 Future (2023) No Action Alternative

Wetlands

No physical development or land transfers would occur for the Future (2023) No Action Alternative. Therefore, no impacts to wetlands would occur.

Floodplains

No physical development or land transfers would occur for the Future (2023) No Action Alternative. Therefore, no impacts to floodplains would occur.

Surface Waters

No physical development or land transfers would occur for the Future (2023) No Action Alternative. Therefore, no impacts to the five major drainages close to the Detailed Study Area, including Airport Wash, Valencia Wash, El Vado Wash, Santa Clara Wash, Hughes Wash, would occur.

Groundwater

No physical development or land transfers would occur for the Future (2023) No Action Alternative. Therefore, no impacts to groundwater would occur.

4.15.1.2 Future (2028) No Action Alternative

Wetlands

No physical development or land transfers would occur for the Future (2028) No Action Alternative. Therefore, no impacts to wetlands would occur.

Floodplains

No physical development or land transfers would occur for the Future (2028) No Action Alternative. Therefore, no impacts to floodplains would occur.

Surface Waters

No physical development or land transfers would occur for the Future (2028) No Action Alternative. Therefore, no impacts to the five major drainages close to the Detailed Study Area, including Airport Wash, Valencia Wash, El Vado Wash, Santa Clara Wash, Hughes Wash, would occur.

Groundwater

No physical development or land transfers would occur for the Future (2028) No Action Alternative. Therefore, no impacts to groundwater would occur.

4.15.2 PROPOSED ACTION

4.15.2.1 Future (2023) Proposed Action

Wetlands

There are no wetlands located within the Detailed Study Area. Therefore, no impacts to wetlands would occur as a result of implementing the Proposed Action.

Floodplains

Impacts to floodplains must be considered, including any direct and indirect impacts that result from the construction and implementation of the Proposed Action. The 100-Year floodplain boundary, encompassing the Airport Wash, intersects with the Detailed Study Area in two locations along the Detailed Study Area's northern boundary. Due to the location of the Proposed Action, construction and implementation of the Proposed Action would not directly impact these areas and would not include an encroachment in a floodplain. Therefore, the Proposed Action would not cause a direct impact to the 100-year floodplain and would not constitute a considerable probability of loss of human life or cause future damage to the floodplain that could be substantial in cost or extent.⁴⁵

A construction staging area for the Proposed Action does occur near the 100-year floodplain boundary. However, construction mitigation measures would be implemented to minimize erosion, such as temporary seeding and mulching and use of temporary silt fencing. TAA would ensure that construction activities adhere to guidelines included in FAA AC, *Standards for Specifying Construction of Airports*.⁴⁶ By implementing the soil erosion mitigation measures including but not limited to temporary seeding or mulching and use of temporary silt fencing there would be no flooding due to construction that would impact airport or facility access roads or to taxiways or runways on the airfield. The mitigation measures would also prevent any flood-induced spills of hazardous material. Therefore, the Proposed Action would not result in any direct or indirect adverse impacts on natural and beneficial floodplain values.

Surface Waters

The construction and implementation of the Proposed Action would result in impacts to surface waters.

⁴⁵ USDOT, 1979, Order 5650.2: Floodplain Management and Protection.

⁴⁶ FAA AC, *Standards for Specifying Construction of Airports*, Item P-156, *Temporary Air and Water Pollution, Soil Erosion, and Siltation Control*, AC 150/5370-10G (July 21, 2014).

Impacts to Jurisdictional Waters of the United States

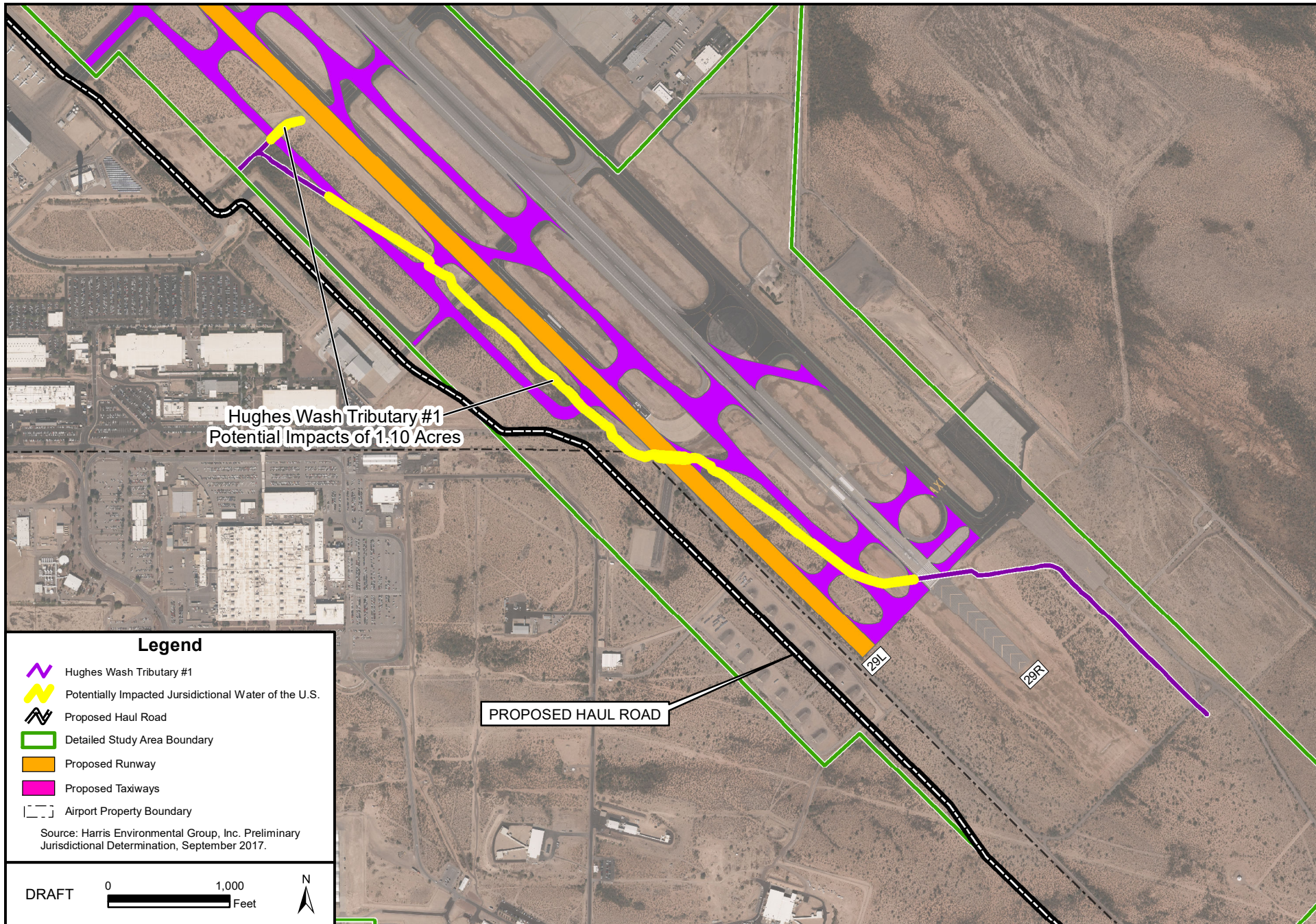
Approximately 1.1 acres of the Hughes Wash Tributary #1 would be impacted due to the construction and implementation of the new parallel runway and taxiway. **Exhibit 4-25** show the jurisdictional waters that would be impacted due to the Proposed Action on the airfield. Final design of the Proposed Action is not complete. However, the Proposed Action would include the installation of stormwater conveyance facilities within the airfield. In order to accommodate and effectively convey the onsite surface water flows through the infield areas of the airfield, pipe culverts would be utilized to route surface water through the infield areas. The size, length, and dimensions of the pipe would be determined based upon the conveyance of the accumulated 5-year discharge reaching each culvert. As disclosed in **Appendix H**, Class V rubber gasket reinforced concrete pipe, or a suitable material able to withstand aircraft loading, would be used with a minimum of 3-feet cover. Culverts can also become blocked due to debris, so regular maintenance should be performed. A minimum pipe diameter should be considered (recommend at least 24-inches in diameter) so that the culverts are less susceptible to debris blockage. Upsizing the culvert diameter a half size (6-inches) should also be considered if regular maintenance is problematic.

In addition, approximately 0.06 acres (about 2,600 square feet) of the Hughes Wash Tributary #2 would be impacted due to the construction and implementation of a new access road. The proposed new access road would connect the Airport to the proposed new MSA. **Exhibit 4-26** show the jurisdictional waters that would be impacted due to the proposed access road and MSA.


Currently there is a roadway in this location. However, in order to accommodate AANG operations, this roadway must be widened and strengthened. Final design of the Proposed Action is not complete. However, the Proposed Action would include the installation of a culvert in order to maintain surface water flow.

Impacts Due To Additional Impervious Surfaces

The Proposed Action would increase impervious surfaces on the Airport by approximately 80 acres. This increase in impervious surface would result in an increase in surface water runoff discharge and volumes. This surface water increase would occur mostly within the airfield. The proposed drainage concept would prevent ponding by connecting the infield areas between the runways and taxiways using culverted crossings and discharging to the two existing conveyance channels. Additionally, new in-line detention basins would be located within open spaces as shown on **Exhibit 4-27** to mitigate the increase in surface water runoff discharge to acceptable pre-project rates to meet drainage design guidelines. The design of the detention basins would take into account the 80 acre increase in impervious surface when determining the size needed. Therefore, no changes in surface water drainage patterns impacting downstream areas would occur due to the Proposed Action.



Legend

-  Hughes Wash Tributary #1
-  Potentially Impacted Jurisdictional Water of the U.S.
-  Proposed Haul Road
-  Detailed Study Area Boundary
-  Proposed Runway
-  Proposed Taxiways
-  Airport Property Boundary

Source: Harris Environmental Group, Inc. Preliminary Jurisdictional Determination, September 2017.

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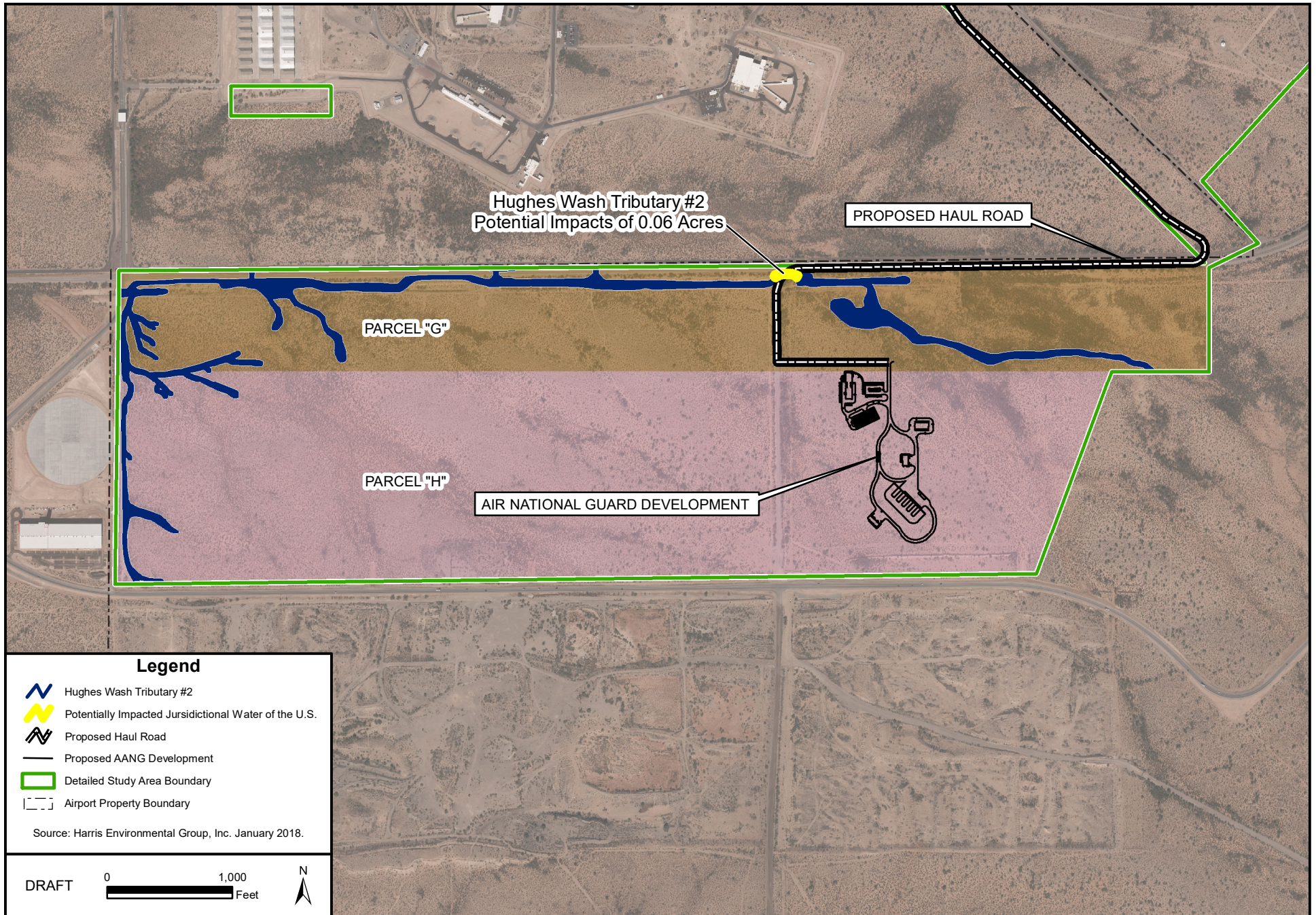


Environmental Impact Statement
Tucson
International Airport

Potential Impacts to Jurisdictional Waters of the U.S. on the Airfield

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4-25

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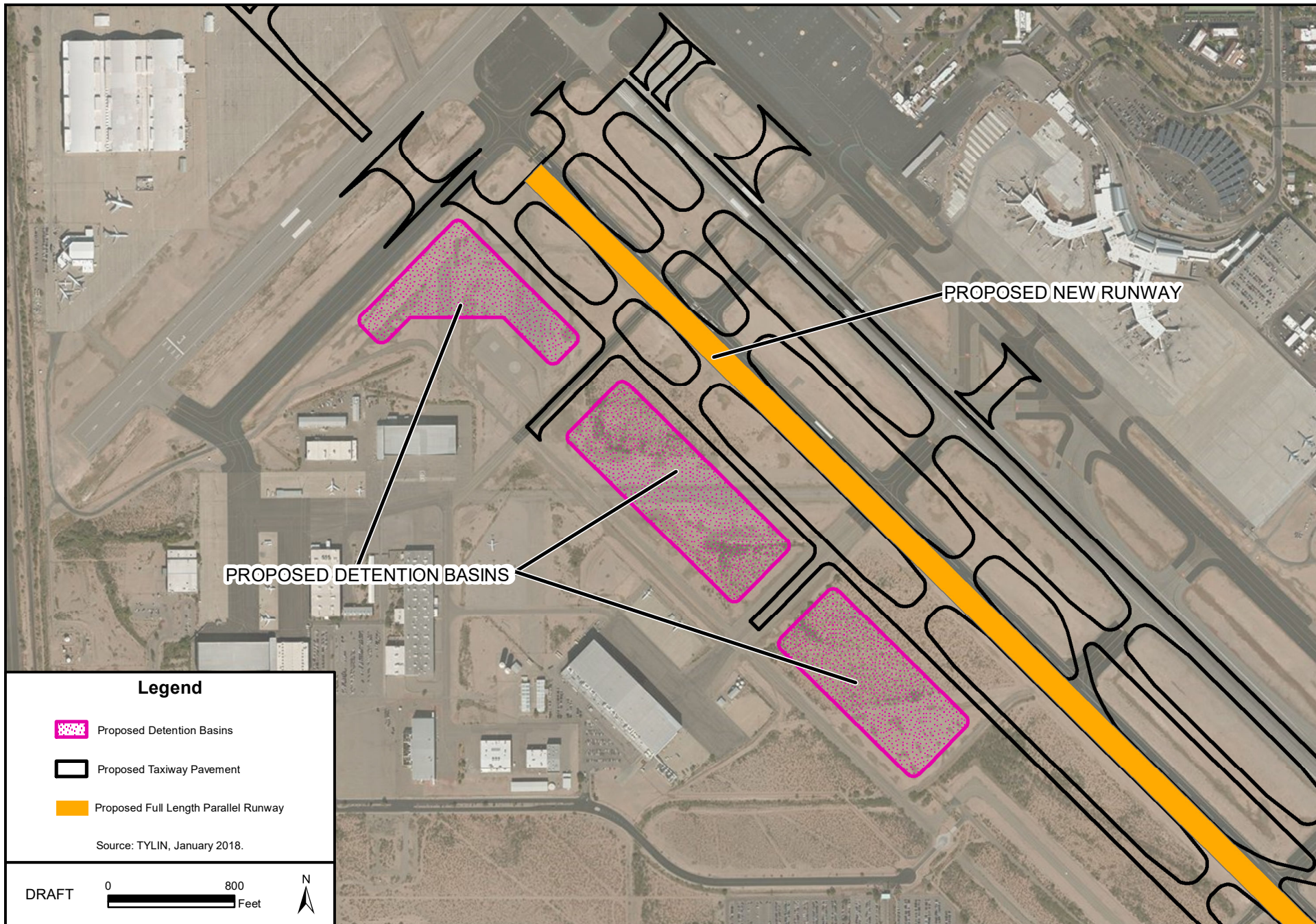


Environmental Impact Statement
Tucson
International Airport




Potential Impacts to Jurisdictional Waters of the U.S. on Parcel "G" and "H"

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4-26

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Legend

-  Proposed Detention Basins
-  Proposed Taxiway Pavement
-  Proposed Full Length Parallel Runway

Source: TYLIN, January 2018.

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Environmental Impact Statement
Tucson
International Airport

Proposed Detention Basins

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4-27

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The storage volume necessary to attenuate the 100-year onsite surface water flows due to the Proposed Action were calculated to be 11.6 acre-feet. The storage volume provided by the proposed detention basins would be up to 31.1 acre-feet. Therefore, the proposed detention basins would effectively attenuate the stormwater discharge and volume as a result of the Proposed Action (See **Appendix H** for additional information).

The proposed detention basins would be designed with a positive slope to the outfall, which would allow for release of detained surface water flow such that the basins would discharge all runoff within a 24-hour period. Adjustments to size, shape, and location of the proposed detention basins would be made during final design to avoid utilities or other existing or planned obstacles. However, it is important to maintain the connectivity between the collection and delivery channels/pipes which bring stormwater to the basins, and then from the basins downstream conveyance to the outfalls.

Permitting

Coordination with the USACE has determined that a permit under Section 404 of the Clean Water Act (CWA) would be required for construction of the Proposed Action. Permitting under Section 401 of the CWA would also be required for the Proposed Action. Furthermore, coordination with the ADEQ will be conducted by TAA in accordance with Section 402 of the Clean Water Act to ensure a National Pollutant Discharge Elimination System (NPDES) permit is obtained.⁴⁷

A requirement of NPDES permits, for both operations and construction activities, is development of a Storm Water Pollution Prevention Plan (SWPPP). A SWPPP outlines how stormwater run-off, erosion, and sediment would be controlled in order to minimize polluted stormwater run-off into nearby waters. The NPDES Construction General Permit is a type of general permit that is required if construction activities would disturb one acre or more of land. Under this permit, construction refers to any actions that result in disturbance of the land, including clearing, grading, and other similar activities. It also includes construction-related activities, which occur in areas that support the construction project such as stockpiles, borrow areas.

Groundwater

Construction activities would occur nearby the location of wells identified in Section 3.15, *Water Resources*. Although the surrounding area of the wells would be disturbed and/or paved, the wells would be avoided and their existing accessibility would be maintained. In addition, due to the depth of the existing groundwater level, 79 to 205 feet below ground, grading and minor excavation of the Proposed Action would not impact groundwater resources.

⁴⁷ Clean Water Act, Section 402, National Pollutant Discharge Elimination System permit.

The Proposed Action would not 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.

4.15.2.2 Future (2028) Proposed Action

Wetlands

The Future (2028) Proposed Action would have the same effects upon wetlands as described for the Future (2023) Proposed Action.

Floodplains

The Future (2028) Proposed Action would have the same effects upon floodplains as described for the Future (2023) Proposed Action.

Surface Waters

The Future (2028) Proposed Action would have the same effects upon surface waters as described for the Future (2023) Proposed Action.

Groundwater

The Future (2028) Proposed Action would have the same effects upon groundwater as described for the Future (2023) Proposed Action.

4.15.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The Proposed Action requires 11.6 acre-feet additional surface water storage volume necessary to attenuate the 100-year onsite surface water flows created by the 80 acres of new impervious surface. Mitigation for this impact has been proposed with the addition of new detention facilities that would effectively attenuate the stormwater discharge and volume. Additionally, pertinent federal, state, and local permits would need to be obtained by TAA for the potential impacts to 1.1 acres of the Hughes Wash Tributary #1 and 0.06 acres of the Hughes Wash Tributary #2. No difficulties have been identified based on water quality impacts for obtaining the permits or authorizations.

With these mitigation measures, the Proposed Action does not exceed water quality standards established by Federal, state, local, and tribal regulatory agencies or contaminate public drinking water supply such that public health may be adversely affected.

In addition, the following minimization measures and best management practices are being provided to further minimize impacts from the Proposed Action. Erosion-control Best Management Practices (BMPs) will be adopted to maintain runoff on-site and minimize the potential for adverse effects on downstream water quality. With the installation of the drainage structures and the implementation of BMPs, the impacts to water resources would not be significant. TAA would ensure that construction activities adhere to guidelines included in FAA AC, *Standards for Specifying Construction of Airports*.^{48,49}

4.16 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This section presents the analysis of potential impacts to irreversible and irretrievable commitment of resources as a result of the No Action Alternative and the Proposed Action. Council on Environmental Quality (CEQ) Regulations (40 C.F.R. § 1502.16) require that an environmental consequences discussion in an EIS include identification of any irreversible or irretrievable commitments of resources which would be involved in the Proposed Action or reasonable alternative(s), should they be implemented. An *irreversible or irretrievable commitment of resources* refers to impacts on or losses to resources that cannot be recovered or reversed. Examples include permanent conversion of wetlands and loss of cultural resources, soils, wildlife, agricultural production, or socioeconomic conditions. The losses are permanent. *Irreversible* is a term that describes the loss of future options. It applies primarily to the impacts of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, that are renewable only over long periods of time. *Irretrievable* is a term that applies to the loss of production, harvest, or use of natural resources.

4.16.1 NO ACTION ALTERNATIVE

4.16.1.1 Future (2023) No Action Alternative

No physical development, consumption of resources, or irreversible and/or irretrievable commitment of resources would occur for the Future (2023) No Action Alternative that are not already occurring. The continued use of resources such as aviation fuels for aircraft operations by both civilian and military aircraft as well as the use of other resources such as electricity, gas, and water would continue to be used as they are today.

4.16.1.2 Future (2028) No Action Alternative

No physical development or land transfers would occur for the Future (2028) No Action Alternative. Therefore, no impacts to any irreversible or irretrievable commitments of resources would occur.

⁴⁸ FAA AC, *Standards for Specifying Construction of Airports*, Item P-156, *Temporary Air and Water Pollution, Soil Erosion, and Siltation Control*, AC 150/5370-10G (July 21, 2014).

⁴⁹ Compliance with the FAA AC by TAA is a condition of approval of any grant in aid agreement (Grant assurances).

4.16.2 PROPOSED ACTION

4.16.2.1 Future (2023) Proposed Action

As a result of implementing the Proposed Action, proposed airfield improvements would be constructed that may cause a portion of aircraft operations to taxi a farther distance than they would for the Future (2023) No Action Alternative. The proposed replacement runway would be constructed approximately 94 feet farther from the existing terminal, general aviation, and AANG facilities, which would cause a slight overall increase in average aircraft taxi distance. Due to the short proposed taxi distance and the availability of fuel in the region, any increase in demand is expected to be minimal and would not exceed the existing supplies.

While the construction and operation of the Proposed Action would potentially increase the demand for Jet A, AvGas, unleaded gasoline, and diesel fuel, any increase in demand for fuel is expected to be minimal and would not exceed the existing and future supplies. As described in Section 1.3, *Project Purpose and Need*, the Proposed Action's purpose and need is to enhance the safety of the TUS airfield and is not a capacity-enhancing project; therefore, the Proposed Action is not intended to attract additional demand for aviation services. The Proposed Action would require the commitment of resources, including construction labor, which is generally non-renewable and irretrievable. The construction of, and travel to and from, the proposed project site would require the consumption of petroleum products and petroleum-based electrical generation provided by the local power company. Commitment of these resources would not be considered significant.

As a result of implementing the Proposed Action, proposed construction activities would require the use of typical paving and construction materials such as sand, gravel, concrete, and asphalt. Metal wiring and plastic insulation would be used for new lighting. These materials are not in short supply and construction for the Proposed Action would not exceed the available supply of these materials. Construction activities may require natural resources such as dirt for fill material, asphalt, water, wood, or gravel. The Airport has a stockpile of dirt for fill material southeast of the terminal area on Airport property. Asphalt, sand, and gravel can be found six miles east of the Airport at the Swann Road Plant and at other vendor locations in Pima County. The demand for nonrenewable resources such as petroleum products or typical construction materials would not exceed current or future supplies and therefore would not constitute an irreversible or irretrievable commitment of resources.

As a result of implementing the Proposed Action, ECMs located on AFP 44 would have to be demolished to prevent munitions storage safety arcs from extending onto the TUS airfield after relocation of Runway 11R/29L and to remove the ECMS from the relocated runway's safety area. In order to maintain the existing munitions storage capacity of AFP 44, replacement storage facilities would be constructed elsewhere on AFP 44 that would provide the same munitions storage capacity currently allowed to be stored in the ECMs. These new ECMs would replace the 12 ECMs to be demolished on Parcel "F" and adjacent to Parcel "F".

The Proposed Action also includes the ultimate transfer of land from Parcel "H" to the USAF as needed on behalf of the NGB for construction of a MSA and access road to support the AANG at Tucson Air National Guard Base. The implementation of the Proposed Action would result in a swap of land between the USAF and the TAA. Because neither the TAA nor the USAF are subject to local property taxes, there would be no change in the local tax base as a result of implementing the Proposed Action. The Proposed Action land transfers would be consistent with future land use plans for Pima County and the City of Tucson as well as USAF and TAA.

The Proposed Action would not significantly alter, contrast, or obstruct the existing views due to the distance from residential areas, the obstacles in the way, and because the relocated runway is similar in character to the existing airfield. Therefore, there would be no noticeable change to the urban environment.

As discussed in Section 4.4, *Air Quality*, Section 4.12, *Noise and Noise-Compatible Land Use*, and Section 4.15, *Water Resources*, mitigation measures would be implemented for the Proposed Action. Therefore, there would be no irreversible and/or irretrievable commitment of these resources. As discussed in Section 4.9, *Historical, Architectural, Archeological, and Cultural Resources*, there would be no historic properties affected as a result of implementing the Proposed Action.

TAA would incorporate energy efficiency and sustainable measures to the extent possible into the Proposed Action. TAA plans to recycle and reuse existing pavement materials (i.e., "old pavement") for subgrade and base course for the Proposed Action to the maximum extent allowed by FAA standards.⁵⁰

4.16.2.2 Future (2028) Proposed Action

The Future (2028) Proposed Action would have the same effects upon irreversible or irretrievable commitments of resources as described for the Future (2023) Proposed Action.

4.16.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The Proposed Action does not exceed the applicable thresholds of significance; therefore, no mitigation measures are required. However, the following minimization measures are being provided to further minimize impacts from the Proposed Action. TAA would incorporate energy efficiency and sustainable measures to the extent possible into the Proposed Action. TAA plans to recycle and reuse existing pavement materials (i.e., "old pavement") for subgrade and base course for the Proposed Action to the maximum extent allowed by FAA standards.⁵¹

⁵⁰ Eric Roudebush, TAA, November 21, 2017, RE: Recycling of old pavements for new runway project at TUS.

⁵¹ Eric Roudebush, TAA, November 21, 2017, RE: Recycling of old pavements for new runway project at TUS.

4.17 CUMULATIVE IMPACTS

This section describes the past, present, and reasonably foreseeable future actions relevant to cumulative impacts. The analysis of cumulative impacts recognizes that while the impacts of individual actions may be small, when combined with the impacts of past, present, and reasonably foreseeable future actions on populations or resources in and around TUS, the impacts could be potentially significant.

Cumulative impacts are defined by the CEQ in 40 C.F.R. § 1058.7 as: "The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." Additionally, the CEQ further explained in *Considering Cumulative Effects under the National Environmental Policy Act* that "each resource, ecosystem, and human community must be analyzed in terms of its ability to accommodate effects, based on its own time and space parameters." Therefore, a cumulative effects analysis normally will encompass geographic boundaries beyond the immediate area of the Proposed Action, and a time frame, including past actions and foreseeable future actions, in order to capture these additional effects.

The evaluation of cumulative impacts in this EIS considers the past, present, and reasonably foreseeable future projects or actions undertaken by TAA and other parties such as the City of Tucson and projects at AFP 44.

4.17.1 DEFINING THE CUMULATIVE IMPACT STUDY AREA AND TIMEFRAMES

For the purposes of this EIS, other projects at the Airport or projects within the General Study Area as shown in Exhibit 3-1 that are within **one mile** of the Airport property will be considered to be within the overall Cumulative Impact Study Area. The FAA 1050.1F Desk Reference Section 15.2 states "*The study area for cumulative impacts analysis is the same area defined for a project's direct and indirect impact analysis. Thus, the study area will be different for each impact category.*" The development of the Cumulative Impact Study Area(s) by the FAA is consistent with the FAA 1050.1F Desk Reference using the Detailed Study Area and the General Study Area and the specific study areas identified in Chapter 3, *Affected Environment* for each resource category.

The projects to be included in the Cumulative Impact analysis were identified through coordination with the TAA, Pima County, City of Tucson, USAF, NGB, and Raytheon Missile Systems. The past actions are defined as those that were completed within the last five years from 2012 to 2016. Present actions are any other actions that are occurring in the same general timeframe as the proposal. Present actions for this EIS are defined as those completed in 2017 or where construction is ongoing. Reasonably foreseeable future actions are actions that may affect projected impacts of a proposal and are not remote or speculative. Reasonably foreseeable future actions are defined as those planned to be completed between 2018 and 2023. This window of time represents a timeframe that is long enough to identify potential follow on impacts yet near enough that realistic predictions of projects and impacts

can be made. Potential projects beyond 2023 would be considered speculative. This section identifies those past, present, and reasonably foreseeable future projects.

4.17.2 PAST ACTIONS

Past actions that have occurred within the past five years in the Cumulative Impact Study Area are identified in **Table 4-44**.

**Table 4-44
PAST ACTIONS
Tucson International Airport
Environmental Impact Statement**

PROJECT NAME	LOCATION	DESCRIPTION	CURRENT STATUS
Aerospace Parkway (East Hughes Access Road Relocation)	South of East Hughes Access Road	The project realigned East Hughes Access Road approximately 2,500 feet south of its alignment and renamed it Aerospace Parkway.	Completed 2015
Nogales-Old South Nogales Intersection Improvement Project	Intersection of South Nogales Highway and Old South Nogales Highway	The project consisted of an intersection improvement and a drainage improvement at Nogales Highway and Old South Nogales Highway.	Completed 2016
Circle K Development	350 East Valencia	The project constructed a convenience store and gas station.	Completed 2016
Airport Traffic Control Tower	Airport Property	The project constructed a new Airport Traffic Control Tower (ATCT).	Completed 2016
Walmart Neighborhood Market & Gas Station	2565 East Commerce Center	The project constructed a grocery store and gas station.	Completed 2016
Ascent Aviation Maintenance Hangar	Airport Property	The project constructed a new aircraft hangar to support Ascent Aviation.	Completed 2015
Non-Movement Apron Reconstruction	Airport Property	The project reconstructed a non-movement apron for TUS.	Completed 2015
FEDEX Distribution Center	3350 East Westco	The project constructed a FEDEX distribution center.	Completed 2015
Solar Photovoltaic Project - Phase 1	Airport Property	The project installed the Phase I solar panels in front of the Airport in the terminal parking lot.	Completed 2014

4.17.3 PRESENT ACTIONS

Present actions that are ongoing in the Cumulative Impact Study Area are identified in **Table 4-45**.

**Table 4-45
PRESENT ACTIONS
Tucson International Airport
Environmental Impact Statement**

PROJECT NAME	LOCATION	DESCRIPTION	CURRENT STATUS
Terminal Optimization Program	Airport Property	Terminal Optimization Project	Completed 2017
Worldview	1805 E Aerospace Parkway	World View Enterprises' new headquarters	Completed 2017
Reconstruct Runway 11L/29R and Connector Taxiways	Airport Property	Rehabilitation of Runway 11L/29R.	Completed 2017
Solar Photovoltaic Project - Phase 2	Airport Property	Installation of solar photovoltaic units within an existing parking lot.	Completed 2017
Alvernon and Hughes Access Bike Lanes	Valencia Road to Old South Nogales Highway	Addition of Alvernon and Hughes Access bike lanes.	Construction Ongoing
Summit View Elementary Safe Routes to School Project	1300-1900 East Summit View	Connectivity improvements to and from the school and subdivisions. The entire project will be ADA compliant.	Construction Ongoing
Faculty Resource Center Expansion	5901 South Calle Santa Cruz	Renovation and expansion of the existing Pima Community College Faculty Resource Center.	Construction Ongoing
Community Room Storage	5901 South Calle Santa Cruz	Construction of a storage room addition adjacent to the Plaza (F) Building of Pima Community College.	Construction Ongoing
AFP 44/ Aerospace Parkway Intersection and Southern AFP 44 roadway extension	Aerospace Parkway and Raytheon Way	Construction of an intersection and at Aerospace Parkway and AFP 44	Construction Ongoing

4.17.4 REASONABLY FORESEEABLE FUTURE ACTIONS

Reasonably foreseeable future actions that may occur within the next five years in the Cumulative Impact Study Area are identified in **Table 4-46**.

**Table 4-46
REASONABLY FORESEEABLE FUTURE ACTIONS
Tucson International Airport
Environmental Impact Statement**

PROJECT NAME	LOCATION	DESCRIPTION	CURRENT STATUS
Arizona Department of Public Safety Facility	Airport Property	Construction of a facility, which includes on-site parking, living quarters, hangar, and storage tank for Jet A fuel.	Anticipated in 2018
New Main Gate (Entry Control Facility)	AANG	Construction of a new base entry complex including a new road system and parking, fencing, traffic check house, traffic control devices and pop-up barrier systems, vehicle inspection area, and over watch area.	Anticipated in 2018/2019
Iraqi Air Force Training Leaving TUS	AANG	Iraqi F-16 aircraft will depart and training operations for these aircraft will no longer take place at TUS	Anticipated in 2018
Taiwanese Air Force Relocation and Continuation of Netherlands Royal Air Force Training	AANG	Transfer of F-16 aircraft belonging to the Taiwan Air Force to TUS. Royal Netherlands Air Force extending their F-16 training mission at TUS. Also includes building renovations and construction.	Anticipated in 2018/2019
Industrial Buildings	Airport Property leased by Raytheon Missile Systems	Construction of three industrial buildings to support operations	Anticipated in 2018
Addition to Building 845	Airport Property leased by Raytheon Missile Systems	Construction of additional hangar space to support operations	Anticipated in 2018
Aerospace Parkway Widening	Aerospace Parkway south of Airport	Widening from two lanes to four lanes from Nogales Hwy to Alvernon Way	Earliest completion estimated 2019
University of Arizona Environmental Research Lab	Airport Property	Demolish environmental research facility, east of Tucson Blvd and Airport Drive at 2601 E Airport Drive	Anticipated in next five years

Table 4-46, Continued
REASONABLY FORESEEABLE FUTURE ACTIONS
Tucson International Airport
Environmental Impact Statement

PROJECT NAME	LOCATION	DESCRIPTION	CURRENT STATUS
Aerospace Parkway Widening	Aerospace Parkway	Widening of Aerospace Parkway	Anticipated in next five years
Combat Air Forces Adversary Air (CAF ADAIR)	Airport Property	The USAF has identified TUS as a potential site among many being discussed for the Combat Air Forces Adversary Air (CAF ADAIR) Program at some point in the future. However, at this time, TUS has not been identified as an alternative CAF ADAIR site location. CAF ADAIR aircraft type and operational numbers have not yet been determined, the CAF ADAIR project has not yet been fully funded, and an CAF ADAIR contractor has not yet been selected. While the FAA is aware of preliminary planning for the CAF ADAIR program, TUS may never be seriously considered as an alternative for CAF ADAIR, therefore, it is too speculative to analyze cumulative impacts as part of this EIS based on a hypothetical possibility without the necessary facts to support analysis. If TUS is ever considered for some form of CAF ADAIR in the future, the USAF would conduct appropriate environmental analysis.	Planning on-going - Anticipated in next five years
Vector Space Systems	Pima County Property	Construction of a rocket manufacturing facility	Anticipated in 2019
Pima Community College Aviation Technology Center Expansion	Airport Property	Expansion of offices and construction of a warehouse on TAA property. The project site is north of the southwest end of Runway 21 and is immediately east of Old South Nogales Highway.	Anticipated in next five years
TEP Relocation	Airport Property	TEP relocation of overhead power poles east of the end of Runway 11L.	Anticipated in next five years

Table 4-46, Continued
REASONABLY FORESEEABLE FUTURE ACTIONS
Tucson International Airport
Environmental Impact Statement

PROJECT NAME	LOCATION	DESCRIPTION	CURRENT STATUS
AFP 44 Entry Control Point	AFP 44	Construction of USAF Entry Control Point into AFP 44 Site.	Anticipated in next five years
Redevelopment of Hangar	Airport Property	Redevelopment of an existing hangar on 1000 East Valencia Rd.	Anticipated in next five years
GA Hangar Area B1 - Pavement Replacement	Airport Property	Redevelopment of general aviation hangars and expansion of supporting offices located west of East Airport Drive.	Bid Awarded in 2016
Development of Aerospace/Defense/ Research Business Park & Corridor	Aerospace Parkway	Development of the Aerospace/Defense/ Research Business Park & Corridor south of Raytheon, along Aerospace Parkway from Nogales Highway to Alvernon Way.	Anticipated in next five years
Maintenance Repair and Overhaul Operations Site	Airport Property	Development of Maintenance Repair and Overhaul Operations site south of new ATCT on Aero Park Blvd.	Anticipated in next five years
Maintenance Repair and Overhaul Operations Site	Airport Property	Development of Maintenance Repair and Overhaul Operations site east of Runway 11L end.	Anticipated in next five years
New GA Hangar	Airport Property	Potential new general aviation hangar constructed north of the northeast end of Runway 3.	Anticipated in next five years
Relocation of Service Road; Extension of Drainage Culver	Airport Property	Relocation of service road and extension of drainage culver which is parallel to taxiway D.	Anticipated in next five years
New Airport Plaza	Airport Property	Construction of Airport Plaza northeast of the corner of Plumer Ave and East Airport Drive.	Anticipated in next five years
Residential Development Project	6 th and Medina	Potential residential project with 30 new residential homes located approximately ¼ mile west of TUS, northeast of the intersection of East Medina Road and South 6 th Avenue. The property is currently undeveloped/vacant.	Anticipated in next five years

Table 4-46, Continued
REASONABLY FORESEEABLE FUTURE ACTIONS
Tucson International Airport
Environmental Impact Statement

PROJECT NAME	LOCATION	DESCRIPTION	CURRENT STATUS
Old Vail Rd Right-of-Way Expansion	Old Vail Rd east of Old South Nogales Highway to Wilmot Rd (South of Aerospace Parkway)	Expansion of the Old Vail Road right of way and construction of a two-lane road.	Anticipated in next five years
Santa Cruz Water Production Facility	Southeast of the intersection of Old South Nogales Highway and E. Hughes Access Road	Construction of the new Santa Cruz Water Production Facility that will treat potable water from the Tucson Water's "Santa Cruz Well Field".	In Bidding process

4.17.5 CUMULATIVE IMPACT COMPARISON

Cumulative impacts must be evaluated relative to the direct and indirect effects of the Proposed Action for each environmental category. Significant cumulative impacts are determined according to the same thresholds of significance used in the evaluation of each environmental category in the environmental consequences discussion.

For environmental resources where construction and implementation of Proposed Action would have no environmental impact, there is no potential for an adverse cumulative environmental impact to occur. Therefore, the following discussion of cumulative impacts discusses only those environmental categories where environmental impacts could result from implementation of the Proposed Action. Those categories are biological resources, land use, noise and noise-compatible land use, environmental justice, and water resources.

4.17.5.1 Air Quality

As discussed in Section 4.4, *Air Quality*, the increase in emissions due to construction and implementation of the Proposed Action would not exceed the applicable thresholds and are therefore not significant. Construction activities associated with the Proposed Action would result in temporary emissions from construction equipment, trucks, and fugitive dust emissions from site demolition and earthwork. The impacts would occur only within the immediate vicinity of the construction site and would be mitigated through best management practices to reduce emissions, particularly fugitive particle emissions, during construction. While the Proposed

Action would contribute to the cumulative emissions of air pollutants in Pima County, the cumulative effect of the net air emissions would not cause or contribute to any new violation of the NAAQS, would not increase the frequency or severity of an existing violation, and would not delay timely attainment of any standard. Therefore, the cumulative impact on air quality is not significant.

4.17.5.2 Biological Resources

As discussed in Section 4.5, *Biological Resources*, the Proposed Action would result in permanent impacts to 64 individual PPC and approximately 24 acres of PPC habitat. Through formal ESA Section 7 consultation with the USFWS suitable mitigation options, including avoidance, mitigation banking, and transplant and monitoring were determined.

Implementation of the Proposed Action combined with the implementation of one or more of the past, present, and reasonably foreseeable future actions would not result in a cumulative impact to biological resources because each of these projects is required to have their own protective measures to avoid, minimize, and provide habitat compensation during implementation of their project. Therefore, implementation of the Proposed Action, when combined with other past, present, or reasonably foreseeable projects would not result in significant adverse impacts to biological resources.

4.17.5.3 Land Use

As discussed in Section 4.10, *Land Use*, the Proposed Action would result in a change to the Airport Layout Plan and a change to the existing property boundaries. In order to provide TUS with sufficient land to maintain the necessary FAA required safety areas associated with the relocated runway, Parcel "F" would need to be acquired from USAF. The USAF loss of land also includes the loss of Airport land for use as AFP 44 safety arcs and future development area, as described below.

- Loss of approximately 58 acres conveyed from USAF to TAA valued at 100%
- Loss of ability to cast explosive arcs on 79 acres of TAA property per 1959 easement with deed restriction property interest valued at 50% (39.5 acres)
- Loss development capability on 115 acres of USAF property valued at 50% decrement (57.5 acres)
- Total loss to USAF of 155 acres of land use

In order to mitigate the potential impacts to land use, TAA would transfer a parcel of land identified as Parcel "G" to the USAF for AFP 44. In addition, TAA would make available a parcel of land identified as Parcel "H" to the USAF for AFP 44 as needed, and to the Arizona Air National Guard for development of a new MSA for Tucson Air National Guard Base. The FAA, TAA, and the USAF have agreed as described in a Memorandum of Understanding for Real Property Transactions signed in 2016 that the mitigation is appropriate.

The Proposed Action includes the demolition of six ECMs from Parcel "F". These six ECMs on Parcel "F" would be considered a direct loss to the USAF because their acquisition is required for FAA safety areas, including the RSA, OFA, and RPZ. The six ECMs directly adjacent to Parcel "F" would be demolished because they cannot be used for their designed purpose because they would no longer meet USAF explosive safety arc requirements. With the demolition of the 12 ECMs, USAF would lose approximately 177,000 cubic feet of storage capacity for AFP 44. In order to maintain the existing munitions storage capacity of AFP 44 and mitigate the potential impacts to land use, replacement storage facilities would be constructed elsewhere on AFP 44 that would provide the same munitions storage capacity currently allowed to be stored in the 12 ECMs. In order to mitigate the adverse effects of the Proposed Action on USAF real property and operational capability at AFP 44, the following mitigation measures are built into the Proposed Action. These include actions to ensure that TUS operates in the safest manner possible, while maintaining the operational capability of AFP 44 and Tucson Air National Guard Base.

TAA, as the Project Sponsor, would apply for federal assistance to provide for the following mitigation measures:

- Provide funding to construct replacement ECMs with the same munitions storage capacity elsewhere on AFP 44 to maintain the capability and capacity of AFP-44, in accordance with FAA regulations and eligibility guidelines for reimbursable project expenses;
- Acquire Parcel "F" at fair market value from USAF;
- Transfer Parcel "G" to USAF for fair market value in exchange for Parcel "F";
- Transfer Parcel "H" ultimately to USAF at fair market value as needed; and,
- Terminate the 1959 easement over Airport property near the existing 12 ECMs.

Implementation of the Proposed Action combined with the implementation of one or more of the past, present, and reasonably foreseeable future actions would not result in a cumulative impact to land uses, because any project that requires a change to land use is required to evaluate their own consistency with future land use plans for Pima County and the City of Tucson as well as USAF and TAA. Therefore, implementation of the Proposed Action, when combined with other past, present, or reasonably foreseeable future projects would not result in significant adverse impacts to existing or future land uses.

4.17.5.4 Noise and Noise-Compatible Land Use

As discussed in Section 4.12, *Noise and Noise-Compatible Land Use*, the Proposed Action would result in significant noise increases, which is defined as an increase of 1.5 dB or more within the DNL 65 dB noise contour over noise sensitive land uses. The area of significant noise increase is located north of the Airport along the extended centerline of the relocated Runway 11R/29L. Mitigation measures have been identified for the 69 housing units in the significant increase area of the Future (2028) Proposed Action noise contour.

The City of Tucson is currently considering a potential residential project with 30 new residential homes located approximately ¼ mile west of TUS, northeast of the intersection of East Medina Road and South 6th Avenue. The property is currently undeveloped/vacant. However if this development were to be built and populated additional housing units may be newly located within the DNL 65 dB noise contour. These residences would not be eligible for FAA sound insulation grants. Per the "FAA Final Policy on Part 150 approval of Noise Mitigation Measures" (62 Federal Register [FR] 16409) and FAA Order 5100.38D, *Airport Improvement Program Handbook*, residences and public buildings in an approved Part 150 Noise Compatibility Program "must have been built prior to October 1, 1998, unless the sponsor has demonstrated to the [FAA] that no published noise contours existed at that time."

Implementation of the Proposed Action combined with the implementation of one or more of the past, present, and reasonably foreseeable future actions would not result in a cumulative impact to noise and noise-compatible land uses, because any significant impact due to noise is required to have their own mitigation measures to minimize impacts during implementation of their project. Therefore, implementation of the Proposed Action, when combined with other past, present, or reasonably foreseeable future projects would not result in significant adverse impacts to noise and noise-compatible land uses.

4.17.5.5 Environmental Justice

As discussed in Section 4.13, *Socioeconomics, Environmental Justice, and Children's Health and Safety Risks*, the Proposed Action would result in impacts to minority and low-income populations. There would be a significant impact to 69 housing units within the area of 1.5 dB increase within the 65 DNL of the Future (2028) Proposed Action noise contour.

Implementation of the Proposed Action combined with the implementation of one or more of the past, present, and reasonably foreseeable future actions would not result in a cumulative impact to environmental justice populations, because any significant impact is required to have their own mitigation measures to minimize impacts during implementation of their project. The Proposed Action would not result in a disproportionate impact on minority populations. Therefore, implementation of the Proposed Action, when combined with other past, present, or reasonably foreseeable future projects would not result in significant adverse impacts to environmental justice populations.

4.17.5.6 Water Resources

As discussed in Section 4.15, *Water Resources*, the Proposed Action would result in impacts to an estimated 1.1 acres of the Hughes Wash Tributary #1 due to the construction and implementation of the new parallel runway and taxiway. In addition, an estimated 0.06 acres of the Hughes Wash Tributary #2 would be impacted due to the construction and implementation of a new haul road.

Coordination with the USACE has determined that a permit under Section 404 of the CWA would be required for construction of the Proposed Action. Permitting under Section 401 of the CWA would also be required for the Proposed Action. Furthermore, coordination with the ADEQ will be conducted by TAA in accordance with Section 402 of the Clean Water Act to ensure a National Pollutant Discharge Elimination System (NPDES) permit is obtained.⁵²

The storage volume necessary to attenuate the 100-year onsite surface water flows due to the Proposed Action were calculated to be 11.6 acre-feet. The storage volume provided by the proposed detention basins would be up to 31.1 acre-feet. Therefore, the proposed detention basins would actually provide a cumulatively beneficial impact.

Implementation of the Proposed Action combined with the implementation of one or more of the past, present, and reasonably foreseeable future actions would not result in a cumulative impact to water resources because each of these projects is required to have their own protective measures and permits to avoid and minimize, impacts during implementation of their project.

The other past, present, or reasonably foreseeable future projects would be required to comply with all existing and future water quality regulatory criteria and permit requirements. In addition, these past, present, or reasonably foreseeable future projects would also be required to develop BMPs that would ensure that concentrations of pollutants of concern do not exceed regulatory criteria. Therefore, there would be no significant cumulative impacts to water resources.

4.17.6 CONCLUSION

The level of cumulative impacts anticipated to occur within these environmental resource categories is not significant due to the types of past, present, and reasonably foreseeable future projects, the extent of the built environment in which they would occur, the lack of certain environmental resources in the area, and the mitigation measures identified for the Proposed Action. Therefore, implementation of the Proposed Action would not result in significant cumulative environmental impacts.

4.18 IDENTIFICATION OF THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

The FAA has identified the Proposed Action as the Environmentally Preferred Alternative. In identifying the Environmentally Preferred Alternative, the FAA considered the ability of each alternative to meet the purpose and need for the project, the Airport Sponsor's goals and objectives, and the potential environmental impacts.

⁵² Clean Water Act, Section 402, National Pollutant Discharge Elimination System permit.