FINAL
ENVIRONMENTAL ASSESSMENT

PROPOSED NORTHEAST AREA DEVELOPMENT PLAN AND ASSOCIATED IMPROVEMENTS PROJECT

Phoenix-Mesa Gateway Airport
Mesa, Arizona

Prepared for:

PHOENIX-MESA GATEWAY AIRPORT AUTHORITY

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
As lead Federal Agency pursuant to the National Environmental Policy Act of 1969

Prepared by:

Ricondo and Associates, Inc.

January 2017

This environmental assessment becomes a Federal document when evaluated, signed and dated by the Responsible FAA Official.

January 9, 2017

Responsible FAA Official **Date**

GENERAL INFORMATION ABOUT THIS DOCUMENT

WHAT'S IN THIS DOCUMENT? This document contains a Final Environmental Assessment (EA) for the Phoenix-Mesa Gateway Airport (IWA) proposed Northeast Area Development Plan and Associated Improvements Project (Proposed Action). The Proposed Action includes relocation of the passenger terminal complex and ancillary facilities to the northeast section of the airport, construction of associated infrastructure and site improvements, relocation of an airport surveillance radar (ASR-8) off-airport, and completion of site preparation for future revenue generating commercial development including retail and office space. This document discloses the analysis and findings of the potential impacts associated with the Phoenix-Mesa Gateway Airport Authority's (PMGAA) proposal and the No Action Alternative.

BACKGROUND. The project would provide a purpose-built replacement passenger terminal complex that will provide the users of Phoenix-Mesa Gateway Airport with a modern, efficient, and expandable passenger terminal complex at a level of service that is consistent and competitive with other air carrier airports in the southwestern United States.

The Draft EA was released for public and agency review on November 10, 2016. The notice of availability of the Draft EA was advertised in the Arizona Business Gazette newspaper to inform the general public and other interested parties.

The document presented herein represents the Final EA for the federal decision-making process, in fulfillment of FAA's policies and procedures relative to NEPA and other related federal requirements. Copies of the document are available for inspection at libraries in the cities of Mesa, Queen Creek, and Gilbert, PMGAA Administrative Offices, the FAA Airports District Office in Phoenix, and the FAA Western-Pacific Region Office in Hawthorne, CA. The addresses for these locations are provided in Chapter 5 of this Final EA.

WHAT SHOULD YOU DO? Read this Final EA to understand the actions that PMGAA and FAA intend to take relative to the Proposed Action at IWA.

WHAT HAPPENS AFTER THIS? Following review of the Final EA, the FAA will either issue a Finding of No Significant Impact/Record of Decision (FONSI/ROD) or decide to prepare an Environmental Impact Statement (EIS).

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WESTERN-PACIFIC REGION

FINDING OF NO SIGNIFICANT IMPACT AND RECORD OF DECISION

Proposed Northeast Area Development Plan and Associated Improvements Project

Phoenix-Mesa Gateway Airport
Mesa, Maricopa County, Arizona

For further information

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March 21, 2017

GENERAL INFORMATION ABOUT THIS DOCUMENT

WHAT'S IN THIS DOCUMENT? This document is the Federal Aviation Administration's (FAA) Finding of No Significant Impact (FONSI) and Record of Decision (ROD) for the proposed Northeast Area Development Plan and Associated Improvements Project at Phoenix-Mesa Gateway Airport located in Mesa, Arizona (the Proposed Action). This document is based on the information and analysis contained in the Final Environmental Assessment dated January 2017, which is attached hereto and incorporated by reference.

This document discusses all alternatives considered by FAA in reaching its decision, summarizes the analysis used to evaluate the alternatives, and summarizes why the Proposed Action would not significantly affect environmental resources. This document identifies conceptual mitigation measures that are part of the preferred alternative.

BACKGROUND. In November 2016, the Phoenix-Mesa Gateway Airport Authority (Airport Authority) prepared a Draft Environmental Assessment (Draft EA) for the Proposed Action. The Proposed Action includes the relocation of the passenger terminal complex and ancillary facilities to the northeast section of the Phoenix-Mesa Gateway Airport; construction of associated infrastructure and site improvements; relocation of an Airport Surveillance Radar (ASR-8) off-airport; and completion of site preparation for future revenue generating commercial development including retail and office space. The Draft EA addressed the potential environmental effects of the Proposed Action including various reasonable alternatives to the Proposed Action.

The Draft EA was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 USC § 4321 *et seq.*), the implementing regulations of the Council on Environmental Quality (CEQ) (40 CFR Parts 1500-1508), FAA Order 1050.1F *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act (NEPA), Implementing Instructions for Airport Actions*. The Airport Authority published the Notice of Availability for the Draft EA on November 10, 2016. The Airport Authority received comments on the draft between November 10, 2016 and December 28, 2016. FAA approved the Final EA on January 9, 2017.

WHAT SHOULD YOU DO? Read the FONSI/ROD to understand the actions that FAA intends to take relative to the Proposed Action.

WHAT HAPPENS AFTER THIS? The Airport Authority may begin to implement the Proposed Action.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT
AND
RECORD OF DECISION

PROPOSED NORTHEAST AREA DEVELOPMENT PLAN AND ASSOCIATED IMPROVMENTS PROJECT

PHOENIX-MESA GATEWAY AIRPORT
MESA, MARICOPA COUNTY, ARIZONA

1. **Introduction.** This document serves as the Federal Aviation Administration's (FAA) Finding of No Significant Impact (FONSI) and Record of Decision (ROD) (FONSI/ROD) for the Final Environmental Assessment (Final EA) for the proposed Northeast Area Development Plan and Associated Improvements Project at Phoenix-Mesa Gateway Airport (IWA or Airport), Mesa, Maricopa County, Arizona. This document has been prepared in compliance with the National Environmental Policy Act of 1969 (NEPA) (42 USC Section 4321, *et seq.*), implementing regulations issued by the Council on Environmental Quality (CEQ) (40 CFR Parts 1500-1508), FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act (NEPA), Implementing Instructions for Airport Actions*.

   The Phoenix Mesa Gateway Airport Authority (Airport Authority) is the sponsor for IWA. FAA must comply with NEPA requirements before being able to take the federal action of approving those portions of the Airport Authority's Airport Layout Plan (ALP) that depict the Proposed Action. Approval of the ALP is authorized by the Airport and Airway Improvement Act of 1982 (Public Law 97-248), as amended.

2. **Purpose and Need of the Proposed Action.** Chapter 1 of the Final EA documents the need (problem) and the purpose (goal) for the Proposed Action. The Airport Authority proposes to construct a centralized passenger terminal complex that is capable of efficiently serving passenger operations and providing passengers with a level of service that is consistent and competitive with other air carrier airports in the Southwestern United States. The problem to be solved is demonstrated in the current situation in which passengers must use air-stairs and walk across the aircraft parking apron to the terminal building during the summer months when temperatures can exceed 110 degrees Fahrenheit. Section 1.5.1 of the Final EA identifies the various specific purposes of the Proposed Action.

   The need for the Proposed Action is described in Section 1.5.2 of the Final EA. This section states the existing passenger terminal has been located on the west side of the airfield since the closure of Williams Air Force Base. The existing terminal is a repurposed military facility. While the facility currently functions today, there are several deficiencies that must be addressed in order to accommodate future airline operations in a manner and level of convenience and comfort that is expected in the United States. IWA still lacks a centralized terminal complex capable of efficiently serving passenger operations.

   Space constraints in the existing terminal area do not provide adequate automobile parking facilities, including long-term parking within a reasonable walking distance to the terminal building. Currently, a portion of the aircraft parking apron south of the existing terminal building is used to park automobiles. This represents an inefficient use of available aircraft parking.

   The FAA's statutory mission is to ensure the safe and efficient use of navigable airspace in the United States. Pursuant to the Federal Aviation Act of 1958, as amended (49 USC § 40101 *et seq.*), FAA must ensure the Proposed Action does not derogate the safety of aircraft and airport operations at IWA.

3. **Proposed Project and Federal Actions.** Under the Proposed Action, the existing former military buildings, currently used as a Passenger Terminal facility along South Sossaman Road, would be reused for another aeronautical purpose. The Airport Authority would build a new purpose-built

passenger terminal complex that would provide a level of service commensurate with other commercial service airports in the Southwestern United States.

As set forth in Section 1.4 and depicted on Exhibit 1-5 of the Final EA, the Proposed Action includes the following actions:

- Construct a purpose-built passenger terminal with second level boarding and the equivalent number of gates as the existing terminal complex (10 gates and 4 aircraft parking spaces), on undeveloped land on the northeast side of IWA property.
- Construct airfield, taxiway, and taxilane improvements to provide airfield access capable of supporting the proposed air carrier operations.
- Complete construction of the full length parallel taxiway northeast of Runway 12L-30R
- Construct an aircraft apron.
- Construct access roadways and terminal curbfront improvements.
- Construct parking spaces equivalent to that currently available.
- Relocate utilities, service roads, and perimeter fencing.
- Construct a new substation on the west side of Ellsworth Road.
- Construct ancillary/support facilities.
- Relocate the ASR-8 off airport (on Bureau of Land Management (BLM) managed lands at Rittenhouse Auxiliary Army Airfield).
- Lease 20-plus acres of land directly northeast of existing Airport property for the relocation of the Ellsworth Channel from the Arizona Department of Transportation.
- Demolish existing, unoccupied buildings and structures within the northeast development area.
- Prepare areas for commercial development (grading, site preparation, and utility connections)

As set forth in Section 1.6 of the Final EA, the federal actions necessary to carry out the Proposed Action include:

- Unconditional approval of the portion of the ALP depicting the proposed improvements pursuant to 49 USC §§ 40103(b), 44718 and 47107(a)(16); Title 14 CFR Part 77, *Safe and Efficient Use, and Preservation of Navigable Airspace*, at 14 CFR 157, *Notice of Construction, Alteration, Activation, and Deactivation*.

- Determinations under 49 USC §§ 47106 and 47107 relating to the eligibility of the Proposed Action for federal funding under the AIP and/or under 49 USC § 40117, as implemented by 14 CFR § 158.25, to impose and use passenger facility charges (PFCs) collected at the Airport for the Proposed Action to assist with construction of potentially eligible development items shown on the ALP.[1]

[1] Certain requirements for AIP funding overlap with environmental review requirements for approval of the ALP and so are addressed as part of the EA for the ALP. These determinations are a prerequisite to funding but do not complete the determinations that are necessary for funding. The decision to approve AIP and PFC funding are completed in separate processes.

- Relocation, installation, operation, and maintenance of the ASR-8 required as part of the Proposed Action, which requires coordinated siting, technical, and NEPA considerations with the FAA Air Traffic Organization and the BLM.

- Processing of airspace changes, installation, and/or relocation of FAA equipment (e.g. ASR-8).

- Approval of a Construction Safety and Phasing Plan to maintain aviation and airfield safety during construction pursuant to FAA Advisory Circular 150/5370-2F, *Operational Safety on Airports During Construction*, [14 CFR Part 139 (49 USC § 44706)].

- Determination under 49 USC § 44502(b) that the airport development is reasonably necessary for use in air commerce or in the interests of national defense.

- Approval of appropriate amendments to the Airport Certification Manual (ACM) pursuant to 14 CFR Part 139 (49 USC § 44706).

- FAA determination of the Proposed Action's effects on the safe and efficient use of airspace.

4. **Reasonable Alternatives Considered.** The following provides a summary of the alternatives development process and alternatives considered. Further details are available in Chapter 2 of the Final EA.

Identification and Evaluation of Potential Alternatives – Alternatives were identified using a three-step alternatives analysis screening process as follows:

Step 1 – Would the Alternative provide an efficient centralized passenger terminal complex?

Step 2 – Would the Alternative provide opportunity for future revenue producing commercial development?

Step 3 - Would the Alternative provide direct access to major highways?

Section 2.3.1 of the Final EA evaluated three non-development alternatives including: use of Alternative Modes of Transportation; Use of Other Public Airports; and Use of Alternative Aircraft.

Section 2.4 of the Final EA evaluated four development alternatives including:

- On-Site Alternative 1 – Expansion of Existing Passenger Terminal Complex
- On-Site Alternative 2 - Southwest Area Development
- On-Site Alternative 3 – Northeast Area Development (Proposed Action)
- Off-Site Alternative 4 – West Expansion of the Existing Passenger Terminal

Section 2.4.4 of the Final EA states that the No Action Alternative and On-Site Alternative 3 were carried forward for detailed impact analysis for the Replacement Passenger Terminal complex. Analysis of the No Action Alternative is required pursuant to 40 CFR § 1502.14(d).

Section 2.6 of the Final EA evaluates the various candidate sites for the proposed relocation of the ASR-8 facility.

Section 2.6.1 of the Final EA identifies the three step alternative screening criteria that were used for the evaluation for the candidate sites for the relocated ASR-8. The operational siting criteria for the ASR are specified in FAA Order 6310.6, *Primary/Secondary Terminal Siting Handbook* which was also used in the screening analysis. The three steps include:

Step 1 – Would the Alternative meet exclusionary criteria?

Step 2 – Would the Alternative meet restrictive criteria?

Step 3 - Would the Alternative meet selective criteria?

Table 2-2 of the Final EA provides a summary of the three-step screening that evaluated 23 candidate sites for the ASR-8. Exhibit 2-8 shows the locations of the various candidate sites that were considered. Section 2.6.3 of the Final EA states that Site RTN7 met all the criteria and was retained for analysis in the Final EA.

The FAA's primary considerations in selecting a preferred alternative include the Purpose and Need for the project and the environmental impacts of the project. In its consideration of alternatives, the FAA is mindful of its statutory charter to encourage the development and safety of civil aeronautics in the United States (49 USC § 40104). Here, the No Action Alternative has fewer environmental effects than the Proposed Action. However, the No Action Alternative does not meet the Purpose and Need for the proposed project: to provide a centralized passenger terminal complex capable of efficiently serving passenger operations, and to provide passengers with a level of service that is consistent and competitive with other air carrier airports in the southwestern United States.

5. **Assessment.** The potential environmental impacts and possible adverse effects were identified and evaluated in the Final EA. The FAA reviewed the Final EA and found it be adequate for the purpose of the proposed Federal action. The FAA determined that the Final EA adequately describes the potential impacts of the Proposed Action.

As set forth in Chapter 3 of the Final EA, the Final EA examined the following environmental impact categories: Air Quality; Biological Resources; Climate, Department of Transportation Act, Section 4(f) and Land and Water Conservation Fund Act, Section 6(f) Resources; Hazardous Materials, Solid Waste, and Pollution Prevention; Historical, Architectural, Archaeological, and Cultural Resources; Land Use; Natural Resources and Energy Supply; Noise and Compatible Land Use; Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks; Visual Effects; Water Resources; and Cumulative Impacts.

The environmental impact categories of Coastal Resources; Farmlands; and Wild and Scenic Rivers were not evaluated in detail because the proposed action at IWA would not pose an impact to these environmental resources.

A. Air Quality. As discussed in Section 4.1 of the Final EA, the Proposed Action will not change aircraft operations at IWA. The Proposed Action will not increase aircraft emissions because it will not change the number and type of aircraft operations at IWA. Table 4-1 of the Final EA, presents the construction emissions for the Proposed Action over 3 years' time. Section 4.1.3.1 of the Final EA discloses the comparison of project emissions to the General Conformity *de minimus* thresholds. Table 4-5 presents the comparison of emissions to the thresholds and shows the applicable pollutant levels are below the *de minimis* thresholds for all applicable pollutants, and therefore, not significant. The Proposed Action would not exceed the *de minimis* thresholds. Section 4.1.3.2 states that the relocated ASR site (site RTN7) also would not exceed the *de minimis* thresholds.

B. Biological Resources. Section 4.2.3.1 of the Final EA states that under the No Action Alternative, there would be no development or change in land use and, therefore, no effects to biological resources would occur. Based on information in a biological assessment, FAA determined that the Proposed Action will not affect any federally listed threatened or endangered species or designated critical habitat. Since FAA has made a no-effect determination, no formal consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act of 1973, as amended, was needed. Section 4.2.3.2 of the Final EA also documents that FAA made the same determination for the proposed relocated ASR-8.

C. Climate. As discussed in Section 4.3 of the Final EA, the CEQ has noted that *"it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or project emissions; as such direct linkage is difficult to isolate and to understand."* Section 4.3.3 of the Final EA states that Green House Gases (GHG) emissions from IWA will increase because of increase in motor vehicle trips associated with the revenue generating, collateral development under the Proposed Action. Table 4-7, presents the annual GHG emissions from construction for the years 2022 and 2027 comparing the Proposed Action and No Action Alternative.

C. Department of Transportation Act, Section 4(f) and Land and Water Conservation Fund Act, Section 6(f) Resources. Section 4.4 of the Final EA states that the area for the Proposed Action contains a portion of the archaeological site U:10:127[ASM]. Section 4.4.3.1 of the Final EA states this site would be avoided during construction activities and thus: not affected. Because this site and two other archaeological sites located on the west side of the Airport would not be affected by the Proposed Action, there would be no direct or constructive use of any properties by the Proposed Action. The RTN7 site for the proposed relocation of the ASR-8 also does not have any DOT Section 4(f) properties. Section 4.4.3.3 of the Final EA states there are no Land and Water Conservation Fund Act, Section 6(f) properties that would be affected by the Proposed Action. The FAA determined the Rittenhouse Auxiliary Army Airfield (RAAF) was not eligible for inclusion into the National Register of Historic Places. The Arizona State Historic Preservation Officer concurred with FAA's determination and finding under the National Historic Preservation Act. Thus, the Proposed Action will not have a direct or constructive use of any resource protected by the DOT Act, Section 4(f) or Land and Water Conservation Fund Act, Section 6(f).

D. Hazardous Materials, Solid Waste, and Pollution Prevention. Section 4.5 of the Final EA notes both the No Action Alternative and the Proposed Action would involve a variety of hazardous substances typically associated with the operation of a commercial airport. Section 4.5.3.1 of the Final EA states that construction associated with the Proposed Action would not directly involve areas where contamination has been recorded. This section of the Final EA states there is a potential to encounter contaminated soil during ground disturbing activities due to use of the facility as U.S. Air Force installation. This section of the EA states that four hazardous materials sites are located within northeast section of the Airport. However, the Arizona Department of Environmental Quality has determined that exposure pathways have been eliminated through both remediation and restricted use/access. Section 4.5.3.1 states that the Proposed Action would not involve the generation, use, or storage of hazardous materials in quantities or types that are substantially different from the No Action Alternative.

E. Historical, Architectural, Archaeological, and Cultural Resources. Section 4.6 of the Final EA describes the impacts to archaeological resources by the Proposed Action. During the development of the Draft EA no intact archaeological resources that would be affected by the Proposed Action were identified. FAA undertook the required Section 106 consultation with the Arizona State Historic Preservation Officer (Arizona SHPO). One historic property, "Site U:10:127[ASM]", is listed on the National Register of Historic Places (NRHP). Section 4.6.3.1 of the Final EA states that this site would be preserved in place by the Airport Authority and would not be disturbed by the Proposed Action. The FAA determined that the Proposed Action would not affect any historic properties listed on or eligible for listing on the NRHP. The Arizona SHPO concurred with FAA's determinations and findings.

FAA also consulted with the Arizona SHPO for the site of the proposed relocation of the ASR-8 site at the Rittenhouse AAAF. FAA found the Proposed Action would not have an adverse effect on any properties listed or eligible for listing on the National Register of Historic Places. The Arizona SHPO concurred with FAA's determination and findings, as documented in Appendix G of the Final EA. Section 4.6.3.3 includes an Unanticipated Discovery Plan for previously unidentified archaeological resources for the Proposed Action and the relocation of the ASR-8.

F. Land Use. Exhibit 3-7 in the Final EA states that the Airport is located in the City of Mesa, Arizona. The Town of Gilbert, Arizona controls land use for the land immediately west of the Airport and Maricopa County controls land use for the land immediately east of the Airport. Section 4.7.3 of the Final EA

states that the No-Action Alternative and the Proposed Action would not have a significant land use impact. Therefore, the Proposed Action is consistent with community planning. Appendix E of Final EA contains the required Land Use Assurance Letter from the Airport Authority to the FAA, dated May 10, 2016.

G. Natural Resources and Energy Supply. Section 4.8.3 of the Final EA states the Proposed Action would not have a significant impact on natural resources. The Proposed Action would not increase aircraft operations or use of the Airport compared to the No Action Alternative. Section 4.8.3.1 of the Final EA states that construction of the Proposed Action would require installation of new utility infrastructure, and that construction impacts to utilities and service systems would not be significant. This section of the Final EA also states that there are no known mineral resources within the area of the Proposed Action. Therefore the Proposed Action would not impact mineral resources. Section 4.8.3.2 of the Final EA states that the proposed relocation of the ASR-8 is expected to have similar energy usage as is used currently.

H. Noise and Compatible Land Use. Section 4.9 of the Final EA states that implementing the Proposed Action would not result in any change in the number of aircraft operations compared to the No Action Alternative for the first full year of operation following construction, which is the year 2022, and for the year 2027. This section notes that the Proposed Action would result in slight changes to taxi times and runway use. Of the three parallel runways at the Airport, Runway 12L-30R, is the runway closest to the Proposed Action. Thus, the Proposed Action is expected to result in a slight shift in the noise contour to the east due to the increased aircraft activity on the east side of the Airport. However, Table 4-9 in the Final EA notes that there are no noise sensitive land uses within the 65 DNL noise contour for the Proposed Action for the year 2022. The same situation is expected for the year 2027 as shown in Table 4-10.

I. Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks. Section 4.10.3.1 states under the Proposed Action, no relocation of residences or businesses would be necessary. Construction of the Proposed Action would create opportunities for local temporary employment during the construction period. During construction, there would be no disproportionately high and adverse human health or environmental impacts to minority or low income populations. This section of the Final EA also notes that there are several schools that are located near the eastern boundary of the Proposed Action. However, analysis of various impact categories indicates that there would be no significant construction impacts resulting from the Proposed Action. Thus, the Proposed Action would not result in significant environmental impacts that would affect children's health or pose safety risks. Section 4.10.3.2 of the Final EA indicates similar finding that the relocation of the ASR-8 would also not result in the relocation of any residences or businesses, alteration of traffic patterns, division of communities, disruption of planned development or appreciable changes in employment. The relocated ASR-8 would have no impacts to low-income or minority populations.

J. Visual Effects. Section 4.11.3.1 of the Final EA states that night time light emissions already occur within the area of the Proposed Action. For visual impacts, the text of the Final EA states that construction equipment and activity would be visible. However, construction fencing would be used to screen construction equipment, materials and activity. The land adjacent to the area of the Proposed Action is either vacant or identified by the Maricopa Association of Governments as "Development Employment Generating" (see Exhibit 3-6 of the Final EA). There are no view sheds of unique or critical value that have been identified in this area. The Proposed Action would not result in any significant visual impacts. For the Proposed ASR-8 relocation, Section 4.11.3.2 of the Final EA notes that the backyards of the nearest residences are separated from Ocotillo Road by a line of ornamental trees and a 6-foot brick wall that limits or blocks the view of the RTN7 site for the ASR-8, which would be a quarter mile north of Ocotillo Road.

K. Water Resources. Section 4.12.3.1 states that no wetlands would be impacted by the construction or operation of the Proposed Action. Section 4.12.3.2 states that the nearest 100-year floodplain is about one mile west of the area of the Proposed Action, and that neither the construction nor operation of the Proposed Action would adversely affect floodplains. Section 4.12.3.4 of the Final EA states that a

2,900 foot long portion of the Ellsworth Channel, which is considered to be Waters of the United States, would be relocated under the Proposed Action. Under the Proposed Action, a 3,000 foot long segment of the Powerline Floodway would be reconstructed and widened to accommodate the additional flow from the Ellsworth Channel. Consultation with the U.S. Army Corps of Engineers would be required, prior to construction activities, to obtain a permit for potential discharges under Section 404 of the Clean Water Act.

L. Cumulative Impacts. The cumulative impacts associated with the incremental effects of future actions combined with past, present and reasonably foreseeable future actions are presented in Section 3.15 of the Final EA. An evaluation of cumulative impacts from these cumulative actions is discussed in Section 4.13 of the Final EA; no significant cumulative impacts were identified.

M. Environmentally Preferred Alternative and FAA Preferred Alternative.

In connection with its decision to approve the proposed ALP revisions, the FAA considered the environmental impacts from the Proposed Action and the No Action Alternative. The FAA determined that all practicable means to avoid or minimize environmental harm from the Proposed Action have been adopted, that there would be no significant environmental impacts from the Proposed Action and that the Proposed Action would not jeopardize the safe and efficient operation of the Airport. The No Action Alternative has fewer environmental effects than the Proposed Action, and thus would be the environmentally preferred alternative. However, the No Action Alternative does not meet the Purpose and Need. Thus, the FAA's preferred alternative is the Proposed Action as defined in the Final EA. FAA selected this alternative because it meets the Purpose and Need, with minimal adverse environmental effects.

6. Public Participation.

The public was encouraged to review and comment on the Draft EA, which was released for public review on November 10, 2016. The Airport Authority conducted scoping meetings for the Draft EA on September 12, 2013. A notice of availability of the Draft EA was published in the following local newspapers in the vicinity of the airport: the *Arizona Republic*, and the *Arizona Business Gazette*. The Airport Authority made the Draft EA available on its web site, and in the following local libraries: City of Mesa Library, Southeast Regional Library, and the Queen Creek Library. The Draft EA was also made available for public review at, the IWA administrative offices, the FAA's Western-Pacific Regional Office in Hawthorne, California and at the FAA's Phoenix Airports District Office in Phoenix, Arizona. Two written comments were received during the public comment period, which were from regulatory agencies. The first, a letter from the Natural Resources Conservation Service, indicated that there are no prime and unique soils in the area of the Proposed Action. The second, a letter from the U.S. Environmental Protection Agency, asked for clarification of various points in the Final EA. The public comment period ended on December 28, 2016. Copies of the newspaper Proof of Publications are provided in Appendix K.1 of the Final EA Responses to comments received are provided in Appendix K.4 of the Final EA.

7. Inter-Agency Coordination.

In accordance with 49 USC § 47101(h), the FAA has determined that no further coordination with the U.S. Department of Interior or the U.S. Environmental Protection Agency is necessary because the Proposed Action does not involve construction of a new airport, new runway or major runway extension that has a significant impact on natural resources including fish and wildlife; natural, scenic, and recreational assets; water and air quality; or another factor affecting the environment.

8. Reasons for the Determination that the Proposed Action will have No Significant Impacts.

The attached Final EA examines each of the various environmental resources that were determined present at the project location, or had the potential to be impacted by the Proposed Action. The Proposed Action would not involve any environmental impacts, after mitigation that would exceed the threshold of significance as defined by FAA Orders 1050.1F and 5050.4B. Based on the information contained in the Final EA, the FAA has determined that the Proposed Action is the most feasible and prudent alternative. The FAA has decided to implement the Proposed Action as described in Section 3 of this FONSI/ROD.

9. Agency Findings.

The FAA makes the following determination for this project based on information and analysis set forth in the Final EA and other portions of the administrative record.

a. **The project is reasonably consistent with existing plans of public agencies for development of the area [49 USC 47106(a)].** The proposed project is consistent with the plans, goals and policies for the area, including the City of Mesa and Maricopa County's General Plan. The proposed project is also consistent with the applicable regulations and policies of federal, State and local agencies.

b. **Independent and Objective Evaluation:** As required by the CEQ (40 CFR § 1506.5), the FAA has independently and objectively evaluated this proposed project. As described in the Final EA, the Proposed Action and the No Action Alternative were studied extensively to determine the potential impacts and appropriate mitigation measures for those impacts. The FAA provided input, advice, and expertise throughout the analysis, along with administrative and legal review of the project.

c. **National Historic Preservation Act**: The Proposed Action will not affect any properties listed or eligible for listing on the National Register of Historic Places. FAA conducted the required consultation with the Arizona SHPO pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended.

10. Decision and Orders.

Based on the information in this FONSI/ROD and supported by detailed discussion in the Final EA, the FAA has selected the Northeast Area Development Plan and Associated Improvements Project (the Proposed Action) as the FAA's Preferred Alternative. The FAA must select one of the following choices:

- Approve agency actions necessary to implement the Proposed Action; or
- Disapprove agency actions to implement the Proposed Action.

Approval signifies that applicable federal requirements relating to the proposed airport development and planning have been met. Approval permits the Airport Authority to proceed with implementation of the Proposed Action. Disapproval would prevent the Airport Authority from implementing the Proposed Action on the Airport.

Under the authority delegated to me by the Administrator of the Federal Aviation Administration, I find that the Proposed Action is reasonably supported. I, therefore, direct that action be taken to carry out the agency actions discussed more fully in Section 3 of this FONSI/ROD.

1. Unconditional approval of the portion of the ALP depicting the proposed improvements pursuant to 49 USC §§ 40103(b), 44718 and 47107(a)(16); Title 14 CFR Part 77, Safe and Efficient Use, and Preservation of Navigable Airspace, at 14 CFR 157, Notice of Construction, Alteration, Activation, and Deactivation.

2. Determinations under 49 USC §§ 47106 and 47107 relating to the eligibility of the Proposed Action for federal funding under the AIP and/or under 49 USC § 40117, as implemented by 14 CFR § 158.25, to impose and use PFCs collected at the Airport for the Proposed Action to assist with construction of potentially eligible development items shown on the ALP.[ii]

3. Relocation, installation, operation, and maintenance of the ASR-8 required as part of the Proposed Action, which requires coordinated siting, technical, and NEPA considerations with the FAA Air Traffic Organization and the BLM.

4. Processing of airspace changes, installation, and/or relocation of FAA equipment (e.g. ASR-8).

5. Approval of a Construction Safety and Phasing Plan to maintain aviation and airfield safety during construction pursuant to FAA Advisory Circular 150/5370-2F, *Operational Safety on Airports During Construction*, [14 CFR Part 139 (49 USC § 44706)].

6. Determination under 49 USC § 44502(b) that the airport development is reasonably necessary for use in air commerce or in the interests of national defense.

7. Approval of appropriate amendments to the ACM pursuant to 14 CFR Part 139 (49 USC § 44706).

8. FAA determination of the Proposed Action's effects on the safe and efficient use of airspace.

This order is issued under applicable statutory authorities, including 49 USC §§ 40101(d), 40103(b), 40113(a), 44701, 44706, 44718(b), and 47101, et seq.

[ii] Certain requirements for AIP funding overlap with environmental review requirements for approval of the ALP and so are addressed as part of the EA for the ALP. These determinations are a prerequisite to funding but do not complete the determinations that are necessary for funding. The decision to approve AIP and PFC funding are completed in separate processes.

I have carefully and thoroughly considered the facts contained in the attached EA. Based on that information, I find the proposed Federal action is consistent with existing national environmental policies and objectives of Section 101(a) of the National Environmental Policy Act of 1969 (NEPA). I also find the proposed Federal action will not significantly affect the quality of the human environment or include any condition requiring any consultation pursuant to section 102(2)(C) of NEPA. As a result, FAA will not prepare an Environmental Impact Statement for this action.

APPROVED:

Dennis E. Roberts
Regional Administrator
Western-Pacific Region, AWP-1

3/21/2017
Date

DISAPPROVED:

Dennis E. Roberts
Regional Administrator
Western-Pacific Region, AWP-1

Date

RIGHT OF APPEAL

This FONSI/ROD constitutes a final order of the FAA Administrator and is subject to exclusive judicial review under 49 USC § 46110 by the U.S. Circuit Court of Appeals for the District of Columbia or the U.S. Circuit Court of Appeals for the circuit in which the person contesting the decision resides or has its principal place of business. Any party having substantial interest in this order may apply for review of the decision by filing a petition for review in the appropriate U.S. Court of Appeals no later than 60 days after the order is issued in accordance with the provisions of 49 USC § 46110.

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1. Purpose and Need

1.1 Introduction

Phoenix-Mesa Gateway Airport Authority (PMGAA) proposes to relocate the passenger terminal complex and associated ancillary facilities at Phoenix-Mesa Gateway Airport (the Airport, or IWA[1]) to the north-east section of the airport. The PMGAA also proposes to construct associated infrastructure and site improvements, to relocate an airport surveillance radar-8 (ASR-8) off airport, and to complete site preparation for future revenue-generating commercial development, including retail and office space. The proposed project is known as the Northeast Area Development Plan (NADP).

This Environmental Assessment (EA) is intended to identify and consider the potential environmental impacts to the proposed Northeast Area Development Plan at IWA. This EA has been prepared pursuant to the requirements of Section 102(2)(c) of the National Environmental Policy Act of 1969 (NEPA, 42 United States Code [U.S.C.] 4321-4370), the President's Council on Environmental Quality (CEQ) Regulations 40 Code of Federal Regulations (CFR) §§ 1500-1508, and Section 509(b)(5) of the Airport and Airway Improvement Act of 1982, as amended. The FAA is the lead federal agency to ensure compliance with NEPA for airport development actions; thus, this EA has been prepared in accordance with Federal Aviation Administration (FAA) Order 1050.1F, *Environmental Impacts: Policies and Procedures*,[2] and FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*.[3] This project includes the proposed relocation of the ASR-8 onto Bureau of Land Management (BLM) managed lands; thus, this EA was also prepared with reference to the BLM's guidance document, BLM H-1790-1, *National Environmental Policy Act Handbook*.[4] At such time as the ASR-8 would be relocated, BLM would be able to use this document in connection with its NEPA environmental impact disclosure responsibilities.

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1 Phoenix-Mesa Gateway Airport is assigned the code "IWA" by the FAA. "AZA," the International Air Transport Association's designation for the Airport, is commonly used by the PMGAA as an abbreviation for the Airport.

2 U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F, *Environmental Impacts: Policies and Procedures*, effective July 16, 2015.

3 U.S. Department of Transportation, Federal Aviation Administration, Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, effective April 28, 2006.

4 U.S. Department of Interior, Bureau of Land Management, H-1790-1, *National Environmental Policy Act Handbook*, January 2008.

This section provides the following: a brief background of IWA; a description of the Proposed Action; a discussion of the purpose of and need for the Proposed Action; a description of the requested federal actions; a summary of the applicable federal EA processes and procedures; and a description of this document's organization.

1.2 Background

1.2.1 AIRPORT DEVELOPMENT HISTORY

IWA is classified as a small-hub[5] primary commercial service airport in the National Plan of Integrated Airport Systems (NPIAS). IWA is owned and operated by the PMGAA, a Joint Powers Airport Authority comprising the City of Mesa, the City of Phoenix, the Gila River Indian Community, the Town of Gilbert, the Town of Queen Creek, and the City of Apache Junction. It is located within the East Valley of the Phoenix metropolitan area in the southeast corner of the City of Mesa, Arizona, approximately 25 miles southeast of Phoenix. Airport property encompasses approximately 3,020 acres of land in Maricopa County, east of the City of Gilbert and north of the City of Queen Creek, as shown on **Exhibit 1-1**. IWA, as shown on **Exhibit 1-2**, includes three parallel runways oriented from northwest to southeast: Runway 12R-30L (10,401 feet), Runway 12C-30C (10,201 feet), and Runway 12L-30R (9,300 feet).

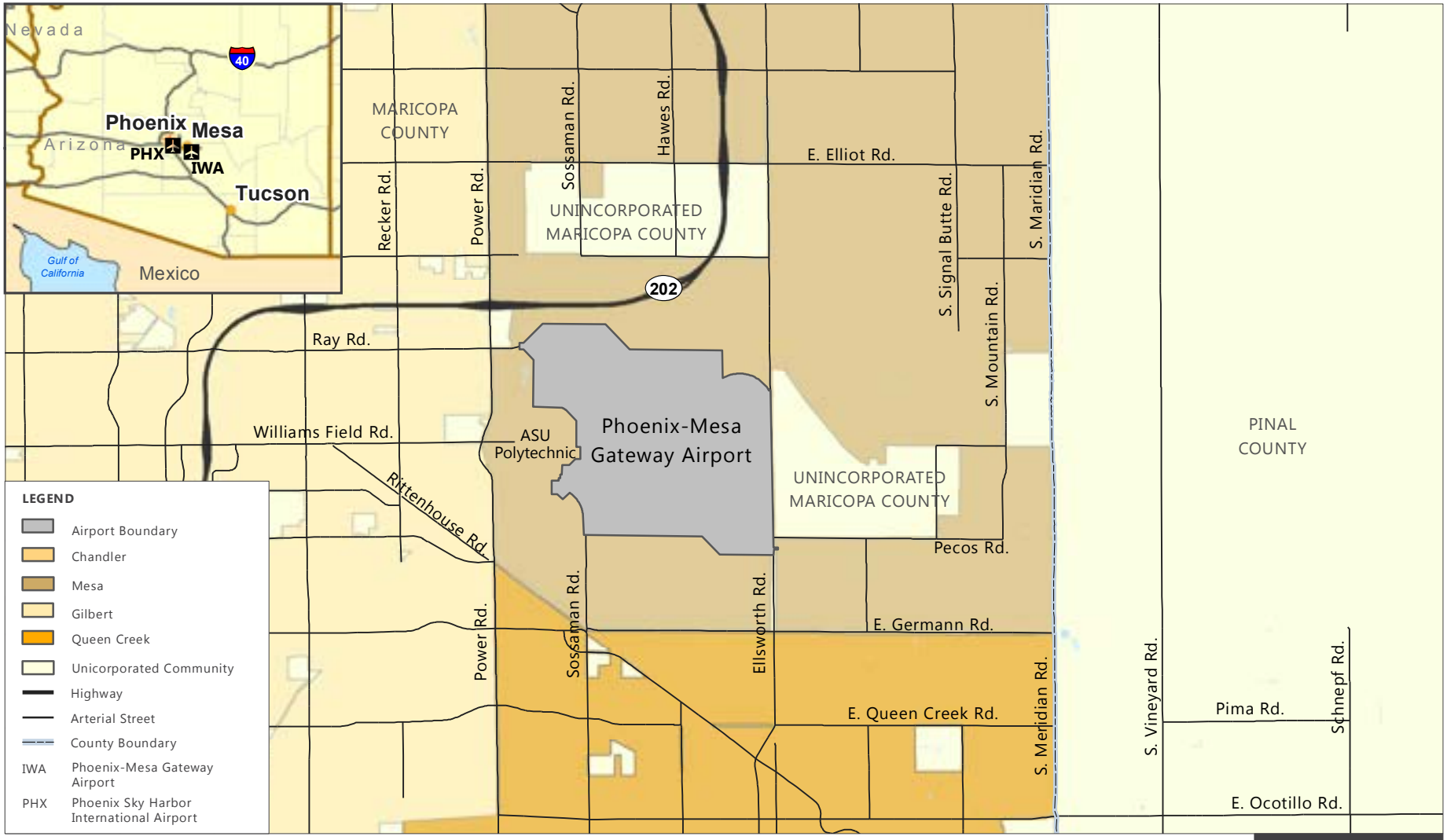
Over the course of several years, passenger terminal construction projects have been completed at IWA to provide short-term efficiency improvements:

- The Terminal Annex was constructed to accommodate the increased operations of Allegiant Air and to help alleviate congestion in the original Passenger Terminal (now referred to as the Ticketing Terminal). The Terminal Annex comprises four gates, holdrooms, and concessions.
- The West Terminal was constructed in three phases; the final phase was completed in the first quarter of 2014. The West Terminal provides six gates, security screening, hold rooms, boarding areas, concessions, support spaces, an arrival lobby, a baggage claim area, a bag service office, and rental car counters.
- The Ticketing Terminal was reconfigured to include airline ticketing and check-in, airline ticket offices, aviation offices, TSA baggage screening, and support spaces.

These improvements completed the passenger terminal expansion to its maximum capacity of 10 airline passenger gates. The current terminal configuration also features four aircraft parking positions.

Construction for IWA began on July 16, 1941, and the space originally served as a military base for training Army Air Corps pilots for World War II. The military base was officially named Williams Field in 1942 and then Williams Air Force Base (WAFB) in January 1948. Under the 1991 Base Realignment and Closure Commission,

[5] Hub classifications are based on the number of enplaned passengers at an airport, and a "small hub" classification signifies that IWA accounts for between 0.05 percent and 0.25 percent of total U.S. enplaned passengers.



SOURCE: Maricopa County Elections, City Data, 2014 (base map layers); Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Data 2010 (base map layers); U.S. Department of Transportation, Federal Aviation Administration, Phoenix-Mesa Gateway Airport ASR-8 Surveillance Radar Addendum, May 27, 2014; U.S Census Bureau, 2016 TIGER/Line Shapefiles, GIS Data, 2016 (base map layers).
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 1-1

NORTH 0 8,500 ft.

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General Location and Vicinity Map

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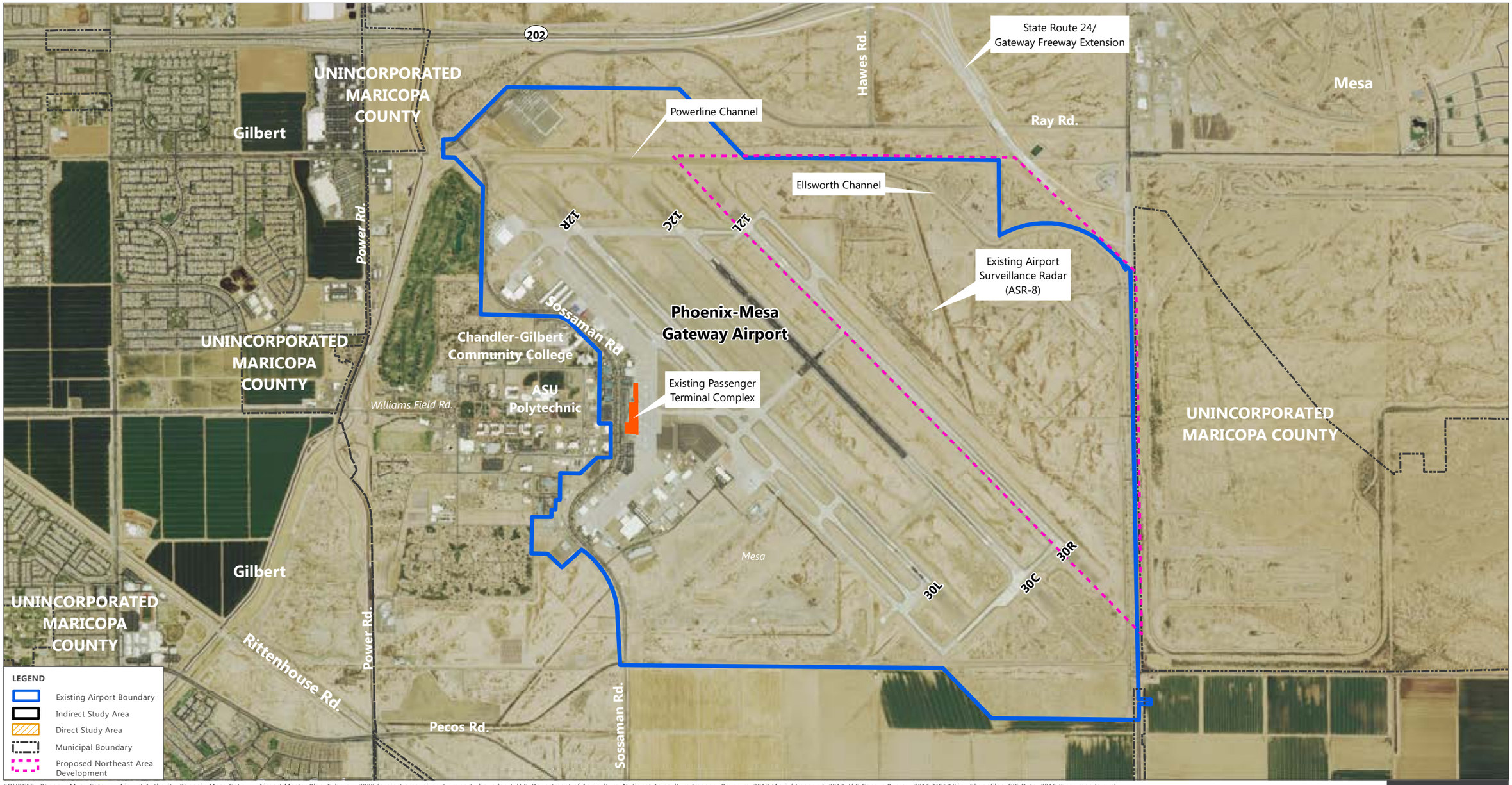

SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); U.S. Department of Agriculture, National Agriculture Imagery Program, 2013 (Aerial Imagery), 2013; U.S Census Bureau, 2016 TIGER/Line Shapefiles, GIS Data, 2016 (base map layers).
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 1-2

NORTH 0 2,000 ft.

Phoenix-Mesa Gateway Airport

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WAFB was closed in 1993. In 1992, the Williams AFB Economic Reuse Planning Advisory Committee, *Economic Reuse Plan,* concluded that the airport should be redeveloped to relieve increasing aviation activity at Phoenix Sky Harbor International Airport (PHX). IWA reopened as Williams Gateway Airport in March 1994 after undergoing improvements to accommodate civilian aircraft operations, and Williams Gateway Airport Authority was established to operate and maintain IWA.

In 2003, the original Passenger Terminal building (23,258 square feet), a WAFB building originally constructed around 1968 and remodeled in 1998, was converted to a passenger handling facility. The original Passenger Terminal included space for ticketing, airline offices, passenger security screening, passenger hold/waiting rooms, and concessions, and it supported two aircraft boarding/parking gates.[6]

IWA is included within an area defined by the City of Mesa General Plan as the Phoenix-Mesa Gateway Area—a 32-square-mile area in southeast Mesa that includes universities, freeways, railroads, and planned developments, which form the economic engine for southeast Mesa and the surrounding region. In 2008, the Mesa City Council adopted the Mesa Gateway Strategic Development Plan (Strategic Development Plan) "to establish a vision for the growth of this unique area and a framework for future environmental, social, and economic sustainability."[7] In the Strategic Development Plan, the City of Mesa committed to realizing the role of IWA by taking the following steps:

- "Establish the 'aviation envelope' that will support the regional interests of airport and airline users. Unless specific lands are absolutely essential for uninterrupted regional airport operations, the property should be considered for non-aeronautical development.
- Promote compatible land uses. A wide range of commercial, recreational, and residential uses can occupy land in close proximity to IWA and its active airspace.
- Transfer the focal point of the passenger and commercial experience to the east side of the property, where a new passenger terminal should be developed as a regional landmark." [8]

The PMGAA updated the Airport Master Plan (AMP) in February 2009.[9] Subsequent to completion of the AMP, the PMGAA examined optimizing the existing passenger terminal complex in the West Terminal Optimization Study (the Study).[10] The purpose of the Study was to determine passenger level of service (LOS) and facility constraints with the existing landside and terminal facilities, as well as to identify whether any improvements could be made in the short term in order to alleviate any identified constraints until a long-term solution could be implemented.

---

6 These two gates were relocated in 2008 as part of terminal expansion projects are two of the ten existing gates at IWA.

7 *The Mesa Gateway Strategic Development Plan Summary Document*, "Vision for the Future," adopted by Resolution No. 9425 on December 8, 2008.

8 Jacobs Consultancy, *Northeast Area Development Plan*, *Phoenix-Mesa Gateway Airport*, Final Technical Report, June 2012.

9 Coffman Associates, Inc., *Airport Master Plan for Phoenix-Mesa Gateway Airport, Mesa, Arizona*, February 2009.

10 CH2M Hill, *West Terminal Optimization Study*, *Phoenix-Mesa Gateway Airport*, July 2014.

1.2.2 AVIATION ACTIVITY

The FAA produces and publishes the Terminal Area Forecast (TAF) annually for all airports with FAA staffed Airport Traffic Control Towers (ATCT), federal contract tower airports, terminal radar approach control (TRACON) facilities, and many airports that do not have an ATCT. The TAF includes historical and forecast data for air carrier and commuter enplanements; itinerant and local air carrier, air taxi, commuter, general aviation, and military aircraft operations; and based aircraft.

The TAF (**Table 1-1**) is prepared to assist the FAA in meeting its planning, budgeting, and staffing requirements, and it also serves as a basis for planning airport improvements through Airport Improvement Program (AIP) funding.[11]

1.3 Existing Deficiencies

1.3.1 TERMINAL FACILITIES

The existing passenger terminal complex is located along the western side of Airport property along South Sossaman Road, approximately equidistant between Ray Road and Pecos Road. **Exhibit 1-3** depicts the site plan of the existing passenger terminal complex. The existing terminal area was originally designed to support facilities for WAFB; airline passenger activity was not initially a factor in developing the current terminal area, and the existing buildings were not originally planned or sized for passenger processing. As previously noted, the final phase of the West Terminal Expansion project was completed in 2014. The Ticketing Terminal, Terminal Annex, and West Terminal function as three separate buildings. Despite these recent expansions, IWA still lacks a centralized terminal complex capable of efficiently serving passenger operations. The existing terminal complex, in its current configuration, is a disparate, inefficient collection of terminal buildings. Further details on the existing terminal complex inefficiencies are provided in **Appendix A**.

1.3.2 LOCATION CONSTRAINTS

As shown on Exhibit 1-2, the existing passenger terminal complex is located east of the Arizona State University (ASU) Polytechnic Campus, the ASU Polytechnic Campus Industrial Park, and Chandler-Gilbert Community College. The existing terminal area is constrained by airport businesses and support facilities to the north and south, and it is also constrained by the local roadway system and airfield to the east and west.

The purpose of the West Terminal Expansion projects was to improve existing facilities, to the extent possible, and to better serve current traffic levels, while also designing them for future aeronautical reuse if the passenger terminal is relocated. Given the landlocked nature of the current site, the existing terminal has been expanded to its maximum footprint, without impacting other buildings, the airfield, or existing roads, as shown on **Exhibit 1-4**. The 25-acre footprint has extremely limited space for any future revenue-producing development, should the terminal remain in its current location.

[11] U.S. Department of Transportation, Federal Aviation Administration, *Terminal Area Forecast Summary, Fiscal Years 2013 – 2040*, January 2015.

Table 1-1: FAA Terminal Area Forecast: Phoenix-Mesa Gateway Airport

	ENPLANED PASSENGERS			ITINERANT OPERATIONS					LOCAL OPERATIONS			
FISCAL YEAR [1/]	AIR CARRIER	COMMUTER	TOTAL	AIR CARRIER	AIR TAXI AND COMMUTER	GENERAL AVIATION	MILITARY	TOTAL	CIVIL	MILITARY	TOTAL	TOTAL OPERATIONS
2008 [2/]	159,481	794	**160,275**	3,534	6,652	75,836	3,294	**89,316**	163,296	2,845	**166,141**	**255,457**
2009 [2/]	267,096	156	**267,252**	4,867	5,784	71,389	3,225	**85,265**	100,376	2,774	**103,150**	**188,415**
2010 [2/]	383,658	59	**383,717**	7,438	6,783	64,847	3,667	**81,712**	93,557	2,561	**96,118**	**177,830**
2011 [2/]	497,349	297	**497,643**	7,438	9,295	59,648	3,687	**80,068**	94,746	3,081	**97,827**	**177,895**
2012 [2/]	682,487	27	**682,514**	9,741	8,985	55,957	4,039	**78,722**	83,147	3,989	**87,136**	**165,858**
2013 [2/]	761,148	958	**762,106**	10,174	10,652	58,784	3,563	**83,173**	84,075	3,174	**87,249**	**170,422**
2014 [2/]	654,878	1,034	**655,192**	9,970	20,174	62,368	3,755	**96,267**	124,897	4,017	**128,914**	**225,181**
2015 [2/]	675,611	488	**676,099**	10,182	28,026	53,910	3,924	**96,042**	113,747	3,839	**117,586**	**213,628**
2016	693,532	488	**694,020**	10,546	28,306	50,677	3,924	**93,453**	113,609	3,839	**117,448**	**210,901**
2017	710,725	520	**711,245**	10,796	28,589	50,943	3,924	**94,252**	113,836	3,839	**117,675**	**211,927**
2018	727,190	552	**727,742**	11,032	28,874	51,210	3,924	**95,040**	114,063	3,839	**117,902**	**212,942**
2019	744,441	584	**745,025**	11,278	29,162	51,478	3,924	**95,842**	114,291	3,839	**118,130**	**213,972**
2020	763,463	616	**764,079**	11,549	29,453	51,748	3,924	**96,674**	114,519	3,839	**118,358**	**215,032**
2025	845,266	776	**846,042**	12,730	30,953	53,117	3,924	**100,724**	115,668	3,839	**119,507**	**220,231**
2030	932,554	936	**933,490**	13,984	32,529	54,523	3,924	**104,960**	116,829	3,839	**120,668**	**225,628**

NOTES:

1/ The federal fiscal year ends September 30. Fiscal year 2008 was the period from October 1, 2007 through September 30, 2008.

2/ Data for federal fiscal years 2008 through 2015 are based on actual historical data. Data for federal fiscal year 2016 and beyond comprise forecast figures.

SOURCE: Federal Aviation Administration, Office of Aviation Policy and Plans, *Terminal Area Forecast Detail Report*, Phoenix-Mesa Gateway Airport, issued January 2016.
PREPARED BY: Ricondo & Associates, Inc., April 2016.

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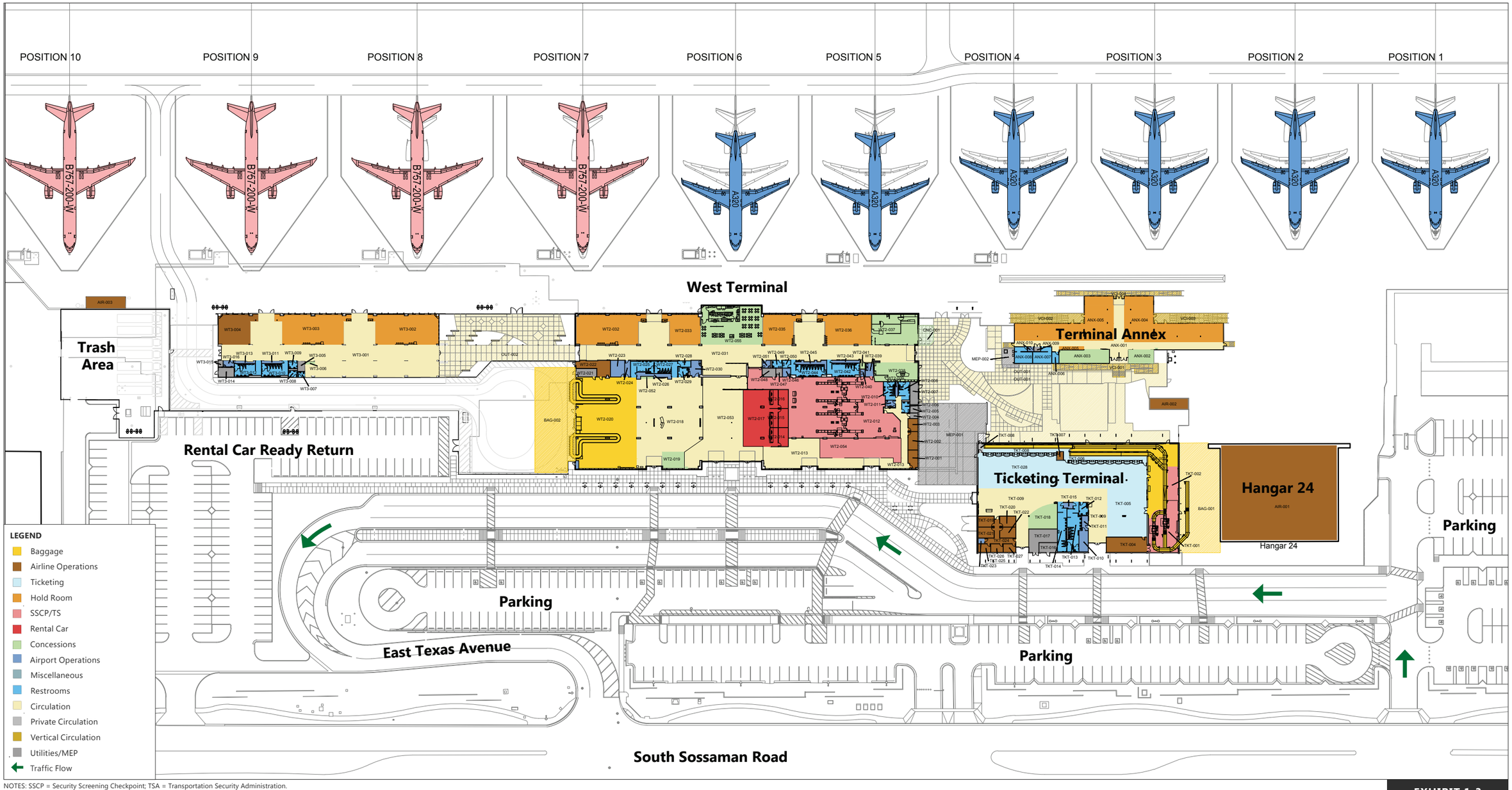

NOTES: SSCP = Security Screening Checkpoint; TSA = Transportation Security Administration.
SOURCE: HNTB, July 2014; Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009.
PREPARED BY: Ricondo & Associates, inc., August, 2016.

EXHIBIT 1-3

NORTH 0 100 ft.

Existing Passenger Terminal Complex

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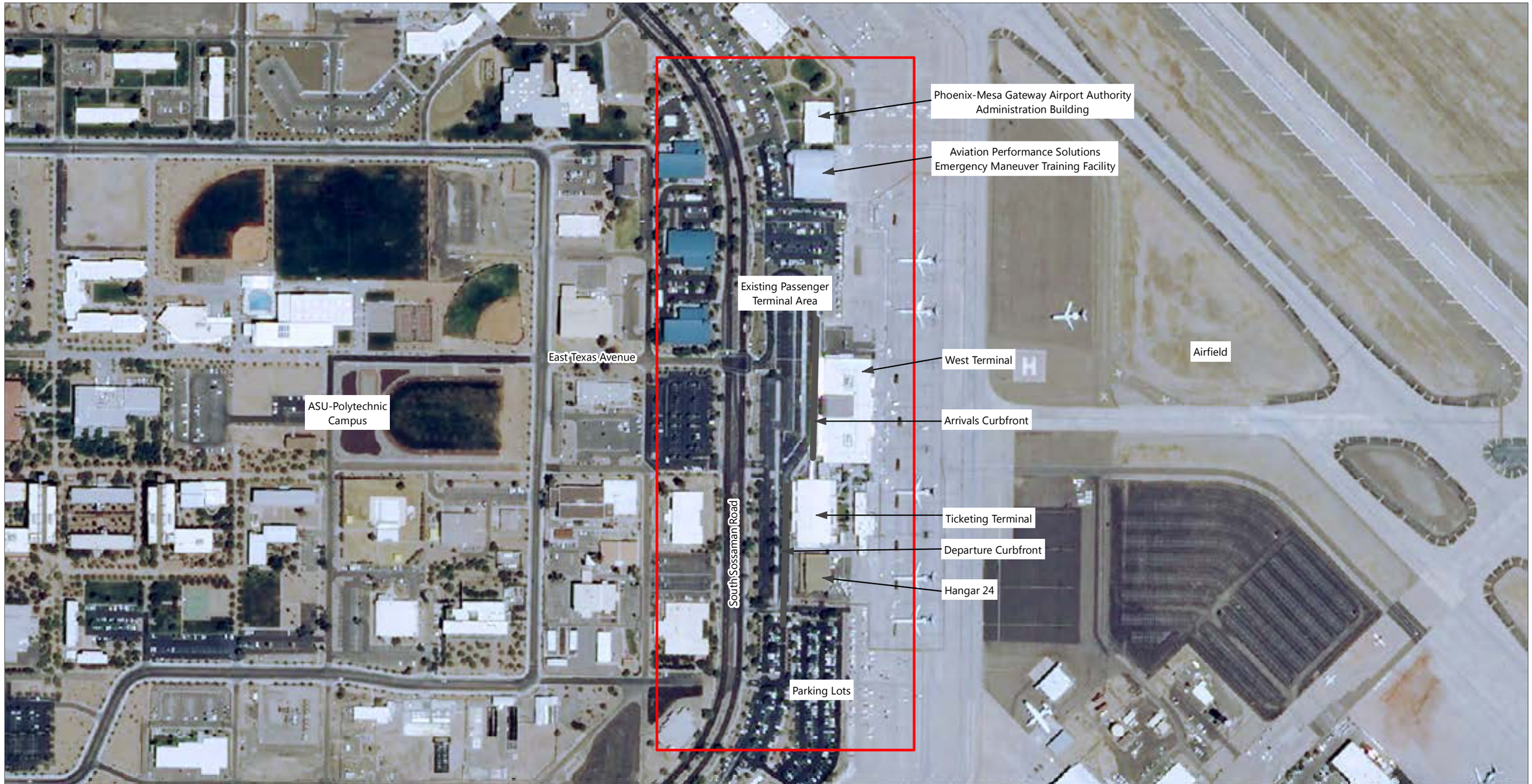

SOURCE: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport, West Terminal Optimization Study, May 2014; U.S. Department of Agriculture, National Agriculture Imagery Program, 2013 (Aerial Imagery), 2013.
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 1-4

NORTH 0 430 ft.

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Existing Passenger Terminal Complex Constraints

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South Sossaman Road is the main access road for passengers and employees utilizing the existing terminal area. In addition to providing access to the passenger terminal complex, it is also the primary access road for ASU Polytechnic Campus, ASU Polytechnic Campus Industrial Park, Chandler-Gilbert Community College, aircraft service centers, flight schools, executive hangars, and other businesses.

South Sossaman Road is a four-lane road with median for 2.5 miles south of Ray Road; it then merges to a two-lane roadway south of the passenger terminal complex. As depicted on Exhibit 1-3, vehicles access the terminal area by turning left from South Sossaman Road (at the southern edge of the terminal area); they turn left again toward the Ticketing Terminal. The access road curves to the east toward the West Terminal and then makes a tight turn and exits onto East Texas Avenue.

Traffic congestion along South Sossaman Road into IWA, evaluated as part of the landside functional area, is based on the City of Mesa's annual traffic count, as well as the Maricopa Association of Government's (MAG) traffic volume forecasts from the regional traffic model. Traffic along South Sossaman Road was evaluated using the City of Mesa's LOS roadway thresholds for capacity analysis.

Under this study, the LOS definitions used for roadways, including South Sossaman Road, are consistent with the City of Mesa 2040 Transportation Plan, adopted November 2014, and are defined in **Table 1-2**. The roadway LOS is determined based on the volume-to-capacity (V/C) ratio that is defined as the existing or forecast volume of vehicles divided by the maximum vehicles (capacity) that a specific roadway segment can accommodate. An LOS with a grade A represents excellent, free-flow traffic conditions. An LOS with a grade F represents a critical failure of roadway conditions with slow speeds and considerable delays.

Currently, South Sossaman Road provides the only access into the IWA terminal area, with limited right-of-way (ROW) expansion and accessible curb space. Projected traffic volumes are based on estimated vehicle trips generated by current peak-hour traffic and Airport access patterns. Volumes for South Sossaman Road are at an acceptable LOS; however, the left-turn pocket was determined to be LOS F.

Table 1-2: City of Mesa Transportation Plan: Level of Service Framework

ASSESSMENT LEVEL	LEVEL OF SERVICE	CONDITIONS
A	Excellent	Represents free flow.
B	High	Is in the range of stable flow, but the presence of other users in traffic stream begins to be noticeable.
C	Good	Is in the range of stable flow but marks the beginning of the range in which the operation of individual users becomes more significantly affected by others.
D	Adequate	Represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the other driver or pedestrian experiences a general poor LOS of comfort and convenience.
E	Inadequate	Represents operating conditions at or near capacity level. All speeds are reduced to a low, but relatively uniform, value. LOS E is unstable and can quickly deteriorate to LOS F.
F	Unacceptable	Is used to define forced or breakdown flow. This condition exists whenever the amount of traffic approaching a point exceeds the amount that can traverse the point.

SOURCES: Phoenix-Mesa Gateway Airport, *West Terminal Optimization Study,* July 2014; City of Mesa, *Mesa 2040 Transportation Plan*, adopted November 17, 2014.
PREPARED BY: Ricondo & Associates, Inc., June 2015.

1.3.3 REGIONAL CONNECTIVITY

As depicted on Figure 1-2, South Sossaman Road does not provide a direct connection to State Route 24 (SR 24). Arizona Department of Transportation (ADOT) is extending SR 24 from SR 202 south towards IWA and east to the Pinal County Line. The first portion of this road is complete between SR 202 and Ellsworth Road. SR 24 will provide access to job centers, commercial areas, and residential developments in the far East Valley.[12]

1.4 Proposed Action

The PMGAA proposes to replace the existing passenger terminal building with a purpose-built terminal complex and associated ancillary and support facilities, with supporting infrastructure, and space for private commercial development in the northeast section of IWA property. Aircraft fueling at the proposed terminal complex would be conducted using fuel trucks. As depicted on **Exhibit 1-5**, the components of the Proposed Action are to:

- Construct a purpose-built passenger terminal with second level boarding and the equivalent number of gates as the existing terminal complex (10 gates and 4 aircraft parking spaces), on undeveloped land on the northeast side of IWA property.
- Construct airfield, taxiway, and taxilane improvements to provide airfield access capable of supporting the proposed air carrier operations.
- Complete construction of the full-length parallel taxiway northeast of Runway 12L-30R.
- Construct an aircraft apron.
- Construct access roadways and terminal curbfront improvements.
- Construct parking spaces equivalent to that currently available.[13]
- Relocate utilities, service roads, and perimeter fencing.
- Construct a new substation on the west side of Ellsworth Road.
- Construct ancillary/support facilities.
- Relocate the ASR-8 off airport (BLM land) (see **Exhibit 1-6** and **Exhibit 1-7**)
- Lease 20-plus acres directly northeast of existing Airport property for the relocation of the Ellsworth Channel. This property is owned by ADOT.[14]
- Demolish existing, unoccupied buildings and structures within the northeast development area.
- Prepare areas for commercial development (grading, site preparation, and utility connections).[15]

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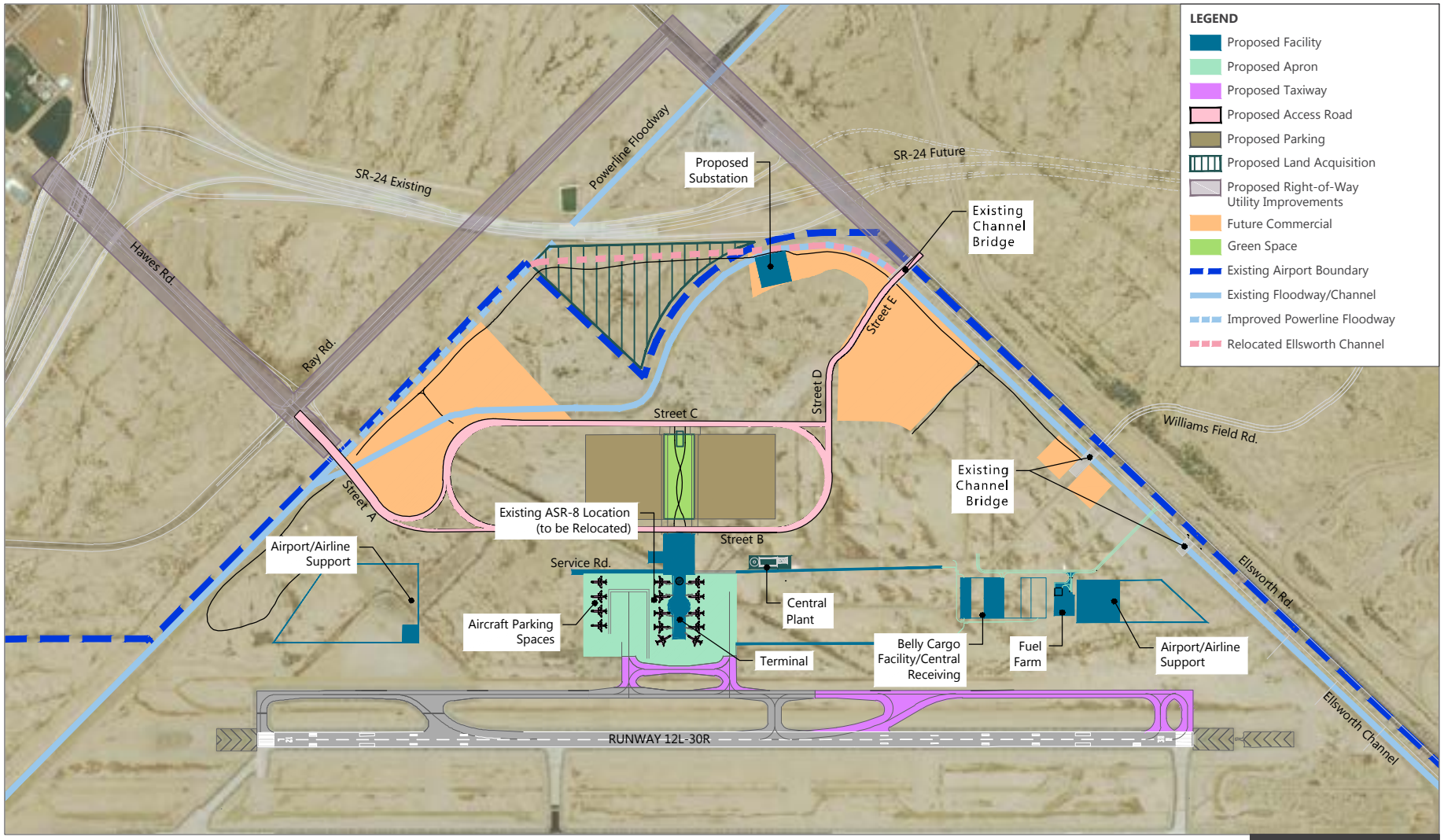
12 Maricopa Association of Governments, *2035 Regional Transportation Plan (RTP)*, January 2014.

13 IWA currently has 876 spaces in the Terminal Daily lot, 186 spaces in the Hourly parking lot, and 2,809 spaces in the Ray Road Economy Lot. Currently available spaces total 3,871.

14 The Arizona Department of Transportation (ADOT) purchased this property as part of the SR 24 project. The 20-plus acres are an uneconomical remnant that ADOT has agreed to lease long term to the City of Mesa. The City of Mesa would lease the property to PMGAA for relocation of the Ellsworth Channel, as part of the proposed project.

15 The buildings that are part of the existing passenger terminal complex will not be demolished, but they will be repurposed for other aeronautical uses.



NOTE: The Proposed Action includes the relocation of the Airport Surveillance Radar to a new location southeast of the Airport in Pinal County (See Exhibits 1-5 and 1-6).

SOURCES: Coffman Associates, Inc., *Airport Master Plan for Phoenix -Mesa Gateway Airport,* Final Report, February 2009; U.S. Census, *2013 TIGER/Line Shapefiles* , http://www.census.gov/cgi-bin/geo/shapefiles2013/main (accessed March 2014); U.S. Department of Agriculture, *National Agriculture Imagery Program* , 2013 (Aerial Imagery), 2013; Ricondo & Associates, Inc., October 2013.

PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 1-5

NORTH 0 1,500 ft.

Proposed Action

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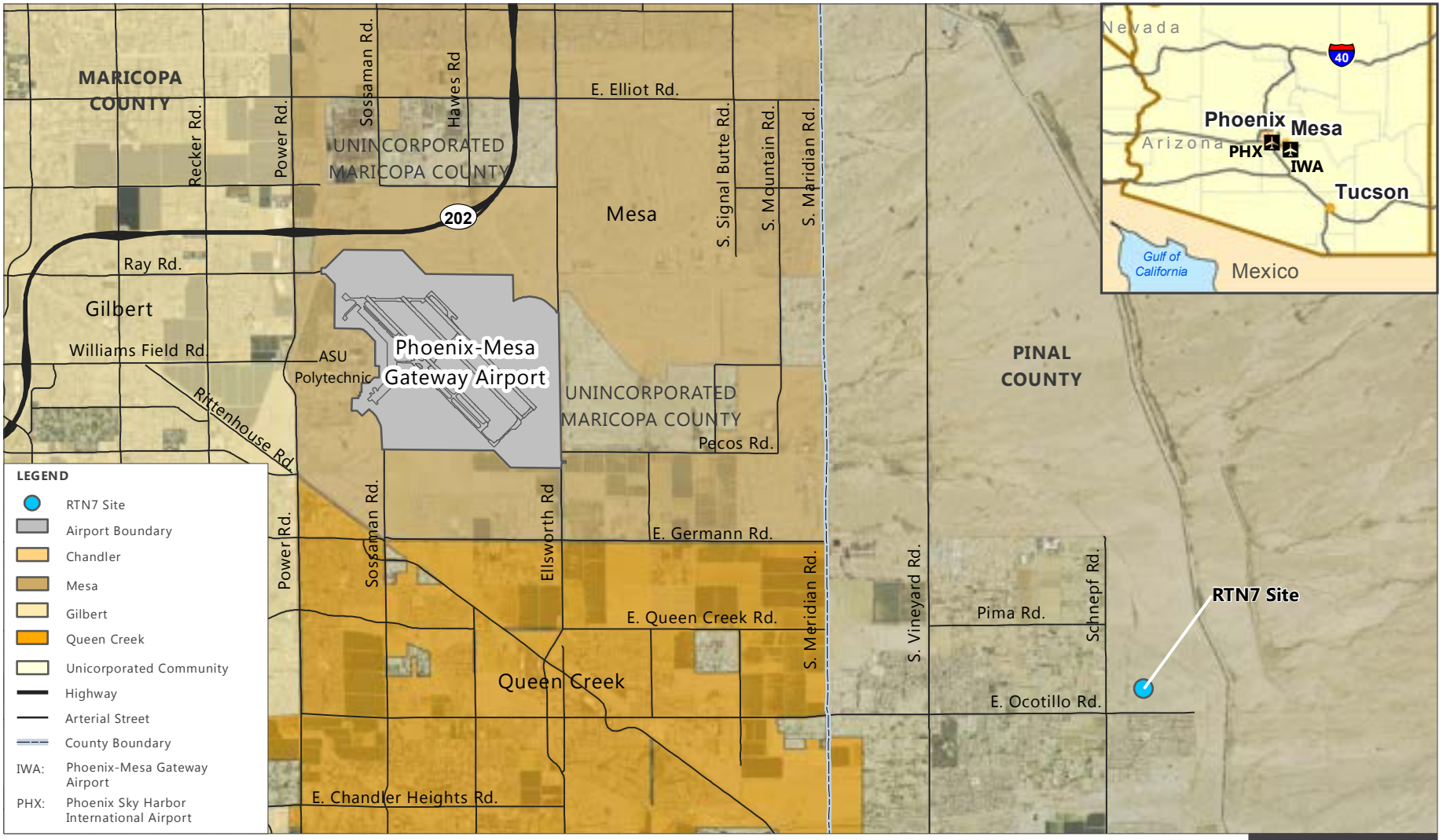

SOURCE: Maricopa County Elections - City Data, 2014 (base map layers); Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); U.S. Department of Agriculture, National Agriculture Imagery Program, 2013 (aerial imagery); ESRI Data 2010 (base map layers); U.S. Department of Transportation, Federal Aviation Administration, Phoenix-Mesa Gateway Airport ASR-8 Surveillance Radar Addendum, May 27, 2014; U.S Census Bureau, 2016 TIGER/Line Shapefiles, GIS Data, 2016 (base map layers).
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 1-6

NORTH 0 9,000 ft.

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Proposed RTN7 Location and Vicinity Map

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SOURCE: Flood District of Maricopa County, 2012 (base map layers);U.S. Department of Transportation, Federal Aviation Administration, Phoenix-Mesa Gateway Airport ASR-8 Surveillance Radar Addendum, May 27, 2014.; U.S. Department of Agriculture, National Agriculture Imagery Program, 2013 (Aerial Imagery), 2013.; U.S. DOT, FAA, ASR-8 Surveillance Radar Addendum, May 27, 2014.
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 1-7

NORTH 0 650 ft.

Proposed RTN7 Site and Access Road

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1.5 Purpose and Need Statement

1.5.1 PURPOSE OF THE PROPOSED ACTION

The following listing identifies the specific purpose of the Proposed Action:

- Provide a centralized passenger terminal complex capable of efficiently serving passenger operations;
- Provide passengers with a level of service that is consistent and competitive with other air carrier airports in the southwestern United States;
- Avoid the current situation in which passengers must use air-stairs and walk across the aircraft parking apron to the terminal building during the summer months when temperatures can exceed 110 degrees Fahrenheit;
- Provide adequate space in the passenger terminal area and landside areas for potential future revenue-producing commercial development;
- Develop new revenue streams that can help the PMGAA become as financially self-sufficient as possible;
- Provide adequate automobile parking facilities, including long-term parking within a reasonable walking distance to the terminal building; and
- Provide more efficient automobile access to IWA for passenger service via the local freeway system.

The existing terminal buildings and associated improvements were designed to provide space that could be easily adjusted and useful for other aeronautical uses that do not generate the large amounts of traffic associated with a passenger terminal. In the event that the Proposed Action is adopted, and consistent with the airport's grant-in-aid obligations to the FAA for funds used to improve the terminal, PMGAA would maintain the existing passenger terminal facility for another aeronautical purpose.

Additionally, in the event that the Proposed Action is adopted, the existing ASR-8 system would need to be relocated to Pinal County, approximately 8 nautical miles southeast of IWA, in order to accommodate the construction of the replacement terminal complex. The proposed replacement ASR-8 system would include the installation of: ASR-8 primary surveillance radar; air traffic control beacon secondary surveillance radar; beacon parrot; primary radar moving target indicator reflector; digitizer with associated communication interfaces between the radar site and existing FAA automation systems; and associated facility infrastructure.

1.5.2 NEED FOR THE PROPOSED ACTION

The existing passenger terminal has been located on the west side of the airfield since the closure of WAFB. This facility is a repurposed military facility that was initially built when IWA was a military installation. While this facility currently functions today, there are several deficiencies that must be addressed in order to accommodate future airline operations in a manner and level of convenience and comfort that is expected in the United States. IWA still lacks a centralized terminal complex capable of efficiently serving passenger

operations. The existing terminal complex, in its current configuration, is a disparate, inefficient collection of terminal buildings.

Space constraints prohibit any further expansion of either the passenger terminal area or landside areas in their current locations. The terminal areas' existing space constraints also limit the potential for future revenue-producing commercial development. Providing lease space for revenue-producing developments is critical to the PMGAA's ability to be financially self-sustaining and meet FAA grant assurances. In accordance with FAA Airport Sponsor Assurances, airport-generated revenues must be used for the capital or operating expenses of the airport.[16]

The existing terminal area does not provide adequate automobile parking facilities, including long-term parking within a reasonable walking distance to the terminal building. Currently, a portion of the aircraft parking apron, south of the existing terminal building, is being used to park automobiles. This represents an inefficient use of available aircraft parking.

A survey of airport passengers conducted in April and May of 2012 revealed that about 78 percent of passengers using IWA arrive from the north. There is no direct freeway access to the existing passenger terminal. Passengers must take a circuitous route to South Sossaman Road in order to reach the existing terminal. While this road serves as the airport access road, unlike most airport access roads, it is not limited to airport use. ASU Polytechnic Campus, ASU Polytechnic Campus Industrial Park, Chandler-Gilbert Community College, aircraft service centers, flight schools, executive hangars, and other businesses also use South Sossaman Road, which contributes to congested traffic on South Sossaman Road in the vicinity of the existing terminal. This is especially noted for airport passengers who must make a left turn into the existing terminal area when traveling southbound on South Sossaman Road, because passengers must wait a significant amount of time for a safe opening before turning left.

ADOT has constructed SR 202 and SR 24 to serve the Mesa area and has built an exit that is located in the northeastern part of IWA. Use of this exit from SR 202 and SR 24 would make access to and from the airport more efficient considering the layout of the existing surface roads makes access to the existing terminal difficult. Furthermore, the relocated ASR-8 would provide air traffic controllers with reliable air traffic data and minimize the radar coverage gap to the south and west due to nearby mountains.

1.6 Requested Federal Actions

1.6.1 REQUESTED FAA ACTIONS:

- Unconditional approval of the Airport Layout Plan (ALP) depicting the proposed improvements pursuant to 49 U.S.C. §§ 40103(b), 44718 and 47107(a)(16); Title 14, CFR Part 77 (14 CFR 77), *Safe,*

[16] U.S. Department of Transportation, Federal Aviation Administration, *Airport Sponsor Assurances*, https://www.faa.gov/airports/aip/grant_assurances/ (accessed June 2015).

Efficient Use, and Preservation of the Navigable Airspace; and 14 CFR 157, *Notice of Construction, Alteration, Activation, and Deactivation*;

- Determinations under 49 U.S.C. §§ 47106 and 47107 relating to the eligibility of the Proposed Action for federal funding under the AIP and/or under 49 U.S.C. § 40117, as implemented by 14 CFR § 158.25, to impose and use passenger facility charges (PFCs) collected at the Airport for the Proposed Action to assist with construction of potentially eligible development items shown on the ALP;
- Relocation, installation, operation, and maintenance of the ASR-8 required as part of the Proposed Action, which requires coordinated siting, technical, and NEPA considerations with FAA Air Traffic Organization and Bureau of Land Management;
- Processing of airspace changes, installation, and/or relocation of FAA equipment (e.g., ASR-8);
- Close coordination with the Airport by appropriate FAA program offices, as required to maintain aviation and airfield safety during construction pursuant to 14 CFR Part 139 (49 U.S.C. § 44706);
- Approval of the appropriate amendments to the Airport Certification Manual (ACM) pursuant to 14 CFR Part 139; and
- FAA determination of the Proposed Action's effects on the safe and efficient use of airspace.

1.6.2 PROPOSED BLM ACTIONS[17]:

- Convey the use of BLM-managed federal lands to the FAA for the construction and operation of federally owned navigational aids (ASR-8).
- Issuance of any associated rights-of-way (ROW) is in conformance with RW-1, for the appropriate Land Management Plan, which states that the ROW must "meet public demand and reduce impacts to sensitive resources by providing an orderly system of development for transportation, including legal access to private in-holdings, communications, flood control, major utility transmission lines and related facilities."
- Prepare and complete an Environmental Due Diligence Audit (EDDA) or Site Assessment on the subject property before BLM transfers the property pursuant CERCLA and SARA. (BLM).

1.7 Timeframe of the Proposed Action

Implementation of the Proposed Action would begin upon FAA approval of the ALP and issuance of a favorable environmental finding. Construction of the Proposed Action is expected to begin within one year and take approximately five years to complete. Depending on available funding, some elements of the Proposed Action may be delayed and constructed in a subsequent phase. The PMGAA acknowledges that an

[17] Relocation of the ASR-8 will ultimately require federal actions on the part of the Bureau of Land Management, on BLM Managed Lands. It is anticipated that at such time as FAA proposes to relocate the ASR-8 onto BLM managed lands, BLM could consider adopting this EA for use in its own NEPA documentation requirements. Thus the following anticipated BLM Federal Actions are included.

environmental finding by the FAA does not constitute funding approval. The PMGAA will apply for a funding grant for eligible portions of the project subsequent to a favorable environmental finding.

1.8 Organization of Document

The format and content of this EA conforms to the requirements of Section (§) 102(2)(c) of the National Environmental Policy Act of 1969 (NEPA, 42 U.S.C. 4321-4370h) and § 509(b)(5) of the Airport and Airway Improvement Act of 1982, as amended. The content of each section of this EA is summarized below.

- Chapter 1—Purpose and Need, provides a brief description of IWA and the Proposed Action, its purpose, and why it is needed.
- Chapter 2—Alternatives, provides an overview of the identification and screening of alternatives considered as part of the environmental evaluation process.
- Chapter 3—Affected Environment, describes existing environmental conditions within the project site.
- Chapter 4—Environmental Consequences, discusses and compares the environmental impacts associated with the Proposed Action, feasible alternatives to the Proposed Action, and the No Action Alternative, and it also identifies mitigation options considered.
- Chapter 5—Coordination and Public Involvement, discusses the coordination and public involvement associated with the EA process. This chapter also presents a list of federal, state, and local agencies, as well as other interested parties, that have been involved in EA coordination efforts.
- Chapter 6—List of Preparers
- Chapter 7—References
- Chapter 8—List of Abbreviations and Acronyms

The Appendices contain various reference materials, including technical information and records of coordination activities.

2. Alternatives

2.1 Introduction

2.1.1 SCOPE OF THE ALTERNATIVES ANALYSIS

This section summarizes the process that was used to identify, compare, and evaluate a reasonable range of alternatives to the Proposed Action. A screening process was used to determine which alternatives would reasonably satisfy the Purpose and Need for the Proposed Action. The alternatives presented include those that were developed as part of the 2009 Phoenix-Mesa Gateway Airport Master Plan,[1] the NADP,[2] and additional alternatives identified by PMGAA as part of this EA process. Lists of applicable federal laws and regulations considered during the analysis are provided at the end of this section.

2.1.2 REQUIREMENTS OF THE FAA AND NATIONAL ENVIRONMENTAL POLICY ACT

FAA Orders 1050.1F and 5050.4B set forth FAA policies and procedures for assessing the environmental impacts of aviation-related projects in compliance with NEPA. These Orders require a thorough and objective assessment of the Proposed Action, the No Action Alternative, and all "reasonable" alternatives that would achieve the stated Purpose and Need for the Proposed Action.

The CEQ regulations (Title 40, CFR § 1502.14) for implementing the National Environmental Policy Act of 1969 requires that federal agencies perform the following tasks:

- Rigorously explore and objectively evaluate all reasonable alternatives and, for alternatives which were eliminated from detailed study, briefly discuss the reasons for their elimination;
- Devote substantial treatment to each alternative considered in detail, including the Proposed Action, so that reviewers may evaluate the alternatives' comparative merits;
- Include reasonable alternatives not within the jurisdiction of the lead agency; and,
- Include the alternative of no action.

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[1] Coffman Associates, Inc., *Airport Master Plan for Phoenix-Mesa Gateway Airport, Mesa, Arizona*, February 2009.

[2] Jacobs Consultancy, *Final Technical Report, Northeast Area Development Plan for Phoenix-Mesa Gateway Airport*, June 2012.

Reasonable alternatives that accomplish the Purpose and Need for the Proposed Action have been identified and evaluated in this EA to satisfy CEQ requirements. The Purpose and Need for the Proposed Action is described in Section 1.5 of this EA. Since the Proposed Action would necessitate the relocation of the existing ASR-8 system to Pinal County, the terminal development and ASR-8 alternatives are discussed in separate sections, Section 2.4 and 2.6, respectively.

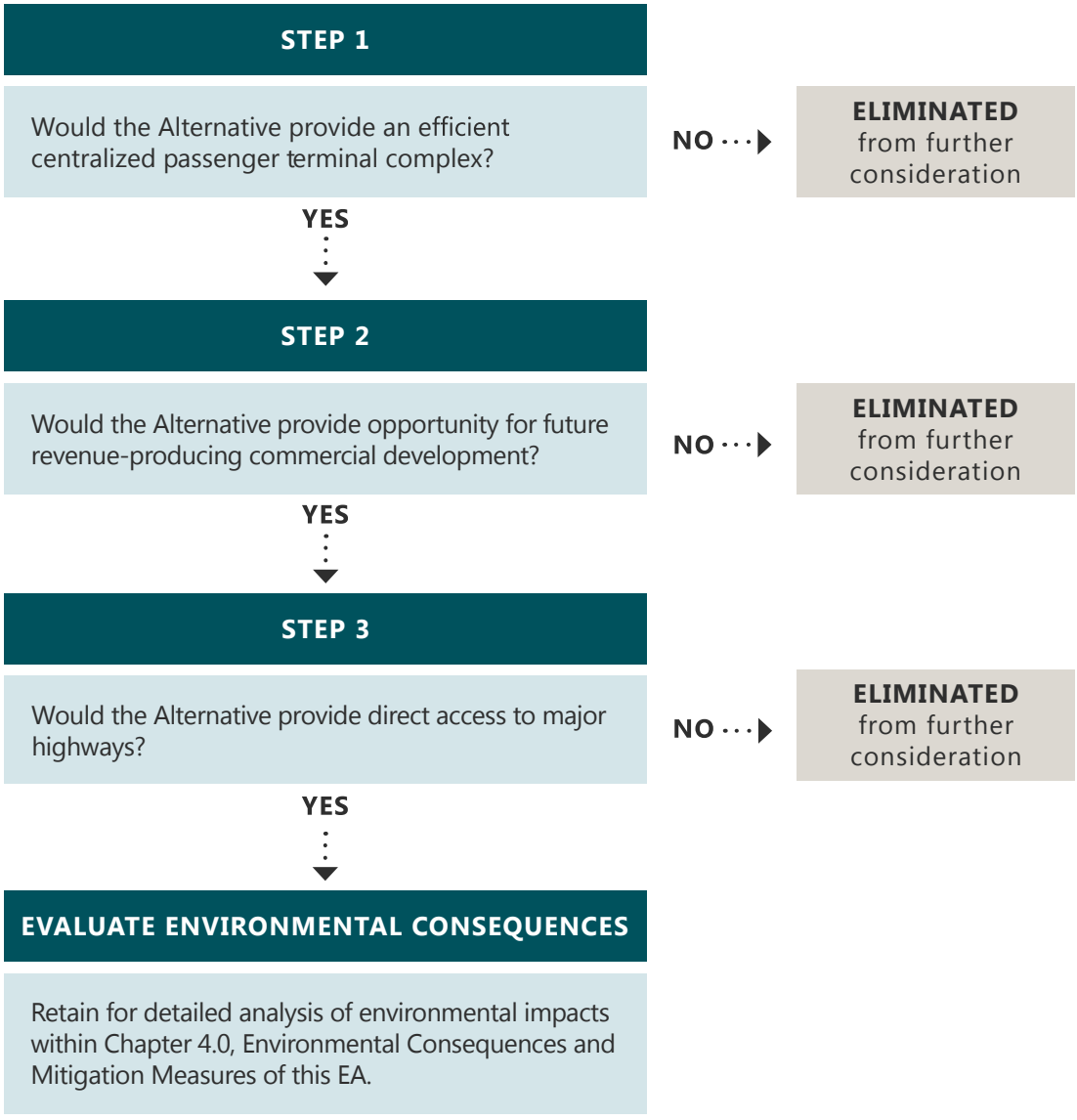
2.2 Alternatives Screening and Evaluation for the Passenger Terminal

This section outlines the criteria and screening process utilized to identify feasible alternatives for detailed environmental analysis. Three groups of alternatives were identified and evaluated: operational alternatives, on-site alternatives, and off-site alternatives.

The evaluation of alternatives was performed using a three-step evaluation process:

- Step 1: Would the Alternative Provide a Modern, Efficient Centralized Passenger Terminal Complex, including a level of service consistent with other southwestern U.S. airports including adequate auto parking facilities, and second level boarding to reduce the time passengers must walk across the apron on 100+ degree days during the hot summer weather?
- Step 2: Would the Alternative Provide Opportunity for Future Revenue-Producing Commercial Development?
- Step 3: Would the Alternative Provide Direct Access to Major Highways?

Exhibit 2-1 illustrates the alternative-evaluation screening process. Each alternative was evaluated in Step 1 to determine whether it would provide an efficient passenger terminal complex. Each alternative that met the Step 1 criteria was then evaluated in Step 2 in order to determine whether or not it would provide future commercial development opportunities. Each alternative that met the Step 1 and Step 2 criteria was then evaluated in Step 3 to determine whether or not it would provide direct access to major highways. The alternatives meeting all three criteria were retained for further analysis of environmental impacts, as presented in Chapter 4.0 of this EA, Environmental Consequences and Mitigation Measures. In accordance with the requirements of the CEQ Regulations, the implementing regulations for NEPA, the No Action Alternative was retained for detailed analysis, as presented in Chapter 4.0.



SOURCE: Ricondo & Associates, Inc., January 2016.
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 2-1

Passenger Terminal Screening Process

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2.2.1 STEP 1 CRITERIA: EFFICIENT, CENTRALIZED PASSENGER TERMINAL COMPLEX

As discussed in Section 1.5, IWA lacks a modern, efficient, and expandable passenger terminal complex at a level of service that is consistent and competitive with other air carrier airports in the southwestern United States. In IWA's current configuration, ticketing activities and the passenger terminal are located in two separate buildings, which results in increased passenger processing times for ticketing, security screening, and baggage claim.

In addition, the existing terminal area does not provide adequate automobile parking facilities, including long-term parking within a reasonable walking distance to the terminal building. Currently, a portion of the aircraft parking apron, south of the existing terminal building, is used to park automobiles. This also represents an inefficient use of the passenger terminal complex.

An objective of the Proposed Action is to reduce passenger processing times and allow for the construction of additional improvements, including adequate automobile parking, to enhance the passenger experience, as well as enhance the overall IWA operations. The Step 1 criteria determine whether an alternative would provide an efficient, centralized passenger terminal complex in order to meet this need.

- An alternative would pass Step 1 criteria if: Passenger terminal facilities are provided in a centralized terminal complex capable of efficiently serving passenger operations, adequate automobile parking and second level boarding are available, could and capable of future expansion. Passengers would be able to park and proceed to the terminal building to process through ticketing, baggage claim, and security in one centralized facility, and the alternative would have future expansion potential.
- An alternative would fail Step 1 criteria if: Passenger terminal facilities and automobile parking are not provided in a centralized terminal complex capable of efficiently serving passenger operations. Passengers would not be able to park, process through ticketing, baggage claim, and security in one centralized facility, and the alternative would not have future expansion potential.

2.2.2 STEP 2 CRITERIA: COMMERCIAL DEVELOPMENT OPPORTUNITY

Chapter 1.0 of this EA discusses the existing space constraints that limit the potential for future revenue-producing commercial development. Providing lease space for revenue-producing developments is critical for the PMGAA's ability to be financially self-sustaining in order to meet FAA grant assurances. The Step 2 criteria determine whether an alternative would provide the opportunity for future revenue-producing commercial development.

- An alternative would pass Step 2 criteria if: The alternative provides more area for potential commercial development than existing conditions.
- An alternative would fail Step 2 criteria if: The alternative does not provide more area for potential commercial development when compared to existing conditions.

2.2.3 STEP 3 CRITERIA: DIRECT ACCESS TO MAJOR HIGHWAYS

Current ground access routes and terminal location do not provide desired connectivity to major highways through direct access to SR 202 and SR 24. The Step 3 criteria determine whether an alternative will provide direct access to major highways.

- An alternative would pass Step 3 criteria if: The alternative provides direct access to major highways.
- An alternative would fail Step 3 criteria if: The alternative does not provide direct access to major highways.

2.3 Identification and Description of Terminal Development Alternatives

2.3.1 IDENTIFICATION OF OPERATIONAL ALTERNATIVES

This section identifies operational alternatives to meet the project's Purpose and Need. Operational alternatives include the use of alternative modes of transportation and other public airports in the area.

2.3.1.1 Use of Alternative Modes of Transportation Alternative

Allegiant Air is currently the only commercial airline operating at IWA, providing passenger service to 38 destinations across the United States. Non-aviation interregional transportation services available to travelers to and from the Phoenix-Mesa Gateway area include commercial bus and light rail train with connections via bus routes. The closest interregional train services are provided by Amtrak, which can be accessed from transit stations in Maricopa (approximately 37 miles southwest of IWA) or Flagstaff (approximately 177 miles north of IWA).[3] The closest interregional bus service is provided by Greyhound Lines, which can be accessed from a bus station in Mesa (approximately 16 miles northwest of IWA).[4] Locations served by Allegiant Air are not directly accessible by train, and the additional travel time required to reach most destinations would be considerable (days rather than hours).

2.3.1.2 Use of Other Public Airports Alternative

IWA is one of two commercial-service airports in Maricopa County. The other airport is Phoenix Sky Harbor International Airport (PHX), which is 28 miles northwest of IWA. As a primary large-hub commercial-service airport, PHX is one of the nation's 10 busiest airports, with 16 airlines and over 22 million annual enplaned passengers.[5] IWA is classified as a primary small-hub commercial airport,[6] and it is instrumental in meeting

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[3] Amtrak, *West Train Routes*, http://www.amtrak.com/west-train-routes (accessed February 21, 2014).

[4] Greyhound, *Station Locator*, http://www.greyhound.com/en/locations/default.aspx (accessed May 19, 2014).

[5] City of Phoenix, Aviation Department, Sky Harbor International Airport, Financial Management Division, *Monthly Statistical Reports*, December 2015, https://skyharbor.com/About/Information/AirportStatistics (Accessed March 31,2016).

[6] U.S. Department of Transportation, Federal Aviation Administration, *Report to Congress, National Plan of Integrated Airport Systems (NPIAS), 2015-2019*, September 30, 2014.

demand for commercial aviation in the region. This alternative would shift passenger activity from IWA to PHX, which is counter to IWA's role as a primary small-hub commercial airport.

2.3.2 IDENTIFICATION OF ON-SITE ALTERNATIVES

Three general sites were identified for potential terminal expansion and development within the existing IWA property boundary, as depicted on **Exhibit 2-2**.

- The existing passenger terminal complex site encompasses the passenger terminal buildings and the surrounding apron/ramp area (approximately 36 acres).
- The Southwest Site is a 292-acre undeveloped site located at the southwest corner of IWA property. This site was the subject of analyses in the 2009 Airport Master Plan for various landside alternatives, referred to as the Southwest Airport Property.[7]
- The Northeast Site is a 700-acre site located in the northeast corner of IWA, mostly on IWA property.[8] This site is also undeveloped and was the preferred site for the terminal complex alternatives analyzed in the 2009 Airport Master Plan.[9] It was also analyzed in the Final Technical Report for the NADP.[10]

The only other on-site, undeveloped areas are located off the ends of the runways, within the runway protection zones. The FAA design criteria prohibit development within the runway protection zones[11]. Thus, no other suitable on-site alternatives are available. The following sections provide descriptions of the on-site alternatives considered.

2.3.2.1 No Action Alternative

The No Action Alternative would result in no change or expansion in the location or function of the existing terminal facilities (Ticketing Terminal, Terminal Annex, and West Terminal), as well as the associated apron/ramp areas as depicted on **Exhibit 2-3**.

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7 Coffman Associates, Inc., *Airport Master Plan for Phoenix-Mesa Gateway Airport*, February 2009, pp. 4–16.

8 A 31-acre area located at the northeast corner of the Northeast Site, and currently located outside of the Airport property boundary, would need to be acquired. (Source: Jacobs Consultancy, *Final Technical Report, Northeast Area Development Plan for Phoenix-Mesa Gateway Airport*, June 2012, pp. 2–3.)

9 Coffman Associates, Inc., *Airport Master Plan for Phoenix-Mesa Gateway Airport*, February 2009, pp. 4–23.

10 Jacobs Consultancy, *Final Technical Report, Northeast Area Development Plan for Phoenix-Mesa Gateway Airport*, June 2012.

11 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13A, *Airport Design*, February 26, 2014.

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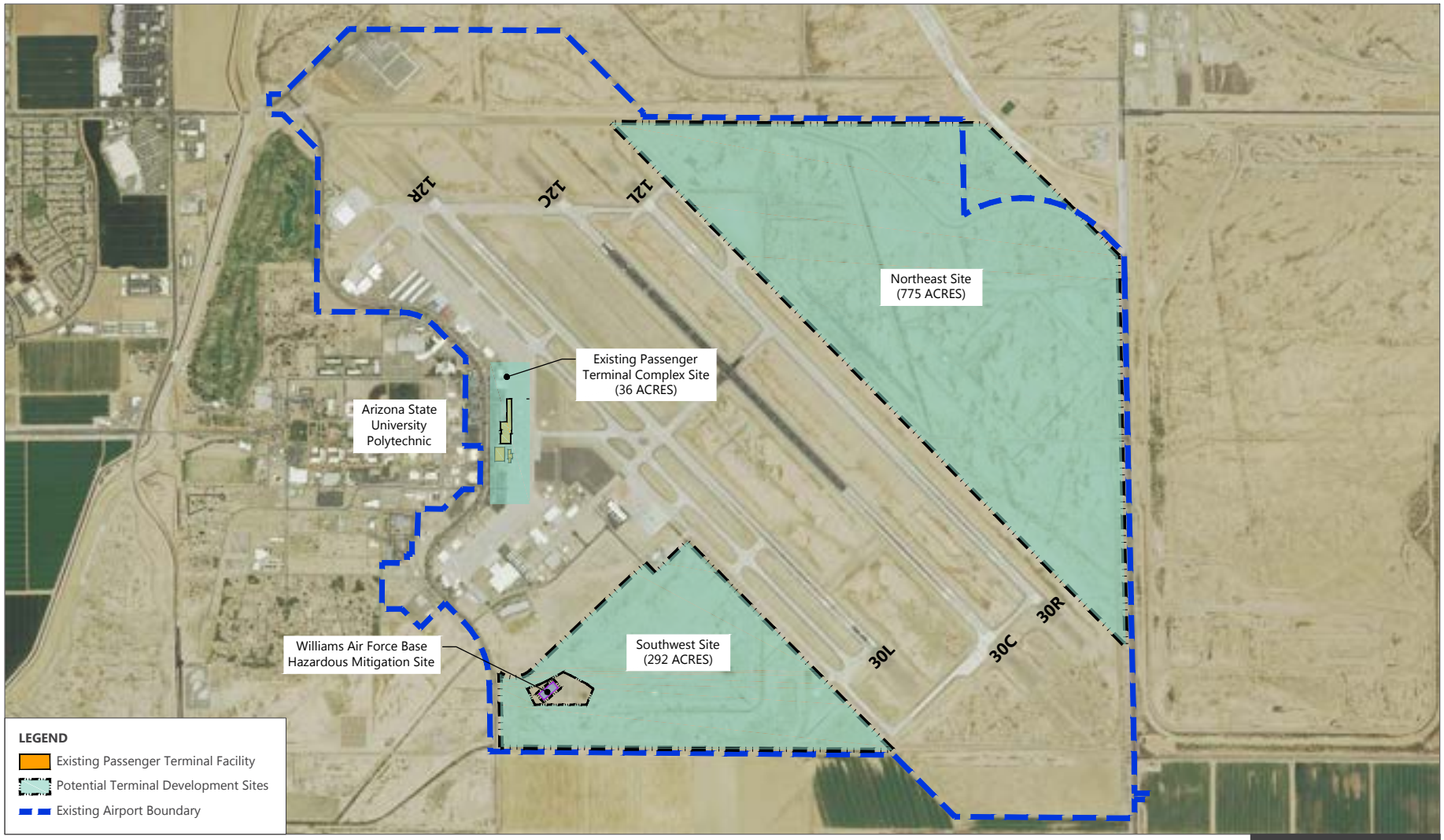

SOURCES: Coffman Associates, Inc., *Airport Master Plan for Phoenix -Mesa Gateway Airport,* Final Report, February 2009; U.S. Department of Agriculture, *National Agriculture Imagery Program* , 2013 (Aerial Imagery), 2013; Ricondo & Associates, Inc., October 2013.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

EXHIBIT 2-2

NORTH 0 2,500 ft.

Alternative Terminal Development Sites

Drawing: Z:\PMGAA\CAD\IWA_NADP_EA_Alternatives_20160817.dwg Layout: 02-2_Potential_Sites Plotted: Dec 27, 2016, 01:12PM

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SOURCES: Coffman Associates, Inc., *Airport Master Plan for Phoenix -Mesa Gateway Airport,* Final Report, February 2009; Phoenix-Mesa Gateway Airport Authority (Aerial Imagery), 2014; Ricondo & Associates, Inc., October 2013.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

EXHIBIT 2-3

NORTH 0 500 ft.

No Action Alternative Existing Conditions

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2.3.2.2 On-Site Alternative 1: Expansion of Existing Passenger Terminal Complex

On-site Alternative 1 would include modifications to the existing Ticketing Terminal and the West Terminal (see **Exhibit 2-4**). The building is single level and could not accommodate second level boarding. Components of On-site Alternative 1 include the following:

- Expand the outbound baggage area by 3,020 square feet on the south end of the Ticketing Terminal, which would require modification of the existing baggage belt and baggage-tug exit path.
- Expand the existing baggage claim area 3,750 square feet and include 180 additional linear feet of baggage claim frontage at the north end of the West Terminal processor, adjacent to the central walkway.
- Expand the security screening checkpoint queue area 675 square feet to the west toward the terminal entrance road at the south end of the West Terminal. This modification would require a realignment of the walkway from the West Terminal to the Ticketing Terminal.
- Expand the secure concessions area 3,050 square feet at the north end of the West Terminal. Airline offices, a tug-maneuver area, and trash area would be relocated to accommodate the additional secure concessions area.
- Add a parking structure over the existing passenger automobile parking area to accommodate passenger automobiles currently parked on the aircraft apron.

2.3.2.3 On-Site Alternative 2: Southwest Area Development

On-site Alternative 2 would include relocating all passenger terminal complex buildings and associated facilities to the southwest corner of IWA, which provides approximately 300,000 square feet of new terminal space. The Southwest Area Development site encompasses approximately 292 acres of undeveloped land, and it is located east of South Sossaman Road and southeast of East Velocity Way. This alternative would also allow for private commercial development in the southwest section of IWA property. As depicted on **Exhibit 2-5**, On-site Alternative 2 is located near the southern ends of Runway 12R-30L and Taxiways A and B, as well as the Mesa Fire Station 215 and the cargo ramp. Components of On-site Alternative 2 would include the following:

- Construct a purpose-built passenger terminal, with second level boarding and the equivalent number of gates as the existing terminal complex (10 gates and 4 aircraft parking spaces), on undeveloped land on the southwest side of IWA property.
- Construct airfield, taxiway, and taxilane improvements to provide airfield access capable of supporting the proposed airline operations.
- Construct an aircraft apron.
- Construct access roadways and terminal curbfront improvements.
- Construct parking spaces equivalent to what is currently available.

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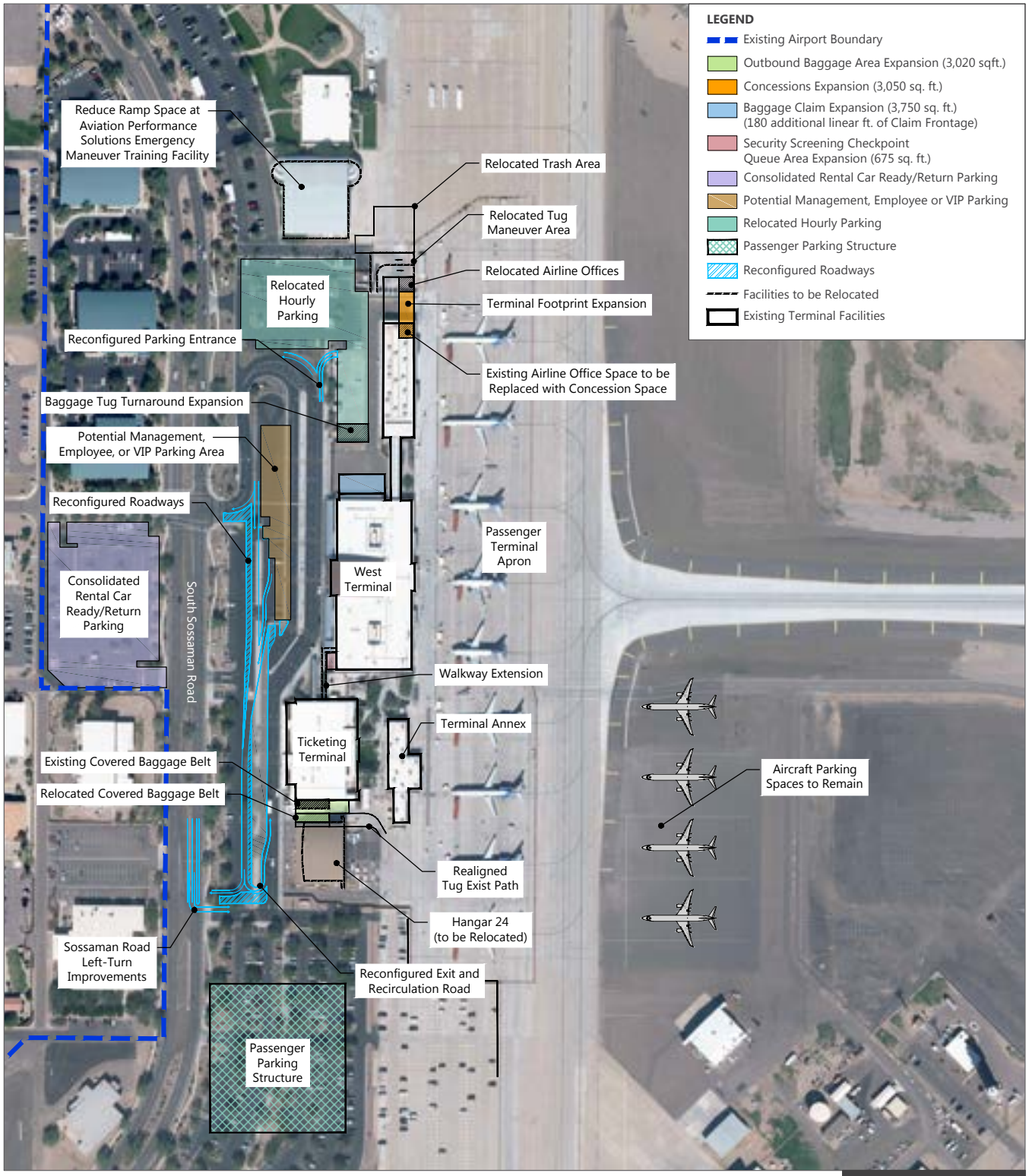

SOURCES: Coffman Associates, Inc., *Airport Master Plan for Phoenix -Mesa Gateway Airport,* Final Report, February 2009; Phoenix-Mesa Gateway Airport Authority (Aerial Imagery), 2014; Ricondo & Associates, Inc., October 2013.
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 2-4

NORTH 0 300 ft.

On-Site Alternative 1
Existing Passenger Terminal Complex Facilities Expansion

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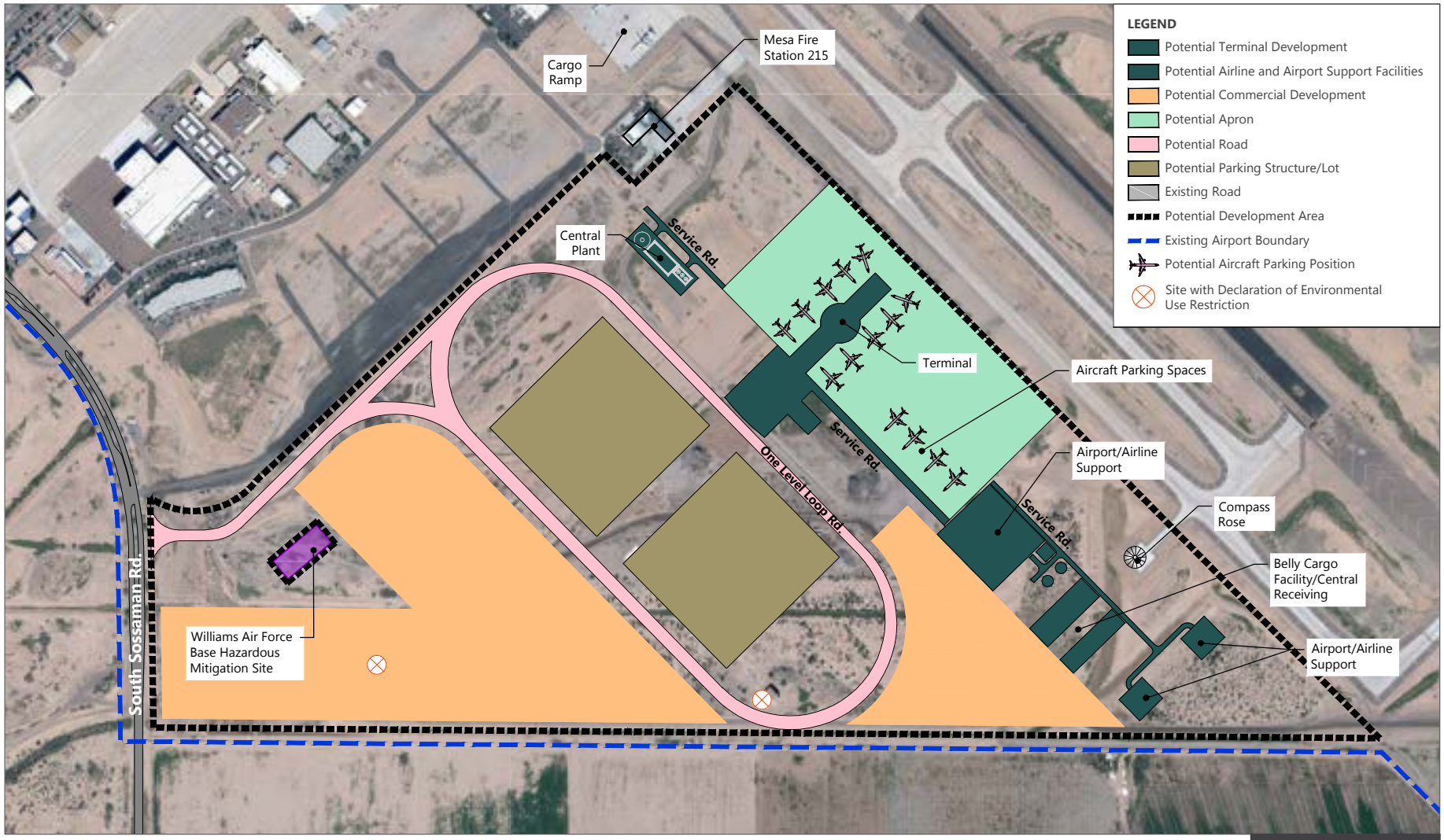

SOURCES: Coffman Associates, Inc., *Airport Master Plan for Phoenix -Mesa Gateway Airport,* Final Report, February 2009; Phoenix-Mesa Gateway Airport Authority (Aerial Imagery), 2014; Ricondo & Associates, Inc., October 2013.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

EXHIBIT 2-5

NORTH 0 800 ft.

On-Site Alternative 2
Southwest Area Development

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- Relocate utilities, service roads, and perimeter fencing.
- Construct ancillary/support facilities.
- Demolish existing buildings and structures within the southwest development area and prepare areas for commercial development (grading, site preparation, and utility connections).[12]

2.3.2.4 On-Site Alternative 3: Northeast Area Development

On-site Alternative 3 would include the construction of approximately 300,000 square feet of new terminal facility space for a purpose-built terminal complex, including associated ancillary and support facilities, along with supporting infrastructure on the northeast side of IWA, as depicted on **Exhibit 2-6**. This alternative would also allow for private commercial development in the northeast section of IWA property. Components of On-site Alternative 3 include the following:

- Construct a purpose-built passenger terminal, with second level boarding and the equivalent number of gates as the existing terminal complex (10 gates and 4 aircraft parking spaces), on undeveloped land on the northeast side of IWA property.
- Construct airfield, taxiway, and taxilane improvements to provide airfield access capable of supporting the proposed airline operations.
- Complete construction of the full-length parallel taxiway northeast of Runway 12L-30R.
- Construct an aircraft apron.
- Construct access roadways and terminal curbfront improvements.
- Construct parking spaces equivalent to what is currently available.
- Relocate utilities, service roads, and perimeter fencing.
- Construct a new substation on the west side of Ellsworth Road.
- Construct ancillary/support facilities.
- Lease 20-plus acres directly northeast of existing IWA property for the relocation of the Ellsworth Channel. This property is owned by ADOT.[13]
- Demolish existing, unoccupied buildings and structures within the northeast development area.
- Prepare areas for commercial development (grading, site preparation, and utility connections).[14]

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[12] The buildings that are part of the existing passenger terminal complex would not be demolished, but they would be repurposed for other aeronautical uses.

[13] The ADOT purchased this property as part of the SR 24 project. The 20-plus acres are an uneconomical remnant that ADOT has agreed to long-term lease to the City of Mesa. The City of Mesa would lease the property to PMGAA for relocation of the Ellsworth Channel, as part of the proposed project.

[14] The buildings that are part of the existing passenger terminal complex would not be demolished, but they would be repurposed for other aeronautical uses.

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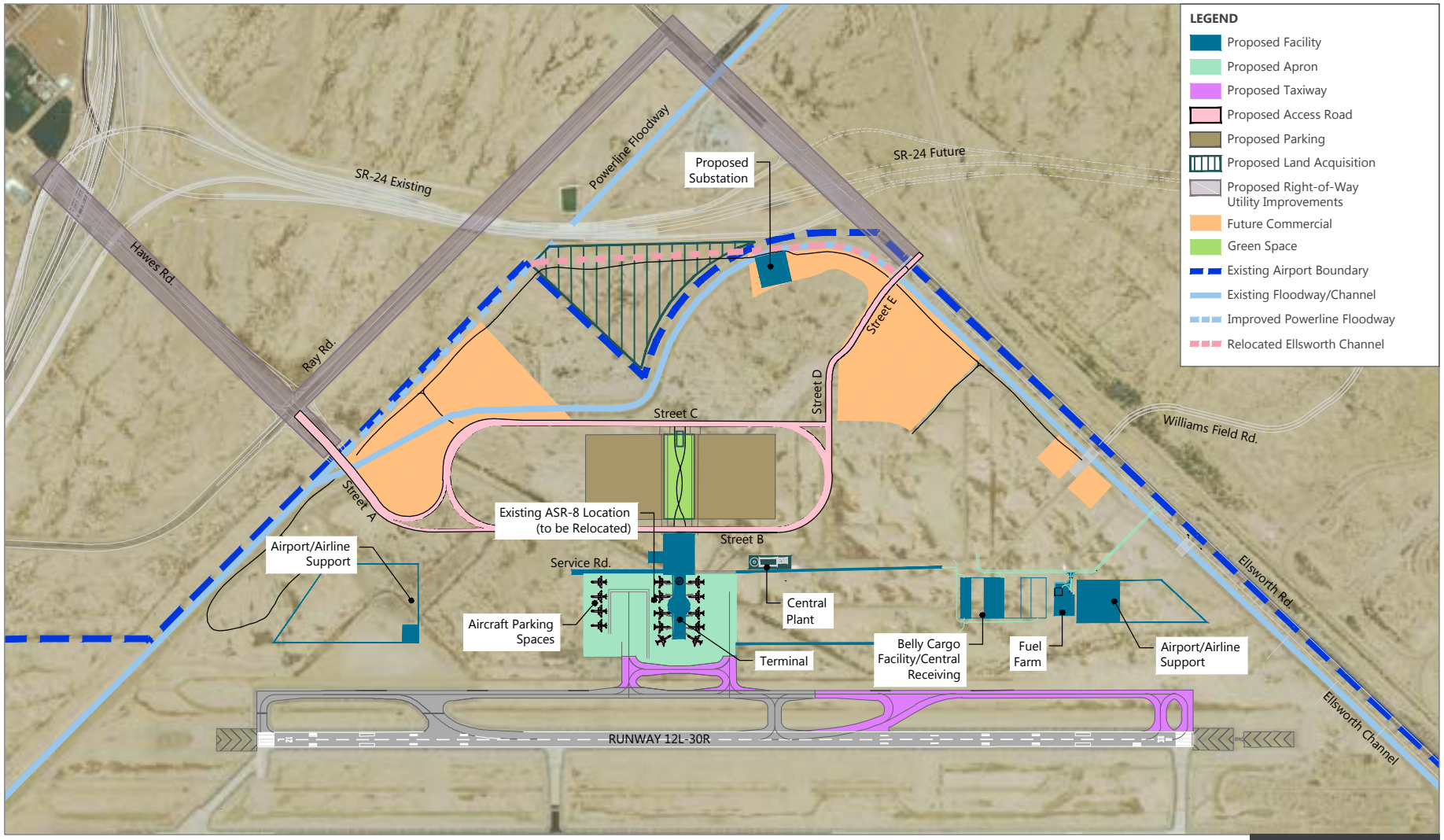

NOTE: On-site Alternative 3 includes the relocation of the Airport Surveillance Radar to a new location southeast of the Airport in Pinal County (See Exhibits 1-5 and 1-6).

SOURCES: Coffman Associates, Inc., *Airport Master Plan for Phoenix -Mesa Gateway Airport,* Final Report, February 2009; U.S. Census, *2013 TIGER/Line Shapefiles* , http://www.census.gov/cgi-bin/geo/shapefiles2013/main (accessed March 2014); U.S. Department of Agriculture, *National Agriculture Imagery Program* , 2013 (Aerial Imagery), 2013; Ricondo & Associates, Inc., October 2013.

PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 2-6

NORTH 0 1,500 ft.

On-Site Alternative 3
Northeast Area Development

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2.3.3 IDENTIFICATION OF OFF-SITE ALTERNATIVES

The identification of off-site alternatives began by examining the existing IWA property boundary to determine whether a site contiguous to the airfield, not already owned by the PMGAA, could be developed for a passenger terminal. One of the primary requirements for a relocated passenger terminal is aircraft access to the airfield. One feasible off-site alternative was identified; this alternative would be suitable for a passenger terminal and also provide access to the runway system. Locations at the end of the runways were not considered feasible due to building restrictions within runway safety areas and protection zones.

Off-Site Alternative 4: West Expansion of the Existing Passenger Terminal Complex

Off-site Alternative 4 would involve modifications to the existing on-airport passenger terminal complex and expansion to the west (off-airport) through the acquisition of additional land. This alternative would involve construction of a 10-gate, 300,000-square-foot terminal building, along with 4 additional aircraft parking spaces. Components of Off-site Alternative 4 include the following:

- Construct a purpose-built passenger terminal, with second level boarding from the South Concourse and the equivalent number of gates as the existing terminal complex (10 gates and 4 aircraft parking spaces), on developed land on the west side of IWA property.
- Construct airfield, taxiway, and taxilane improvements to provide airfield access capable of supporting the proposed airline operations.
- Construct an aircraft apron.
- Construct access roadways and terminal curbfront improvements.
- Construct equivalent parking spaces to what is currently available.
- Relocate utilities, service roads, and perimeter fencing.
- Construct ancillary/support facilities.

Components of this alternative, and the phasing of the components, are illustrated on **Exhibit 2-7**. In order to accommodate the facilities listed, Off-site Alternative 4 would require the following:

- Acquire land to facilitate the realignment of South Sossaman Road.
- Demolish existing buildings and structures within the western development area and prepare areas for commercial development (grading, site preparation, and utility connections).[15]

[15] The buildings that are part of the existing passenger terminal complex would not be demolished, but they would be repurposed for other aeronautical uses.

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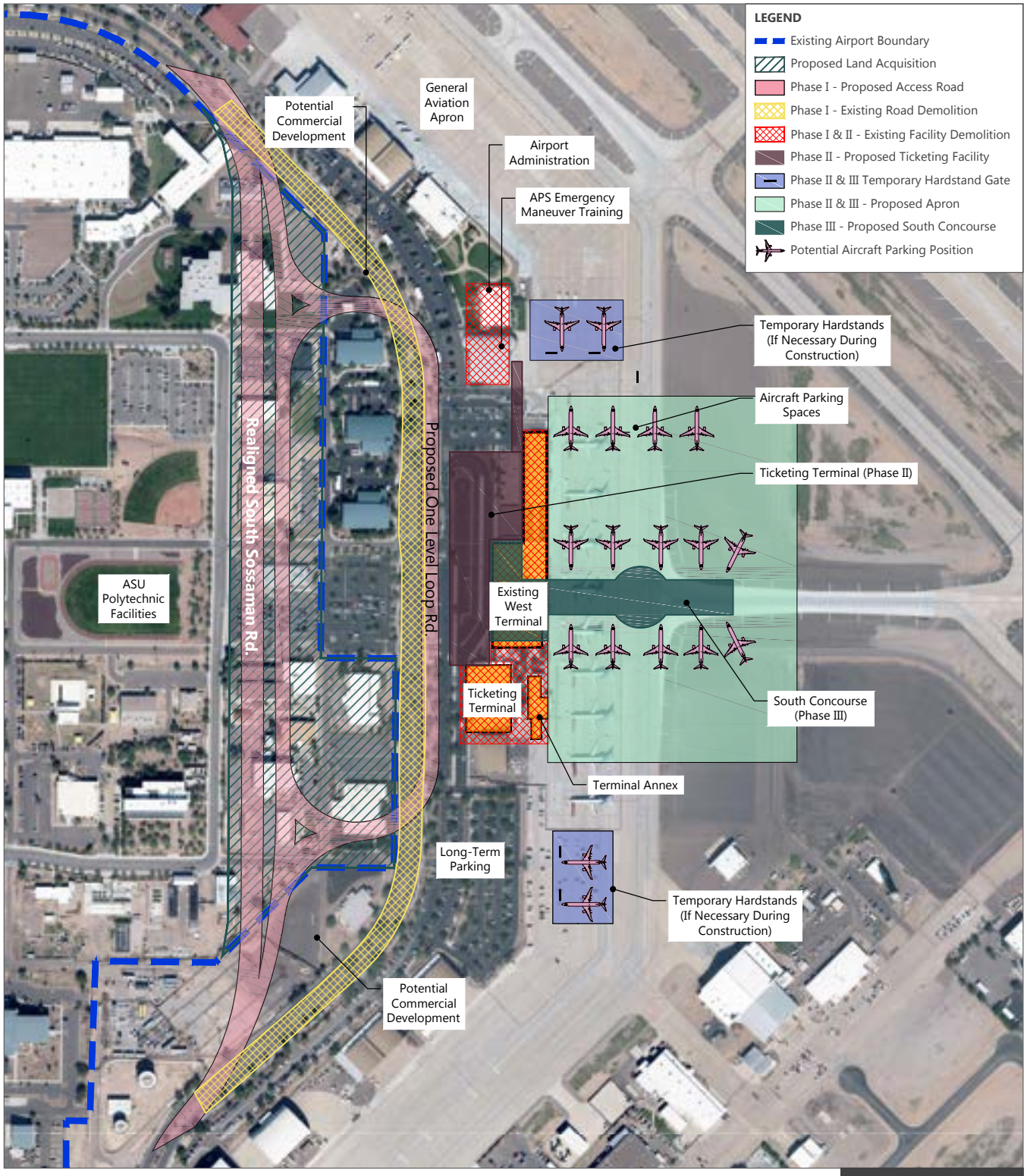

SOURCES: Coffman Associates, Inc., *Airport Master Plan for Phoenix -Mesa Gateway Airport,* Final Report, February 2009; Phoenix-Mesa Gateway Airport Authority (Aerial Imagery), 2014; Ricondo & Associates, Inc., October 2013.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

EXHIBIT 2-7

NORTH 0 500 ft.

Off-Site Alternative 4
Existing Passenger Terminal Complex, West Expansion

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2.4 Evaluation of Terminal Development Alternatives

As described in Section 2.2, a screening analysis was undertaken to determine which alternatives should be retained for further analysis of potential environmental consequences.

2.4.1 STEP 1 CRITERIA: EFFICIENT CENTRALIZED PASSENGER TERMINAL COMPLEX

The Step 1 criteria determine whether an alternative would provide an efficient centralized passenger terminal complex including adequate parking within a reasonable walking distance. A standard of a quarter-mile was used as the measure of a reasonable walking distance.

2.4.1.1 Use of Alternative Modes of Transportation Alternative

The lack of access to interregional passenger train service, coupled with extended travel time, renders use of other transportation modes an infeasible alternative for addressing the inefficient collection of terminal buildings at IWA. The use of alternative modes of transportation as an alternative to the Proposed Action would not provide an efficient centralized passenger terminal complex. The FAA and the PMGAA do not have the authority to compel IWA airport users to use other modes of transportation. Thus, since this alternative would not meet Step 1 screening criteria, it was eliminated from further consideration.

2.4.1.2 Use of Other Public Airports Alternative

The use of other airports as an alternative to the Proposed Action, in order to address the inefficient collection of terminal buildings at IWA, would not provide an efficient centralized passenger terminal complex. The use of other public airports to replace some or all of the air transportation activity at IWA does not meet the Purpose and Need to improve the terminal complex at IWA. Furthermore, the FAA and the PMGAA do not have the authority to divert air transportation activity from IWA to other area airports. Thus, since this alternative would not meet Step 1 screening criteria, it was eliminated from further consideration.

2.4.1.3 No Action Alternative

The No Action Alternative would not provide an efficient centralized passenger terminal complex, and it does not meet the Step 1 criteria, but it remains under consideration pursuant to 40 CFR 1502.14(d).

2.4.1.4 On-Site Alternative 1

On-site Alternative 1 would be located on the existing terminal complex and expand upon the existing facilities. However, this alternative would not provide a centralized terminal complex or second-level boarding. Passengers would still be required to move between facility buildings for ticketing, baggage claim, and security, and would still be forced to walk outside on the apron to board and de-board aircraft. On-site Alternative 1 would also not have the potential for future expansion. Therefore, On-site Alternative 1 was eliminated from further consideration in this EA.

2.4.1.5 On-Site Alternative 2

On-site Alternative 2, located in the southwestern portion of IWA, would provide a purpose-built passenger terminal, with second level boarding and the equivalent number of gates as the existing terminal complex. This facility would allow passengers to access ticketing, baggage claim, and security in one building. Additionally, this alternative would have the potential for future facility expansion.

On-site Alternative 2 includes two proposed parking areas located within the terminal access road loop; each area comprises approximately 15 acres in available parking (approximately 30 acres total available). At the farthest point, these parking areas would be slightly less than the quarter-mile walking distance standard. This alternative passes the Step 1 screening evaluation.

2.4.1.6 On-Site Alternative 3

On-site Alternative 3, located in the northeastern portion of IWA, would provide a purpose-built passenger terminal, with second level boarding and the equivalent number of gates as the existing terminal complex. This facility would be consolidated into one building, allowing passengers to access ticketing, baggage claim, and security in the same building. Additionally, this alternative would have the potential for future facility expansion.

On-site Alternative 3 includes two proposed parking areas located within the terminal access road loop; each area comprises approximately 15 acres in available parking (approximately 30 acres total available). At the farthest point, these parking areas would be slightly less than the quarter-mile walking distance. This alternative passes the Step 1 screening evaluation.

2.4.1.7 Off-Site Alternative 4

Off-site Alternative 4, through the expansion of existing facilities to the west, would provide a purpose-built passenger terminal, with second level boarding and the equivalent number of gates as the existing terminal complex. This alternative would consolidate facilities, allowing passengers to access ticketing, baggage claim, and security in one building. Although limited, this alternative would have potential for future facility expansion. This alternative would construct equivalent parking spaces to what is currently available. Therefore, this alternative passes the Step 1 screening evaluation.

2.4.2 STEP 2 CRITERIA: COMMERCIAL DEVELOPMENT OPPORTUNITY

The Step 2 criteria determine whether an alternative would provide the opportunity for future revenue-producing commercial development.

2.4.2.1 On-Site Alternative 2

On-site Alternative 2 would provide approximately 75 acres of land southwest of the proposed terminal (Exhibit 2-6) that would be available for potential commercial development opportunities. Additionally, On-site Alternative 2 would allow for future facility expansion of the passenger terminal facilities, which could be used for potential commercial development within the terminal. Therefore, this alternative passes the Step 2 screening evaluation.

2.4.2.2 On-Site Alternative 3

On-site Alternative 3 would provide approximately 76 acres of land northeast of the proposed terminal (Exhibit 2-7) that could be available for potential commercial development opportunities. On-site Alternative 3 would also allow for future facility expansion of the passenger terminal facilities, which could be used for potential commercial development within the terminal. Therefore, this alternative passes the Step 2 screening evaluation.

2.4.2.3 Off-Site Alternative 4

Off-site Alternative 4 would provide approximately 7.5 acres of land north and south of the proposed terminal for potential commercial development opportunities. This alternative would offer limited potential for future passenger terminal facility expansion and, thus, limited opportunity for potential commercial development within the terminal. Since this alternative would offer significantly fewer opportunities for development than other viable alternatives, and would limit potential terminal expansion, Off-site Alternative 4 was eliminated from further consideration in this EA.

2.4.3 STEP 3 CRITERIA: DIRECT ACCESS TO MAJOR HIGHWAYS

Step 4 criteria determine whether an alternative will provide direct access to major highways.

2.4.3.1 On-Site Alternative 2 Evaluation

Based on the Phoenix-Mesa Gateway Airport User Survey[16], approximately 78 percent of IWA users arrive from the north. On-site Alternative 2 would relocate the passenger terminal to a section of South Sossaman Road, which is currently a two-lane roadway. This would move the terminal access point farther south from the direction most travelers are arriving from, and it would increase travel times for passengers and IWA employees. The primary access route from the north is SR 202 to South Power Road, followed by East Ray Road to South Sossaman Road. This alternative would increase the travel distance to and from SR 202, using the existing ground transportation network, from approximately 2.3 miles to the existing terminal to approximately 3.5 miles to On-site Alternative 2.

ADOT recently completed the first segment of the SR 24 freeway from SR 202 Red Mountain Freeway to Ellsworth Road. The distance from the SR 24 interchange at the northeast corner of IWA to the existing terminal is approximately 4.5 miles; On-site Alternative 2 would increase this distance to approximately 5.0 miles. In addition, On-site Alternative 2 would require secondary ground transportation access from SR 24 in order to approach the terminal via East Pecos Road to South Sossaman Road, along the southern edge of IWA.

This alternative would result in increased travel distances for passengers and IWA employees, and it would require continued utilization of South Sossaman Road as the primary access to the terminal area and to the commercial development. Since On-Site Alternative 2 does not provide direct access to major highways, and

[16] Maricopa Association of Governments, *Airport Travel Model Update and Data Collection*, July 2013.

since it actually increases ground transportation travel distances to major highways, this alternative was eliminated from further evaluation in this EA.

2.4.3.2 On-Site Alternative 3 Evaluation

On-site Alternative 3 would relocate the passenger terminal complex to the northeastern side of IWA, adjacent to the newly constructed segment of SR 24 and near the SR 24–SR 202 interchange. This alternative would decrease the travel distance from SR 202 to the terminal, using the existing ground transportation network, from approximately 2.3 miles to approximately 1.9 miles. On-site Alternative 3 would reduce the distance from the existing terminal to SR 24 from approximately 4.5 miles to less than one mile. Since On-site Alternative 3 would provide direct access to major highways, this alternative passes the Step 3 screening evaluation.

2.4.4 ALTERNATIVES RETAINED FOR ANALYSIS AND IDENTIFICATION OF THE PROPOSED ACTION

Table 2-1 presents the results of the screening analysis. Based on the evaluation of the alternatives, two alternatives were retained for analysis in this EA:

- No Action Alternative
- On-Site Alternative 3

2.5 Identification of ASR-8 Site Relocation Alternatives

In order to complete the improvements associated with the Proposed Action, the FAA will need to relocate the ASR-8 system from its existing location at IWA. The ASR system, owned and operated by the FAA for regional radar coverage, is used by Airport Traffic Control Towers (ATCT) at IWA, PHX, and Scottsdale Airport. The proposed tower height of the ASR-8 would be 27 feet above ground level. An access road, one story masonry building, and shelter for a diesel backup generator would need to be constructed. Adequate three-phase electricity, as well as telephone service, would also be needed.

Table 2-1: Summary of Alternatives Screening Evaluation—Passenger Terminal Complex

		ALTERNATIVE MEETS THE CRITERIA			
LOCATION	**ALTERNATIVE**	**STEP 1 CRITERIA**	**STEP 2 CRITERIA**	**STEP 3 CRITERIA**	**RETAINED FOR FURTHER ANALYSIS IN THE EA**
Operational Alternatives	Use of Other Modes of Transportation	No, does not provide centralized terminal facility			No
	Use of Other Public Airports	No, does not provide centralized terminal facility			No
On-Site Alternatives	No Action Alternative	No, does not provide centralized terminal facility			Yes[1/]
	Alternative 1—Expansion of Existing Passenger Terminal Complex	No, does not provide centralized terminal facility			No
	Alternative 2—Southwest Area Development	Yes, provides centralized terminal facility and adequate automobile parking	Yes, provides potential commercial development opportunities	No, does not provide direct access to major highways	No
	Alternative 3—Northeast Area Development	Yes, provides centralized terminal facility and adequate automobile parking	Yes, provides potential commercial development opportunities	Yes, provides direct access to major highways	Yes
Off-Site Alternatives	Alternative 4—West Expansion of the Existing Passenger Terminal Complex	Yes, provides centralized terminal facility and adequate automobile parking	No, provides fewer commercial development opportunities than other viable alternatives		No

NOTE:

1/ Analysis of the No Action Alternative is required by 40 CFR § 1502.14(d).

SOURCE: Ricondo & Associates, Inc., December 2015.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

This section outlines the criteria and screening process utilized to identify feasible alternatives for detailed environmental analysis for the relocation of the ASR-8. Both on-site and off-site alternatives were assessed based on a standardized site survey approach, as well as through a three-tiered screening evaluation criteria identified by the FAA. The identification and evaluation of alternatives in this EA incorporates information presented in the Phoenix-Mesa Gateway Airport ASR-8 Surveillance Radar Site Survey Report[17] and the Phoenix-Mesa Gateway Airport ASR-8 Surveillance Radar Site Survey Report Addendum, which are included in **Appendix B**.[18]

A total of 20 potential candidate sites for the ASR-8 relocation were identified at a kick-off meeting held in September 2013 (see **Exhibit 2-8** for the location of the candidate sites). Following the analysis of data gathered during the FAA and PMGAA field investigations of the 20 potential sites, six sites were moved to more optimal locations, and the FAA added two sites at the Rittenhouse (RTN) Army National Guard site (ANG1 and ANG2) for additional analysis. In November 2013, the FAA and PMGAA identified three final candidate sites from the 12 remaining candidate sites. The three final candidate sites included Rittenhouse ANG2 (RTN2), Site 20A (on Chandler Airport), and Site 1A:

- **Rittenhouse ANG2 (RTN2)**. This site is on land managed by BLM and leased to the Arizona Army National Guard (ANG), and it is located southeast of IWA, north of East Ocotillo Road across from residential housing. The site has an elevation of 1,571 feet above mean sea level (MSL).
- **Site 20A (Chandler Airport)**. This site is located on the Chandler Airport, which is located approximately 7 miles southwest of IWA, and it has an elevation of approximately 1,241 feet MSL.
- **Site 1A.** This site is near a commercial dirt racetrack and motocross track located approximately 5.3 miles east of IWA, approximately 200 feet west of North Ironwood Road. The site has an elevation of 1,484 feet MSL.

In May 2014, the Arizona ANG determined that the RTN2 site was no longer available due to potential interference with existing and planned ANG operations; therefore, the FAA identified a new site at the Rittenhouse Army National Guard site, identified as RTN6. [19]

RTN6. This site is approximately 7.5 acres, and it is located on land managed by the BLM and leased to the Arizona ARNG, approximately 7 miles southeast of IWA and 1,300 feet north of East Ocotillo Road.

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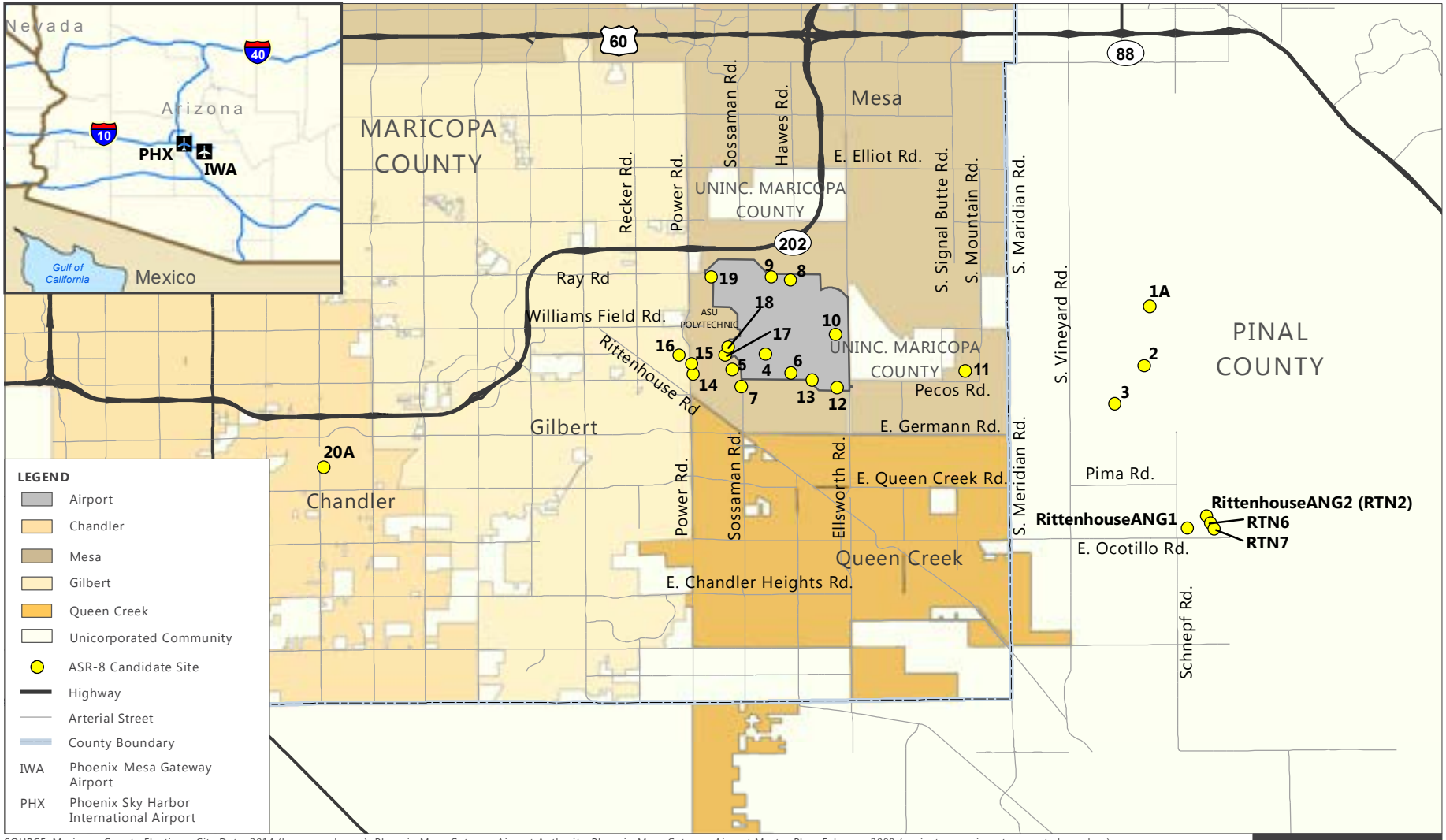
17 Federal Aviation Administration, ASR-11 Program Branch Office, *Phoenix-Mesa Gateway Airport ASR-8 Surveillance Radar Site Survey Report*, February 27, 2014.

18 Federal Aviation Administration, ASR-11 Program Branch Office, *Phoenix-Mesa Gateway Airport ASR-8 Surveillance Radar Addendum*, June 16, 2014.

19 In July 2014, it was determined the RTN6 site was no longer a viable alternative due to potential interference with planned National Guard activities. A new site, RTN7, was identified 1,000 feet south of the RTN6 site that would be suitable for the ASR-8 relocation. RTN7 is discussed in more detail in the evaluation of alternatives (Section 2.6.2).



SOURCE: Maricopa County Elections, City Data, 2014 (base map layers); Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Data 2010 (base map layers); U.S. Department of Transportation, Federal Aviation Administration, Phoenix-Mesa Gateway Airport ASR-8 Surveillance Radar Addendum, May 27, 2014; U.S Census Bureau, 2016 TIGER/Line Shapefiles, GIS Data, 2016 (base map layers).
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 2-8

ASR-8 Candidate Sites and Vicinity Map

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The Site Survey Report Addendum documented the analysis of the RTN6 site, as well as the previously considered sites (Site 1A, Site 20A, RTN2), based on the screening criteria outlined in Section 2.6, in addition to expected radar coverage and construction costs.[20] The primary factors that could influence construction costs include telecommunication accessibility, power access, tower height, access roads, real estate, and environmental screening.

2.6 Screening and Evaluation of ASR-8 Site Relocation Alternatives

2.6.1 ALTERNATIVES SCREENING CRITERIA

The site-survey process outlines a site-screening procedure that employs existing data to eliminate areas with known operational restrictions, sensitive environmental resources, and construction constraints. The evaluation of the ASR-8 site location alternatives was performed using a three-step evaluation process, including the operational siting criteria in FAA Order 6310.6, *Primary/Secondary Terminal Siting Handbook*[21]:

- Step 1: Would the alternative meet exclusionary criteria?

  These criteria could eliminate a site from further consideration due to immitigable, significant impacts or physical constraints regarding a site's suitability for construction. Additional operational siting criteria are based on, but not limited to, the ASR-8 system specification and FAA Order 6310.6, in order to ensure a potential site is viable.

- Step 2: Would the alternative meet restrictive criteria?

  These criteria could eliminate a site from further consideration due to the extensive mitigation required to offset potentially significant impacts, or due to unacceptable operational impacts. Many of these criteria originate from federal law, regulations, or executive orders. Additionally, many of the criteria are covered by state and local laws, which were consulted as appropriate.

- Step 3: Would the alternative meet selective criteria?

Exhibit 2-9 illustrates the ASR-8 site alternative- evaluation screening process. These criteria provide positive, negative, and neutral site-specific considerations that assist in site-to-site comparisons.

[20] Federal Aviation Administration, ASR-11 Program Office, *Phoenix-Mesa Gateway Airport, ASR-8 Surveillance Radar, Addendum*, May 27, 2014.

[21] Federal Aviation Administration, Order 6310.6, *Primary/Secondary Terminal Siting Handbook*, May 13, 1982.

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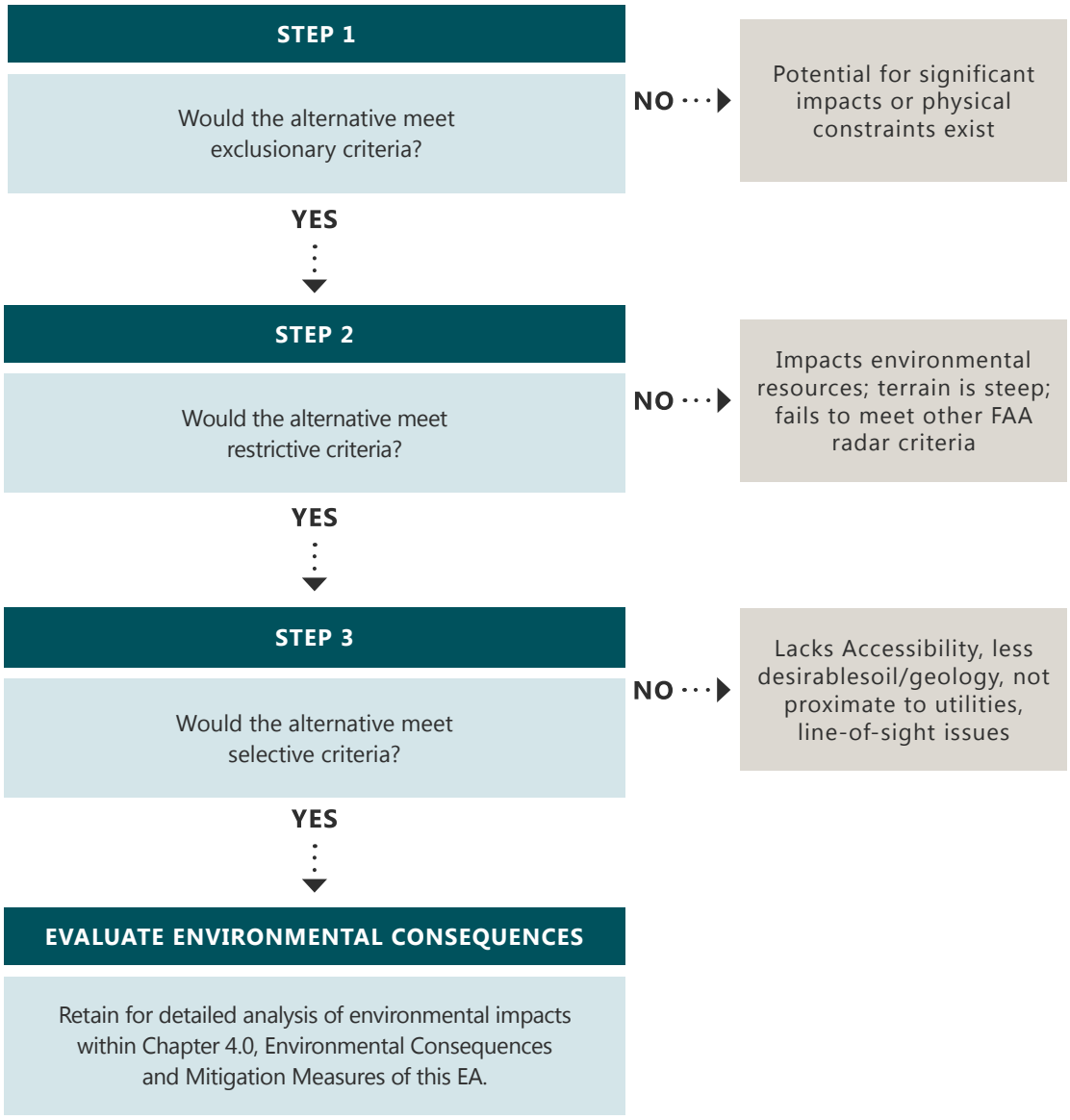

SOURCE: Ricondo & Associates, Inc., January 2016.
PREPARED BY: Ricondo & Associates, Inc., March 2016.

EXHIBIT 2-9

ASR-8 Site Alternatives Screening Process

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The first two levels, exclusionary and restrictive, attempt to eliminate potential-site areas from further consideration based on operational, environmental, and construction criteria. The third level, selective, allows a comparison of candidate sites. Each screening level invokes distinct operational, construction, and environmental siting criteria to assess a site's suitability.[22]

After applying the screening criteria, the Radar Support System (RSS) tool was utilized by the FAA to generate radar coverage predictions for the candidate sites. The RSS tool utilizes a terrain database (ground elevation and ground cover, such as water, agricultural land, forest, etc.) and a cultural database (trees and manmade structures, such as buildings, roads, etc.) to model the general area.

Since IWA is designated as a primary airport for ASR-8 coverage, the site-survey approach considered air traffic control coverage requirements. The requirements for the evaluation comprise the following:

- Coverage of aircraft targets on final approach need to be provided up to the Missed Approach Point.
- Departing aircraft targets need to be detected by the ASR-8 within one nautical mile from the departure runway end.

In order for the radar to provide detection of the air traffic coverage requirements, the following target detection conditions must be met:

- All coverage requirements for aircraft should be visible on direct line-of-sight from the radar.
- Given line-of-sight visibility, radar should be capable of detecting all aircraft at the range and altitude of each coverage requirement.
- The radar site must be located at least 0.5-nautical mile from any point where detection of aircraft is desired.

2.6.1.1 Step 1 Criteria: Exclusionary

The criteria used in Step 1 evaluate the essential environmental, construction, and operational constraints of each site considered. The exclusionary criteria identify whether there would be the potential for significant impacts or whether physical constraints exist for any alternative site. A site would fail Step 1 criteria if it would result in any of the following:

- impact an occupied existing or planned structure
- located within a railroad, highway, or power line ROW
- located within safety areas or object free areas associated with runways or taxiways

[22] Federal Aviation Administration, ASR-11 Program Branch Office, *Phoenix Mesa Gateway Airport ASR-8 Surveillance Radar Site Survey Report*, February 27, 2014.

- impact wilderness areas or natural landmarks
- fail to meet coverage and target criteria noted above

Additionally, a site must be able to provide an area of at least 160 feet by 160 feet and be located at least 1,500 feet away from any nonremovable, above-ground screening/reflecting object.

2.6.1.2 Step 2 Criteria: Restrictive

The criteria used in Step 2 further refine the operational and environmental specifications for each site that passed Step 1 criteria. A site would fail Step 2 criteria if it would impact:

- ecological/wildlife areas
- prime and unique farmlands
- parks and recreation areas
- historical, archaeological, and culturally sensitive areas
- wetlands
- endangered or threatened species or habitat
- designated unremediated hazardous waste sites
- capped landfills
- scenic highways
- coastal zones
- floodplains

Additionally, a site would be eliminated from consideration if it consisted of steep terrain; would penetrate the various imaginary surfaces defined in Title 14 Code of Federal Regulation (CFR) Part 77, *Objects Affecting Navigable Airspace*, and; would be located within 2,500 feet of existing electronic facilities or high-tension power lines; would be located within the cone of silence impact coverage of approaches and navigational routes; would be located within 2,500 feet of industrial operations; or located within 0.5-nautical mile of any operational runways, approach, and departure paths.

2.6.1.3 Step 3 Criteria: Selective

The criteria used in Step 3 provided positive, negative, and neutral site-specific considerations that assisted in site-to-site comparisons for those alternative sites that passed both Step 1 and Step 2 criteria. Selective criteria included:

- visual sensitivity
- accessibility to existing roads
- soils

- geology
- proximity to power
- proximity to telephone lines
- zoning
- subsurface rights
- unique habitats
- existing utilities
- planned use of site
- water resources
- recreational use
- underground cable routing
- line-of-sight visibility to air traffic coverage requirements
- secondary radar coverage

Sites that met all of the selective criteria were then ranked in terms of radar coverage; thus, a site that passed all three screening steps and had the best radar coverage would be identified as the preferred alternative.

2.6.2 EVALUATION OF ALTERNATIVES

The following candidate sites were eliminated at the kickoff meeting utilizing the Step 1 and Step 2 criteria[23]:

- Candidate Sites 4, 8, 9, and 10 were too close to planned construction;
- Candidate Site 6 was too close to the Compass Rose, which has an associated clear zone;
- Candidate Site 7 was too close to a Next Generation Radar (NEXRAD) facility, and it could be located in an archaeological area;
- Candidate Sites 12, 13, and 19 were in a radar cone of silence near the end of runways; and
- Candidate Site 14 was located too close to the East Valley Institute of Technology and could be potentially screened by planned hangars.

The same three steps of exclusionary, restrictive, and selective criteria were applied to the candidate sites identified in Section 2.5. Site 20A (Chandler Airport) is located within 0.5-nautical miles of operational runways and, therefore, did not pass Step 2 criteria. Site 1A had the highest real estate cost and was not near

[23] Federal Aviation Administration, ASR-11 Program Office, *Phoenix-Mesa Gateway Airport, ASR-8 Surveillance Radar, Site Survey Report, Draft,* February 27, 2014.

an adequate power source. As stated in Section 2.5, the Arizona Army National Guard (ARNG) determined that the RTN2 site was no longer available. The RTN6 site had the best radar coverage and the lowest real estate costs of the remaining potential candidate sites. The Site Survey Report Addendum stated the RTN6 site was not located close to any residential development, recreational areas, or known historic sites, which minimizes the potential for creating visual impacts due to the tower height of the ASR-8.[24]

Progress to secure the RTN6 final approval from the Arizona ARNG was delayed due to another requirement added for the ARNG helicopter training area. A high intensity radio transmission area (HIRTA) was designated around the center of the helicopter training area. This addition negated the RTN6 site due to the 500-foot buffer requirement for a HIRTA.

At the conclusion of the site-selection process, the FAA determined that the preferred site would be an "area" near the RTN6 site. This new area was located approximately 1,000 feet south of the original RTN6 site and approximately 1,000 feet north of East Ocotillo Road. The new area is the RTN7 site. The FAA determined that, because the shift of the RTN6 site 1,000 feet to the south would place the ASR-8 facilities in an area with similar terrain and features as the original RTN6 site, the analysis conducted for the RTN6 site was also applicable to the RTN7 site.

2.6.3 ALTERNATIVES RETAINED FOR ANALYSIS

Table 2-2 presents the results of the screening analysis for each ASR-8 relocation candidate site. Based on the evaluation of the alternatives, the RTN7 alternative met all the criteria; therefore, this alternative was retained for analysis in this EA.

2.7 Sponsor's Preferred Alternative

The Proposed Action—On-Site Alternative 3 and RTN7 Site Alternative—is the Sponsor's Preferred Alternative. This alternative would include the following: construction of a 10-gate terminal building with 4 aircraft parking spaces and associated apron; improvements to the airfield, taxiway, and taxilane system associated with the new passenger terminal facilities; construction of access roadways, terminal curbfront, and parking facilities for passengers and employees; construction of a new electrical substation; and areas dedicated to commercial development. This alternative would also include the relocation of the ASR-8 system, which would require the construction of a one-story masonry building, shelter for a diesel backup generator, 1,000-gallon aboveground storage tank to provide fuel for the generator, a steel lattice tower 27 feet in height, and an access road of approximately 1,500 feet. The antenna, building, generator, and fuel storage tank would be enclosed by a chain-link security fence. See Section 1.4 and Exhibit 1-8 for the project elements of the Proposed Action.

[24] Federal Aviation Administration, ASR-11 Program Office, *Phoenix-Mesa Gateway Airport, ASR-8 Surveillance Radar, Addendum*, May 27, 2014.

Table 2-2: Summary of Alternatives Screening Evaluation—ASR-8 Sites

ALTERNATIVE	STEP 1 CRITERIA	STEP 2 CRITERIA	STEP 3 CRITERIA	RADAR COVERAGE RANKING	RETAINED FOR FURTHER ANALYSIS IN THE EA
Alternative 1—Candidate Site 1A	Yes	Yes	Yes	Second	No
Alternative 2—Candidate Site 2	Yes	Yes	No		No
Alternative 3—Candidate Site 3	Yes	Yes	No		No
Alternative 4—Candidate Site 4	Yes	No			No
Alternative 5—Candidate Site 5	Yes	Yes	No		No
Alternative 6—Candidate Site 6	No				No
Alternative 7—Candidate Site 7	No				No
Alternative 8—Candidate Site 8	Yes	No			No
Alternative 9—Candidate Site 9	Yes	No			No
Alternative 10—Candidate Site 10	Yes	No			No
Alternative 11—Candidate Site 11	Yes	Yes	No		No
Alternative 12—Candidate Site 12	No				No
Alternative 13—Candidate Site 13	No				No
Alternative 14—Candidate Site 14	No				No
Alternative 15—Candidate Site 15	Yes	Yes	No		No
Alternative 16—Candidate Site 16	Yes	Yes	No		No
Alternative 17—Candidate Site 17	Yes	Yes	No		No
Alternative 18—Candidate Site 18	Yes	Yes	No		No
Alternative 19—Candidate Site 19	No				No
Alternative 20—Candidate Site 20A (Chandler Airport)	Yes	No			No
Rittenhouse ANG2 (RTN2)	No				No
Rittenhouse ANG6 (RTN6)	No				No
Rittenhouse ANG7 (RTN7)	Yes	Yes	Yes	First	Yes

SOURCE: Ricondo & Associates, Inc., December, 2015.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

2.8 Permits Required

As required under Chapter 6-1, paragraph a.(4) of FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, a preliminary list of permits required for implementation of the Proposed Action Alternative is provided in **Table 2-3**.

Table 2-3: Preliminary List of Permits Required for the Proposed Action

ISSUING AGENCY	PERMIT NAME/TYPE
Arizona Department of Environmental Quality	General Construction Stormwater Permit and Standard Urban Stormwater Mitigation Plan (SUSMP)
	Water Discharge Requirements Application
	General National Pollutant Discharge Elimination System (NPDES) Stormwater permit under Section 402 of the Clean Water Act (CWA) for construction activities
	General NPDES Stormwater permit under Section 402 of the CWA for industrial activities
U.S. Army Corps of Engineers	Clean Water Act Section 404 permit

SOURCE: Ricondo & Associates, Inc., December 2015.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

2.9 Federal Laws and Regulations Considered

As required under Chapter 6 of FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, the relevant federal laws and statutes, executive orders, and other federal regulations considered during preparation of this EA are listed in **Table 2-4**, **Table 2-5**, and **Table 2-6**.

Table 2-4: Federal Laws and Statutes Considered

	CITATION
National Environmental Policy Act of 1969	42 U.S.C. 4321 *et seq.*
Clean Air Act of 1970, as amended	42 U.S.C. 7401 *et seq.*
Department of Transportation Act of 1966, Section 4(f)	49 U.S.C. 303(c)
Vision 100 – Century of Aviation Reauthorization Act of 2003	49 U.S.C. 40101
Airport and Airway Improvement Act of 1982, as amended	49 U.S.C. 47101 *et seq.*
Airport Noise and Capacity Act of 1990	49 U.S.C. 4752 *et seq.*
Aviation Safety and Noise Abatement Act of 1979	49 U.S.C. 47501 *et seq.*
Aviation Safety and Capacity Expansion Act of 1990	49 U.S.C. App. 2226
Federal Aviation Act of 1958, as amended	49 U.S.C. 40101 *et seq.*
Hazardous Materials Transportation Act of 1975	49 U.S.C. 5101 *et seq.*
Endangered Species Act of 1973	16 U.S.C. 1531 *et seq.*
Fish and Wildlife Coordination Act of 1958	16 U.S.C. 661 *et seq.*
Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended	16 U.S.C. 1801 *et seq.*
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Community Environmental Response Facilitation Act of 1992	42 U.S.C. 6901 *et seq.*
Resource Conservation and Recovery Act of 1976, as amended by the Solid Waste Disposal Act of 1980	42 U.S.C. 6901 *et seq.*
Safe Drinking Water Act of 1974	42 U.S.C. 300 *et seq.*
Emergency Planning & Community Right to Know Act of 1986	42 U.S.C. 11001 *et seq.*
National Historic Preservation Act of 1966, as amended	16 U.S.C. 470 *et seq.*
Archaeological and Historic Preservation Act of 1974, as amended	16 U.S.C. 469 *et seq.*
Land and Water Conservation Fund Act of 1965	16 U.S.C. 4601 *et seq.*
Federal Water Pollution Control Act of 1972, as amended (commonly referred to as the Clean Water Act)	33 U.S.C. 1251 *et seq.*
Rivers and Harbors Act of 1899, Section 10	33 U.S.C. 403 *et seq.*
Farmland Protection Policy Act	7 U.S.C. 4201 *et seq.*
Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970	42 U.S.C. 4601 *et seq.*
Wild and Scenic Rivers Act of 1968	16 U.S.C. 1271 *et seq.*
Toxic Substances Control Act	15 U.S.C. 2601 *et seq.*
Coastal Zone Management Act of 1972	16 U.S.C. 1452 *et seq.*
Oil Pollution Control Act of 1990	33 U.S.C. 2701 *et seq.*

SOURCE: Ricondo & Associates, Inc., May 2014.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

Table 2-5: Executive Orders Considered

	CITATION
Executive Order 11593, Protection and Enhancement of the Cultural Environment	36 FR 8921
Executive Order 11988, Floodplain Management	43 FR 6030
Executive Order 11990, Protection of Wetlands	42 FR 26961
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	59 FR 7629
Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks	62 FR 19883

SOURCE: Ricondo & Associates, Inc., May 2014.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

Table 2-6: FAA Orders, Advisory Circulars, and Federal Regulations Considered

U.S. Department of Transportation and FAA Orders
U.S. Department of Transportation (DOT), FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*
U.S. DOT, FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*
U.S. DOT, Order 5650.2, *Floodplain Management and Protection*
U.S. DOT, Order 5660.1A, *Preservation of the Nation's Wetlands*
U.S. DOT, Order 5680.1, *Final Order to Address Environmental Justice in Low-Income and Minority Populations*
FAA Advisory Circulars
U.S. DOT, FAA Advisory Circular (AC) 150/5020-1, *Noise Control and Compatibility Planning for Airports*
U.S. DOT, FAA AC 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports*
U.S. DOT, FAA AC 36-3H, *Estimated Airplane Noise Levels in A-Weighted Decibels*
U.S. DOT, FAA AC 150/5300-13A, *Airport Design*
U.S. DOT, FAA AC 150/5370-10A, *Standards for Specifying Construction of Airports*
Code of Federal Regulations
Title 14 CFR Part 71, Designation of Class A, Class B, Class C, Class D, and Class E Airspace Areas; Airways; Routes; and Reporting Points
Title 14 CFR Part 77, Objects Affecting Navigable Airspace
Title 14 CFR Part 135, Operating Requirements: Commuter and On-Demand Operations and Rules Governing Persons on Board Such Aircraft
Title 14 CFR Part 150, Airport Noise Compatibility Planning
Title 40 CFR Part 93, Determining Conformity of Federal Actions to State or Federal Implementation Plans, Subpart B
Title 40 CFR Part 122, EPA Administered Permit Programs: The National Pollutant Discharge Elimination System
Title 40 CFR Part 123, State Program Requirements
Title 40 CFR Part 124, Procedures for Decision-making
Title 40 CFR Part 172, Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
Title 40 CFR Parts 1500–1508, President's Council on Environmental Quality

SOURCE: Ricondo & Associates, Inc., July 2015.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

3. Affected Environment

This chapter describes the existing conditions and resources within the geographic area that could potentially be directly or indirectly affected by the Proposed Action, which includes the proposed Northeast Area Development Alternative and ASR-8 relocation. Direct effects are those that result from physical disturbance of an environmental resource, such as through construction or ground disturbance activities. Indirect effects are those such as impacts to air quality or visual resources that are not the result of a direct physical effect. In accordance with FAA Orders 1050.1F and 5050.4B, those resources that could potentially be affected by the Proposed Action are identified herein. This chapter identifies the geographic areas potentially affected by the Proposed Action, identifies environmental resources that would not be affected by the Proposed Action, and documents existing conditions for potentially affected resources.

3.1 Identification and Description of Study Areas

IWA is located in the East Valley of the Phoenix Metropolitan Area in the southeast corner of the City of Mesa, Arizona, approximately 25 miles southeast of Phoenix (Exhibit 1-1). It is within the Mesa Gateway Area, which is a 32-square-mile area in southeast Mesa containing universities, freeways, railroads, and planned developments designed to form an economic engine for southeast Mesa and the surrounding region. IWA is bounded by East Ray Road to the north, South Ellsworth Road to the east, East Pecos Road to the south, and South Sossaman Road to the west. Separate study areas were identified for the Northeast Area Development Alternative and the RTN7 Site Alternative, since these locations are separated by approximately 7 miles.

3.1.1 NORTHEAST AREA DEVELOPMENT ALTERNATIVE

The Proposed Project Area (PPA) for the Northeast Area Development Alternative includes those areas with the potential to be indirectly impacted by the Proposed Action. The Ground Disturbance Area (GDA) for the Northeast Area Development Alternative marks the boundary of physical disturbance within the PPA that would be affected by the relocation of the passenger terminal. The GDA is located primarily within existing IWA property, except for the portion northeast of IWA where relocation of the Powerline Floodway and the Ellsworth Channel would occur. This land is currently leased from the ADOT to the City of Mesa and subleased to PMGAA. The land is to be purchased by the City of Mesa in 2018, and it would be leased as IWA property as part of the Proposed Action (**Exhibit 3-1**). Additionally, right-of-way utility improvements along Ellsworth Road, Ray Road, and Hawes Road would occur outside of the existing IWA boundary.

The PPA was identified based on existing physical features and boundaries surrounding IWA. The northern PPA boundary is formed by SR 202 through the interchange with SR 24 to the northeast. The eastern boundary is marked by the point where Williams Field Road begins at the intersection with South Crimson

Road. The southern boundary of the PPA is formed by East Pecos Road. The western PPA boundary is formed by South Power Road (Exhibit 3-1). The PPA was established to identify potential indirect impacts involving resources that may extend outside the GDA. The following environmental categories were evaluated within the PPA for the Northeast Area Development Alternative: Department of Transportation Act, Section 4(f); land use; noise and noise-compatible land uses; socioeconomics, environmental justice, and children's environmental health and safety risks; visual effects; and water resources. Since data related to air quality and climate is more regional in scope, the boundary used for the evaluation of these categories was the Phoenix-Mesa metropolitan area. All other environmental categories were evaluated within the GDA.

3.1.2 RTN7 SITE ALTERNATIVE

The GDA for the RTN7 Site Alternative is located approximately 7 miles southeast of IWA and 0.45 miles east of North Schnepf Road, and it represents the area of physical disturbance associated with relocation of the ASR-8 (**Exhibit 3-2**). Land within the RTN7 Site Alternative GDA is managed by the BLM and leased to the Arizona Army National Guard (AZ ARNG). It includes adequate space for the proposed relocation of the ASR-8 tower, access roadway, and all required utility infrastructure.

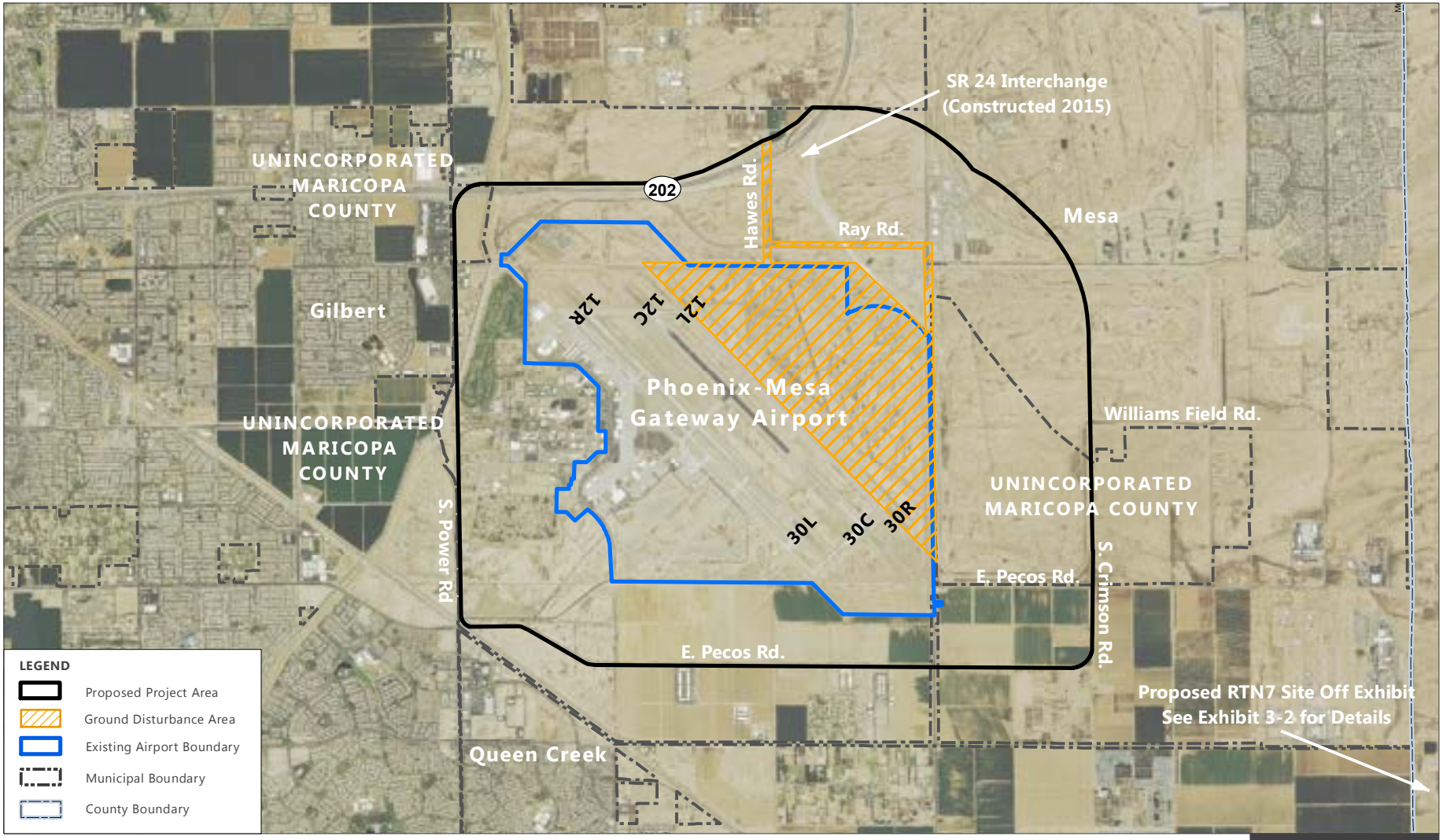
The RTN7 Site Alternative PPA encompasses a one-quarter-mile buffer around the GDA. As with the Northeast Area Development Alternative, the PPA for the RTN7 Site Alternative was established to allow identification of potential indirect impacts involving resources that may extend outside the GDA. The following environmental categories were evaluated within the PPA for the RTN7 Site Alternative: Department of Transportation Act, Section 4(f); land use; noise and noise-compatible land uses; socioeconomics, environmental justice, and children's environmental health and safety risks; visual effects; and water resources. Since data related to air quality and climate is more regional in scope, the boundary used for the evaluation of these categories was the Phoenix-Mesa metropolitan area. All other environmental categories were evaluated within the GDA.

3.2 Environmental Resources Not Affected

Of the environmental impact categories defined in FAA Order 1050.1F, the following resources have been eliminated from further consideration because they do not exist within the Proposed Project Area or would otherwise not be affected by the Proposed Action:

- Coastal Resources. There are no coastal resources within the study areas. The nearest coastal area is the Gulf of California, which is located over 160 miles to the southwest in Mexico.
- Farmlands. There are no prime or unique farmlands within the Direct Study Area. The nearest farmlands are located south of IWA.
- Wild and Scenic Rivers. There are no Wild and Scenic Rivers within the study areas. The nearest designated section of a Wild and Scenic River is the Verde River, in the Mazatzal Wilderness, which is located over 25 miles north of the study areas.[1]

[1] U.S. Department of the Interior, National Park Service, https://www.nps.gov/ncrc/programs/rtca/nri/states/az.html (accessed July 29, 2016).



SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); U.S. Department of Agriculture, National Agriculture Imagery Program, 2013 (Aerial Imagery), 2013; U.S Census Bureau, 2016 TIGER/Line Shapefiles, GIS Data, 2016 (base map layers).
PREPARED BY: Ricondo & Associates, Inc., March 2016.

EXHIBIT 3-1

NORTH 0 5,000 ft.

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Study Areas - Northeast Area Development Alternative

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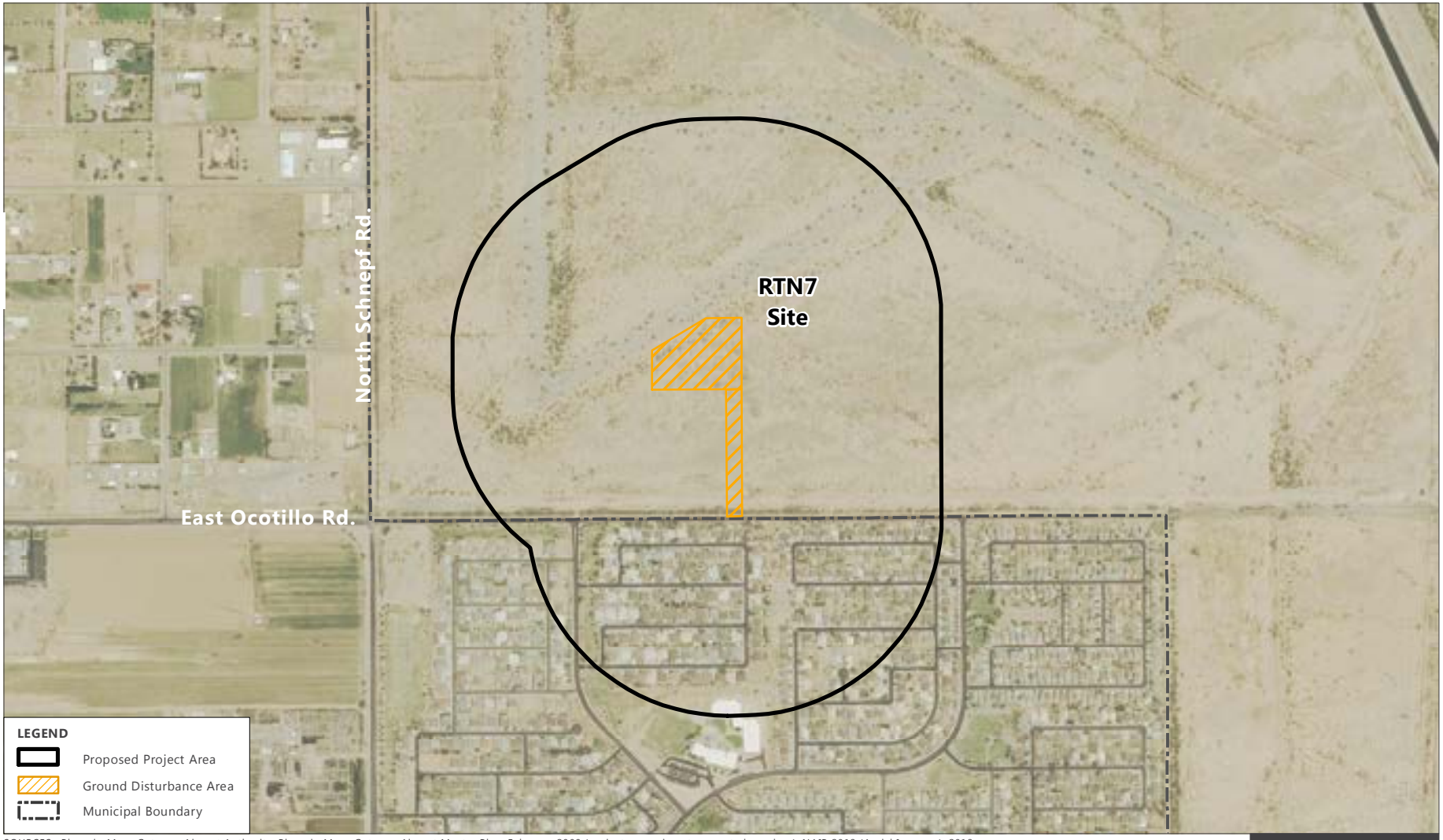

SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); NAIP 2013 (Aerial Imagery), 2013.
PREPARED BY: Ricondo & Associates, Inc., March 2016.

EXHIBIT 3-2

NORTH 0 1,000 ft.

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Study Areas - RTN7 Site Alternative

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3.3 Air Quality

3.3.1 REGULATORY SETTING

Under the federal Clean Air Act (CAA), as amended, the U.S. Environmental Protection Agency (EPA) has developed National Ambient Air Quality Standards (NAAQS) for the following air pollutants, referred to as criteria air pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), particulate matter up to 10 micrometers in size (PM_{10}), and particulate matter smaller than 2.5 micrometers in size ($PM_{2.5}$). The CAA defines the need to establish two standards – primary standards, which define maximum concentrations of criteria air pollutants to protect public health, and secondary standards, which define maximum concentrations of criteria air pollutants to protect public welfare.[2]

Individual states are required to identify general geographic areas where the NAAQS for these criteria air pollutants are not met. The EPA designates such areas as nonattainment areas and qualifies the nonattainment status by severity of nonattainment ranging from marginal to moderate to serious to extreme nonattainment. Areas that were in nonattainment but have since attained the NAAQS are considered to be an attainment/maintenance area for several years before being designated as being in attainment. A state with a nonattainment or maintenance area must prepare a State Implementation Plan (SIP) that describes the programs and requirements that the state will implement to attain or maintain the NAAQS by the deadlines specified in the CAA, as well as subsequent related documents promulgated by the EPA.

The CAA requires federal agencies to ensure that actions proposed to occur in a designated nonattainment area, or a maintenance area, conform to the appropriate SIP, also known as General Conformity. The General Conformity Rule establishes the *de minimis* levels by which a proposed action may show that it complies with the SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards. Pursuant to FAA Order 1050.1F, a proposed aviation-related project would generally be considered in compliance if it would not cause emissions that exceed NAAQS *de minimis* levels or increase the severity of an existing violation. Federal, state, and local agencies involved in the implementation of the CAA are identified in **Table 3-1**.

[2] Title 40 CFR Part 50, *National Primary and Secondary Ambient Air Quality Standards*, Section 2(b).

Table 3-1: Federal, State, and Local Agency Roles in CAA Implementation

ROLE	FEDERAL AGENCY	STATE AGENCY	LOCAL AGENCY
Policy and regulations to protect air quality	EPA establishes the CAA and promulgates the NAAQS	ADEQ enforces overall state air quality regulations	MCAQD enforces local air quality regulations
Plans to meet NAAQS	EPA approves SIPs	ADEQ formulates and maintains SIPs	MAG supports ADEQ in preparation and implementation of SIPs for Maricopa County
Permits		ADEQ issues air permits to facilities for regulated pollutants	MCAQD has delegated authority from the EPA to issue permits for stationary sources that are below the regulatory thresholds defined in Title V[1/] of the CAA but are not considered exempt
Monitor air quality	EPA tracks areas in nonattainment with the NAAQS	ADEQ monitors air quality conditions throughout the state	MCAQD monitors air quality conditions in the county

NOTES:

ADEQ—Arizona Department of Environmental Quality

CAA—Clean Air Act

EPA—U.S. Environmental Protection Agency

MAG—Maricopa Association of Governments

MCAQD—Maricopa County Air Quality Department

NAAQS—National Ambient Air Quality Standards

SIPs—State Implementation Plans

1/ Title V of the Clean Air Act requires major sources of air pollutants to obtain and operate in compliance with an operating permit.

SOURCES: City of Phoenix, April 2016; U.S. Environmental Protection Agency, webpage: Operating Permits Issued under Title V of the Clean Air Act, https://www.epa.gov/title-v-operating-permits (accessed June 24, 2016); Arizona Department of Environmental Quality, webpage: Air Quality Division: Permits: Title V Permit Tracking, http://legacy.azdeq.gov/environ/air/permits/title_v/index.html (accessed June 24, 2016); and Maricopa County Air Quality Department, webpage: About Us, https://www.maricopa.gov/aq/about/ (accessed June 24, 2016).

PREPARED BY: Ricondo & Associates, Inc., June 2016.

3.3.2 AFFECTED ENVIRONMENT

Air quality effects are considered on a regional scale; thus, consistent with the EPA's designation of nonattainment areas, the affected environment for air quality considers conditions in Maricopa County. IWA is located in the Salt River Valley, which has a desert climate with low rainfall and low relative humidity. The Salt River Valley is at an elevation of approximately 1,100–1,200 feet above sea level (ASL) and is surrounded by mountains with maximum elevations ranging between 2,300 and 4,000 feet ASL. Deterioration of air quality is exacerbated by temperature inversions that typically occur in the winter when cold air sinks and gets trapped under a layer of warmer air. An inversion traps air pollutants close to the ground.

The Arizona Department of Environmental Quality (ADEQ) operates 23 air quality monitoring sites in the Phoenix metropolitan area that measure criteria air pollutants. These stations, their locations relative to the Northeast Area Development Alternative, and a tabulation of the most recent monitoring data are provided in **Table 3-2**. Notably, with one exception, these values are within (i.e., below) the NAAQS. The exception is O_3 levels recorded at the Falcon Field Station. However, because O_3 is a regional pollutant, the elevated levels are ubiquitous throughout the entire Phoenix airshed.

Based upon compliance with the NAAQS, areas are designated by the EPA as (1) Attainment when they meet the standards, (2) Nonattainment when they do not meet the standards, or (3) Maintenance when they are in transition from Nonattainment to Attainment.

The current attainment/nonattainment designations for the Phoenix-Mesa metropolitan area are listed in **Table 3-3**. As shown, the area (including IWA) is in "attainment" for Pb, NO_2, SO_2, and $PM_{2.5}$. The "attainment" designations signify that pollutant levels are either below or meet the NAAQS for these criteria pollutants. For CO, the area is designated as Attainment/Maintenance, indicating a transition period from formerly Nonattainment to Attainment. However, the Phoenix-Mesa metropolitan area is currently designated as a Nonattainment Area for O_3 and PM_{10}. These designations signify that violations of the NAAQS for these pollutants have occurred within the airshed in the past.

In accordance with the CAA, a state with a designated Nonattainment and/or Attainment/Maintenance area must prepare a State Implementation Plan (SIP) that describes the programs and requirements that will be implemented to attain the NAAQS by specified deadlines—established by the EPA. In Arizona, the ADEQ, Maricopa County Air Quality Department (MCAQD), and MAG share in the responsibility of developing the SIP for the Phoenix area. The Phoenix-area SIPs for O_3 and PM_{10} and the CO Maintenance Plan are listed in **Table 3-4**.

Table 3-2: Air Monitoring Data in the IWA Area (2013–2014)

SITE NAME	LOCATION, DISTANCE, AND DIRECTION FROM NOTHEAST AREA DEVELOPMENT ALTERNATIVE	POLLUTANT	AVERAGING PERIOD	NAAQS	2013	2014	EXCEEDS NAAQS
310 S Brooks, Mesa	12 miles northwest	$PM_{2.5}$	Annual	15.0 µg/m^3	5.7	8.3	No
			24-hour (98th percentile)	35 µg/m^3	13	19	No
		PM_{10}	24-hour	150 µg/m^3	151	155	Yes
		CO	8-hour	9 ppm	1.2	1.4	No
			1-hour	35 ppm	1.8	1.9	No
1645 E Roosevelt St Central Phoenix Station	23 miles northwest	SO_2	24-hour	0.14 ppm	0.004	0.003	No
			1-hour (99th percentile)	0.075 ppm	0.008	0.007	No
		NO_2	Annual	0.053 ppm	0.020	0.019	No
			1-hour (98th percentile)	0.100 ppm	0.060	0.060	No
4530 E McKellips Road, Falcon Field Station, Mesa	9 miles north	O_3	8-hour	0.075 ppm	0.082	0.088	Yes
3955 E Superstition Boulevard, Apache Junction	10 miles north	0_3	8-hour	0.075 ppm	0.074	0.074	No
		$PM_{2.5}$	Annual	15.0 µg/m^3	5.5	5.8	No
			24-hour (98th percentile)	35 µg/m^3	13	12	No
		PM_{10}	24-hour	150 µg/m^3	151	99	No

NOTES:

Indicates highest measured for the year, unless otherwise noted.

ppm = parts per million, µg/m3 = micrograms/cubic meter

SOURCE: Environmental Protection Agency, *AIRData–Monitor Data Queries*, 2016.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

Table 3-3: Attainment/Nonattainment Designations

POLLUTANT	STATUS[1]
Carbon monoxide (CO)	Attainment/Maintenance
Lead (Pb)	Attainment
Nitrogen dioxide (NO_2)	Attainment
Ozone (O_3), 8-hour	Nonattainment/Marginal
Particulate matter (PM_{10})	Nonattainment/Serious
Particulate matter ($PM_{2.5}$)	Attainment
Sulfur dioxide (SO_2)	Attainment

SOURCE: Environmental Protection Agency, *The Green Book Nonattainment Areas for Criteria Pollutants*, 2016.
PREPARED BY: KB Environmental Sciences, Inc. March 2016.

Table 3-4: Applicable State Implementation Plans

POLLUTANT	DOCUMENT TITLE	COMMENTS
Carbon monoxide (CO)	MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area MAG 2003 Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area	Maintenance plan control measures; emissions inventories; maintenance demonstration; monitoring network and verification of continued attainment; contingency provisions; transportation conformity budget; and subsequent maintenance plan revisions.
Ozone (O3)	MAG 2007 Eight-Hour Ozone Plan for the Maricopa Nonattainment Area	This Plan demonstrated attainment of the 1997 8-hour ozone standard assuming emission reduction credits for seven attainment measures.
Particulate matter (PM_{10})	Revised MAG 1999 Serious Area Particulate Plan for PM_{10} MAG 2012 Five Percent Plan for PM_{10} for the Maricopa County Nonattainment Area	The plan is required to include Best Available Control Measures, which are designed to achieve the maximum degree of emissions reduction from a PM_{10} source.

SOURCE: KB Environmental Sciences, March 2016.
PREPARED BY: KB Environmental Sciences, March 2016.Biological Resources

3.4 Biological Resources

A Biological Resources Technical Memorandum was prepared by AMEC for the Northeast Area Development Alternative PPA in conjunction with this EA, and it can be found in **Appendix C**. This technical memorandum includes records and database research, along with site investigations of the Northeast Area Development Alternative PPA, conducted by AMEC scientists on August 26, 2013 and on October 3, 2013.

In December 2014, a Biological Resources Technical Memorandum was developed for the RTN7 Site Alternative GDA in conjunction with this EA by AMEC, and it can be found in Appendix C. This technical memorandum includes records and database research, along with a site investigation of the RTN7 Site Alternative GDA, conducted by AMEC scientists on October 15, 2014.

3.4.1 REGULATORY SETTING

3.4.1.1 Federally Protected Species and Habitat

The Endangered Species Act, 16 U.S.C. 1531 *et seq*. (ESA), requires all federal agencies to seek to conserve threatened and endangered species. Section 7(a)(2) requires federal agencies, in consultation with the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS), to ensure that any federal action authorized, funded, or carried out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.

The Bald and Golden Eagle Protection Act, 16 U.S.C. 668 *et seq*., protects bald and golden eagles from the unauthorized capture, purchase, or transportation of the birds, nests, or eggs. The Act is administered by the USFWS.

The Fish and Wildlife Coordination Act, 16 U.S.C. 661-667d, requires that federal agencies consult with the USFWS, NMFS, and appropriate state fish and wildlife agencies regarding the conservation of wildlife resources when proposed federal projects may result in control or modification of the water of any stream or other water body.

3.4.1.2 State Protected Species and Habitat

The mission of the Arizona Game and Fish Department (AGFD) Nongame Branch is to prevent species from becoming endangered in a cost-effective manner, as well as to reintroduce species that have been extirpated from the state. Specific emphasis is placed on identifying and managing the wildlife and habitat of greatest conservation need, or species that are no longer abundant and face increasing threats from habitat degradation, disease, introduction of nonnative species, and climate change.[3]

[3] Arizona Game and Fish Department, http://www.azgfd.gov/w_c/conservation/EndangeredWildlifeConservation.shtml (accessed March 10, 2016).

The Arizona Department of Agriculture (ADA) enforces the Arizona Native Plant Law, under which plants cannot be removed from any lands, public or private, without a permit from the ADA.[4]

3.4.1.3 Migratory Birds

The Migratory Bird Treaty Act, 16 U.S.C. 703 *et seq*. (MBTA), protects migratory birds by prohibiting intentional taking, selling, or other activities that would harm migratory birds, eggs, or nests (such as removal of an active nest or nest tree), unless authorized under a special permit from the USFWS. Nonnative species, such as the rock pigeon (*Columba livia*) and house sparrow (*Passer domesticus*), are not protected by the MBTA.

3.4.2 AFFECTED ENVIRONMENT

3.4.2.1 Northeast Area Development Alternative

Vegetation

The habitat within the Northeast Area Development Alternative GDA and surrounding parcels supports a limited number of biological resources, because most of the area is extensively developed or disturbed. Much of the vegetation is typical of previously disturbed desert landscape, such as the dense stands of burrobush (*Hymenoclea salsola*), desert broom (*Baccharis sarothroides*), Russian thistle (*Salsola tragus*), and other ruderal species in areas where indications of mechanical surface disturbance was prevalent. One section in the northeast portion of the Northeast Area Development Alternative GDA appears to have been less impacted by ground disturbance, and the vegetation in that area more closely reflects the undisturbed portions of the surrounding landscape, with stands of creosote bush (*Larrea tridentata*), mesquite (*Prosopis sp.*), and crucifixion thorn (*Castela emoryi*).[5]

Wildlife

Wildlife observed within the Northeast Area Development Alternative GDA include the following: kangaroo rat (*Dipodyms sp.*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), rock squirrel (*Spermophilus variegatus*), round-tailed ground squirrel (*Xerospermophilus tereticaudus*), zebra-tailed lizard (*Callisaurus draconoides*), desert spiny lizard (*Sceloporus magister*), regal horned lizard (*Phrynosoma solare*), tiger whiptail (*Aspidoscelis tigris*), western diamondback (*Crotalus atrox*), lesser nighthawk (*Chordeiles acutipennis*), mourning dove (*Zenaida macroura*), American kestrel (*Falco sparverius*), Gambel's quail (*Lophortyx gambelii*), and a pair of western burrowing owls (*Athene cunicularia hypugaea*) and their burrow. One nest, likely to have been constructed by a mid-sized or larger hawk, was noted in a concrete pipe in the northern portion of the Northeast Area Development Alternative GDA. However, no signs of recent nest occupation were observed.[6]

Western burrowing owls are commonly found near agricultural lands and urban development. The USFWS considers the western burrowing owl to be a Bird of Conservation Concern (BCC). BCC are species that are not currently protected under the ESA. However, without additional conservation actions, they are likely to

[4] Arizona Department of Agriculture, https://agriculture.az.gov/protected-arizona-native-plants (accessed March 10, 2016).

[5] AMEC, *Biological Resources – Affected Environment Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, October 2013.

[6] Ibid.

become candidates for listing. The western burrowing owl is not currently considered a candidate species for listing under the ESA. As a migratory nongame bird, the western burrowing owl is protected under the MBTA. A list of all migratory nongame birds with the potential to occur within the Northeast Area Development Alternative PPA can be found in Appendix C.

Endangered, Threatened, and Special Status Species

Utilization of the USFWS Information for Planning and Conservation (IPaC) online resource tool, as well as the AGFD Online Environmental Review Tool, resulted in the identification of two endangered species, one threatened species, and two proposed or candidate species previously recorded as occurring within Maricopa County. **Table 3-5** lists the potential species and their associated habitat. None of these species or habitat was observed during the site investigations conducted by AMEC biologists.

Table 3-5: Threatened and Endangered Species—Northeast Area Development Alternative

SPECIES	SCIENTIFIC NAME	STATUS	HABITAT	OBSERVED WITHIN GDA	OBSERVED WITHIN PPA
BIRDS					
California Least Tern	*Sterna antillarum browni*	Endangered	Coastal areas with sandy gravelly beaches	No	No
Sprague's Pipit	*Anthus spragueii*	Candidate	Open prairie grassland with no shrubs or trees	No	No
Yellow-billed Cuckoo	*Coccyzus americanus*	Threatened	Wooded areas with dense cover and water nearby	No	No
FISH					
Roundtail Chub	*Gila robusta*	Proposed Threatened	Rivers and streams with deep pools and vegetated banks	No	No
MAMMALS					
Lesser Long-nosed Bat	*Leptonycteris curasoae yerbabuenae*	Endangered	Desert scrub with saguaro cacti and nearby caves or mines for roosting	No	No

SOURCE: U.S. Fish and Wildlife Service, *IPaC Trust Resource Report – Northeast Area Development Alternative*, January 11, 2016.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

Protected Native Plants

Eight plants protected under the Arizona Native Plant Law were observed within the Northeast Area Development Alternative GDA, including the following: velvet mesquite (*Prosopis velutina*), blue palo verde (*Parkinsonia florida*), foothills palo verde (*Parkinsonia aculeate*), saguaro (*Carnegiea gigantea*), chain-fruit cholla (*Opuntia fulgida*), barrel cactus (*Ferocactus sp.*), crucifixion thorn (*Koeberlinia spinose*), and ocotillo (*Fouquieria splendens*).[7]

[7] AMEC, *Biological Resources – Affected Environment Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, October 2013.

3.4.2.2 RTN7 Site Alternative

Vegetation

The habitat within the RTN7 Site Alternative GDA is characterized by plant species of the Lower Colorado River Valley subdivision of the Sonoran Desert scrub biotic community, and it generally consists of previously disturbed desert lands to the north and east, the Central Arizona Project Canal and ephemeral drainages to the east, and agricultural fields to the southwest. Species observed within the RTN7 Site Alternative GDA include the following: creosote bush (*Larrea tridentata*), velvet mesquite (*Prosopis velutina*), woolly tidestromia (*Tidestromia lanuginosa*), turpentine bush (*Ericameria laricifolia*), burrobush (*Hymenocleasalsola*), desert broom (*Baccharis sarothroides*), chinchweed (*Pectis papposa*), devil's claw (*Proboscidea parviflora*), triangle leaf bursage (*Ambrosia deltoidea*), canyon ragweed (*Ambrosia ambrosioides*), desert globe mallow (*Sphaeralcea ambigua*), red brome (*Bromus rubens*), khakiweed (*Alternanthera pungens*), and redstem stork's bill (*Erodium cicutarium*).[8]

Wildlife

Species observed within the RTN7 Site Alternative GDA were the kangaroo rat (*Dipodyms* sp.) and desert spiny lizard (*Sceloporus magister*).[9] Pursuant to the Migratory Bird Treaty Act of 1918, it is illegal to harass or kill a nongame migratory bird without a valid federal permit. A list of migratory nongame birds with the potential to occur within the RTN7 Alternative PPA can be found in Appendix C.

Endangered, Threatened, and Special Status Species

Utilization of the USFWS IPaC online resource tool, as well as the AGFD Online Environmental Review Tool, resulted in the identification of one endangered species, two threatened species, and one proposed threatened species with the potential to occur within the RTN7 Site Alternative GDA. **Table 3-6** lists the potential species and associated habitat. None of these species or habitat was observed during the site investigation conducted by AMEC biologists.[10]

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8 AMEC, *Biological Resources – Affected Environment Airport Surveillance Radar (ASR) Site Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, December 2014.

9 Ibid.

10 Ibid.

Table 3-6: Threatened and Endangered Species—RTN7 Site Alternative

SPECIES	SCIENTIFIC NAME	STATUS	HABITAT	OBSERVED WITHIN GDA	OBSERVED WITHIN PPA
BIRDS					
Yellow-billed Cuckoo	*Coccyzus americanus*	Threatened	Wooded areas with dense cover and water nearby	No	No
FISH					
Roundtail Chub	*Gila robusta*	Proposed Threatened	Rivers and streams with deep pools and vegetated banks	No	No
MAMMALS					
Lesser Long-nosed Bat	*Leptonycteris curasoae yerbabuenae*	Endangered	Desert scrub with saguaro cacti and nearby caves or mines for roosting	No	No
REPTILES					
Northern Mexican Garter snake	*Thamnophis eques megalops*	Threatened	River riparian woodlands and forests; wetlands with highly organic, alkaline soils	No	No

SOURCE: U.S. Fish and Wildlife Service, *IPaC Trust Resource Report – RTN6 Alternative*, January 11, 2016.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

Protected Native Plants

Plants protected by ADA observed within the RTN7 Site Alternative GDA include the following: velvet mesquite (*Prosopis velutina*), palo verde (*Parkinsonia sp.*), saguaro (*Carnegiea gigantea*), chain-fruit cholla (*Opuntia fulgida*), barrel cactus (*Ferocactus sp.*), crucifixion thorn (*Koeberlinia spinose*), and ocotillo (*Fouquieria splendens*).[11]

3.5 Climate

3.5.1 REGULATORY SETTING

Greenhouse gases (GHGs), known to trap heat in the earth's atmosphere, include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), O_3, and water vapor.[12] GHGs result primarily from combustion of fuels, and there is a direct relationship between fuel combustion and GHG emissions. The General Accounting Office reports that domestic aviation accounts for about 3 percent of total domestic CO_2 emissions.

[11] AMEC, *Biological Resources – Affected Environment Airport Surveillance Radar (ASR) Site Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, December 2014.

[12] U.S. Environmental Protection Agency, Overview of Greenhouse Gases, http://www3.epa.gov/climatechange/ghgemissions/gases.html (accessed January 20, 2016).

At the time of writing this EA, no federal standards have been established for aviation-related GHG emissions. Pending formal guidance, CEQ proposes consideration of opportunities to reduce GHG emissions and to adapt to climate change as part of the evaluation of the Proposed Action pursuant to NEPA.

3.5.2 AFFECTED ENVIRONMENT

Climate change due to GHG emissions is a global phenomenon; therefore, the affected environment is the global environment.[13] The *Arizona Climate Change Action Plan*, released in 2006 by ADEQ, identified the two largest sources of GHGs in Arizona: transportation (39 percent) and electricity production (38 percent). With a goal of reducing statewide GHG emissions to 2000 levels by 2020, and 50 percent below 2000 levels by 2040, recommended actions for the transportation sector include promoting transit-oriented development, promoting multimodal transit, and increasing the use of biodiesel.

The City of Mesa has emergency response strategies in place for severe storm and monsoon preparedness, which are made available to the Mesa community on the city's website.[14]

3.6 Department of Transportation Act, Section 4(f) and Land and Water Conservation Fund Act, Section 6(f) Resources

3.6.1 REGULATORY SETTING

Section 4(f) provides that the Secretary of Transportation may approve a transportation program or project that requires the use of any publicly owned land from a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance, or land from any publicly or privately owned historic site of national, state, or local significance, only if there is no feasible and prudent alternative to the use of such land and the program or 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 of 1965 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.

3.6.2 AFFECTED ENVIRONMENT

3.6.2.1 Northeast Area Development Alternative

The Northeast Area Development Alternative GDA does not contain any land that is considered a park or is used for recreational purposes. In addition, portions of this GDA have restricted public access due to safety and security measures associated with IWA operations. There are no existing or proposed publicly owned

[13] As explained by the EPA, "greenhouse gases, once emitted, become well mixed in the atmosphere, meaning U.S. emissions can affect not only the U.S. population and environment, but other regions of the world as well. Likewise, emissions in other countries can affect the United States." (U.S. Environmental Protection Agency, *Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act; Final Rule,* December 15, 2009 [Federal Register, vol. 74, no. 239])

[14] City of Mesa, http://www.mesaaz.gov/residents/emergency (accessed March 10, 2016).

parks, recreational areas, or wildlife or waterfowl refuges, or any historic sites eligible for the National Register of Historic Places (NRHP) within the Northeast Area Development Alternative GDA.

Within the Northeast Area Development Alternative PPA is the Toka Sticks Golf Club, which is an 18-hole public golf course located just west of South Sossaman Road. In addition, the ASU-Polytechnic Campus has a fitness complex just south of the Toka Sticks Golf Club. Neither of these properties used land and water conservation funds, so there are no Section 6(f) resources within the PPA.[15]

According to the NRHP database, three archaeological sites, three potential historic sites and four potential historic structures are located within the Northeast Area Development Alternative PPA. A historic site is a location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archeological value, regardless of the value of any existing structure. An historic structure is a functional construction made for purposes other than creating shelter, for example, a bridge. The three archaeological sites are the Midvale, Will E. Coyote, and Southwest Germann archaeological sites. Located on the ASU-Polytechnic Campus, the historic sites include: the Housing Storage Supply Warehouse, the Civil Engineering Maintenance Shop, and a flagpole. The historic structures include: a demountable hangar located on the western portion of IWA property, north of the existing terminal complex; a water pump station and water tower located on the ASU-Polytechnic Campus; and ammo bunkers S-1007 and S-1008, located south of the ASU-Polytechnic Campus.[16]

3.6.2.2 RTN7 Site Alternative

The RTN7 Site Alternative GDA does not contain any land purchased with LWCF Act funds.[17] In addition, this GDA is restricted from public access due to safety and security reasons, since it is part of the Rittenhouse Auxiliary Airfield (RAAF).[18]

There are no existing or proposed parks, recreational areas, publicly owned wildlife or waterfowl refuges, or any historic sites eligible for the NRHP within the RTN7 Site Alternative GDA or PPA. There are also no Section 6(f) resources as this property has not used land or water conservation funds.

3.7 Hazardous Materials, Solid Waste, and Pollution Prevention

This section provides a discussion of hazardous materials, existing contamination, and waste streams present in the GDA. This section is organized to discuss:

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15 National Park Service, *Land & Water Conservation Fund, Detailed Listing of Grants*, http://waso-lwcf.ncrc.nps.gov/public/index.cfm, (accessed March 28, 2016).

16 National Register of Historic Places, *Integrated Resource Management Applications Portal, National Register of Historic Places Geodatabase*, https://irma.nps.gov/App/Reference/Profile/2210280/ (accessed August 11, 2015).

17 National Park Service, *Land & Water Conservation Fund, Detailed Listing of Grants*, http://waso-lwcf.ncrc.nps.gov/public/index.cfm (accessed March 28, 2016).

18 Federal Aviation Administration, ASR-11 Program Office, *Phoenix-Mesa Gateway Airport ASR-8 Surveillance Radar, Addendum,* February 27, 2014.

- Hazardous materials
- Solid waste
- Pollution prevention measures

3.7.1 HAZARDOUS MATERIALS

3.7.1.1 Regulatory Setting

Many laws regulate the handling and disposal of hazardous materials, chemicals, substances, and waste. **Table 3-7** lists the regulations that apply to the Proposed Action.

Table 3-7: Regulations Pertaining to the Management of Hazards and Hazardous Materials

----- FEDERAL -----
Comprehensive Environmental Response, Compensation & Liability Act (CERCLA) – Regulation of former and new waste disposal and spill sites. Established the "Superfund" program and the National Priorities List (NPL).
Resource Conservation & Recovery Act (RCRA)—Regulation of the generation, transportation, storage, treatment, and disposal of hazardous materials.
Clean Water Act (CWA)—Regulation of discharges and spills of pollutants (including hazardous materials) to surface and ground-waters.
Safe Drinking Water Act (SDWA)—Regulation of discharges of pollutants to underground aquifers.
Clean Air Act (CAA)—Regulation of discharges of air emissions (including hazardous air pollutants) to the ambient (i.e., "outside") air.
Hazardous Materials Transportation Act (HMTA)—Regulation of the transport of hazardous materials by motor vehicles, marine vessels, and aircraft.
Emergency Planning & Community Right to Know Act (EPCRA)—Regulation of facilities that use hazardous materials in quantities that require reporting to emergency response officials.
----- STATE -----
Arizona Administrative Code Title 18, Chapter 8 Hazardous Waste Management—Regulates the disposal and management of hazardous waste within the State of Arizona.
----- LOCAL -----
Maricopa County Health Code Chapters 1 & 2—Regulates nonhazardous solid waste, nonhazardous liquid waste, and bio-hazardous medical waste transportation vehicles, refuse containers, chemical toilets, and construction debris landfills within Maricopa County.

SOURCE: Ricondo & Associates, Inc., August 2014.
PREPARED BY: Ricondo & Associates, Inc., August 2014.

Hazardous materials are controlled by a number of federal laws and regulations, most of which are promulgated by the EPA. The two statutes most applicable to airport projects are the Resource Conservation and Recovery Act (RCRA), as amended by the Federal Facilities Compliance Act of 1992, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended (also known as Superfund). RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for cleanup of any release of a hazardous substance (excluding petroleum) in the environment. In addition to RCRA and CERCLA, the Hazardous Materials Transportation Act (HMTA) and the Emergency Planning & Community Right to Know Act (EPCRA) serve as guiding principles governing the storage, use, and transportation of hazardous and other regulated materials from their time of origin to their ultimate disposal. The recovery and cleanup of environmental contamination resulting from the accidental or unlawful release of these materials and substances are also governed by these regulations.

At the state level, the ADEQ Waste Programs Division implements federal and state hazardous waste management laws in the State of Arizona. The Waste Programs Division is responsible for effectively implementing standards for the safe generation, management, treatment, storage, transport, and disposal of hazardous waste.

At the local level, the Maricopa County Department of Emergency Management is responsible for regulating hazardous materials, hazardous waste, and USTs county-wide. The Environmental Services Branch of the Pinal County Public Works Department ensures the safe management, treatment, and disposal of hazardous waste within Pinal County. The Flood Control District of Maricopa County has jurisdiction over the management of potential sources of surface and groundwater contamination, such as the cleanup of UST and AST spill sites. USTs are managed in accordance with International Fire Code regulations.

3.7.1.2 Affected Environment

Northeast Area Development Alternative

A Hazardous Materials Technical Memorandum was developed for the Northeast Area Development Alternative GDA in conjunction with this EA by AMEC. This technical memorandum includes a literature and database review, along with a site investigation, conducted by AMEC scientists on August 26, 2013.

Activities and facilities that involve the use of hazardous materials include the fueling, servicing, and repair of aircraft, ground support equipment (GSE), and motor vehicles; the operation and maintenance of the airfield, main terminal complex, and passenger concourses; and a range of other special purposes connected with commercial aviation (e.g., rental car and air cargo facilities, navigation and air traffic control functions).

According to information provided by PMGAA, and based on site observations, the following potential hazardous materials and petroleum products are currently stored or in use within the central portion of the Northeast Area Development Alternative GDA: three ASTs containing diesel fuel, small rockets and rocket accessories, and propellants for seat belts and airbags. The three diesel-fueled emergency generators are located in or near structures at the project site: a generator with a 550-gallon belly tank, located within Building 1101 (Communications Transmitter) in the southern portion of the project site; 1,000-gallon AST, located outside of the Radar facility in the central portion of the project site, servicing the generator located within the building; and a generator with a 510-gallon belly tank located within the East Lighting Vault, located in the central portion of the project site. The AST at the Radar facility is located within a concrete secondary containment system. The other two ASTs are located within buildings. The ASTs are shown on

Exhibit 3-3 as sites 1024, 1101, and 1102, respectively. The rockets are stored within one of eight storage lockers at the former munitions magazine storage building, which is leased by Am Safe Company (site 1120). The propellants are stored within two of the former munitions bunkers leased by Orbital Science Corp (site 1111).

Though hazardous materials and petroleum products are known to have been previously stored, used, and/or disposed of during the time the IWA was operating as the former WAFB, no hazardous chemicals, petroleum products, drums, or bulk containers were observed within the Northeast Area Development Alternative GDA during the site investigation, with the exception of the three ASTs containing diesel fuel. No evidence of USTs, such as fill ports, vent pipes, or dispensing pumps, was identified within the Northeast Area Development Alternative GDA during the site investigation.

Based on a review of multiple historical documents and regulatory records, four sites within the Northeast Area Development Alternative GDA were identified as areas previously used for the storage, use, and disposal of hazardous materials and petroleum products (**Exhibit 3-4**).[19] These activities were associated with the operation of the former WAFB from 1941 through 1993 and include a skeet range (SS020), firing range (SS020), hardfill area (LF026), and munitions incinerator (SS034). SS020 has a Declaration of Environmental Use Restrictions (DEUR) due to the potential high level of lead and asbestos-containing material in the soil. The DEUR limits land uses on this site to nonresidential. The ADEQ has determined that exposure pathways at the former WAFB have been eliminated through remediation and restricted use/access provided by the DEUR, and no known human health risk exposure is present at this time.[20]

RTN7 Site Alternative

A Hazardous Materials Technical Memorandum was developed by AMEC for the RTN7 Site Alternative GDA in conjunction with this EA. This technical memorandum includes a literature and database review, along with a site investigation, conducted by AMEC scientists on October 15, 2014.

According to database searches, literature reviews, and an on-site investigation, the RTN7 Site Alternative GDA is largely undeveloped, with the exception of runway pavement used for the RAAF. Based on a review of historical documents and regulatory records, a UST was reported to be located at the RAAF, but it was removed in 1995. No Leaking UST (LUST) records were found, and no obvious indications or evidence of other environmental issues or concerns were identified within the RTN7 Site Alternative GDA.

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19 Partial Deletion sites illustrated on Exhibit 3-4 are EPA National Priorities List (NPL) sites that have cleanup criteria met for portions of the site. Rather than wait until cleanup of the entire site is completed these areas are classified as Partial Deletion Sites by the EPA. https://www.epa.gov/superfund/superfund-npl-deletion-guidance-and-policy.

20 Arizona Department of Environmental Quality, http://www.azdeq.gov/environ/waste/sps/Former_Williams_Air_Force_Base.html (accessed January 6, 2016).

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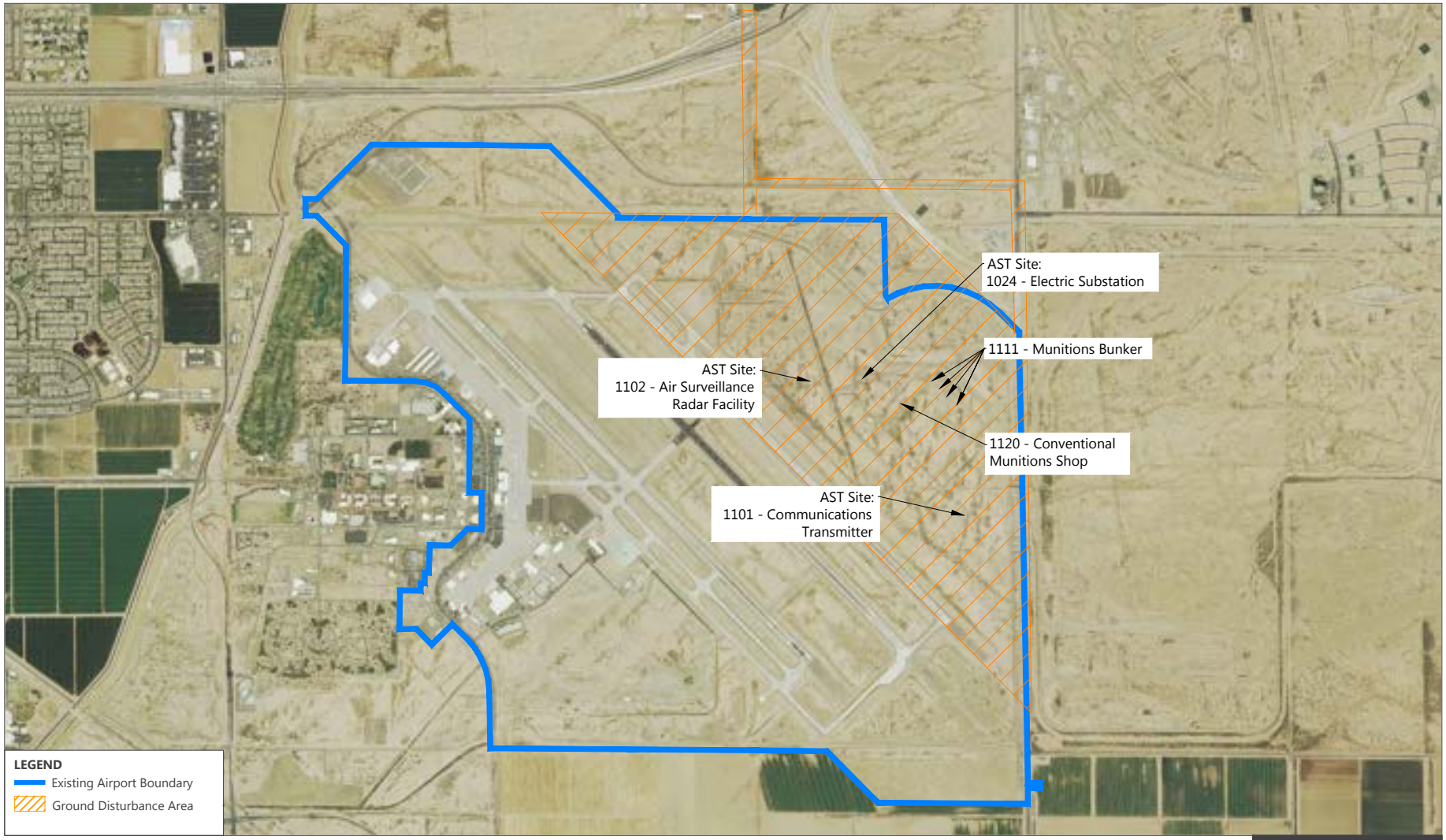

SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (airport property boundary); U.S. Department of Agriculture, National Agriculture Imagery Program, 2013 (Aerial Imagery), 2013; AMEC Environment and Infrastructure, Inc., Technical Memorandum: Hazardous Materials – Affected Environment Northeast Area Development Plan, Phoenix-Mesa Gateway Airport, November 2014.

PREPARED BY: Ricondo & Associates, Inc., March 2016.

EXHIBIT 3-3

Potential Hazardous Material Sites within the Northeast Area Development Alternative Ground Disturbance Area

NORTH 0 3,000 ft.

Drawing: Z:\PMGAA\CAD\IWA_NADP_EA_Affected Environment_20160818.dwg Layout: Ex 3-3_AMEC_ASTs Plotted: Dec 27, 2016, 01:34PM

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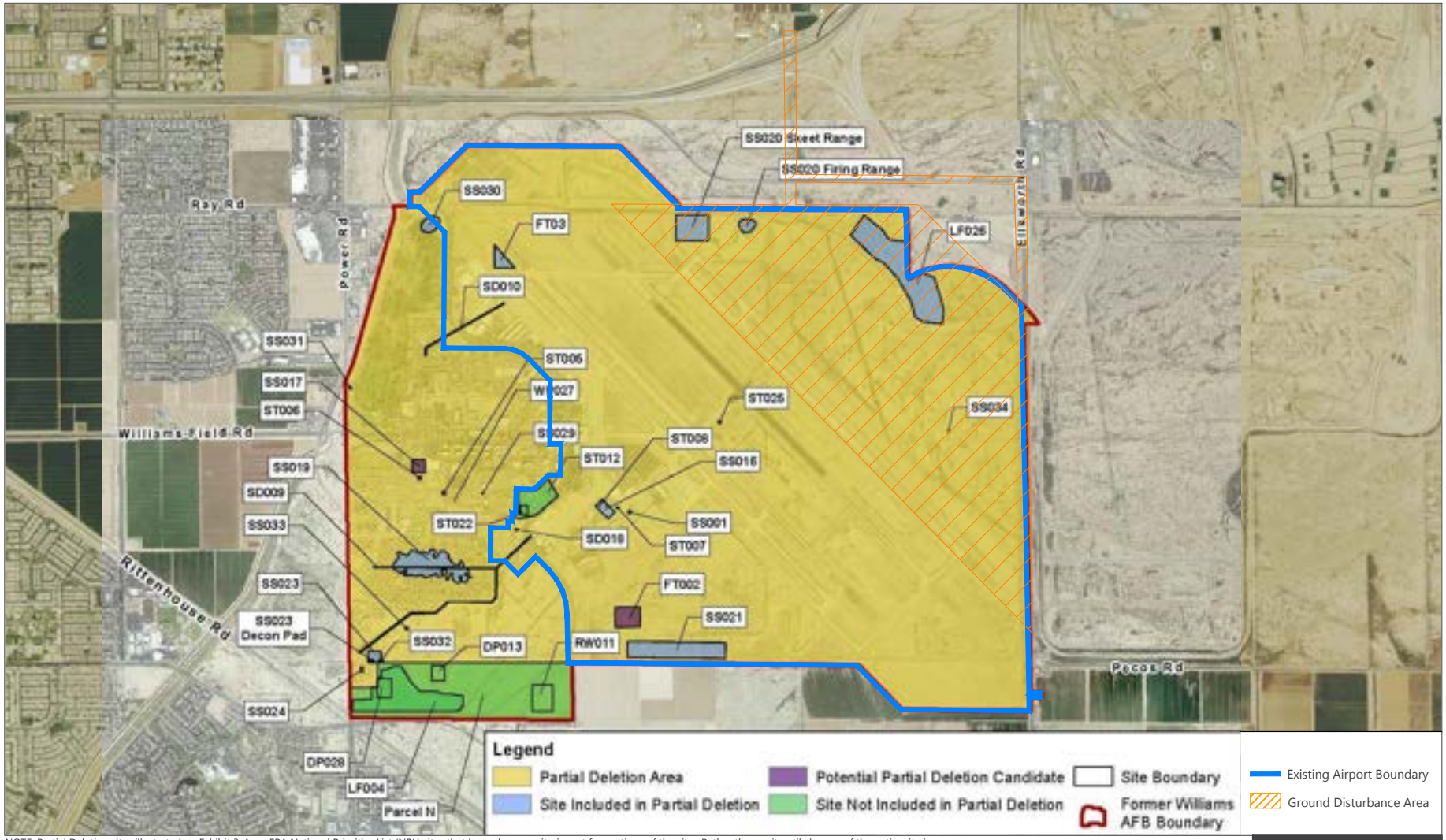

NOTE: Partial Deletion sites illustrated on Exhibit 3-4 are EPA National Priorities List (NPL) sites that have cleanup criteria met for portions of the site. Rather than wait until cleanup of the entire site is completed these areas are classified as Partial Deletion Sites by the EPA. https://www.epa.gov/superfund/superfund-npl-deletion-guidance-and-policy.

SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (airport property boundary); U.S. Department of Agriculture, National Agriculture Imagery Program, 2013 (Aerial Imagery), 2013; AMEC Environmental & Infrastructure Inc., Draft Partial Deletion Documentation Former Williams Air Force Base Mesa, Arizona, September 29, 2014.

PREPARED BY: Ricondo & Associates, Inc., March 2016.

NORTH 0 3,500 ft.

EXHIBIT 3-4

Partial Deletion Sites

Drawing: Z:\PMGAA\CAD\IWA_NADP_EA_Affected Environment_20160818.dwg Layout: Ex 3-4_AMEC_Part_Del Plotted: Dec 27, 2016, 01:34PM

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3.7.2 SOLID WASTE

3.7.2.1 Regulatory Setting

The City of Mesa's Solid Waste Management Department is responsible for enforcing regulations pertaining to solid waste disposal units (i.e., landfills, old burn dumps, etc.) at IWA. The City of Mesa's Environmental Management and Sustainability Department provides various programs and services, such as trash and recycling for area residents and businesses. Solid waste transfer and waste tire recycling services within Maricopa County are administered by the Maricopa County Waste Resources and Recycling Management Department and in adjacent Pinal County by the Public Works Environmental Services Department. Solid waste and sanitation collection, bulk trash collection, household hazardous waste collection, and recycling within the Northeast Area Development Alternative GDA, including IWA, are administered by the City of Mesa.[21] Arizona Administrative Code Title 18, Chapter 13 Solid Waste Management—Regulates solid waste management practices within the State of Arizona.

3.7.2.2 Affected Environment

Northeast Area Development Alternative

Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 10,000 feet at airports serving turbine-powered aircraft in order to reduce the risk of hazardous wildlife attractants.[22] According to the Maricopa County Waste Resources and Recycling Department, there are 13 landfills within the County. Of the 13 landfills, 7 are listed as accepting municipal waste, and 4 are limited to construction and demolition debris. Of the 13 landfills, 12 are privately owned and operated, and 1 is owned and operated by a city municipality. There is one landfill and one transfer station in Apache Junction, AZ in Pinal County.[23] These facilities are more than five miles from IWA. No landfills are located within 10,000 feet of IWA.[24] **Table 3-8** lists the municipal solid waste landfills, for which information is readily available, and their capacity levels as of March 2015.

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21 Maricopa County, *Solid Waste Program*, http://www.maricopa.gov/EnvSvc/WaterWaste/SolidWaste/SolidWaste.aspx (accessed January 29, 2014).

22 Federal Aviation Administration, AC 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports*, August 2007.

23 Pinal County, Public Works, Environmental Services, *Landfill & Transfer Stations*, http://www.pinalcountyaz.gov/PublicWorks/EnvironmentalServices/Pages/LandfillTransferStations.aspx (accessed September 12, 2016).

24 Maricopa County, Waste Resources & Recycling, Landfill Services, http://swm.maricopa.gov/landfill-services.htm (accessed July 27, 2015).

Table 3-8: Maricopa County Landfills

LANDFILL NAME	PHYSICAL ADDRESS	CITY	LANDFILL OWNER ORGANIZATION(S)	LANDFILL DESIGN CAPACITY (TONS)	WASTE IN PLACE (TONS)	PERCENT FILLED
Cactus Landfill	22481 E. Deepwell Ranch Rd	Florence	Republic Services	NA	NA	NA
Northwest Regional MSW Landfill	19401 W. Deer Valley Road	Surprise	Waste Management, Inc.	152,057,863	10,505,502	7%
Sickles Sanitation	53412 N Industrial Rd	Wickenburg	CR&R Inc.	NA	NA	NA
State Route 85 Landfill	28633 W. Patterson Road	Buckeye	City of Phoenix, AZ	29,510,617	NA	NA
Butterfield Station Landfill	40404 S. 99th Avenue	Mobile	Waste Management	125,170,075	9,300,000	7%
Salt River Pima Maricopa Indian Landfill	13602 N. Beeline Highway	Scottsdale	Pima Maricopa Indian Community	22,996,463	3,000,000	13%
Southwest Regional Landfill	24427 S Highway 85	Buckeye	Allied Waste	29,004,965	NA	NA

NOTE: NA = Not Available

SOURCE: U.S. Environmental Protection Agency, *Landfill Methane Outreach Program Landfill and Project Data* (updated March 2015), http://www3.epa.gov/lmop/projects-candidates/ (accessed January 13, 2016).

PREPARED BY: Ricondo & Associates, Inc., January 2016.

Solid waste within the Northeast Area Development Alternative GDA is concentrated in several areas. The most notable area of solid waste observed is in the hardfill area (LF026), which contains concrete and asphalt rubble in the northern portion of the Northeast Area Development Alternative GDA (Exhibit 3-4). This area also contains discarded tires, wood and metal debris, bottles, building materials, and concrete piping. Old building materials, safety equipment (vehicle barriers, lights, caution posts, etc.), and metal debris were observed at the firing range. In addition, smaller areas of concrete rubble and construction debris were observed at several locations around the Northeast Area Development Alternative GDA.

RTN7 Site Alternative

There are no solid waste generation or disposal activities currently occurring within the RTN7 Site Alternative GDA, and no evidence of illegal dumping was observed.

Solid waste transfer and waste tire recycling services within Pinal County are administered by the Environmental Services Branch of the Pinal County Public Works Department. There are 12 existing landfills and transfer stations in use by Pinal County.

Solid waste collection, bulk trash collection, household hazardous waste collection, and recycling in the portion of Pinal County containing the RTN7 Site Alternative GDA must be diverted to the Butterfield or

Ironwood Landfills.[25] The capacity of the Butterfield Landfill is included in Table 3-8. **Table 3-9** lists the capacity level of the Ironwood Landfill as of March 2015 as well as the landfill and transfer station noted under the Northeast Area Development Alternative discussion.

Table 3-9: Pinal County Landfills

LANDFILL NAME	PHYSICAL ADDRESS	CITY	LANDFILL OWNER ORGANIZATION(S)	LANDFILL DESIGN CAPACITY (TONS)	WASTE IN PLACE (TONS)	PERCENT FILLED
Apache Junction Landfill	4050 S Tomahawk Rd	Apache Junction	Republic Services, Inc.	NA	1,000,000	NA
Apache Junction - RAD Recycling & Waste Transfer Station	3755 S Royal Palm Rd	Apache Junction	Right Away Disposal	NA	NA	NA
Ironwood Landfill	12720 East Highway 287	Florence	Waste Management, Inc.	1,730,494	286,464	17%

SOURCE: U.S. Environmental Protection Agency, *Landfill Methane Outreach Program Landfill and Project Data* (updated March 2015), http://www3.epa.gov/lmop/projects-candidates/ (accessed January 13, 2016).
PREPARED BY: Ricondo & Associates, Inc., January 2016.

3.7.3 POLLUTION PREVENTION

3.7.3.1 Regulatory Setting

The EPA is responsible for the administration and enforcement of Spill Prevention Control and Countermeasures (SPCC) Plan requirements. The requirements are intended to prevent oil from reaching navigable waters through measures to prevent, control, and mitigate oil spills. An SPCC Plan must be prepared for a facility if the potential exists for oil to discharge to a navigable water and if 1,320 gallons or greater of oil, including petroleum, is stored in aboveground storage tanks (ASTs) of 55 gallons and greater or if 42,000 gallons or greater is stored in USTs.

Section 402 of the Clean Water Act (CWA) formed the National Pollutant Discharge Elimination System (NPDES) to regulate pollutant discharge, including stormwater, into navigable waters, referred to as waters of the United States. EPA delegated authority to Arizona to administer the NPDES Permit Program in Arizona, which is referred to as the Arizona Pollutant Discharge Elimination System (AZPDES). ADEQ administers the AZPDES Permit Program for the state. To receive an AZPDES permit, a project must be designed to protect waters of the United States, implement erosion control Best Management Practices (BMPs), and, for construction activities exceeding 1 acre of land area, develop a SWPPP that describes construction measures to prevent the discharge of sediments and other pollutants to the stormwater system. Section 402 also regulates stormwater discharges for Municipal Separate Storm Sewer Systems (MS4) that serve populations of 100,000 or more under the NPDES program, which is administered by ADEQ's AZPDES program. The MS4 permit requires development and implementation of BMPs to protect water quality from stormwater discharges.

[25] Pinal County, Public Works, Environmental Services, *Landfill & Transfer Stations*, http://www.pinalcountyaz.gov/PublicWorks/EnvironmentalServices/Pages/LandfillTransferStations.aspx (accessed September 12, 2016).

The ADEQ Waste Programs Division is responsible for regulating underground storage tanks (USTs) and aboveground storage tanks (ASTs) and for managing potential sources of surface and groundwater contamination, such as the cleanup of UST and AST spill sites.

3.7.3.2 Affected Environment

The PMGAA, along with the IWA tenants, developed and implemented a Stormwater Pollution Prevention Plan (SWPPP) containing control measures intended to eliminate or reduce the release of contaminants into the environment. A number of these control measures pertaining to hazardous materials include secondary containment, spill cleanup kits, and covered storage facilities; procedures and equipment for the cleanup of spills and accidental releases; training, record keeping, auditing; and other work practices.

3.8 Historical, Archaeological, Architectural, and Cultural Resources

3.8.1 REGULATORY SETTING

Historic, archaeological, architectural, and cultural resources are prehistoric and/or historic districts, structures, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Numerous laws and regulations require that potential effects on historic, architectural, archaeological, and cultural resources be considered during the planning and execution of federal undertakings. These laws and regulations stipulate a process of compliance, define the responsibilities of the federal agency proposing the actions, and prescribe the relationships among involved agencies. NEPA directs federal agencies to assess the environmental impacts of their proposed actions, including impacts to historic and cultural resources. In addition to NEPA, the primary laws that pertain to the treatment of historic, architectural, archaeological, and cultural resources during environmental analyses are the National Historic Preservation Act (NHPA), especially Sections 106 and 110, the Archaeological Resources Protection Act, the American Indian Religious Freedom Act, and the Native American Graves Protection and Repatriation Act.

Section 106 of the NHPA requires that federal agencies consider whether their activities could affect historic properties that are already listed, determined eligible, or not yet evaluated under the NRHP criteria. Properties that are listed in, or eligible for listing in, the NRHP are provided the same measure of protection under Section 106. Section 106 of the NHPA requires that federal agencies consider the effects of their undertakings on historic properties through consultation with the State Historic Preservation Officer (SHPO) and Tribal Historic Preservation Officer (THPO) when the Proposed Action may affect historic resources of religious and cultural significance to a tribe. A historic property is defined as any prehistoric or historic district, site, building, structure, or object listed in, or eligible for listing in, the NRHP. To complete this review, the FAA consulted with the Arizona SHPO and THPO to consider the project's potential effects on historic properties and to resolve any adverse effects.

The CEQ and the Advisory Council on Historic Preservation have advised agencies to integrate the NEPA and Section 106 processes when feasible, in order to improve efficiencies in the regulatory process and to improve environmental reviews. Section 106 regulations, as codified at 36 CFR Part 800, provide that NEPA public

involvement processes may be used in lieu of Section 106 processes, provided they are adequate and consistent with Section 106 public involvement requirements.

At the state level, the Arizona Antiquities Act of 1960 establishes requirements related to antiquities encountered during construction by a state or local government agency. Requirements include preservation and reporting of all discoveries of archaeological materials to the Director of the Arizona State Museum, in addition to procedures for disposition of the discovered archaeological materials, prohibition of intentional disturbance of human remains or funerary objects without the written permission of the Arizona State Museum, and procedures for the treatment of unintentional discovery or disturbance of human remains or funerary objects.[26]

Exhibit 3-5 depicts the Area of Potential Effect (APE) utilized by the FAA to identify whether any historic properties exist within the area with the potential to be affected by the Proposed Action. The APE was defined by determining the extent of construction or alteration of existing structures and the limits of potential ground disturbance.

3.8.2 AFFECTED ENVIRONMENT

An archeological survey (AS) and a historic buildings inventory (HBI) were prepared by SWCA Environmental Consultants (SWCA) in conjunction with this EA, and they are included as **Appendix D**. The AS includes a cultural resources records search and literature review, along with on-site field surveys. SWCA archaeologists and an AMEC environmental archaeologist surveyed the Northeast Area Development Alternative APE between October 21–24 and October 28–30, 2013. Additional NRHP testing of four sites was conducted in November 2015. The RTN7 Site Alternative APE was surveyed by an SWCA archeologist on October 16, 2014. The HBI includes an historic records search, as well as a field survey that includes photography conducted on September 10, 2013 by SWCA Architectural Historians. The Architectural Historians completed a State of Arizona Historic Property Inventory Form for each existing building and structure in the APE.

3.8.2.1 Northeast Area Development Alternative

Archaeological Resources

IWA would lease 30 acres of land as part of the Proposed Action, which is reflected in the APE. This parcel has been subjected to prior cultural resources studies associated with the ADOT SR 24 Gateway Freeway project. The results of that project included one archaeological site: AZ U:10:259(ASM), a Hohokam artifact scatter, extending partly within the current APE.[27]

[26] Arizona Revised Statutes 41-844.

[27] SCWA Environmental Consultants, *Archaeological Survey for the Phoenix Mesa Gateway Northeast Area Development Plan, Mesa, Maricopa County, Arizona*, January 2014.

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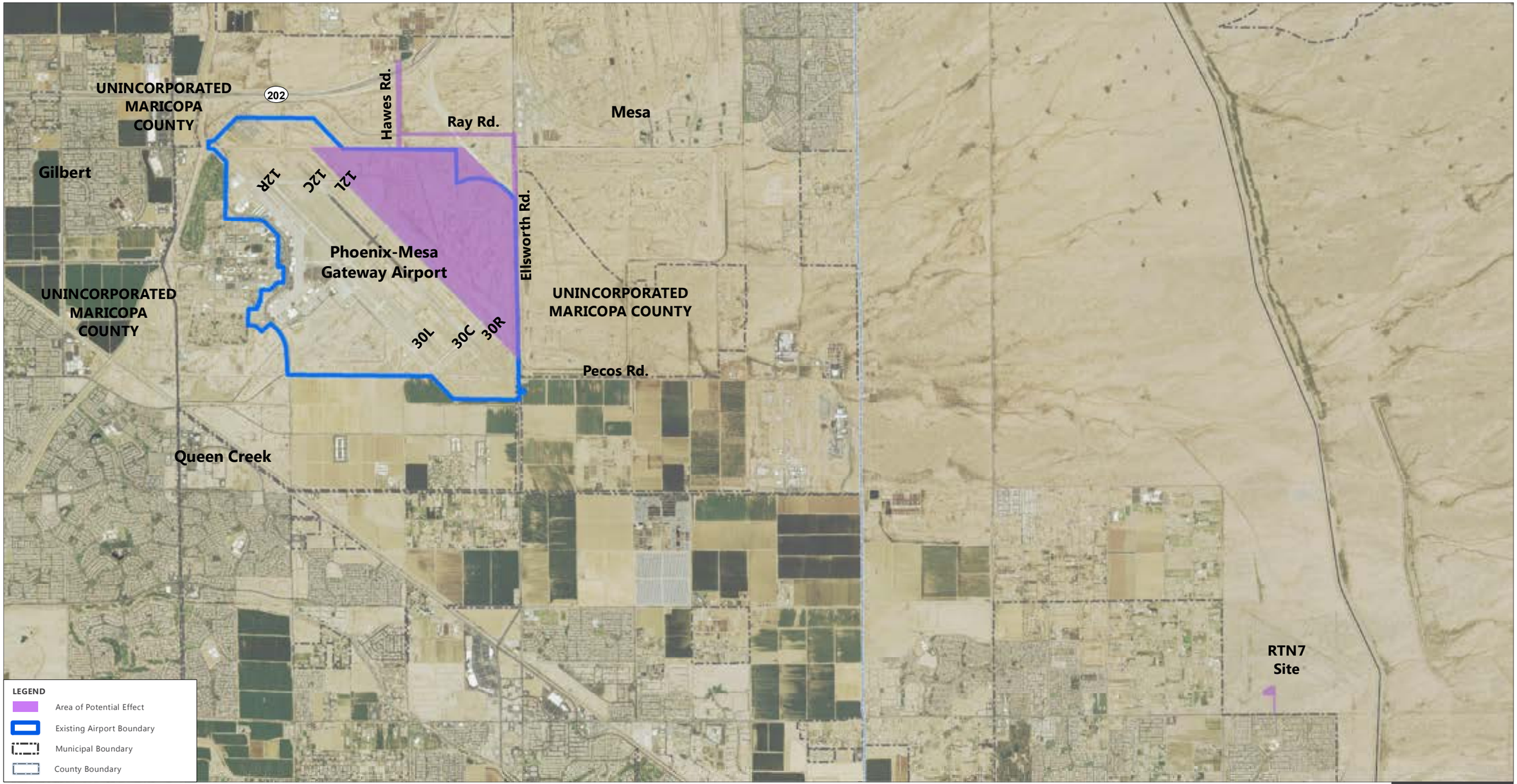

SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); U.S. Department of Agriculture, National Agriculture Imagery Program, 2013 (Aerial Imagery), 2013; U.S Census Bureau, 2016 TIGER/Line Shapefiles, GIS Data, 2016 (base map layers).
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 3-5

NORTH 0 4,500 ft.

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Area of Potential Effect

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In 2011, Archaeological Consulting Services, Ltd. (ACS), conducted eligibility testing at the site and determined it contained intact buried archaeological features indicative of a small habitation site. As a result, the site was determined eligible for the NRHP, and a phase of data recovery excavation followed to mitigate the adverse effects on the site from the construction of SR 24. The data recovery excavations were described as having exhausted the site's data potential, and no further archaeological work at the site was recommended. The part of the site within the APE contained no archaeological features when tested by ACS in 2011.[28]

The records search and archeological survey identified 15 archaeological sites within the Northeast Area Development Alternative APE. Additionally, 70 Isolated Occurrences (IOs) were identified within this APE. **Table 3-10** lists the archeological sites found within this APE. Nine of the sites and the 70 IOs are recommended, or have been previously determined, ineligible for listing in the NRHP. One site, AZ U:10:127 (ASM), is listed in the NRHP. Five sites—all newly recorded—are of indeterminate NRHP eligibility. Further testing was recommended to determine the eligibility of these five sites.[29]

Eligibility testing methodology was submitted to the SHPO and THPO prior to testing. Once the methodology was approved, SWCA conducted NRHP testing of four sites identified in Table 3-10: AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM) in November 2015. During this investigation, no archaeological features or significant cultural deposits were identified at any of these sites. SWCA determined that the four archaeological sites warrant no additional study or preservation, and that they are ineligible for NRHP consideration. Further details of the NRHP site testing are provided in Appendix D.[30] One site, U:10:319(ASM), was not tested for NRHP eligibility.

Historic, Architectural, and Cultural Resources

No traditional cultural properties, Native American heritage sites, or other culturally important sites or areas have been identified within the Northeast Area Development Alternative APE. However, previous cultural surveys in advance of the United States Air Force's (USAF) disposal of WAFB resulted in the identification of multiple historic properties and the development and execution of a Programmatic Agreement with USAF, SHPO, and the Advisory Council on Historic Preservation.

A total of 18 properties were recorded, including a suite of WAFB-associated features, such as roads, fences, and utilities.[31] All of these properties postdate World War II and most were built during the Cold War (1948–1989). All WAFB properties dated to the 1940s and associated with World War II have been previously determined eligible for the NRHP are located outside the APE.

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28 Ibid.

29 Ibid.

30 SCWA Environmental Consultants, *Archaeological Survey for the Phoenix Mesa Gateway Northeast Area Development Plan, Mesa, Maricopa County, Arizona*, January 2014.

31 Ibid.

Table 3-10: Archeological Sites within the APE

SITE NUMBER	LANDOWNER	CULTURAL AFFILIATION	SITE TYPE	PREVIOUS INVESTIGATIONS	NRHP ELIGIBILITY
AZ U:10:61(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter with features	Eligibility testing and archival research	Delisted
AZ U:10:64(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter	Eligibility testing	Determined ineligible
AZ U:10:65(ASM)	PMGAA	Hohokam	Artifact scatter with features	Eligibility testing and data recovery	Delisted
AZ U:10:66(ASM)	PMGAA	Hohokam	Artifact scatter with features	Eligibility testing and data recovery	Delisted
AZ U:10:67(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter with features	Eligibility testing	Determined ineligible
AZ U:10:127(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter with features	Testing and data recovery	Listed
AZ U:10:259(ASM)	ADOT	Hohokam	Artifact scatter with features	Eligibility testing and data recovery	Recommended ineligible; previously determined eligible, but subsequently data recovered
AZ U:10:314(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter	–	Recommended ineligible
AZ U:10:315(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter	–	Recommended ineligible
AZ U:10:316(ASM)	PMGAA	Hohokam	Artifact scatter	–	Recommended ineligible
AZ U:10:317(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter	–	Recommended ineligible
AZ U:10:318(ASM)	PMGAA	Hohokam	Artifact scatter	–	Recommended ineligible
AZ U:10:319(ASM)	PMGAA	Hohokam	Artifact scatter	–	Unknown; requires testing
AZ U:10:320(ASM)	PMGAA	Hohokam	Artifact scatter	–	Recommended ineligible
AZ U:10:321(ASM)	PMGAA	Hohokam	Artifact scatter	–	Recommended ineligible

SOURCE: SWCA Environmental Consultants, *Archaeological Survey for the Phoenix Mesa Gateway Northeast Area Development Plan, Mesa, Maricopa County, Arizona*, January 2014; SWCA Environmental Consultants *Results of National Register of Historic Places Eligibility Testing of Four Sites at Phoenix –Mesa Gateway Airport, Mesa, Maricopa County, Arizona*, December 2015.

PREPARED BY: Ricondo & Associates, Inc., January 2016.

The Cold War buildings and structures are not individually eligible for listing in the NRHP, and they are not eligible as contributing resources to a historic district. Their duties in service to the nation are concluded and duly noted; they are not otherwise worthy of preservation.

3.8.2.2 RTN7 Site Alternative

Archaeological Resources

The records search identified one archaeological feature of a previously recorded site and one IO within the RTN7 Site Alternative APE. The archaeological feature is the remains of an abandoned runway at the former RAAF (also referred to as AZ U: 10:80 [ASM]). The IO is a Hohokam mica-tempered plain ware pottery sherd. The IO is ineligible for listing in the NRHP.[32] See Appendix D for the full Archaeological Survey conducted for this APE.

Historic, Architectural, and Cultural Resources

No traditional cultural properties, Native American heritage sites, or other culturally important sites or areas have been identified within the RTN7 Site Alternative APE.

A cultural resources survey was completed for this proposed undertaking in December 2014.[33] The survey noted a small portion of one of the RAAF runways in the northern part of this APE. A previous cultural resources survey of the RAAF was prepared for the BLM, the federal agency that manages the property that is leased to the AZ ARNG. The cultural resources survey recommended the site was not eligible for inclusion into the NRHP because it lacked historic integrity.

FAA reexamined the cultural resources report prepared for this EA (see Appendix D).[34] FAA also reviewed recent photos of the site that show significant vegetation growing up through the remains of the significantly deteriorated pavement. Based on the information contained in the report and recent photos, FAA has determined the Rittenhouse AAAF is not eligible for inclusion into the NRHP under any of the four criterion specified in Title 36, Code of Federal Regulations (CFR) Section 60.4. FAA also found the proposed undertaking will not affect any properties listed or eligible for listing on the NRHP at the RAAF. FAA consulted with the Arizona SHPO on its determination of eligibility and finding of effect for the RAAF by letter dated October 25, 2016. The SHPO concurred November 2, 2016. The correspondence is included in Appendix J.

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32 SCWA Environmental Consultants, *Archaeological Survey for the Phoenix Mesa Gateway Airport ASR-8 Relocations, Rittenhouse Auxiliary Airfield, Pinal County, Arizona*, December 2014.

33 SCWA Environmental Consultants, *Archaeological Survey for the Phoenix Mesa Gateway Airport ASR-8 Relocations, Rittenhouse Auxiliary Airfield, Pinal County, Arizona*, December 2014.

34 SCWA Environmental Consultants, *Archaeological Survey for the Phoenix Mesa Gateway Airport ASR-8 Relocations, Rittenhouse Auxiliary Airfield, Pinal County, Arizona*, December 2014.

3.9 Land Use

3.9.1 REGULATORY SETTING

Pursuant to 49 U.S.C. § 47107(a)(10), the airport sponsor is required to provide written assurance that appropriate action has been, or will be, taken to ensure existing and planned land uses adjacent to or in the immediate vicinity of an airport are compatible with normal airport operations. Additionally, pursuant to 49 U.S.C. § 47106(a)(1), the airport sponsor must provide assurance that a proposed action is consistent with existing land use plans.

3.9.2 AFFECTED ENVIRONMENT

Land use designations and regulations applicable to development at IWA, including the Proposed Action, are set forth in the following land use plans:

- Mesa 2040 General Plan, City of Mesa, 2014
- Phoenix-Mesa Gateway Airport Master Plan, Williams Gateway Airport Authority, 2008
- Northeast Area Development Plan, Phoenix Mesa Gateway Airport, Phoenix Mesa Gateway Airport Authority, 2012
- Maricopa County Comprehensive Plan, 2002
- Pinal County Comprehensive Plan, 2014
- The Mesa Gateway Strategic Development Plan, City of Mesa, 2008
- Town of Gilbert General Plan, 2012
- Town of Queen Creek General Plan, 2008

The Mesa 2040 General Plan and Phoenix-Mesa Gateway Airport Master Plan identify a new passenger terminal at IWA (i.e., the Proposed Action) as being an anchor for the region. Policies in the land use plans support IWA growth, as well as the prevention of encroachment of incompatible land uses near IWA and the coordination to protect flight safety and airspace. Planning for the Phoenix-Mesa Gateway Area, which includes IWA, emphasizes preservation and growth of aviation-related employment opportunities.

The Mesa Gateway Strategic Development Plan and Northeast Area Development Plan support implementation of the Proposed Action to create a regional landmark, and they make IWA an economic engine for the region. The ultimate goal of the plan is for IWA to be an airport of choice for the region that complements PHX operations, rather than merely accommodating overflow aircraft. The Comprehensive Plans for Maricopa and Pinal Counties and General Plans for the towns of Gilbert and Queen Creek recognize the need to plan for land uses compatible with aircraft operations near IWA. Coordination between PMGAA and all adjacent municipalities on the Planning Advisory Committee continues with an ongoing update to the Airport Land Use Compatibility Plan.

As required under 49 U.S.C. § 47107(a)(10), the Airport sponsor, the PMGAA, assures that appropriate action, including the adoption of zoning laws, has been or will be taken, to the extent reasonable, to restrict the use of land under the Airport's ownership and control to activities compatible with normal airport operations, including landing and takeoff of aircraft. In addition, the PMGAA works with the municipalities having jurisdiction over land adjacent to, or in the immediate vicinity of IWA and encourages the adoption of zoning laws, to the extent reasonable, to restrict the land uses in these areas to activities and purposes compatible with airport operations. A copy of the letter documenting this assurance is provided in **Appendix E**.

3.9.2.1 Northeast Area Development Alternative

Land Uses within the GDA

The majority of land within the GDA for the Northeast Area Development Alternative is within the airport property boundary. The Northeast Area Development Alternative GDA also includes vacant land northeast of IWA.

Land Uses within the PPA

Land uses within and surrounding the PPA for the Northeast Area Development Alternative are described in the following list for each cardinal direction (**Exhibit 3-6**).[35]

- North of IWA—SR 202 (Loop 202) is the freeway nearest to IWA and passes through the northern portion of the Northeast Area Development Alternative PPA. Land uses north of IWA consist of vacant and agricultural land, with some industrial and smaller tracts of low-density commercial and residential land just outside of the Northeast Area Development Alternative PPA north boundary. Farther north are additional industrial and existing low-density residential uses within unincorporated Maricopa County, which is identified in the Maricopa County Comprehensive Plan as General Plan Development Area and defined as areas that are likely to be annexed in the future.[36] The City of Mesa General Plan calls for mixed-use activity and employment with no new residential identified.[37]
- East of IWA—The area in the northeast portion of the Northeast Area Development Alternative PPA was previously part of the General Motors (GM) Proving Ground and is designated for Mixed Use and Developing Employment Generating in the City of Mesa General Plan.[38] This area is presently vacant, but it is planned for future commercial retail/social and residential uses. Part of this area has been designated for the Eastmark Community Plan (see Exhibit 3-6). The area outside the Northeast Area Development Alternative PPA, but immediately to the east of it, comprises vacant land within unincorporated Maricopa County, but it is designated as a General Plan Development Area in the Maricopa County Comprehensive Plan. The City of Mesa General Plan designates this area for employment uses.

[35] Maricopa County, Arizona, Maricopa Association of Governments, *2012 Existing Land Use GIS Shapefile*, 2012.

[36] Maricopa County, *Maricopa County 2020, Eye to the Future*, adopted October 20, 1997, revised August 7, 2002.

[37] City of Mesa, *Mesa 2040 General Plan*, adopted June 16, 2014.

[38] Ibid.

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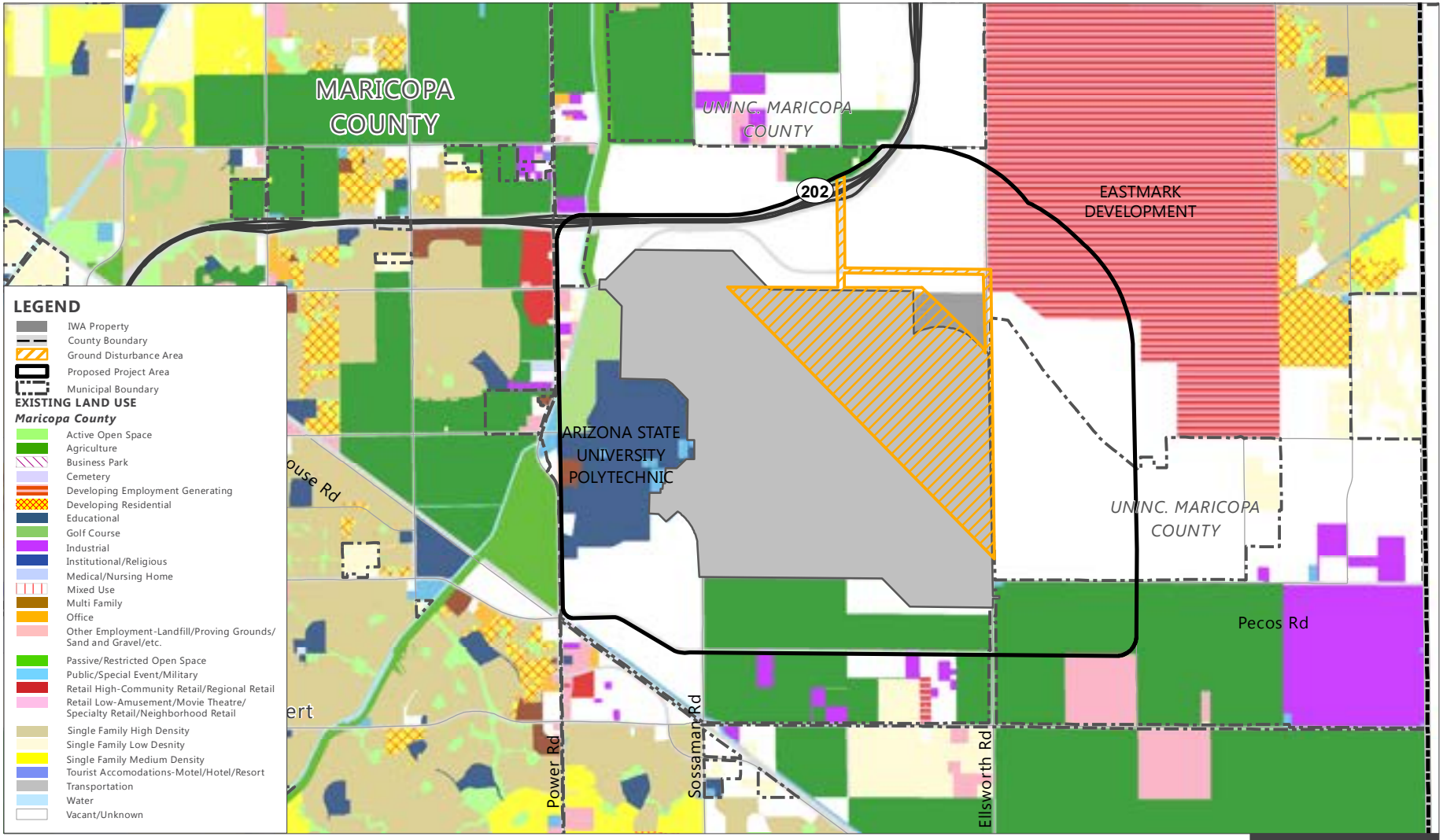

SOURCE: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Data 2010 (base map layers); Maricopa County, Arizona, Maricopa Association of Governments, 2012 Existing Land Use GIS Shapefile, 2012; U.S Census Bureau, 2016 TIGER/Line Shapefiles, GIS Data, 2016 (base map layers).
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 3-6

NORTH 0 5,500 ft.

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Maricopa County Land Use

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- South of IWA—The area immediately to the south of IWA within the Northeast Area Development Alternative PPA comprises agricultural and light-to-general industrial uses. Additionally, aerial imagery indicates low- to medium-density residential development mixed with light agricultural land uses just outside of the Northeast Area Development Alternative PPA south boundary.[39]
- West of IWA—The area immediately to the west of IWA and within the Northeast Area Development Alternative PPA comprises educational land uses within the City of Mesa. The polytechnic campus of ASU and the Chandler-Gilbert Community College (Williams Campus) are located just west of IWA's main terminal and associated air support facilities. The Town of Gilbert has jurisdiction over the areas west of Power Road, which includes a mix of commercial and industrial land uses outside the west boundary of the Northeast Area Development Alternative PPA.

Zoning within the GDA and PPA

The Northeast Area Development Alternative GDA and PPA are zoned as light industrial and covered by an Airfield (AF) Overlay District. The City of Mesa's Zoning Ordinance includes AF Overlay Districts to promote the public health and safety in the vicinity of aircraft operations, by minimizing exposure to the noise associated with aircraft activity and encouraging compatible land use supportive of airport operations.[40] AF Overlay Districts contain four subareas: a runway protection zone (RPZ) and three Airport Overflight Areas (AOA 1–3) based on the 60 and 65 day-night level (DNL) noise contours and areas of overflight activity.[41] The RPZ, AOA 1, and AOA 2 have use limitations. AOA 3 is the area outside the 60 DNL and has no use limitations. Buildings are restricted within the RPZ; uses are limited to agriculture, commercial, industrial, public and semi-public, transportation, and utilities in AOA 1 and AOA 2.

The Eastmark Community Plan and the related rezoning were approved by the City of Mesa on November 3, 2008.[42] While no part of the Eastmark project area was exposed to noise of DNL 60 or greater at the time of Community Plan approval, the project lies within the Airport Land Use Compatibility Plan's Airport Overflight Area (AOA)-3 boundary – the area subject to frequent low altitude aircraft overflights. The approved Community Plan includes several airport compatibility regulations for future development.[43]

Maricopa County and the Towns of Gilbert and Queen Creek have also included IWA and the location of noise-sensitive uses into their land-use planning and zoning ordinances through similar overlay zones on areas in close proximity to IWA (**Exhibit 3-7**). Areas to the west of the Northeast Area Development Alternative GDA and PPA are zoned for semi-public and educational uses. Properties to the north, east, and south are zoned for industrial uses. All planned land uses within, and in the immediate vicinity of, the Northeast Area Development Alternative GDA and PPA are compatible with aircraft operations—either through land use restrictions or avigation easements and/or noise attenuation practices.

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39 U.S. Department of Agriculture, National Agriculture Imagery Program, 2013.

40 City of Mesa, *Mesa Zoning Ordinance*, http://mesaaz.gov/business/development-sustainability/planning/zoning-ordinance (accessed July 13, 2015).

41 AOA 1: the area within the 65 DNL contour; AOA 2: the area between the 60 and 65 DNL contours, squared off by the addition of one-half mile for ease of application; AOA 3: the area from the 60 DNL contour to the AF Overlay District boundary.

42 City of Mesa, Ordinance Number 4893, November 8, 2008.

43 Mesa Proving Grounds Community Plan, April 28, 2011, Section 4, page 4.

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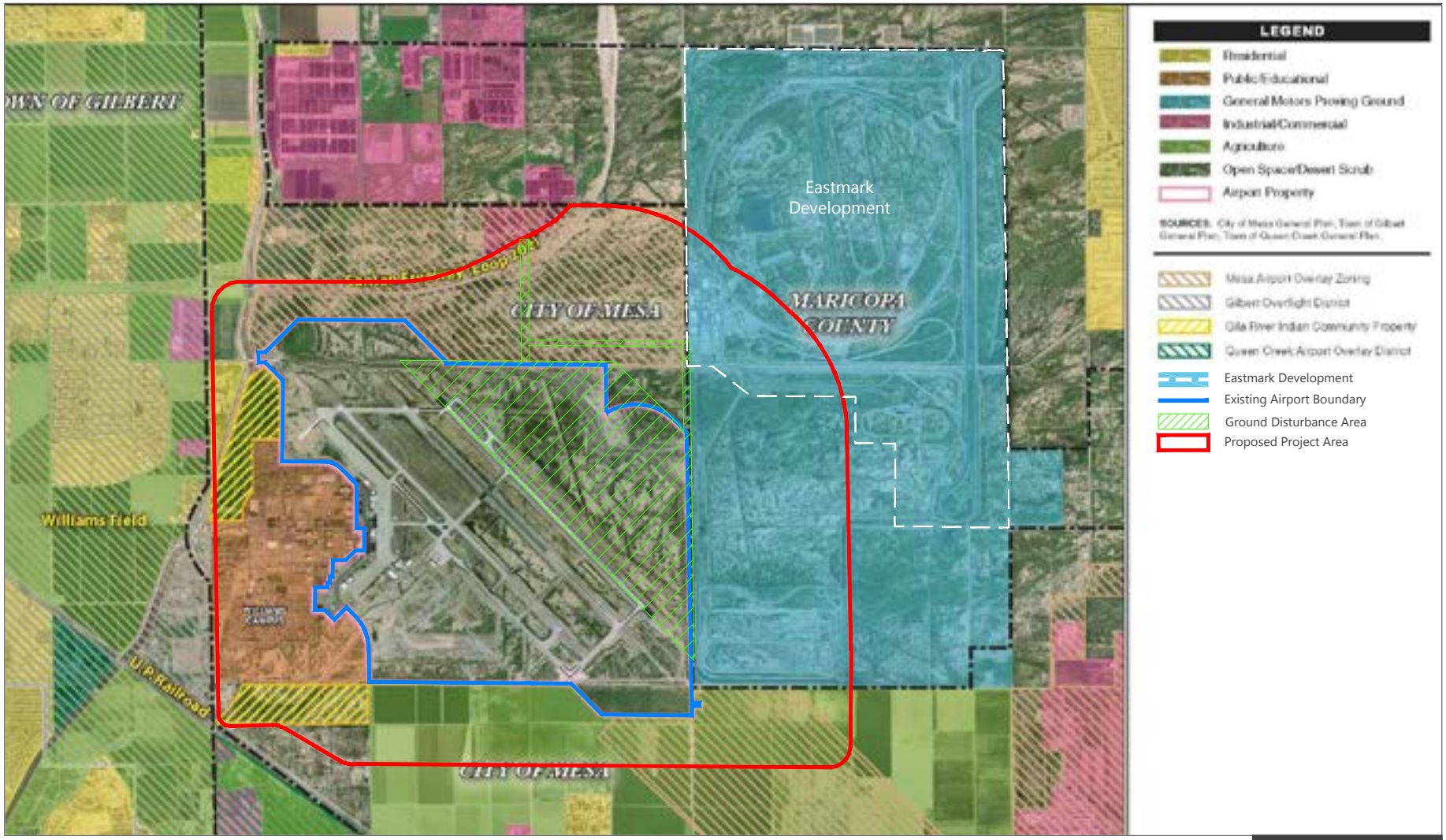

SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (airport property boundary); Williams Gateway Airport Authority, Phoenix-Mesa Gateway Airport, Airport Master Plan, February 2009.
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 3-7

NORTH 0 5,000 ft.

Airport Master Plan Zoning and Overlay Districts

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3.9.2.2 RTN7 Site Alternative

Land Uses within the GDA

The RTN7 Site Alternative GDA is southeast of IWA in Pinal County, and it encompasses a 7.5-acre plot leased to the AZ ARNG. Management of the area is the responsibility of the AZ ARNG; therefore, it is not included in a BLM Resource Management Plan. The land is designated as military land use and is currently being utilized for AZ ARNG helicopter training operations (**Exhibit 3-8**). No existing facilities are present within the RTN7 Site Alternative GDA. However, the AZ ARNG has plans to build an armory southwest of the GDA near the intersection of East Ocotillo Road and North Schnepf Road.

Land Uses within the PPA

Land uses within and surrounding the PPA for the RTN7 Site Alternative are described in the following subsections for each cardinal direction (Exhibit 3-7).[44]

- The areas immediately to the north and northeast of the RTN7 Site Alternative are within unincorporated Pinal County and designated as military land use. This area includes BLM property that contains the RAAF, and it is used by the AZ ARNG as a helicopter training facility.
- The area east of the site is vacant land designated for moderate, low-density residential use.
- The area immediately to the west of the RTN7 Site Alterative is land managed by the BLM and leased to the AZ ARNG as a training facility, beyond which is North Schnepf Road. The area to the west of North Schnepf Road comprises moderate, low-density residential and agricultural mixed-use land located within San Tan Valley in unincorporated Pinal County.
- The area immediately to the south of East Ocotillo Road is designated for moderate, low-density residential uses within San Tan Valley in unincorporated Pinal County. Much of this land has been developed for suburban residential use. The Kathryn Sue Simonton Elementary School and recreational facilities, located on 40300 North Simonton Boulevard in Queen Creek, is approximately 1,500 feet south of the proposed RTN7 Site.

Zoning within GDA and PPA

The RTN7 Site Alternative GDA and PPA are zoned as General Rural within the Pinal County Zoning Ordinance. Permitted uses within the General Rural zone include agricultural, low density residential, and public uses.[45]

[44] Maricopa County, Arizona, Maricopa Association of Governments, *2012 Existing Land Use GIS Shapefile*, 2012.

[45] Pinal County, *Pinal County Development Services Code*, http://www.codepublishing.com/AZ/pinalcounty/ (accessed July 14, 2015).

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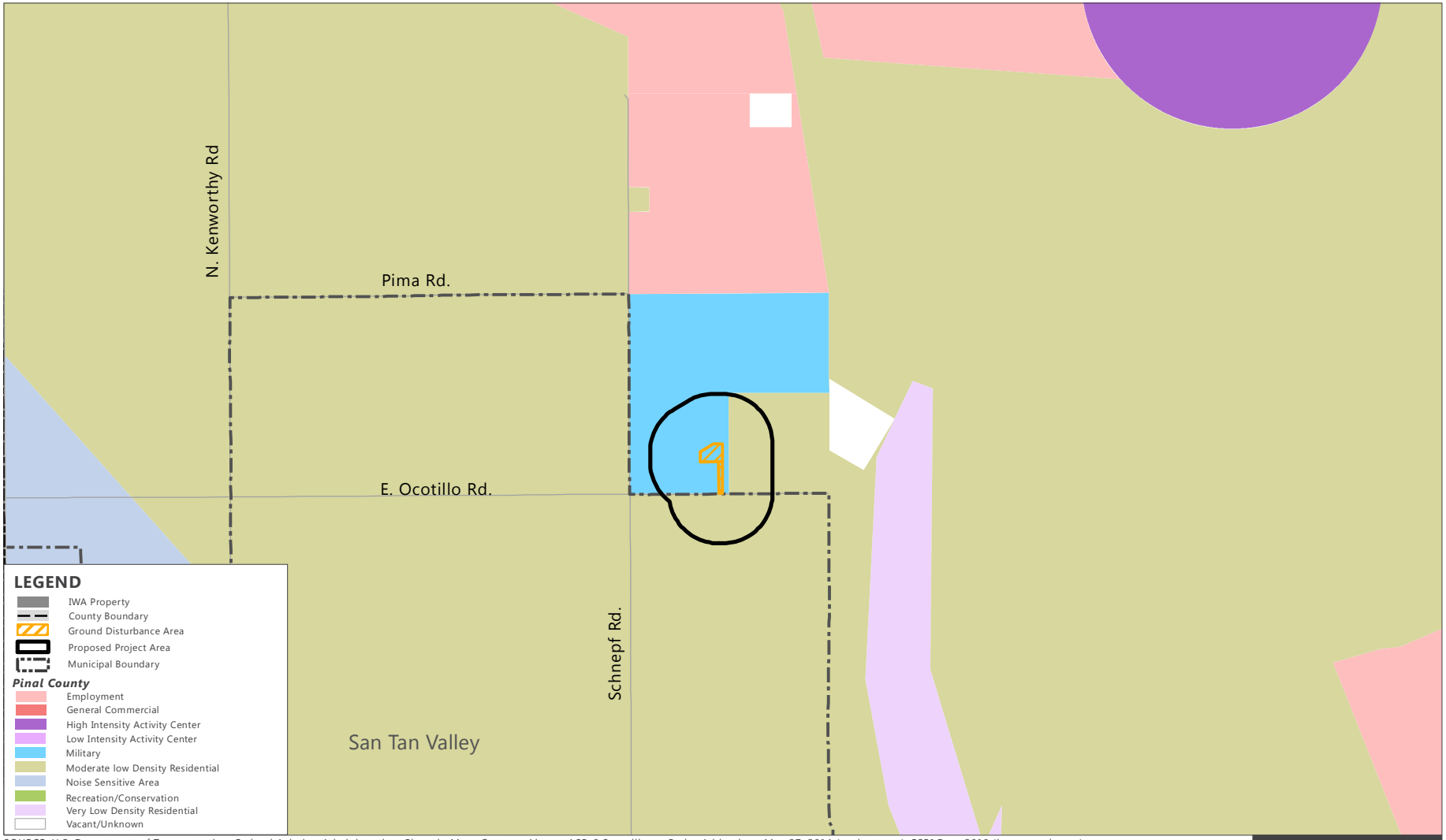

SOURCE: U.S. Department of Transportation, Federal Aviation Administration, Phoenix-Mesa Gateway Airport ASR-8 Surveillance Radar Addendum, May 27, 2014 (project area); ESRI Data 2010 (base map layers); Maricopa County, Arizona, Maricopa Association of Governments, 2012 Existing Land Use GIS Shapefile, 2012; Pinal County, Land Use Categories, GIS Shapefile; U.S Census Bureau, 2016 TIGER/Line Shapefiles, GIS Data, 2016 (base map layers).
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 3-8

NORTH 0 4,000 ft.

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Pinal County Land Use

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3.10 Natural Resources and Energy Supply

3.10.1 REGULATORY SETTING

Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, establishes an integrated strategy towards sustainability in the federal government and makes reduction of GHG emissions a priority for federal agencies.

3.10.2 AFFECTED ENVIRONMENT

3.10.2.1 Northeast Area Development Alternative

The State of Arizona has a long history of mining and still relies upon mining as a significant economic resource. According to U.S. Geological Survey data for Arizona, the GDA for the Northeast Area Development Alternative is underlain by sand and gravel dating from the Holocene period. The very western edge of the Northeast Area Development Alternative GDA is underlain by sand and gravel from the middle-to-late Pleistocene period.[46] No mines are located within the GDA. While sand and gravel quarries are operated throughout the state, no sand or gravel quarries exist within the GDA for the Northeast Area Development Alternative.

The City of Mesa is the designated municipal provider of water service for IWA. The IWA area is within the Falcon Field Pressure Zone. There is an existing 16-inch water line running north-south along Sossaman Road, which supplies the airport with two 12-inch lines. New 20-inch and 24-inch water lines have been installed along the north boundary of the Airport.[47]

The City of Mesa is the provider for wastewater collection and treatment for the incorporated area of the City, which includes IWA. The City has three reclaimed wastewater facilities to treat and provide for a variety of reuse opportunities. These include the Northwest Water Reclamation Plant, Southeast Water Reclamation Plant, and the Greenfield Water Reclamation Plant (GWRP). The entire area south of Elliot Road, including IWA, flows south and west to the GWRP. The Airport is served by a 12-inch line in Sossaman Road that flows north near Ray Road, where it connects to a 30-inch line and then south in a 54-inch line along Power Road and, ultimately, to the GWRP.[48]

The Salt River Project (SRP) is the certified provider for electric power to the study area. Their facilities include generation plants, substations, and transmission and distribution lines. Electrical power is generated at the recently expanded 1,200 megawatt (MW) Santan Generating Station, located south of Warner Road on Val Vista Road in Gilbert. Power is transmitted via the Browning Power Receiving Station north of Elliott and Signal Butte Roads, with scheduled additions of the Dinosaur substation on Germann Road at the Central

[46] U.S. Geological Survey, *Arizona Geologic Map Data*, https://mrdata.usgs.gov/geology/state/state.php?state=AZ (accessed January 6, 2016).

[47] Jacobs, *Final Technical Report Northeast Area Development Plan Phoenix-Mesa Gateway Airport*, June 2012.

[48] Ibid.

Arizona Project (CAP) canal and Moody substation south of Pecos and Recker Roads. SRP currently serves the study area from five distribution substations.[49]

Southwest Gas is the natural gas provider for the majority of the Mesa Gateway area. Currently, the study area is surrounded by both low- and high-pressure distribution lines. A high-pressure line runs along Signal Butte Road northeast of IWA and turns west on Elliot Road. It follows Elliot Road until the intersection of Ellsworth Road, where it turns south past IWA to Germann Road. This line continues east and west along Germann Road, beyond the west boundary of the Airport and east to Crismon Road.[50]

3.10.2.2 RTN7 Site Alternative

The RTN7 Site Alternative is also underlain by sand and gravel dating from the Holocene period. There are no mines or quarries present within the GDA. Electrical District No. 3 of Pinal County is a political subdivision of the State of Arizona formed as a Special District by the Pinal County Board of Supervisors. Electrical District No. 3 is a nonprofit utility serving both rural and urban electric customer needs in western Pinal County. Southwest Gas is also the natural gas provider in the RTN7 Site Alternative PPA.

3.11 Noise and Compatible Land Use

3.11.1 NOISE DESCRIPTORS

The FAA has determined that the cumulative aircraft noise exposure experienced by individuals must be established in terms of the yearly DNL metric. Unless otherwise stated, all sound levels (decibels [dB]) reported in this EA are in A-weighted decibels (dBA).

A-Weighted Sound Pressure Level (dBA): The dB is a unit used to describe sound pressure level. When expressed in dBA, the sound has been filtered to reduce the effect of very low and very high frequency sounds, much as the human ear filters sound frequencies. Without this filtering, calculated and measured sound levels would include events that the human ear cannot hear (e.g., dog whistles and low frequency sounds, such as the groaning sounds emanating from large buildings with changes in temperature and wind). With A-weighting, calculations and sound monitoring equipment approximate the sensitivity of the human ear to sounds of different frequencies.

Day-Night Average Sound Level (DNL): DNL, formerly referred to as L_{dn}, is expressed in dBA and represents the noise level over a 24-hour period. Because environmental noise fluctuates over time, DNL was devised to relate noise exposure over time to human response. DNL is a 24-hour average of the hourly L_{eq}; however, it has penalties to account for the increased sensitivity to noise events that occur during the more sensitive nighttime periods. Specifically, DNL penalizes noise 10 dB during the nighttime period (10:00 p.m. to 7:00 a.m.). The EPA introduced the metric in 1976 as a single-number measurement of community noise exposure. The FAA adopted DNL as the noise metric for measuring cumulative aircraft noise under 14 CFR Part 150,

[49] Jacobs, *Final Technical Report Northeast Area Development Plan Phoenix-Mesa Gateway Airport*, June 2012.

[50] Ibid.

Airport Noise Compatibility Planning. The Department of Housing and Urban Development, the Veterans Administration, the Department of Defense, the United States Coast Guard, and the Federal Transit Administration have also adopted DNL for measuring cumulative noise exposure.

DNL is employed to describe existing and predicted noise exposure in communities in airport environs; this is based on the average daily operations over the year and the average annual operational conditions at an airport. Therefore, at a specific location near an airport, the noise exposure on a particular day is likely to be higher or lower than the annual average noise exposure, depending on the specific operations at an airport on that day. DNL is widely accepted as the best available method to describe aircraft noise exposure, and it is the noise descriptor required for aircraft noise exposure analyses and land use compatibility planning under 14 CFR Part 150 and for EAs for airport improvement projects (FAA Order 10501.F).

3.11.2 REGULATORY SETTING

The FAA has a long history of providing guidance regarding aviation noise and land use criteria in the vicinity of airports. These laws and regulations provide a basis for the local development of airport plans, an analysis of potential impacts from airport development, and land use compatibility policies. In terms of land use compatibility, the primary role of the FAA is the regulation of noise at the source. This includes the development of noise standards for certificated aircraft and the approval of noise abatement flight procedures. The FAA also plays a supporting role in the development of local airport noise abatement plans and policies to ensure that land uses in the immediate vicinity of airports are compatible with normal airport operations.

The FAA defines DNL 65 dB as the threshold of exterior noise compatibility for residential and other noise-sensitive land uses, such as schools, libraries, and religious facilities. The FAA requires an analysis of noise exposure when development actions may change the cumulative noise exposure of individuals to aircraft noise in areas surrounding an airport. Common development actions that may change the cumulative noise environment include the following: runway reconfiguration, aircraft operations and/or movements, aircraft types using the airport, or aircraft tracks and profiles.

Potential noise impacts are analyzed using the methodologies developed by the FAA and published in Appendix B of FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. This guidance states that a Proposed Action or its action alternatives would be considered to have a significant impact with regard to aviation noise, when compared to the No Action Alternative for the same timeframe, if it would cause noise-sensitive areas located at or above DNL 65 dB to experience a noise increase of at least DNL 1.5 dB.

The State of Arizona regulations are preempted by federal law as described in the previous sections. Arizona Revised Statute 28-8486, *Public Airport Disclosure*,[51] requires the recording of public airport disclosure maps. The maps provide information to homeowners as well as to prospective homebuyers.

Locally, the City of Mesa has developed AF Overlay Districts as described in Section 3.2.3. These districts are intended to promote the public health and safety in the vicinity of aircraft operations by minimizing exposure

[51] Arizona Revised Statutes, *Title 28 – Transportation, Section 28-8486 Public Airport Disclosure*, 2013.

to the noise associated with aircraft activity and by encouraging compatible land use supportive of airport operations.[52]

3.11.3 METHODOLOGY

On May 15, 2015, the FAA published a policy statement in the Federal Register regarding the required use of models for noise and air emissions for FAA actions. The notice states that effective May 29, 2015, the Aviation Environmental Design Tool (AEDT) Version 2b replaces AEDT Version 2a, Integrated Noise Model (INM), and Emissions and Dispersion Modeling System (EDMS) as the required tool for noise, fuel burn, and emissions modeling of FAA actions.[53] Because the EA began prior to the publication of this notice, the input files were originally developed for use in INM version 7.0d, released May 30, 2013. The input files were later converted to run in AEDT, version 2b.

The AEDT incorporates the number of annual average daily daytime, evening, and nighttime aircraft operations, flight paths, and flight profiles of aircraft, along with its extensive internal database of aircraft noise and performance information, in order to calculate the DNL around an airport. From a grid of points, the AEDT contouring program draws contours of equal DNL that can be superimposed onto land-use maps. For this EA, four standard ranges of DNL noise contours are presented: DNL 60–64 dB, DNL 65–69 dB, DNL 70–75 dB, and DNL 75 dB and above.[54]

The flight tracks modeled in the AEDT are based on the radar data of the flights operated at IWA in 2013. The radar data was obtained from the Airport Noise Monitoring System at PHX. Aircraft operations and fleet mix data used for this noise analysis are based on the FAA's Enhanced Traffic Management System Counts (ETMSC); the FAA's ATCT counts records from the Operations Network (OPSNET); and the Airport Operations records.

3.11.4 AFFECTED ENVIRONMENT

The existing noise environment at and around the Study Area is dominated by noise from airport-related uses, including aircraft departing, landing, and taxiing on runways and connecting taxiways. Noise levels from aircraft departure operations commonly exceed 110 dBA at locations near the runway. The year used to establish existing noise conditions was 2013, which was the last full year of available data at the time the EA was initiated. The AEDT input data utilized to prepare the noise contours is included in **Appendix F**.

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52 City of Mesa, *Mesa Zoning Ordinance*, http://mesaaz.gov/business/development-sustainability/planning/zoning-ordinance (accessed July 13, 2015).

53 U.S. Department of Transportation, Federal Aviation Administration 14 CFR Chapter I, "Noise, Fuel Burn, and Emissions Modeling Using the Aviation Environmental Design Tool Version 2b," *Federal Register 80*, no. 94 (May 15, 2015).

54 DNL 60 dB contours are illustrated on noise contour exhibits in this EA for information purposes only.

3.11.4.1 Northeast Area Development Alternative

The nearest noise-sensitive area to the PPA consists of institutional land uses to the west of IWA that comprise the ASU Polytechnic Campus and Williams Campus, along with residential uses in this area (**Exhibit 3-9**). The existing noise contours illustrate the DNL 65 dB contour is contained completely within the Airport property boundary, with the exception of a few areas, as shown on Exhibit 3-9. The land uses within the DNL 65 dB contour, outside the Airport boundary, are agricultural and/or vacant along the southeastern Airport boundary and institutional along the western Airport boundary.

3.11.4.2 RTN7 Site Alternative

Noise sources within the RTN7 Site PPA generally include helicopter traffic performing various types of training activities during the daytime hours and roadway noise from vehicular traffic on North Schnepf Road and East Ocotillo Road, which are to the west and south, respectively. The only noise-sensitive land use within the RTN7 Site Alternative PPA is single-family residences. Since IWA operations do not occur at the RTN7 Site, noise contours were not generated for the RTN7 Alternative.

3.12 Socioeconomics, Environmental Justice, and Children's Health and Safety Risks

3.12.1 REGULATORY SETTING

Socioeconomics encompasses the activities and resources associated with the everyday human environment, particularly related to population centers, their demographics, and the economic activities generated. Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was enacted in 1994. The purpose of this Executive Order is to ensure the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations, or the execution of federal, state, tribal, and local programs and policies. Environmental justice concerns must be considered for populations in the vicinity of a proposed project funded by the federal government.

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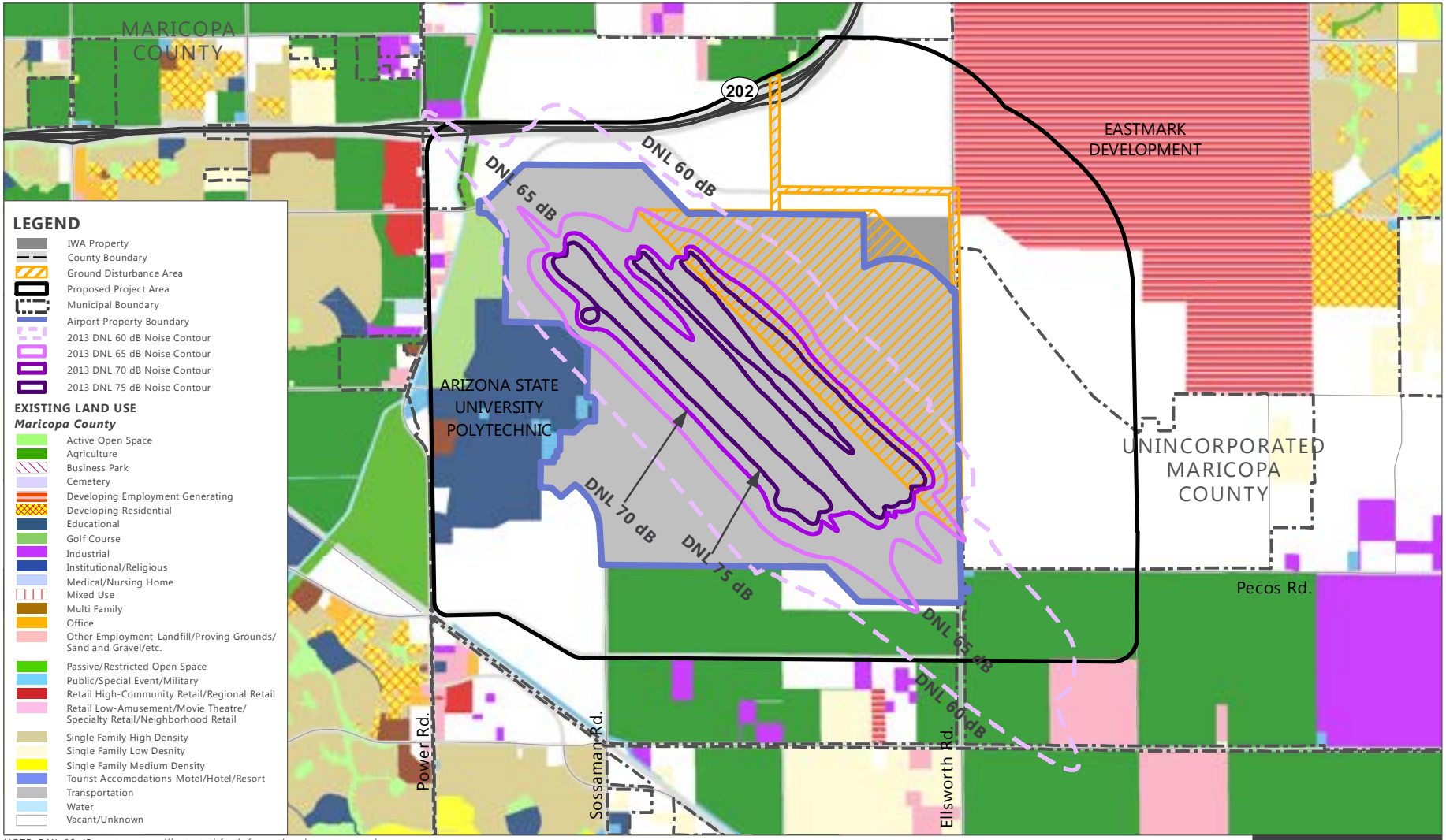

NOTE: DNL 60 dB contours are illustrated for informational purposes only.

SOURCE: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Data 2010 (base map layers); Maricopa County, Arizona, Maricopa Association of Governments, 2012 Existing Land Use GIS Shapefile, 2012; Pinal County, Land Use Categories, GIS Shapefile; U.S Census Bureau, 2016 TIGER/Line Shapefiles, GIS Data, 2016 (base map layers).

PREPARED BY: Ricondo & Associates, Inc., September 2016.

EXHIBIT 3-9

NORTH 0 4,500 ft.

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Existing Noise Contours (2013)

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3.12.2 AFFECTED ENVIRONMENT

3.12.2.1 Northeast Area Development Alternative

In order to determine the potential environmental justice and children's health and safety impacts of the Northeast Area Development Alternative portion of the Proposed Action within the defined PPA, a series of census tracts were identified for socioeconomic analysis. **Exhibit 3-10** depicts these census tracts in relation to the Northeast Area Development Alternative PPA. The following tables provide detailed socioeconomic information on the communities surrounding IWA. The following U.S. Census tracts for Maricopa County, 5228 and 8176, are within the PPA. **Exhibit 3-11** illustrates the 2010 U.S. Census tract population density for the Northeast Area Development Alternative PPA. As shown, the majority of the population living within the Northeast Area Development Alternative PPA is located just west of IWA. Exhibit 3-10 shows other areas around IWA that are populated with less than one resident per acre of land.

The two census tracts analyzed have a population that is predominantly White (75 percent), with the next highest ethnic group reporting as Some Other Race, at 14 percent (**Table 3-11**). Within the Northeast Area Development Alternative PPA, approximately 30 percent of residents are minors (under 18 years of age) and approximately 5 percent are seniors (65 years of age and older). Median household income ranges from $35,086 in tract 5228 to $48,611 in tract 8176 (**Table 3-12**). The percentage of people below the poverty line within these census tracts ranges from 31 percent in tract 5228 to 33 percent in tract 8176.

3.12.2.2 RTN7 Site Alternative

In order to determine the potential impacts of the ASR-8 relocation as part of the Proposed Action, a socioeconomic analysis of Census Blocks within Pinal County Census Tract 2.07 was conducted. The RTN7 Site Alternative PPA includes the following Census Blocks within Pinal County Census Tract 2.07: 1009, 3005, 3030, 3032, 3034, 3036, 3037, 3038, 3039, 3040, 3041, and 3045. Exhibit 3-10 depicts these Census Blocks, within Census Tract 2.07, in relation to the RTN7 Site PPA. Exhibit 3-11 illustrates the 2010 U.S. Census Block population density for the PPA. As shown, the majority of the population living within the RTN7 Site Alternative PPA is located in the southern portion of the PPA. The area surrounding the RTN7 Site Alternative PPA to the north is populated with less than one resident per acre of land.

Census Blocks within this PPA have a population that is predominantly White (78 percent), with 1.9 percent reporting as Black or African American, the next highest single ethnic group (**Table 3-13**). Within the RTN7 Site Alternative PPA, approximately 40 percent of residents are minors and 4.3 percent are seniors. Census Tract 2.07 is largely an affluent population with 88 percent above the poverty line, with an average median household income of $51,541.

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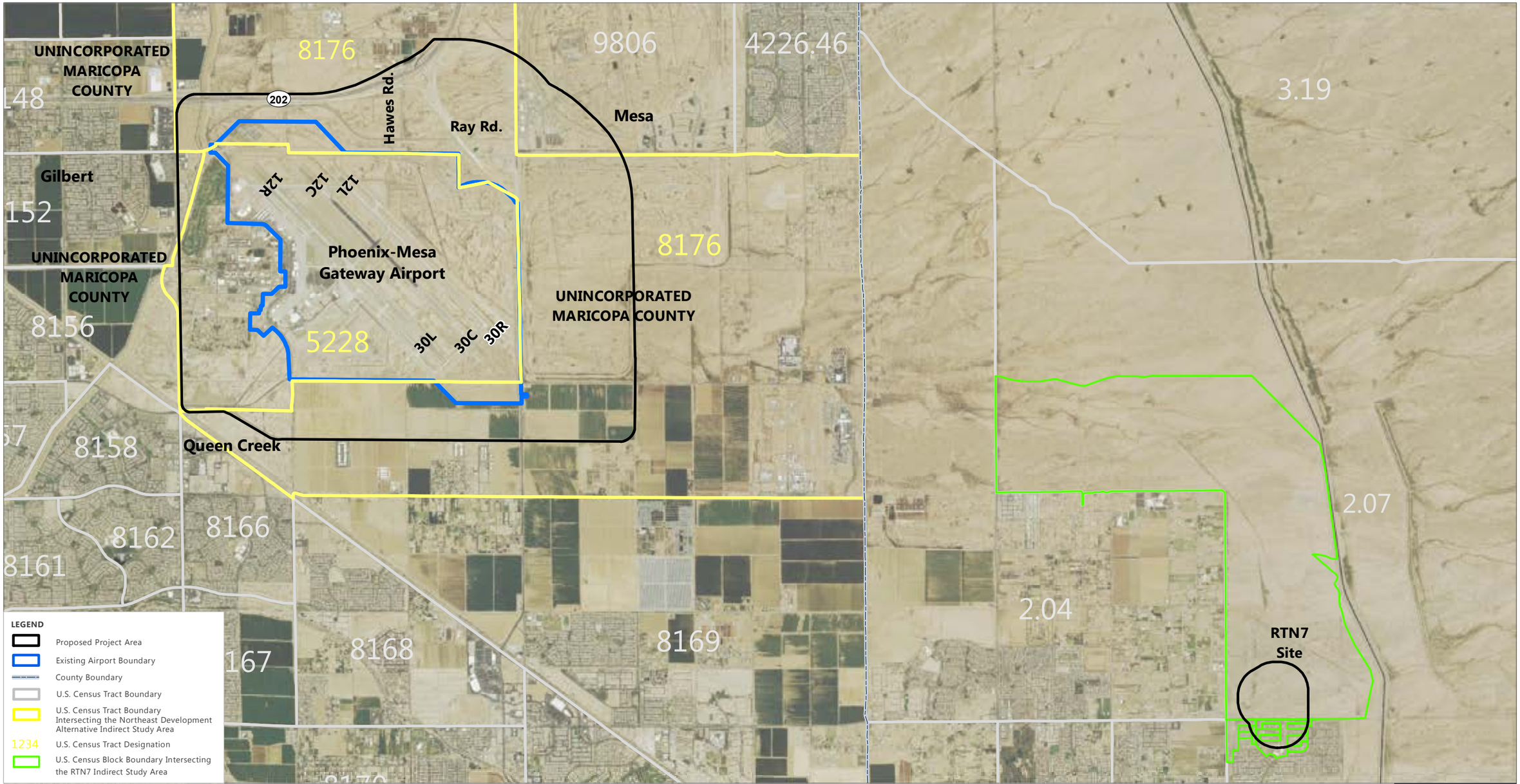

SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); U.S. Department of Agriculture, National Agriculture Imagery Program, 2013 (Aerial Imagery), 2013; U.S. Census, 2013 TIGER/Line Shapefiles, http://www.census.gov/cgi-bin/geo/shapefiles2013/main (accessed March 2014).
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 3-10

NORTH 0 4,500 ft.

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U.S. Census Tracts and Blocks within the Indirect Study Area

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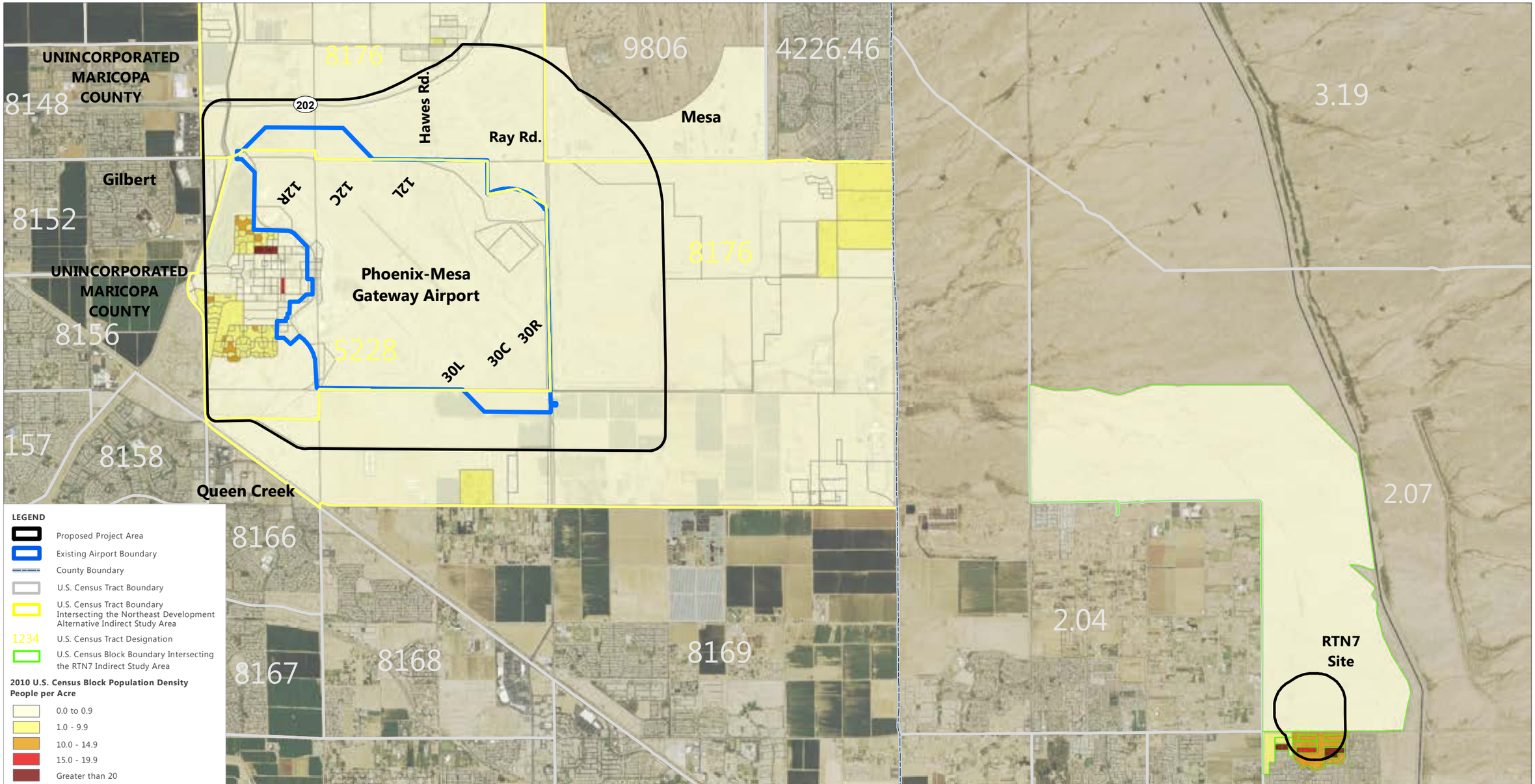

SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); U.S. Department of Agriculture, National Agriculture Imagery Program, 2013 (Aerial Imagery), 2013; U.S. Census, 2013 TIGER/Line Shapefiles, http://www.census.gov/cgi-bin/geo/shapefiles2013/main (accessed March 2014).
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 3-11

NORTH 0 4,500 ft.

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2010 U.S. Census Block Population Density

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Table 3-11: Northeast Area Development Alternative Demographic and Socioeconomic Data

	MARICOPA COUNTY		CITY OF MESA		NORTHEAST AREA DEVELOPMENT PROPOSED PROJECT AREA[1/]	
Total Residents	3,947,382		452,091		2,454	
Percent by Ethnicity Group						
White	3,162,279	80.1%	381,845	84.5%	1,853	75.5%
Black or African American	203,650	5.2%	15,838	3.5%	57	2.3%
Pacific Islander/Native Hawaiian	8,138	0.2%	1,518	0.3%	0	0.0%
Asian	144,749	3.7%	8,844	2.0%	83	3.4%
American Indian and Alaska Native	74,454	1.9%	9,813	2.2%	37	1.5%
Some Other Race	235.737	6.0%	22,312	4.9%	353	14.4%
Reporting Two or More Races	118,375	3.0%	11,921	2.6%	71	2.9%
Hispanic or Latino [1/]						
Hispanic or Latino (of any race)	1,181,100	29.9%	121,147	26.8%	623	25.4%
Not Hispanic or Latino	2,766,282	70.1%	330,944	73.2%	1,831	74.6%
Age Demographics						
Minors (Residents Under 18 Years)	1,011,479	25.6%	111,398	24.6%	728	29.7%
Seniors (Residents 65 Years and Over)	513,536	13.0%	69,083	15.3%	127	5.2%
Socioeconomic Data						
Median Household Income	$53,689		$48,259		**(See Table 3-12)**	
Persons Below Poverty Level	17.1%		16.3%			

NOTES:

1/ The Proposed Project Area includes the following Maricopa County Census Tracts: 5228 and 8176.

2/ According to the U.S. Census Bureau, ""…race and Hispanic origin (also known as ethnicity) are two separate and distinct concepts…Persons who report themselves as Hispanic can be of any race and are identified as such in our data tables." For more information, see www.census.gov/population/hispanic/about/faq.html#Q1 or www.census.gov/population/hispanic/.

SOURCES: U.S. Census Bureau American Fact Finder, *2014 American Community Survey 5 Year Estimates*, http://factfinder2.census.gov/ (accessed April 27, 2016).

PREPARED BY: Ricondo & Associates, Inc., April 2016.

Table 3-12: Economic Data by Census Tract

CENSUS TRACT	MEDIAN HOUSEHOLD INCOME ($)	PERCENT PEOPLE BELOW POVERTY LEVEL[1/]
5228	$35,086	31.1%
8176	$48,611	33.9%

NOTE:

1/ Poverty level is $11,880 for one person and an additional $4,160 for each additional family member in the lower 48 contiguous states and Washington, D.C. (U.S. Department of Health & Human Services, https://aspe.hhs.gov/poverty-guidelines, (accessed April 1, 2016).

SOURCE: U.S. Census Bureau American Fact Finder, *2014 American Community Survey 5 Year Estimates*, http://factfinder2.census.gov/ (accessed April 27, 2016).

PREPARED BY: Ricondo & Associates, Inc., April 2016.

Table 3-13: RTN7 Site Alternative Demographic and Socioeconomic Data

	PINAL COUNTY		RTN7 SITE PROPOSED PROJECT AREA[1/]	
Total Residents	390,160		1,861	
Percent by Ethnicity Group				
White	309,920	79.4%	1,455	78.2%
Black or African American	203,650	5.2%	36	1.9%
Pacific Islander/Native Hawaiian	1,658	0.4%	5	0.3%
Asian	6,616	1.7%	27	1.5%
American Indian and Alaska Native	20,698	5.3%	6	0.3%
Some Other Race	22,280	5.7%	1	0.05%
Reporting Two or More Races	10,875	2.8%	25	1.3%
Hispanic or Latino [2/]				
Hispanic or Latino (of any race)	113,046	29.0%	306	16.4%
Not Hispanic or Latino	277,114	71.0%	1,555	83.6%
Age Demographics				
Minors (Residents Under 18 Years)	99,708	25.6%	753	40.5%
Seniors (Residents 65 Years and Over)	61,947	15.9%	80	4.3%
Socioeconomic Data[3/]				
Median Household Income	$50,248		$53,149	
Persons Below Poverty Level	16.8%		11.0%	

NOTES:

1/ The Proposed Project Area includes a portion of the Pinal County Census Tract 2.07. Census Blocks within the RTN7 PPA include: 1009, 3005, 3030, 3032, 3034, 3036, 3037, 3038, 3039, 3040, 3041, and 3045. Census Block data is not available in U.S. Census American Community Survey 5 Year Estimates. Population values are from 2010 Decennial Census Data.

2/ According to the U.S. Census Bureau, ""…race and Hispanic origin (also known as ethnicity) are two separate and distinct concepts…Persons who report themselves as Hispanic can be of any race and are identified as such in our data tables." For more information, see www.census.gov/population/hispanic/about/faq.html#Q1 or www.census.gov/population/hispanic/.

3/ 2014 U.S. Census, American Community Survey 5 Year Estimates. Census Block data not available, Pinal County Census Tract 2.07 data provided.

SOURCE: U.S. Census Bureau American Fact Finder, *2014 American Community Survey 5 Year Estimates*, http://factfinder2.census.gov/ (accessed April 27, 2016).

PREPARED BY: Ricondo & Associates, Inc., April 2016.

3.13 Visual Effects

3.13.1 NORTHEAST AREA DEVELOPMENT ALTERNATIVE

3.13.1.1 Light Emissions

The primary sources of light emissions from airports are the FAA-required lighting for security, obstructions, and navigation on the airfield. Lighting is used throughout the Northeast Area Development Alternative PPA and on IWA property to support existing operations from dawn to dusk, as well as to support other periods of low visibility. Airfield lighting consists of in-pavement lights along taxiways and runways and lights mounted on towers for the approach lighting system (ALS).

3.13.1.2 Visual Resources and Visual Character

The vicinity of IWA is largely surrounded by open land, with the exception of the ASU Polytechnic campus and the Chandler-Gilbert Community College campus, which are located west of the existing airport passenger terminal complex. The Airport is a mix of open space and transportation-related, commercial, and industrial development. Visual resources include the transportation-related structures and open-space desert. These resources create a visual character dominated by Airport facilities; level, graded surfaces; and paved runways.

3.13.2 RTN7 SITE ALTERNATIVE

3.13.2.1 Light Emissions

Light emissions in the vicinity of the RTN7 Site Alternative PPA are limited to the land uses surrounding the RTN7 Site. East Ocotillo Road and automobile traffic, along with residential land use, are the main sources of light emissions in this PPA. A radio tower that emits pulsing light emissions is located southwest of the RTN7 Site Alternative PPA.

3.13.2.2 Visual Resources and Visual Character

Visually, the majority of the RTN7 Site Alternative PPA is located on BLM land that is vacant of structures, with the exception of a security fence around the perimeter of the AZ ARNG site. The southern portion of this PPA comprises a residential neighborhood that consists of single-family residences, a school, and open space.

3.14 Water Resources

3.14.1 WETLANDS

3.14.1.1 Regulatory Setting

Wetlands, waterways, and special aquatic sites—together referred to as Waters of the United States (WOTUS)—are protected under federal and state regulations and have important functions and values.

The U.S. Army Corps of Engineers (USACE) defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands provide valuable water quality functions as well as wildlife habitat. Some of the functions of wetlands are groundwater recharge, sediment/toxicant retention, nutrient removal, and flood-flow alteration. Recognized functions and values of wetlands include the following:

- flood-flow alteration, shoreline stabilization, storm protection, and climate control;
- groundwater recharge, water purification, and sediment and nutrient retention and modification;
- commercial products, recreation, and tourism;
- biodiversity, including fish, shellfish, and wildlife habitat, and the associated scientific and cultural benefits.

Laws, regulations, and policies related to wetlands include:

- Clean Water Act, Sections 401 and 404
- Executive Order 11990, *Protection of Wetlands*
- DOT Order 5660.1A, *Preservation of the Nation's Wetlands*

These wetland laws, regulations, and policies, as they relate to the affected environment, are described further in the following paragraphs.

Section 401 of the Clean Water Act gives the EPA and the State of Arizona certification responsibility and authority over violation of water quality standards within their respective jurisdictions.

Section 404 of the Clean Water Act gives the U.S. ACE responsibility and authority over activities that result in the discharge of dredge or fill material into wetlands and waterways.

Executive Order 11990, *Protection of Wetlands*, requires consideration of indirect effects on wetlands, provides a long-term goal of no net loss of wetlands, and requires federal agencies to adopt procedures that ensure compliance with Executive Order 11990.

DOT Order 5660.1A, *Preservation of the Nation's Wetlands*, sets U.S. DOT policy to assure the protection, preservation, and enhancement of the nation's wetlands to the fullest extent practicable and establishes procedures for implementation of the policy.

3.14.1.2 Affected Environment

Northeast Area Development Alternative

Approved jurisdictional determinations and preliminary jurisdictional determinations are tools used by the USACE to help implement Section 404 of the Clean Water Act. AMEC prepared a preliminary jurisdictional determination request for the USACE in conjunction with this EA (**Appendix G**), which was submitted on

March 31, 2015. The request identified 5.77 acres of the Powerline Floodway and 20.02 acres of the Ellsworth Channel within the Northeast Area Development Alternative GDA as potential jurisdictional waters of the United States.[55] In a letter dated April 7, 2015, the USACE issued a preliminary jurisdictional determination that accepted the 25.79 acres identified by AMEC as waters of the United States. (Appendix G).[56] The potential WOTUS are shown on **Exhibit 3-12**.

A Water Resources Technical Memorandum was developed by AMEC for the Northeast Area Development Alternative PPA in conjunction with this EA, and it can be found in Appendix G. This technical memorandum includes records and database research, along with site investigations of the Northeast Area Development Alternative PPA, conducted by AMEC scientists on August 26, 2013 and on October 3, 2013. Water resources in the Northeast Area Development Alternative GDA are shown on **Exhibit 3-13.**

The USACE *Wetland Delineation Manual* defines wetlands as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."[57] No wetlands were observed within the Northeast Area Development Alternative GDA during the site investigations conducted by AMEC scientists.

The USFWS National Wetlands Inventory (NWI) identifies two small wetlands classified as freshwater ponds within the Northeast Area Development Alternative PPA. The AMEC technical memorandum documented one of the ponds as a stormwater detention basin that holds runoff from Ellsworth and Ray Roads. The other pond is located on a dairy farm off IWA property at the northern boundary of the Northeast Area Development Alternative PPA. The NWI also classifies a series of vegetated drainage ditches in the southwest portion of the Northeast Area Development Alternative PPA as riverine wetlands.

RTN7 Site Alternative

In November 2014, AMEC developed a Water Resources Technical Memorandum for the RTN7 Site Alternative PPA in conjunction with this EA, which can be found in Appendix G. This technical memorandum includes records and database research, along with a site investigation of the RTN7 Site Alternative PPA, conducted by AMEC scientists on October 15, 2014. Water resources in the RTN7 Site Alternative PPA are shown on Exhibit 3-12.

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55 AMEC, *Preliminary Jurisdictional Determination Request Phoenix-Mesa Gateway Airport Northeast Area Development Plan Maricopa County, Arizona,* March 2015.

56 Diebolt, Sallie, USACE, Arizona Branch, Regulatory Division, "Preliminary Jurisdictional Determination Regarding Geographic Jurisdiction," letter to Mary Reker, April 7, 2015.

57 U.S. Army Corps of Engineers, *Wetland Delineation Manual*, pg 9, January 1987

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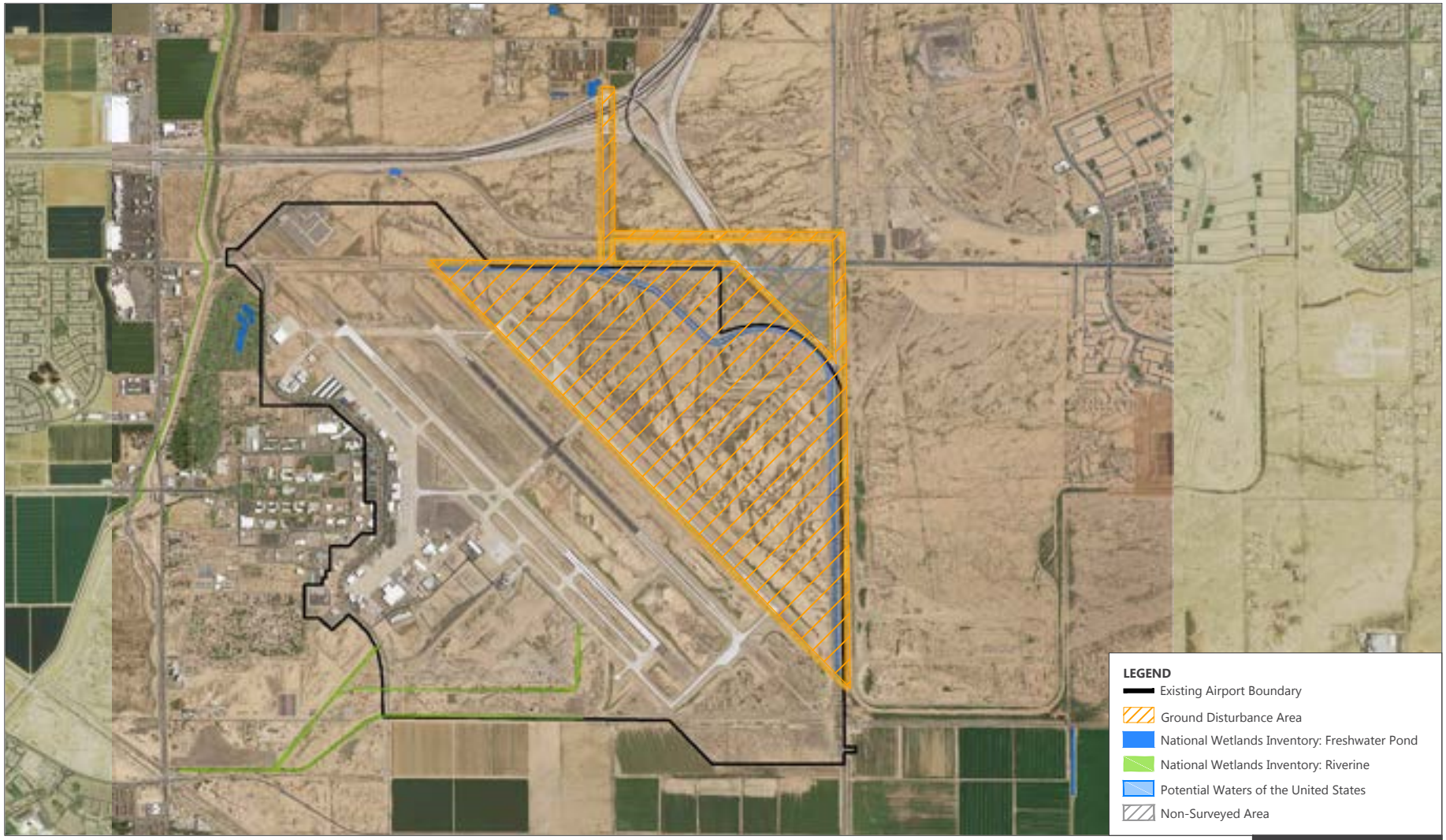

SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (airport property boundary); U.S. Department of Agriculture, National Agriculture Imagery Program, 2013 (Aerial Imagery), 2013; AMEC Environment and Infrastructure, Inc., Preliminary Jurisdictional Determination Request, Phoenix-Mesa Gateway Airport Northeast Area Development Plan, March 2015.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

EXHIBIT 3-12

NORTH 0 3,500 ft.

Northeast Area Development Alternative: Potential Waters of the United States

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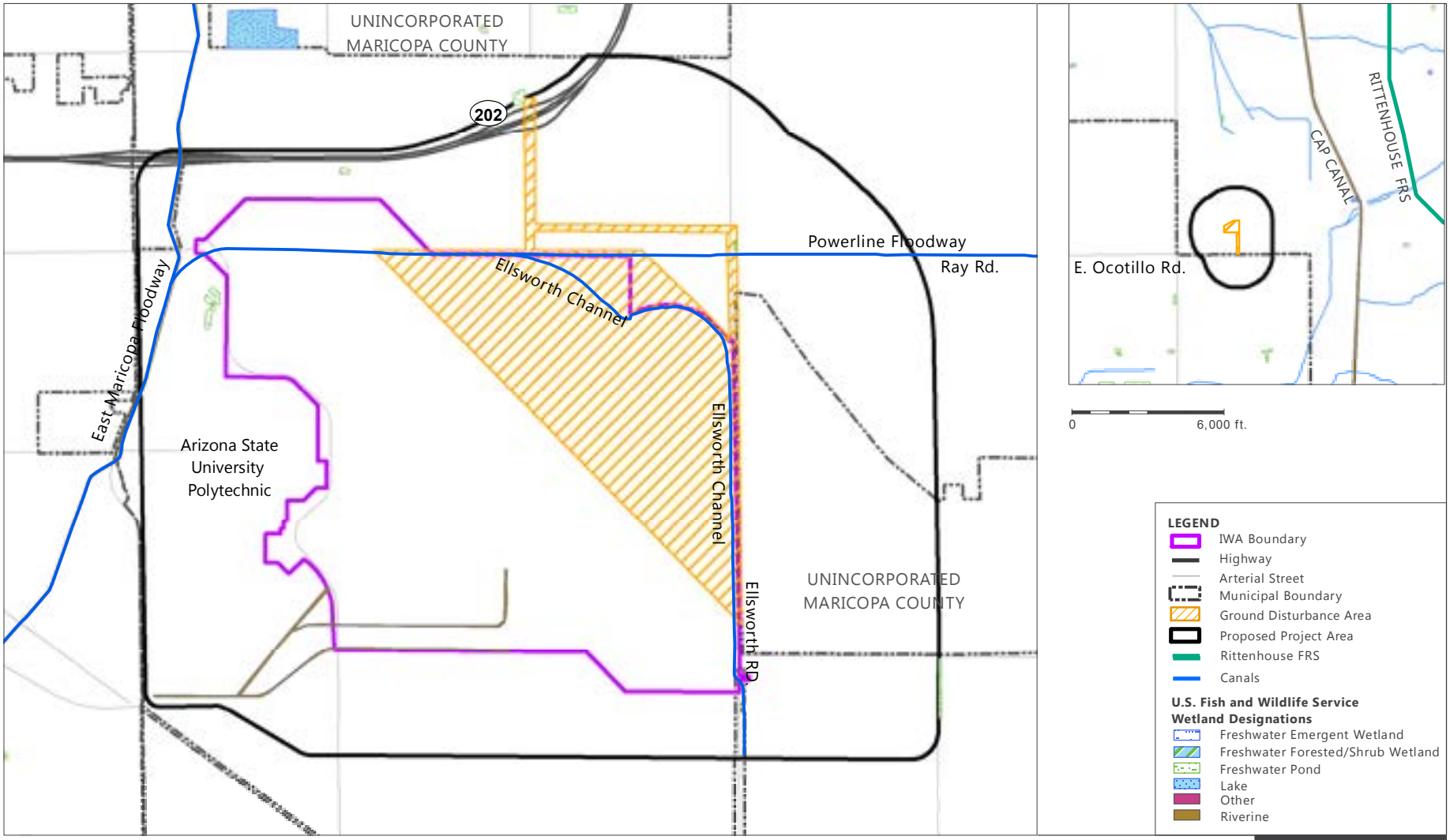

SOURCE: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009, February 2009 (project area, airport property boundary); ESRI Data 2010 (base map layers); U.S. DOT, FAA, ASR-8 Surveillance Radar Addendum, May 27, 2014; U.S. Fish and Wildlife Service, National Wetlands Inventory, Wetlands Data by State, http://www.fws.gov/wetlands/Data/State-Downloads.html, (accessed January 2016).
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 3-13

NORTH 0 4,000 ft.

Water Resources

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The NWI did not identify any wetlands within the RTN7 Site Alternative GDA. No wetlands or waters of the United States were observed in the RTN7 Site Alternative GDA during the site investigation conducted by AMEC scientists.[58]

3.14.2 FLOODPLAINS

3.14.2.1 Regulatory Setting

Executive Order No. 11988 was enacted in 1977 to avoid, to the maximum extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, as well as to avoid direct and indirect support of floodplain development wherever there is a practical alternative. The order was issued in furtherance of NEPA, the National Flood Insurance Act of 1968, and the Flood Disaster Act of 1973. Floodplains are defined as lowland and flat areas adjoining waters that are subject to a 1 percent or greater chance of flooding in any given year, i.e., a 100-year flood event.

3.14.2.2 Affected Environment

Northeast Area Development Alternative

According to Federal Emergency Management Agency (FEMA) Floodplain Maps of Maricopa County and Unincorporated Areas, two flood zones have been delineated for the Northeast Area Development Alternative PPA.[59,60] Portions of the Northeast Area Development Alternative PPA along Hawes Road, Ray Road, and the east side of Ellsworth Road are classified as Zone X. Zone X indicates areas of moderate flood hazard, which is usually between the limits of the 100-year and 500-year flood events. The remaining portions of the Northeast Area Development Alternative PPA are designated as Zone D, which indicates possible, but undetermined, flood hazards, as no analysis of flood hazards has been conducted (**Exhibit 3-14**).[61]

RTN7 Site Alternative

According to FEMA Floodplain Maps of Pinal County, Arizona and Incorporated Areas, the RTN7 Site Alternative PPA has been delineated as Zone D (**Exhibit 3-15**). Flood Zone D indicates possible, but undetermined, flood hazards, as no analysis of flood hazards has been conducted.[62]

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58 AMEC, *Water Resources – Affected Environment Airport Surveillance Radar (ASR) Site Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, November 2014.

59 Federal Emergency Management Agency, *Map Panel ID: 04013C2695H, Maricopa County Unincorporated and Incorporated Areas,* April 1, 2008, https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1&userType=G (accessed October 2, 2013).

60 Federal Emergency Management Agency, *Map Panel ID: 04013C2685H, Maricopa County Unincorporated and Incorporated Areas,* October 1, 2005, https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-&userType=G (accessed October 2, 2013).

61 AMEC, *Water Resources – Affected Environment Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, November 2013.

62 Federal Emergency Management Agency, *Flood Insurance Rate Map, Map Panel IDs: 04021C0200E, 04021C0475E, Pinal County, Arizona and Incorporated Areas,* effective date December 4, 2007, https://msc.fema.gov/portal (accessed July 20, 2015).

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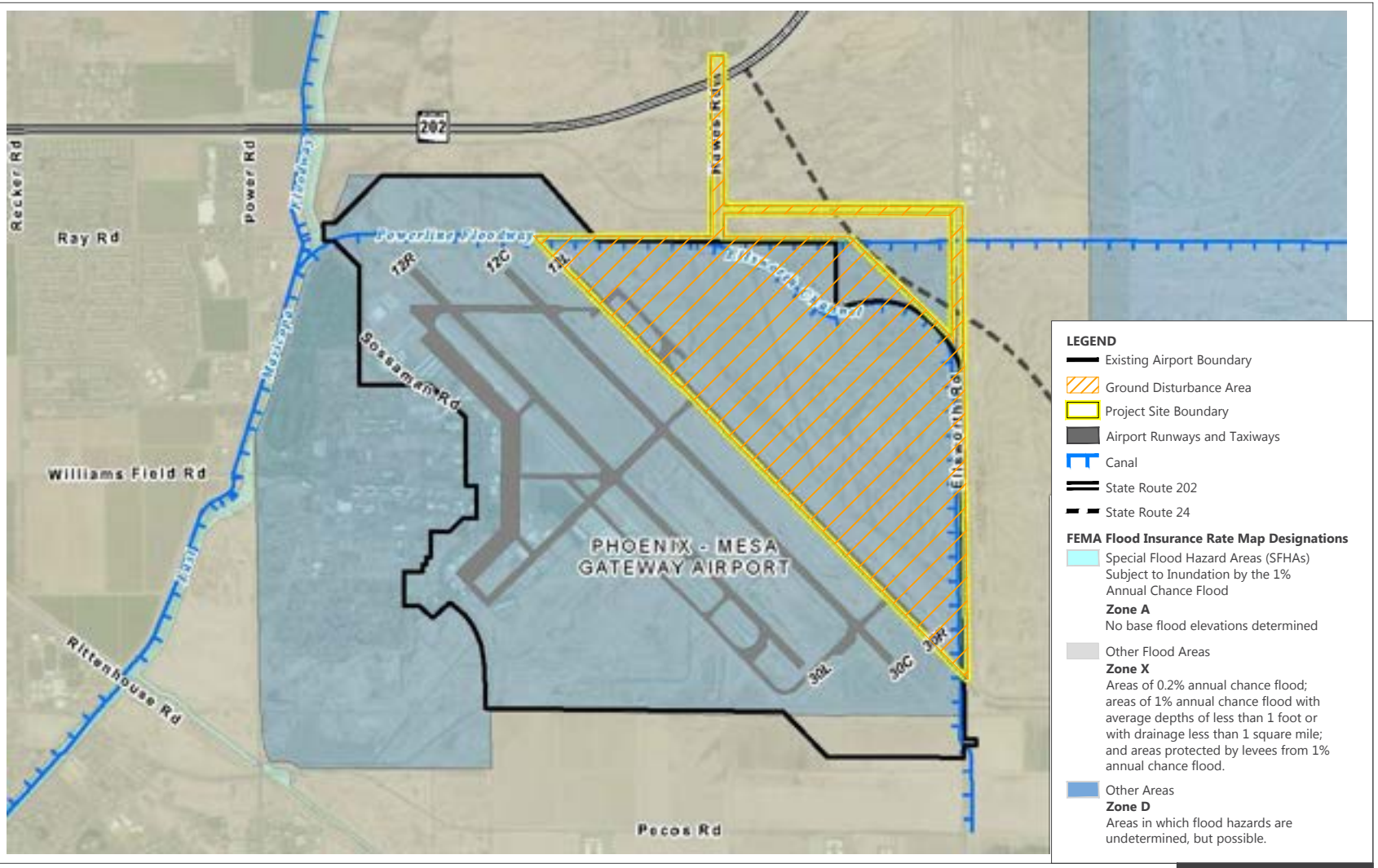

SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (airport property boundary); AMEC Environment and Infrastructure, Inc.,Technical Memorandum: Water Resources - Affected Environment Northeast Area Development Plan, Phoenix-Mesa Gateway Airport, January 2014.
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 3-14

NORTH 0 3,500 ft.

Floodplains - Northeast Area Development Alternative

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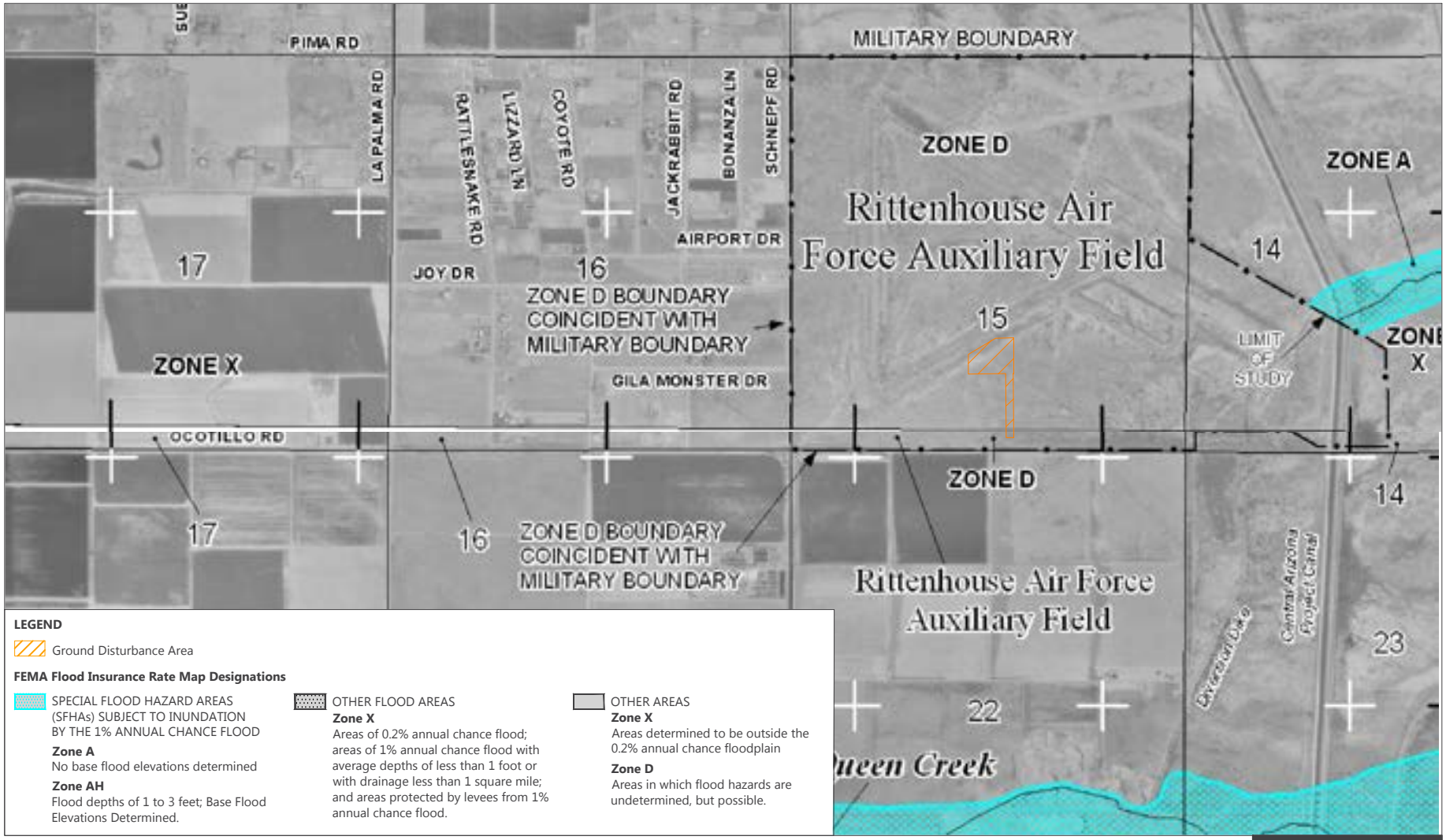

SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (airport property boundary); Federal Emergency Management Agency (FEMA). Flood Insurance Rate Map, Map Panel IDs: 04021C0200E, 04021C0475E, Maricopa County, Arizona and Incorporated Areas, Revised October 2013, https://msc.fema.gov/portal (accessed July 20, 2015).
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 3-15

NORTH 0 2,000 ft.

Floodplains - RTN7 Site Alternative

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3.14.3 SURFACE WATERS

3.14.3.1 Regulatory Setting

Surface waters are sensitive to changes in land cover and uses. Therefore, any proposed improvements or operational changes that increase impervious area at the Airport will likely temporarily or permanently affect stormwater runoff patterns, thus directly or indirectly influencing local water resources.

Applicable laws and regulations related to water resources that the Proposed Action could impact include:

- Section 402 of the Clean Water Act, which regulates discharge of pollutants or combinations of pollutants into waters of the United States[63]
- Safe Drinking Water Act, as amended, also known as the Public Health Service Act, which prohibits federal agencies from funding actions that would contaminate a sole-source aquifer or its recharge area[64]

3.14.3.2 Affected Environment

Northeast Area Development Alternative

The Northeast Area Development Alternative PPA is located within the Middle Gila River Watershed. The Powerline Floodway and the Ellsworth Channel control stormwater runoff within the Northeast Area Development Alternative PPA. The flood control properties for each channel are described in the following paragraphs:[65]

Powerline Floodway—The Powerline Floodway is located along the northern boundary of the Northeast Area Development Alternative PPA. The Floodway serves to convey discharges from the Powerline Flood Retarding Structures (FRS), located approximately five miles northeast of IWA. The Powerline Floodway also collects overland sheet flow and stormwater runoff to its confluence with the East Maricopa Floodway, located approximately one mile west of the Northeast Area Development Alternative PPA. The Flood Control District of Maricopa County manages the Powerline Floodway.

Ellsworth Channel—The Ellsworth Channel runs parallel to Ellsworth Road along the east boundary of the Northeast Area Development Alternative GDA, and it serves to mitigate flooding along Ellsworth Road. The Channel discharges stormwater runoff into the Powerline Floodway, which discharges to the East Maricopa Floodway. The Ellsworth Channel, managed by the City of Mesa, ultimately discharges to the Gila River, which is approximately 14.3 miles southwest of IWA.

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63 33 U.S.C. § 1251; 40 CFR Parts 110, 112, 116, 117, 122, 125, 129, 130, 131, 136, 142, 149, 401, and 403.

64 42 U.S.C. § 300.f, *et seq.*, December 1974.

65 AMEC, *Water Resources – Affected Environment Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, January 2014.

RTN7 Site Alternative

There are no perennial surface waters within the RTN7 Site Alternative GDA. The Central Arizona Project Canal runs east of the RTN7 Site Alternative PPA, and the Rittenhouse FRS is located approximately one-half mile east of the RTN7 Site Alternative GDA.[66]

3.14.4 GROUNDWATER

3.14.4.1 Regulatory Setting

The Safe Drinking Water Act (SDWA) authorizes the EPA to set standards for drinking water quality, and the EPA can delegate authority to states to implement the Act within their jurisdictions, if they meet or exceed EPA standards. Title 40 CFR Parts 141-149 prohibit federal agencies from funding actions that would contaminate EPA-designated sole-source aquifers or recharge zones.

ADEQ maintains enforcement authority for the SDWA in Arizona, and the ADEQ Water Quality Division regulates discharges of pollutants to aquifers through the Aquifer Protection Permit program to protect groundwater quality for drinking water use. The program defines facility types that are considered to discharge pollutants to groundwater: surface impoundments, solid waste disposal facilities, injection wells, land treatment facilities, salt domes/beds, drywells, underground caves, mines and related facilities, septic tank systems, underground water storage facilities, sewage or wastewater treatment facilities, and wetlands designed to treat municipal and domestic wastewater for underground storage.

3.14.4.2 Affected Environment

Northeast Area Development Alternative

Based on groundwater level measurements, collected from the Liquid Fuels Storage Area at the former WAFB in 2012, the groundwater table is located at approximately 140 to 160 feet below ground surface. These measurements were collected approximately 1.2 miles southwest of the Northeast Area Development Alternative GDA. Additionally, there are no sole-source aquifers within the Northeast Area Development Alternative PPA.[67]

RTN7 Site Alternative

Based on information provided by the Phoenix Active Management Area for groundwater, the depth of groundwater within the RTN7 Site Alternative GDA varies from 322 to 399 feet below ground surface.[68] There are no sole-source aquifers within the RTN7 Site Alternative GDA.

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66 AMEC, *Water Resources – Affected Environment Airport Surveillance Radar (ASR) Site Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, November 2014.

67 AMEC, *Water Resources – Affected Environment Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, January 2014.

68 AMEC, *Water Resources – Affected Environment Airport Surveillance Radar (ASR) Site Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, November 2014.

3.15 Past, Present, and Reasonably Foreseeable Future Actions

Cumulative impacts to environmental resources result from incremental effects of future actions combined with other past, present, and reasonably foreseeable future actions in the area. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (federal, state, and local) or individuals. In accordance with NEPA, a discussion of cumulative impacts resulting from projects proposed, under construction, recently completed, or planned for implementation in the near future is required. For purposes of this analysis, projects implemented within the last five years or proposed to be implemented within the next five years, and located within one mile of the Proposed Action, were identified (**Table 3-14**). Past, Present, and Reasonably Foreseeable Future Actions are shown on **Exhibit 3-16**.

Table 3-14 (1 of 2): Past, Present, and Reasonably Foreseeable Future Actions in the PPA

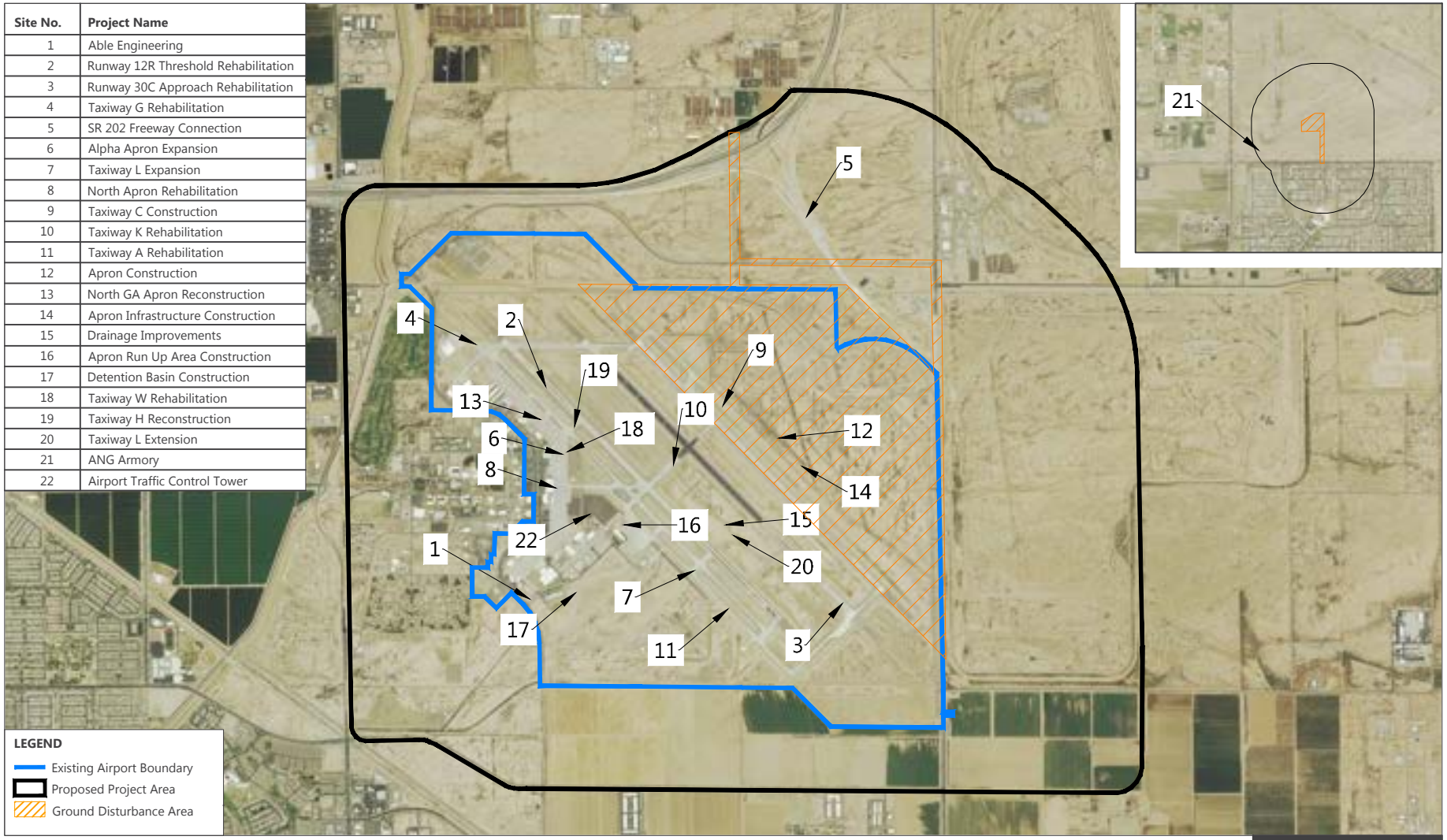
SITE NUMBER	PROJECT NAME	LOCATION	DESCRIPTION	CURRENT STATUS
PAST ACTIONS				
1	Able Engineering	7660 East Velocity Way (Mesa)	Development of industrial office at the Airport	Completed
2	Runway 12R Threshold Rehabilitation	Airport	Rehabilitation of 1,000 feet of Runway 12R Threshold including shoulders, lighting, drainage, and marking	Completed
3	Runway 30C Approach Rehabilitation	Airport	Rehabilitation of 1,000 feet of Runway 30C Approach end including shoulders, lighting, drainage, signage, and marking	Completed
4	Taxiway G Rehabilitation	Airport	Rehabilitation of Taxiway G at Taxiway B Hammerhead including shoulders, lighting, drainage, signage, and marking	Completed
5	SR 202 Freeway Connection	SR 202 and South Ellsworth Road	Construction of elevated ramps connecting SR 202 and the one-mile stretch of SR 24 to South Ellsworth Road	Completed
6	Taxiway C Construction	Airport	Construction of Taxiway C (Phase 2) from Taxiway J to Taxiway L including shoulders, lighting, drainage, signage, and markings	Completed
PRESENT ACTIONS				
7	Alpha Apron Expansion	Airport	Construction of Alpha apron Phase 3 to northwest	Earliest completion estimated late 2018
8	Taxiway L Expansion	Airport	Extension of Taxiway L (Phase 2) from Taxiway A into south Tract of Taxiway L including shoulders, lighting, drainage, signage, marking	Earliest completion estimated late 2018
9	North Apron Rehabilitation	Airport	Rehabilitation of North Apron (Phase 1 & Phase 2) including lighting, drainage, signage, and markings	Earliest completion estimated late 2017

Table 3-14 (2 of 2): Past, Present, and Reasonably Foreseeable Future Actions in the PPA

SITE NUMBER	PROJECT NAME	LOCATION	DESCRIPTION	CURRENT STATUS
			FUTURE ACTIONS	
10	Taxiway K Rehabilitation	Airport	Rehabilitation of Taxiway K between Runway 12R and Runway 12C including shoulders, lighting, drainage, signage, and markings	Earliest completion estimated late 2017
11	Taxiway A Reconstruction	Airport	Reconstruction of Taxiway A between Taxiway N to Taxiway L including shoulders, lighting, drainage, signage, and marking	Earliest completion estimated late 2018
12	Apron Construction	Airport	Construction of Phase 1 Apron including utilities, roadways, drainage, lighting, and signage for East Side Terminal Area	Earliest completion estimated late 2018
13	North GA Apron Reconstruction	Airport	Reconstruction of North GA Apron (Phase 3)	Earliest completion estimated late 2017
14	Apron Infrastructure Construction	Airport	Construction of East Side Terminal Area infrastructure	Earliest completion estimated late 2019
15	Drainage Improvements	Airport	Improvements for Runway Phase 2 Airfield drainage between Runways 12R-30L and 12C-30C south of Taxiway K	Earliest completion estimated mid-2016
16	Apron Run Up Area Construction	Airport	Construction of Phase 1 & 2 of aircraft run-up areas to accommodate Group III aircraft for engine maintenance runs	Earliest completion estimated late 2018
17	Detention Basin Construction	Airport	Construction of detention basin to ultimate size to accommodate drainage requirements to the Airport's south industrial area	Earliest completion estimated late 2018
18	Taxiway W Rehabilitation	Airport	Rehabilitation of Taxiway W located north of Taxiway W/Taxiway T intersection	Earliest completion estimated late 2020
19	Taxiway H Reconstruction	Airport	Reconstruction of Taxiway H between Taxiway B and Runway 12R including shoulders, lighting, drainage, signage, and marking	Earliest completion estimated late 2020
20	Taxiway L Extension	Airport	Extension of Taxiway L (Phase 3) between Runway 30L and Runway 30C including shoulders, drainage, and lighting	Earliest completion estimated late 2019
21	AZ Army National Guard Armory	RAAF	NA	NA
22	Relocate Airport Traffic Control Tower (ATCT)	Airport	Construct a replacement ATCT north of the existing ATCT	Earliest completion estimated 2020

SOURCES: FAA and ADOT 2015 Five-Year Capital Improvement Program, December 2013 and Phoenix-Mesa Gateway Airport Authority, February 2016.
PREPARED BY: Ricondo & Associates, Inc., January 2016.

Site No.	Project Name
1	Able Engineering
2	Runway 12R Threshold Rehabilitation
3	Runway 30C Approach Rehabilitation
4	Taxiway G Rehabilitation
5	SR 202 Freeway Connection
6	Alpha Apron Expansion
7	Taxiway L Expansion
8	North Apron Rehabilitation
9	Taxiway C Construction
10	Taxiway K Rehabilitation
11	Taxiway A Rehabilitation
12	Apron Construction
13	North GA Apron Reconstruction
14	Apron Infrastructure Construction
15	Drainage Improvements
16	Apron Run Up Area Construction
17	Detention Basin Construction
18	Taxiway W Rehabilitation
19	Taxiway H Reconstruction
20	Taxiway L Extension
21	ANG Armory
22	Airport Traffic Control Tower



SOURCES: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (airport property boundary); NAIP 2013 (Aerial Imagery), 2013; FAA and ADOT 2015 Five-Year Capital Improvement Program, December 2013.
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT 3-16

NORTH 0 4,000 ft.

Past, Present, and Reasonably Foreseeable Future Actions

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4. Environmental Consequences and Mitigation Measures

The potential environmental consequences associated with the No Action Alternative and the Proposed Action are discussed in this chapter. The Proposed Action includes both the Northeast Area Development Alternative and the RTN7 Site Alternative. Of the environmental categories specified in FAA Orders 1050.1F and 5050.4B, the following were evaluated as part of this EA and are documented in the following sections:

- Air Quality (Section 4.1)
- Biological Resources (Section 4.2)
- Climate (Section 4.3)
- Department of Transportation Act, Section 4(f) and Land and Water Conservation Fund Act, Section 6(f) Resources (Section 4.4)
- Hazardous Materials, Solid Waste, and Pollution Prevention (Section 4.5)
- Historical, Architectural, Archeological, and Cultural Resources (Section 4.6)
- Land Use (Section 4.7)
- Natural Resources and Energy Supply (Section 4.8)
- Noise and Compatible Land Use (Section 4.9)
- Socioeconomic Impacts, Environmental Justice, and Children's Health and Safety Risks (Section 4.10)
- Visual Effects (Section 4.11)
- Water Resources (Section 4.12)
- Cumulative Impacts (Section 4.13)

The remaining environmental resources specified in FAA Orders 1050.1F and 5050.4B would not be affected by the Proposed Action, which includes the Northeast Area Development Alternative and the RTN7 Site Alternative. These categories, identified in Section 3.2, include: coastal resources, farmlands, and wild and scenic rivers.

4.1 Air Quality

4.1.1 METHODOLOGY

The overall approach and methodology for assessing the Proposed Action's potential impacts to air quality were accomplished in accordance with current FAA Orders, guidelines for preparing air quality assessments under NEPA and the federal CAA, and the IWA Air Quality Protocol. [1,2] Following these guidelines, the air quality assessment included the EPA criteria pollutants (and their precursors), HAPs, and GHG. For comparative purposes, future-year operational conditions, both with and without the Proposed Action, were evaluated, as were construction-related emissions attributable to the project.

The majority of the technical analyses were accomplished using the latest version of the FAA's Emissions and Dispersion Modeling System (EDMS version 5.1.4.1).[3] EDMS is specifically designed for assessing airport-related air quality impacts.[4] Other approved models included the EPA's Motor Vehicle Emissions Simulator (MOVES version 2010b), and the NONROAD (Version 2008a) emission-factor database for construction-related equipment and vehicles. [5, 6, 7] Importantly, and for the purposes of coordination and consistency, the approach, methodology, and models used for this analysis were reviewed, commented upon, and agreed to by the EPA and ADEQ in the form of an Air Quality Assessment Protocol prior to conducting the assessment.[8]

In accordance with FAA guidelines, the air quality assessment was first based upon the preparation and outcomes of emission inventories under future-year conditions for both the No Action Alternative and the Northeast Area Development Alternative. Wherever appropriate, the outcomes from these analyses are compared to the CAA General Conformity Rule thresholds and/or presented for disclosure purposes under NEPA (Section 4.1.3.3).

In general terms, an emissions inventory is a quantification of the amount, or weight, of pollutants emitted from a source (or combination of sources) over a period of time. The outcome is a product of source activity levels (i.e., aircraft operations) combined with appropriate emission factors (i.e., grams of pollutant/operation). The results are segregated by pollutant type (i.e., CO, NO_x, VOC, etc.) and emission source (i.e., aircraft, GSE, motor vehicles, etc.), and they are commonly reported in units of tons per year (tpy). In the case of a construction-related emissions inventory, the emission sources comprise construction equipment/vehicles and activities.

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1 FAA Order 1050.1F, Environmental Impacts: Policies and Procedures (including the accompanying Desk Reference), Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions, and the FAA's Aviation Emissions and Air Quality Handbook*.

2 Quantifying emissions of hazardous air pollutants was a component of the overall technical approach outlined in the *Draft Final Air Quality Assessment Protocol* (June 2014) that was submitted to federal, state, and local air quality regulatory agencies.

3 The air quality assessment commenced before the release of the FAA's new model, the Aviation Environmental Design Tool (AEDT).

4 Federal Aviation Administration, *Emissions and Dispersion Modeling System (EDMS)*, June 2014.

5 U.S. Environmental Protection Agency, *Motor Vehicle Emissions Simulator (MOVES) 2010b*, June 2012.

6 U.S. Environmental Protection Agency, *NONROAD2005 Model*, December 2005. and EPA NONROAD Model Updates for 2008, April 2009.

7 U.S. Environmental Protection Agency, *EPA NONROAD Model Updates for 2008*, April 2009.

8 K.B. Environmental Sciences, Inc., *Air Quality Assessment Protocol, Phoenix-Mesa Gateway Airport, Northeast Area Development Plan, Environmental Assessment*, June 2014.

The emissions inventories for the Proposed Action are presented separately by operational- and construction-related pollutants, since they are generated over different timeframes and by different sources. The results are also segregated by planning phases (e.g., years 2022 and 2027).

Supporting documentation and data collected and/or developed in support of the assessment are contained in **Appendix H**. Finally, for ease of review and understanding, the EPA "criteria" pollutants (and their precursors) are presented first, followed by the HAPs. Emissions of GHGs are presented separately in Section 4.3.

4.1.2 THRESHOLDS OF SIGNIFICANCE

The evaluation of significance involves identifying if the Proposed Action would cause pollutant concentrations to exceed one or more of the NAAQS for any of the time periods analyzed or would increase the frequency or severity of any such existing violations. Therefore, the Proposed Action and the No Action Alternative were evaluated for conformity with the applicable SIPs, which are plans to eliminate or reduce the severity and number of violations of the NAAQS and to achieve expeditious attainment of those standards, pursuant to the CAA. Established under the CAA, the General Conformity Rule applies to proposed federal actions in a nonattainment or maintenance area if the total of direct and indirect emissions of the relevant criteria air pollutants and precursor pollutants caused by the Proposed Action equal or exceed defined *de minimus* amounts. If the project causes an exceedance of *de minimus*, then the federal agency would need to make a determination of General Conformity.

In Maricopa County, the General Conformity *de minimus* thresholds were established to evaluate the applicability of the General Conformity Rule. If the project emissions do not exceed the *de minimus* thresholds, the FAA can determine that the General Conformity Rule does not apply, and no further analysis or documentation is required.

4.1.3 COMPARISON OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

Neither the Proposed Action nor the No Action Alternative would cause pollutant concentrations to exceed any of the NAAQS for the time periods analyzed or increase the frequency or severity of existing violations in Maricopa County.

4.1.3.1 Northeast Area Development Alternative

Under the No Action Alternative, there are no expected changes to the airport layout or facilities that would result in an increase in operational-related criteria pollutant emissions—beyond those that would be attributable to the Airport under normal future-year conditions (i.e., without the Northeast Area Development Alternative) as shown in Table 1-1. Nevertheless, emissions associated with the No Action Alternative are computed and compared to the Northeast Area Development Alternative. Additionally, there would be no construction-related emissions associated with the No Action Alternative.

Construction Emissions

The principal sources of construction-related criteria pollutant emissions include the following: (1) heavy equipment, such as graders, dozers, loaders, pavers, cranes, etc., (2) construction vehicles, such as on/off-road trucks, employee vehicles, etc., and (3) construction activities, such as clearing, grading, material handling, etc.

Consistent with the planned construction schedule for the Northeast Area Development Alternative, the construction emissions inventory encompasses a three-year period. The emissions inventories for these sources and pollutants are compiled and presented in **Table 4-1**.

Table 4-1: Construction Emission Inventory—Criteria Pollutants (tons)

	POLLUTANTS					
CONSTRUCTION YEAR	**CO**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**VOC**
Year 1	39	44	0.2	6	3	82
Year 2	40	41	0.2	5	2	76
Year 3	9	6	<0.1	1	0.4	14

NOTES:

CO = carbon monoxide NO_x =nitrogen oxides SO_x = sulfur oxides $PM_{10/2.5}$ = particulate matter VOC =volatile organic compound

No Action emissions are totaled and include aircraft, APUs, GSE, and on-site motor vehicles.

See Appendix H for details.

SOURCE: U.S. Environmental Protection Agency, EPA NONROAD Model Updates for 2008, April 2009; Phoenix-Mesa Gateway Airport Authority, *Construction Period Data,* December 2015.

PREPARED BY: KB Environmental Sciences, Inc., March 2016.

There are no construction-related emissions associated with the No Action Alternative, since there would be no construction activities under this condition. Under the Northeast Area Development Alternative, construction emissions are shown to range from <0.1 to 82 tons, depending on the pollutant (e.g., CO, NO_x, PM_{10}) and the year of construction (e.g., Year 1, Year 2, Year 3).

Operational Emissions

The primary sources of operational emissions associated with the Northeast Area Development Alternative include the following: aircraft engines and their APUs, GSE, and motor vehicles traveling to, from, and within the Northeast Area Development Alternative. The emission inventories of criteria pollutants for these sources are compiled and presented in **Table 4-2** and **Table 4-3**, under both the No Acton Alternative and the Northeast Area Development Alternative, for the years 2022 and 2027. For ease of comparison, Northeast Area Development Alternative-related emissions are broken out by emission source (e.g., aircraft, APUs, GSE), while the No Action Alternative results are displayed as the overall sum. It is also noteworthy that motor vehicle emissions are segregated by "on-site" and "off-site" in support of the CAA General Conformity Section (Section 4.1.3.3).

Table 4-2: Criteria Pollutant Emissions Inventory (tons/year)—2022

	POLLUTANT TYPES					
EMISSION SOURCE	**CO**	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Aircraft	1,138	57	86	10	5	5
APUs	4	<1	3	<1	<1	<1
GSE	27	1	3	<1	<1	<1
Motor Vehicles (On-Site)	41	2	2	<1	1	<1
Northeast Area Development Alternative	1,209	60	95	10	6	6
No Action Alternative	1,214	65	94	11	6	6
Net Change in Emissions—Northeast Area Development Alternative	**(5)**	**(5)**	**1**	**(1)**	**<1**	**<1**
Motor Vehicles (Off-Site)						
Northeast Area Development Alternative	110	5	7	<1	2	<1
No Action Alternative	18	1	1	<1	<1	<1
Net Change in Emissions—Northeast Area Development Alternative	**93**	**5**	**5**	**<1**	**2**	**<1**

NOTES:

Values may reflect rounding.

Values in () denote a decrease in emissions.

CO = carbon monoxide VOC = volatile organic compounds NO_x =nitrogen oxides SO_x = sulfur oxides $PM_{10/2.5}$ = particulate matter APU =auxiliary power units GSE = ground support equipment

No Action Alternative emissions are totaled and include aircraft, APUs, GSE, and on-site motor vehicles.

See Appendix H for details.

SOURCE: Federal Aviation Administration, *EDMS Version 5.1.4.1*, June 2014.
PREPARED BY: KB Environmental Sciences Inc., March 2016.

Table 4-3: Criteria Pollutant Emissions Inventory (tons)—2027

	POLLUTANT TYPES					
SOURCE	**CO**	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Aircraft	1164	57	89	10	5	5
APUs	3	<1	3	<1	<1	<1
GSE	24	1	3	<1	<1	<1
Motor Vehicles (on-site)	51	3	2	<1	1	<1
Northeast Area Development Alternative	1242	61	97	11	7	6
No Action Alternative	1237	66	96	11	6	6
Net Change in Emissions— Northeast Area Development Alternative	**5**	**(5)**	**1**	**<1**	**1**	**<1**
Motor Vehicles (Off-Site)						
Northeast Area Development Alternative	138	7	6	<1	4	1
No Action Alternative	14	1	1	<1	<1	<1
Net Change in Emissions— Northeast Area Development Alternative	125	7	6	<1	3	1

NOTES:

Values may reflect rounding.

Values in () denote a decrease in emissions.

CO = carbon monoxide VOC = volatile organic compounds NO_x =nitrogen oxides SO_x = sulfur oxides $PM_{10/2.5}$ = particulate matter APU =auxiliary power units GSE = ground support equipment

No Action Alternative emissions are totaled and include aircraft, APUs, GSE, and on-site motor vehicles.

See Appendix H for details.

SOURCE: Federal Aviation Administration, *EDMS Version 5.1.4.1*, June 2014.
PREPARED BY: KB Environmental Sciences Inc., March 2016.

In 2022, as shown in Table 4-2, aircraft represent the largest source of criteria pollutant emissions under the Northeast Area Development Alternative. These values range from 5 to 1,138 tons, depending on the pollutant type (e.g., CO, VOC, etc.). Motor vehicles moving within the site represent the second largest source, followed by GSE and aircraft APUs.

When comparing total emissions for the Northeast Area Development Alternative to those of the No Action Alternative (e.g., for VOC: 60 tons – 65 tons = -5 tons), the results show that VOC emissions decrease by 5 tons with the Northeast Area Development Alternative. Under this scenario, the resultant decrease in aircraft taxi distance to and from the runway (and the associated emissions) more than offset the expected increase in on-site motor vehicle trips. The only exception to this is NO_x, which is shown to increase with the Northeast Area Development Alternative by 1 ton (i.e., about 1 percent) over the No Action Alternative.

The data in Table 4-3 shows that by 2027, total emissions of the criteria pollutants increase slightly for some pollutants (e.g., CO at 3 percent) and remain the same for others (e.g., SO_x and $PM_{10/2.5}$). In this case, the forecast increase in on-site motor vehicle trips (and their emissions) marginally outweighs the corresponding reductions in emissions due to the decrease in taxi distance from the terminal to the runway.

Hazardous Air Pollutants

HAPs are pollutants that do not have established NAAQS, but they present potential adverse human health risks from short-term (acute) or long-term (chronic) exposures. An inventory of 20 individual HAPs, selected by the FAA as being appropriate for airport projects, was performed. However, because of the absence of applicable standards or thresholds, only the HAPs emission inventories for both study years are presented. The total amounts of HAPs are calculated by source (aircraft, ground service equipment, auxiliary power units, and on-airport vehicles) for the Northeast Area Development Alternative. The emissions inventories from these sources were compiled and are presented in **Table 4-4**.

Comparison to General Conformity de minimus Threshold

The information presented previously in Section 3.3.1 indicated that the Phoenix-Mesa metropolitan area is currently classified as a Nonattainment Area for O_3 and PM_{10} and as an Attainment/Maintenance area for CO. As a result of these designations, SIPs are in place by the ADEQ to help ensure that violations of the NAAQS for each of these pollutants do not reoccur.

A provision of the federal CAA (called the General Conformity Rule) dictates that all federal actions (including those under the jurisdiction of the FAA) must be shown to comply with the emission-reduction targets, strategies, and timetables of the applicable SIPs. Compliance with the SIP is most effectively demonstrated by showing that the Proposed Action's emissions are below (i.e., within) prescribed minimum thresholds (i.e., *de minimis* levels).

It is important to note that the General Conformity Rule applies to criteria pollutants (and their precursors) for which the project area has been designated as Nonattainment or Attainment/Maintenance. Moreover, the requirement targets emissions that are characterized as "direct" emissions (i.e., emissions that the FAA or airport owner/operator) have direct control over. The General Conformity Rule also does not apply to HAPs or GHGs.

For the purposes of addressing the General Conformity Rule requirement, **Table 4-5** and **Table 4-6** present the operational and construction emissions of CO, PM_{10}, NO_x, and VOCs associated with the Northeast Area Development Alternative. For comparison, the corresponding *de minimis* levels are also provided.

As shown in Table 4-5, under the Northeast Area Development Alternative, operational emissions of CO, VOC, NO_x, and PM_{10} are all below (i.e., within) the prescribed General Conformity Rule for *de minimis* levels. Similarly, construction emissions (Table 4-6) associated with the Northeast Area Development Alternative are also below these thresholds. There are no other regulatory criteria or analyses that apply to the air quality impacts of the Proposed Action.

Table 4-4: HAPs Emissions Inventory (tons per year)

	HAZARDOUS AIR POLLUTANTS	
POLLUTANT	**NORTHEAST AREA DEVELOPMENT ALTERNATIVE (2022)**	**NORTHEAST AREA DEVELOPMENT ALTERNATIVE (2027)**
1,3-butadiene	0.907	0.915
2,2,4-trimethylpentane	0.068	0.085
2-methylnaphthalene	0.078	0.077
Acetaldehyde	2.369	2.392
Acetone	0.646	0.658
Acrolein	1.277	1.289
Benzaldehyde	0.271	0.273
Benzene	0.984	0.996
Ethylbenzene	0.128	0.143
Formaldehyde	7.122	7.191
Isopropylbenzene (cumene)	0.001	0.001
M & P-xylene	0.151	0.153
Methyl alcohol	0.679	0.680
M-xylene	0.014	0.013
Naphthalene	0.292	0.295
N-heptane	0.040	0.040
N-hexane	0.071	0.086
O-xylene	0.213	0.260
Phenol (carbolic acid)	0.311	0.313
Propionaldehyde (CAA)	0.437	0.442
Styrene	0.180	0.182
Toluene	0.570	0.651
Total HAPs	**16.8**	**17.1**

NOTES:

Values may reflect rounding.

See Appendix H for details.

SOURCE: Federal Aviation Administration, *EDMS Version 5.1.4.1*, June 2014.
PREPARED BY: KB Environmental Sciences Inc., March 2016.

Table 4-5: General Conformity Determination—Operational Emissions

	POLLUTANT TYPES (TONS/YEAR)			
CONDITION/CRITERIA	**CO**	**VOC**	**NO_x**	**PM_{10}**
Year 2022	(5)	(5)	1	(1)
Year 2027	5	(5)	1	<1
De minimis Level	100	100	100	70
Above *De minimis* Level?	No	No	No	No
Conforms to SIP?	Yes	Yes	Yes	Yes

NOTES:

Values may reflect rounding.

Values in () denote a decrease in emissions.

CO = carbon monoxide VOC = volatile organic compounds NOx = nitrogen oxides PM10 = particulate matter

See Appendix H for details.

SOURCE: KB Environmental Sciences, Inc., March 2016.
PREPARED BY: KB Environmental Sciences, Inc., March 2016.

Table 4-6: General Conformity Determination—Construction Emissions

	POLLUTANT TYPES (TONS/YEAR)			
EMISSIONS/CRITERIA	**CO**	**VOC**	**NO_x**	**PM_{10}**
Total Annual Emissions	40	82	44	3
De minimis Level	100	100	100	70
Above *De minimis* Level?	No	No	No	No
Conforms to SIP?	Yes	Yes	Yes	Yes

NOTES:

Values may reflect rounding.

Values in () denote a decrease in emissions.

CO = carbon monoxide VOC = volatile organic compounds NOx = nitrogen oxides PM10 = particulate matter

Total Annual Emissions represents the highest values during the three-year construction period.

See Appendix H for details.

SOURCE: KB Environmental Sciences, Inc., March, 2016.
PREPARED BY: KB Environmental Sciences, Inc., March, 2016.

4.1.3.2 RTN7 Site Alternative

There are no construction-related activities or operational activities associated with the No Action Alternative; therefore, there are no increases in emissions for the criteria pollutants or for the HAPs.

The RTN7 Site Alternative would not entail operational activities (e.g., aircraft and GSE). There would be an emergency generator that would require periodic testing and would run in the event of a power outage. Because the RTN7 Site Alternative is off-Airport property, there would also be emissions from the vehicle used to reach the site. The burning of fossil fuels to reach and test the generator, and to operate the generator in the event of a power outage, would produce criteria pollutants and HAPS. The criteria pollutants attributable to its infrequent testing and use would not be significant. When combined with the emissions from the Northeast Development Alternative, the Proposed Action would not exceed *de minimis* levels.

The construction activities (e.g., radar site preparations, building/equipment assembly, etc.) required for the RTN7 Site Alternative are expected to be both short-term and localized. Therefore, there are no significant amounts of criteria pollutants or HAPs emissions related to this Alternative.

The emissions from the RTN7 Site Alternative's operational activities would be less than significant. Based upon these results, both the operation and construction of the Proposed Action conform to the SIP.

4.1.3.3 Mitigation Measures

Construction activities associated with the Proposed Action, which includes the Northeast Area Development Alternative and the RTN7 Site Alternative, would not exceed the General Conformity *de minimis* thresholds for criteria pollutants. Therefore, a General Conformity Analysis would not be required under Section 176(c) of the Clean Air Act.

Estimated operational emissions of criteria pollutants from implementation of the Proposed Action would not exceed applicable General Conformity *de minimis* thresholds and, accordingly, would conform to the Phoenix metropolitan area SIP.

Best management practices (BMPs) would be employed during construction and operation of the Proposed Action in order to minimize emissions. BMPs for construction and operation of the Proposed Action are listed below:

- Post a publicly visible sign(s) with the telephone number and person to contact regarding dust complaints; this person shall respond and take corrective action within 24 hours.
- During construction, the contractor shall demonstrate that all ground surfaces are covered or treated sufficiently to minimize fugitive dust emissions (e.g., wetting down exposed soil, street sweeping, etc.).
- All roadways, driveways, sidewalks, etc., being installed as part of the project should be completed as soon as practical; in addition, building pads should be laid as soon as practical after grading.
- Prohibit idling or queuing of diesel-fueled vehicles and equipment in excess of five minutes during construction and operation. Exemptions may be granted for safety-related and operational reasons.

- All diesel-fueled equipment used for construction and operation will be outfitted with the best available emission control devices, where technologically feasible, primarily to reduce emissions of diesel particulate matter (PM), including fine PM ($PM_{2.5}$), and secondarily, to reduce emissions of NOx.
- Ensure all equipment and engines are properly maintained and have up-to-date service records.

4.2 Biological Resources

4.2.1 METHODOLOGY

The potential for impacts to biotic communities and threatened and endangered species were assessed through:

- Review of databases of potentially present species maintained by the USFWS and AGFD.
- Assessment of the presence of species and habitat during field surveys of the Proposed Project Area for the Northeast Area Development and RTN7 Site Alternatives , which were conducted in October 2013 and December 2014, respectively.

4.2.2 THRESHOLDS OF SIGNIFICANCE

Under the ESA, the FAA, as the responsible federal agency, determines if the Proposed Action may affect a threatened or endangered species, and if so, the FAA must initiate consultation with the USFWS for terrestrial and freshwater species and NMFS for marine species to determine significance. Additionally, under the Fish and Wildlife Coordination Act, the FAA must consult with the USFWS regarding the conservation of wildlife resources when a federal action may result in control or modification of the water of any stream or other water body to determine if effects are significant.

To identify the potential for impacts to biological species, the Proposed Action or No Action Alternative were reviewed to determine whether either would:

- Create a long-term or permanent loss of an unlisted species;
- Adversely affect special status species or their habitats;
- Create a substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or populations; or
- Adversely affect a species' reproductive success rates, natural mortality rates, non-natural mortality, or ability to sustain minimum population levels required for population maintenance.

4.2.3 COMPARISON OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

4.2.3.1 Northeast Area Development Alternative

No development or change in land use would occur under the No Action Alternative; therefore, no effects to biological resources would occur.

Construction Impacts

Based on a biological assessment, the FAA has determined the proposed project will not affect any federally listed threatened or endangered species or designated critical habitat. Thus, no formal consultation with the U.S. Fish and Wildlife Service, pursuant to Section 7 of the Endangered Species Act of 1973, as amended, is needed. The western burrowing owl, a Bird of Conservation Concern (BCC), was observed within the Northeast Area Development Alternative GDA; however, BCC are not under the purview of the Endangered Species Act. The Northeast Area Development Alternative GDA is 1,079 acres, including the Ellsworth Channel and Powerline Floodway portions. Construction would occur within the limits of the GDA, which is characterized by previously disturbed desert landscape of marginal habitat value for other wildlife species, including migratory birds. Construction would not jeopardize any species or result in a significant loss of habitat for dependent species. Preconstruction surveys for burrowing owl would be conducted in accordance with AGFD management guidelines in order to determine the presence of active and potentially active burrows. The results of the survey would be reported to AGFD. If owls or active burrows are detected, then coordination with the appropriate agencies would occur prior to initiating ground-disturbing activity. Any nesting pairs, if present, would need to be relocated by a qualified contractor, or construction may need to be delayed to accommodate periods of active nesting. By following the AGFD's burrowing owl project clearance protocol (conducting preconstruction surveys, appropriate agency coordination, and mitigation, if necessary), construction impacts to burrowing owls, if present, would not be significant.[9, 10]

The project area lies within the bird migratory route known as the Pacific Flyway, and more than 350 bird species travel within this migration route.[11] During construction, care would be taken to minimize the risk of injury to migratory bird species. Birds protected under MBTA include all common songbirds, raptors, waterfowl, shorebirds, seabirds, and wading birds.[12] Vegetation removal and the grading of vegetated areas would be scheduled outside peak bird-breeding season to the maximum extent practicable. If construction activities cannot occur outside bird nesting season, surveys would be conducted prior to scheduled construction activity to determine if active nests are present within the construction area. If active nests or breeding behavior are detected, then no vegetation removal activities should be conducted until nestlings have fledged, the nest fails, or breeding behaviors are no longer observed.

Construction activities would also have the potential to impact plants protected under the Arizona Native Plant Law, as described in Section 3.4.1.2. Projects involving the potential removal of plant species protected under the Arizona Native Plant Law are subject to review and recommendations by the ADA. Prior to any land disturbance, coordination with the ADA would occur to determine the potential need for focused botanical preconstruction surveys in order to identify plant species that would be affected by project activities. Preconstruction surveys would be conducted to ensure that any protected plants would be avoided, removed,

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9 Arizona Game and Fish Department, Arizona Burrowing Owl Working Group, *Burrowing Owl Project Clearance Guidance for Landowners*, January 2009.

10 Arizona Game and Fish Department, Arizona Burrowing Owl Working Group, *Burrowing Owl Management Guidelines for Municipalities*, June 2007.

11 Pacific Flyway Council, *Migratory Bird Management,* http://pacificflyway.gov/Index.asp (accessed September 25, 2013).

12 AMEC, *Biological Resources – Affected Environment Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, October 2013.

or relocated in accordance with permits issued by the ADA.[13] Compliance with state permits and management guidelines would ensure no significant impacts to biological resources would occur.

Operational Impacts

The IWA *Wildlife Hazard Management Plan* (WHMP) defines habitat management techniques utilized to minimize wildlife attractants at the Airport.[14] The proposed terminal complex would have building ledges that have the potential to provide habitat for migratory birds. The habitat management techniques and deterrent practices outlined in the IWA WHMP would reduce the potential for migratory bird nests on building ledges. Therefore, no significant operational impacts to biological resources would occur within the Northeast Area Development Alternative GDA.

4.2.3.2 RTN7 Site Alternative

No development or change in land use would occur under the No Action Alternative; therefore, no effects to biological resources would occur.

Construction Impacts

Based on literature research, field site reconnaissance, and agency correspondence (see Appendix C), the FAA has determined the proposed project will not affect any federally listed threatened or endangered species or designated critical habitat. Thus, no formal consultation with the U.S. Fish and Wildlife Service, pursuant to Section 7 of the Endangered Species Act of 1973, as amended, is needed. Areas of marginal habitat for other wildlife species, including migratory birds, exist adjacent to the GDA. Such areas generally consist of previously disturbed desert lands to the north and east of the project site, the CAP Canal and ephemeral drainages east of the project site, and the agricultural fields southwest of the project site. Construction would not jeopardize any species or result in a significant loss of habitat for dependent species. During construction, care would be taken to minimize the risk of injury to migratory bird species, as described in Section 4.2.3.1.

Construction activities would have the potential to impact plants protected under the Arizona Native Plant Law, as identified in Section 3.4.1.2. Preconstruction surveys would be conducted to ensure that any protected plants would be avoided or removed/relocated in accordance with permits issued by the ADA. Compliance with state permits would ensure no significant impacts to biological resources would occur.

Operational Impacts

FAA AC 150/5200-33B is concerned about wildlife attractants when they are located within 10,000 feet of any runway used by turbine-powered aircraft, or within a five-mile radius of an airport. Because the RTN7 Site Alternative is not on an airport, the Airport's existing WHMP would not apply to this site. Operation of the proposed ASR-8 radar system would comply with federal, state, and local biological resources regulations. Therefore, no significant operational impacts to biological resources would occur.

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13 Arizona Department of Agriculture, https://agriculture.az.gov/protected-arizona-native-plants (accessed February 11, 2016).

14 Phoenix-Mesa Gateway Airport Authority, *Phoenix-Mesa Gateway Airport Wildlife Hazard Management Plan (WHMP)*, February 2013.

4.2.3.3 Mitigation Measures

Preconstruction surveys would be conducted to determine the presence of sensitive plant species, plants protected under the Arizona Native Plant Law, the western burrowing owl, and migratory bird active nests or breeding behavior. Any species discovered would be avoided, removed, relocated, or otherwise mitigated, as determined by the appropriate agency. Compliance with AGFD and ADA regulations, and mitigation if necessary, would ensure any impact would not be significant.

4.3 Climate

4.3.1 METHODOLOGY

An analysis of GHG emissions was conducted using the FAA EDMS and the EPA's MOVES version 2010b. For the purposes of this analysis, the majority of the GHGs are assumed to be in the form of CO_2. No long-term effects related to operation of the Proposed Action or No Action Alternative are expected, so a qualitative discussion of climate is provided.

4.3.2 THRESHOLDS OF SIGNIFICANCE

The CEQ has indicated that climate change should be considered in NEPA analyses. However, CEQ notes "…it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or project emissions, as such direct linkage is difficult to isolate and to understand."[15] Thus, the FAA has not established a threshold of significance for climate and GHG emissions.

4.3.3 COMPARISON OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

The GHG emissions inventory under both the No Acton Alternative and Proposed Action, for the years 2022 and 2027, respectively, are compiled and presented in **Table 4-7**. For ease of comparison, the results are displayed as the overall sums.

As shown, GHGs associated with the Proposed Action are expected to increase by 3,611 and 6,090 tons by 2022 and 2027, respectively, when compared to the No Action Alternative. This increase is largely attributable to the corresponding increase in motor vehicle trips associated with the revenue generating, collateral development under the Proposed Action. The trips attributed to the collateral development are discussed in Section 4.10.3.1.

[15] Sutley, Nancy H., Chair, Council on Environmental Quality, *Subject: Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*, memorandum for heads of federal departments and agencies, February 18, 2010.

http://ceq.hss.doe.gov/nepa/regs/Consideration_of_Effects_of_GHG_Draft_NEPA_Guidance_FINAL_0218201 0.pdf (accessed February 21, 2012).

Table 4-7: Greenhouse Gas Emissions Inventory (tons)

	GREENHOUSE GASES	
SOURCE	**2022**	**2027**
Total With Proposed Action	28,415	31,710
Total No Action Alternative	24,805	25,620
Net Change in Emissions—Proposed Action	3,611	6,090

NOTES:

EDMS does not compute CO2 emissions for APUs and GSE.

Values may reflect rounding.

See Appendix H for details.

SOURCE: Federal Aviation Administration, *EDMS Version 5.1.4.1*, June 2014.
PREPARED BY: KB Environmental Sciences Inc., March 2016.

The FAA has not identified any factors to consider when making a significance determination for GHG emissions.[16] GHG emission increases from the Proposed Action would comprise a very small fraction of the U.S.-based emissions of 6,673 million metric tons of carbon equivalents, and they would comprise an even smaller amount than the 49 gigatons of carbon dioxide-equivalent global GHG emissions.[17,18]

Construction activity, the shift in aircraft operations to the northeast runway, and increased vehicle traffic associated with collateral development (Section 4.10.3) would very slightly contribute to global climate change, accounting for less than one-hundredth of a percent of U.S. GHG emissions.

The cumulative impact of the Proposed Action Alternative on global climate, when added to other past, present, and reasonably foreseeable future action, is not scientifically predictable. Aviation has been calculated to contribute approximately 3 percent of the global CO_2 emissions; this contribution may grow to 5 percent by 2050. Actions are underway in the United States, and in other nations, to reduce aviation's contribution to these emissions, such as through new aircraft technologies to reduce emissions and to improve fuel efficiency, renewable alternative fuels with lower carbon footprints, more efficient air traffic management, market-based measures, and environmental regulations, including an aircraft CO_2 standard.

The United States has goals to achieve carbon-neutral growth for aviation by 2020, compared to a 2005 baseline, and to gain absolute reductions in GHG emissions by 2050. At present, there are no calculations of the extent to which measures individually or cumulatively may affect aviation's CO_2 emissions. Moreover,

16 U.S. Department of Transportation, Federal Aviation Administration, *1050.1F Desk Reference*, July 2015.

17 Environmental Protection Agency, *U.S. Greenhouse Gas Inventory Report: 1990-2013*, http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html (accessed January 25, 2016).

18 Intergovernmental Panel on Climate Change, *IPCC Fourth Assessment Report: Climate Change 2007*, http://www.ipcc.ch/publications_and_data/ar4/wg3/en/spmsspm-b.html (accessed January 25, 2016).

there are large uncertainties regarding aviation's impact on climate. The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies, has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions, with quantified uncertainties for current and forecast aviation scenarios under changing atmospheric conditions.

4.4 Department of Transportation Act, Section 4(f) and Land and Water Conservation Fund Act, Section 6(f) Resources

4.4.1 METHODOLOGY

Public lands near IWA were documented through a review of applicable plans and maps. The information gathered during the inventory of resources, and information obtained from the National Park Service (NPS), was used to identify potential impacts to any Section 4(f) lands. An initial assessment was made to determine whether the Proposed Action would result in the use of any property to which Section 4(f) applies.

4.4.2 THRESHOLDS OF SIGNIFICANCE

A Section 4(f) use would occur if the Proposed Action would involve a physical or constructive use of a Section 4(f) property. A physical use includes the purchase of land or a permanent easement, physical occupation of a portion or all of the property, or alternation of structures or facilities on the property. A 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.

According to FAA Order 1050.1F, a significant impact would occur to Section 4(f) lands when:

- The action involves more than a minimal physical use of a resource, or
- The action constitutes a "constructive use" based on an FAA determination that the project would substantially impair the resource.

The impacts to historic resources, which are also considered Section 4(f) resources, are discussed in Section 4.6, "Historic, Architectural, Archaeological, and Cultural Resources."

The NPS database (Land & Water Conservation Fund Detailed Listing of Grants) was reviewed to determine if there were any Section 6(f) resources present. There are no Section 6(f) resources within either PPA (Section 3.6.1).

4.4.3 COMPARISON OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

4.4.3.1 Northeast Area Development Alternative

None of the improvements included in the Proposed Action would be constructed under the No Action Alternative. There would be no actions at IWA that would induce growth or affect the demand for recreational resources. Therefore, no impacts to Section 4(f) properties would occur.

Construction Impacts

The Northeast Area Development Alternative GDA contains a portion of the Will E. Coyote archaeological site (U:10:127[ASM]) listed on the NRHP. Section 4.6.3.1 concludes the Northeast Area Development Alternative would avoid the one site listed in the NRHP. Because the site would be avoided, Section 4(f) properties would not be affected during construction. The remaining two archaeological sites referenced in Section 3.6.2.1 are not within the Northeast Area Development Alternative GDA and would not be impacted by construction.

Operational Impacts

The Toka Sticks Golf Club and ASU-Polytechnic Campus sports recreational facilities are west of IWA, within the Northeast Area Development Alternative PPA. There would be no direct (physical) use of these properties by the Northeast Area Development Alternative. There would not be a significant increase in noise and, therefore, no constructive use of these properties, as indicated in the noise analysis (Section 4.9). As described in Section 3.6.2.1, according to the NRHP database, three archaeological sites, three historic sites, and four historic structures within the Northeast Area Development Alternative PPA have been identified as being eligible for inclusion in the NRHP. Of these, only one structure, a 1942 demountable hangar, is located on the western portion of IWA property, which is outside the Northeast Area Development Alternative GDA. Only one of the three archaeological sites eligible for inclusion in the NRHP (AZ U:10:127 [ASM]), is within the Northeast Area Development Alternative GDA. This site would be avoided by the Proposed Action and preserved in place by PMGAA. There would be no direct or constructive use of either of these properties by the operation of the Northeast Area Development Alternative and, thus, no impact to Section 4(f) properties.

4.4.3.2 RTN7 Site Alternative

None of the improvements included in the RTN7 Site Alternative would be constructed under the No Action Alternative. Therefore, no impacts to Section 4(f) resources would occur under the No Action Alternative.

Construction Impacts

The RTN7 Site Alternative would be located on property managed by the BLM. There are no existing or proposed parks, recreational areas, publicly owned wildlife or waterfowl refuges, or any historic sites eligible for the NRHP within the RTN7 Site Alternative GDA. There would be no direct or constructive use of Section 4(f) properties during construction of the RTN7 Site Alternative.

Operational Impacts

There are also no existing or proposed parks, recreational areas, publicly owned wildlife or waterfowl refuges, or any historic sites eligible for the NRHP within the RTN7 Site Alternative PPA. Therefore, no significant impacts to Section 4(f) properties would occur.

4.4.3.3 Mitigation Measures

The Proposed Action was designed to avoid the one identified feature (AZ U:10:127 [ASM]) listed on the NRHP. Construction activities would be confined to the GDAs of the Northeast Area Development Alternative and the RTN7 Site Alternative. No direct or constructive use of properties to which Section 4(f) or Section 6(f) applies would occur during either construction or operation of the Proposed Action at either the Northeast Area Development Alternative or the RTN7 Site Alternative. Thus, no significant impacts to Section 4(f) properties or Section 6(f) resources would occur. Consequently, no mitigation measures are proposed under this environmental resource category.

4.5 Hazardous Materials, Solid Waste, and Pollution Prevention

4.5.1 METHODOLOGY

For the purpose of this EA, the locations of facilities that involve hazardous materials and sites with known, or potential, environmental contamination, located within or adjacent to the Northeast Area Development Alternative GDA, were identified (refer to Exhibit 3-3). No sites with known, or potential, environmental contamination were identified within the RTN7 Site Alternative GDA. Potential impacts to the areas identified were analyzed relative to the No Action Alternative and Proposed Action. The types of hazardous materials, environmental contamination, and/or other regulated substances potentially associated with implementation of the Proposed Action were also evaluated. This analysis was developed from information known about existing land uses and facilities at IWA, as well as from the design and construction requirements under the Proposed Action. The potential for impacts was further evaluated for areas that were located on, or adjacent to, areas where hazardous substances and materials may be encountered.

The findings of these evaluations were compared to the appropriate regulatory guidelines, significance thresholds, and other appropriate criteria. These include the list of pertinent federal, state, and local regulations summarized in Table 3-7. Relevant safeguards and precautions that would be undertaken to avoid or minimize potential environmental impacts associated with hazardous materials and/or environmental contamination during the construction and operational phases of the Proposed Action were also evaluated.

The No Action Alternative and the Proposed Action were also evaluated for the potential to result in impacts associated with the generation and/or disposal of municipal solid waste (MSW). Specifically, the evaluation included MSW impacts from construction and demolition (C&D) activities.

The potential for the temporary generation of solid wastes from C&D activities was analyzed based on the type of construction activities that would occur during implementation of the Proposed Action. According to FAA AC 150/5200-33B, C&D landfills generally do not attract wildlife hazardous to aircraft.[19] However, municipal solid waste landfills are considered incompatible when located within 10,000 feet of any runway

[19] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants on and near Airports*, August 28, 2007.

used by turbine-powered aircraft, or within a five-mile radius of an airport (to protect approach, departure, and circling airspace).

4.5.2 THRESHOLDS OF SIGNIFICANCE

The FAA has not established significance thresholds for hazardous materials, solid waste, and pollution prevention. However, FAA Order 1050.1F identifies factors to consider when evaluating potential environmental impacts. To identify the potential for impacts, the Proposed Action or No Action Alternative were reviewed to determine whether either would:

- Violate federal, state, local, or tribal regulations
- Affect a contaminated site
- Produce an appreciably different quantity/type of hazardous waste
- Produce an appreciably different quantity/type of solid waste that would exceed local capacity
- Adversely affect human health and the environment

4.5.3 COMPARISON OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

4.5.3.1 Hazardous Materials

A variety of hazardous materials typically associated with the operation of a commercial airport, including those of airport tenants, are used at IWA. Such use and activities are strictly controlled by numerous federal, state, and local safety regulations. Under the No Action Alternative, the amount, handling, and management of hazardous materials and solid waste would increase over time, which is proportionate to the growth in enplanements and operations. Existing pollution prevention methods would remain in place; therefore, no operational impacts would occur.

During construction of the proposed improvements, hazardous materials (i.e., fuel, waste oil, solvents, paint, and other hydrocarbon-based products) would be used in quantities that are typical in the construction industry. The construction contract documents would require that these materials be stored, labeled, and disposed of in accordance with federal, state, and local regulations. The contractors would also be responsible for reporting any discharges of hazardous materials or other similar substances in amounts above reportable quantities. Contractors would be required to stop work in the event that previously unknown contaminants were discovered, or if a spill occurs during construction, until the Mesa Fire Department and/or Airport Operations are notified.[20]

Given the historical use of IWA as the WAFB, there is potential for encountering contaminated materials during excavation and grading activities. Four sites within the Northeast Area Development Alternative GDA were identified as areas previously used for the storage, use, and disposal of hazardous substances and petroleum products associated with the operation of the former WAFB (Exhibit 3-4). However, the ADEQ has determined that exposure pathways have been eliminated through remediation and restricted use/access, and

[20] Phoenix-Mesa Gateway Airport Authority, *Rules and Regulations*, October 2015.

no known human health risk exposure is present at this time.[21] Additional reports and regulatory listing information indicate that ongoing remedial activities at the former WAFB are not within areas associated with the project site. In addition, Finding of Suitability to Transfer documents have been recorded, authorizing the transfer of property from the United States to the PMGAA.[22]

The Hardfill Drum Removal Area (refer to LF026 on Exhibit 3-4) and the Firing Range (refer to SS020 on Exhibit 3-4), within the boundaries of the project site, include Environmental Use Restrictive Covenants, which prohibit residential development in these areas because of the potential for lead- and asbestos-containing material (ACM) in the soil. Current development plans associated with the Northeast Area Development Alternative do not include the development of residential areas. Although soil in these areas may be impacted by these hazardous materials, groundwater is unlikely to be impacted by any planned development activities due to the depth of groundwater reported, 140 to 160 feet, in the project vicinity.[23] Although remedial actions included the excavation and disposal of 693 tons of soil, in addition to the lead separation treatment of an additional 762 tons of soil, additional notices and covenants indicated that lead-based paint and ACM may be located on the property. The possible presence of these contaminates in the soil would be identified in the construction contract documents. The contractor would be responsible for ensuring that proper health and safety protocols, as well as environmental contamination best practices, were in place to specifically address the potential to encounter these hazardous wastes during construction activities in these areas. All excavation waste would be disposed of in accordance with federal, state, and local laws.

The types of activities proposed under the Northeast Area Development Alternative would not involve the generation, use, or storage of hazardous materials in quantities or types that are substantially different from those that are currently occurring at IWA. The Northeast Area Development Alternative would not create additional long-term risks to the public or to the environment from exposure to these substances. Further, the Northeast Area Development Alternative would be subject to current safety management requirements and design standards that serve to minimize the potential for, and the management of, accidents involving hazardous materials.

The fueling system for the proposed aircraft fuel farm would include several design features to prevent exposure to fuel leaks, spills, and vapors. The fueling system would include a vapor recovery system to prevent fuel vapors from escaping into the atmosphere during storage tank refills. Several features would be incorporated into the fueling system design to prevent the escape of hazardous materials, including double-walled storage and piping and a leak detection and monitoring system. Aircraft fueling at the proposed terminal complex would be conducted using fuel trucks.

In summary, the Northeast Area Development Alternative would not involve the generation, use, or storage of hazardous materials in quantities or types that are substantially different from the No Action Alternative, and it would not create a significant long-term hazard to the public or to the environment. Potential hazardous

[21] Arizona Department of Environmental Quality, http://www.azdeq.gov/environ/waste/sps/Former_Williams_Air_Force_Base.html (accessed January 6, 2016).

[22] AMEC, *Hazardous Materials – Affected Environment Northeast Area Development Plan, Phoenix-Mesa Gateway Airport*, November 2014.

[23] Ibid.

materials and solid waste impacts would not be significant as a result of the operation of the Northeast Area Development Alternative.

No known or listed hazardous material or clean-up sites are located within areas of the RTN7 Site Alternative GDA. The RTN7 Site Alternative GDA is not an existing or proposed NPL site. Hazardous or contaminated materials encountered during the proposed construction activities would not be anticipated.

4.5.3.2 Solid Waste

Solid waste generated from construction of the Northeast Area Development Alternative, as well as existing waste described in Section 3.7.2.2, would be recycled to the extent practicable. Concrete materials would be reused, to the extent practicable, on-site. Remaining debris would be disposed of in an appropriate C&D debris landfill, as identified by the Maricopa County Waste Resources and Recycling Management Department.

The proposed terminal complex would replace the existing terminal in operation at IWA. Enplanements would be equal to the No Action Alternative's enplanement levels. Therefore, there would not be a significant increase in operational solid waste generation as compared to the No Action Alternative. Solid waste would continue to be recycled, managed, and disposed of in the same manner as under the No Action Alternative.

The RTN7 Site Alternative would generate solid waste during construction; however, the contractor would be responsible for disposal in an appropriate C&D landfill. Hazardous materials used during construction, such as fuel, would be stored and labeled in accordance with federal, state, and local regulations.

4.5.3.3 Pollution Prevention

The use of hazardous materials during construction would be in quantities that are typical of the construction industry. The removal of existing surface materials (asphalt and concrete) to prepare the new surfaces (reconstructed concrete) would involve relatively shallow excavations. Arizona's Stormwater Construction General Permit requires procedures to prevent and respond to spills, leaks, and other releases.[24] With standard construction pollution prevention practices in place, no significant construction impacts relative to hazardous materials or solid waste would occur.

The RTN7 Site Alternative would include a diesel-engine generator in a shelter to provide back-up electric power in the case of a commercial power outage. A 1,000-gallon diesel AST to provide fuel for the engine generator would also be included. The installation of the AST would be in compliance with local fire codes, and applicable leak-and-spill prevention practices would be followed. Once in operation, the RTN7 Site Alternative would not generate solid waste. There would be no significant impact to hazardous materials or solid waste as a result of the RTN7 Site Alternative.

[24] Arizona Department of Environmental Quality, Water Quality Division, *Permits: Stormwater Construction General Permit*, https://www.azdeq.gov/environ/water/permits/cgp.html (assessed March 28, 2016).

4.6 Historical, Architectural, Archeological, and Cultural Resources

On June 17, 2015, the FAA initiated Section 106 consultation with the Arizona SHPO and THPO for the Northeast Area Development Alternative. The FAA provided copies of the APE for the Northeast Area Development Alternative and the RTN7 Site Alternative to the SHPO and THPO, who concurred with the APE in letters dated June 19, 2015 and June 25, 2015, respectively. Agency correspondence is included in Appendix D. In letters to SHPO and THPO, dated March 28, 2016, the FAA described that the Northeast Area Development Alternative would be designed to avoid sites within the Northeast Area Development Alternative APE that were either determined to be eligible or required additional evaluation in order to be listed in the NRHP. The FAA also provided its determination that no historical, archeological, architectural, or cultural resources would be impacted, along with a finding of No Adverse Effect. The SHPO and THPO concurred with the FAA's No Adverse Effect finding in letters dated April 6, 2016 and April 26, 2016, respectively.

4.6.1 METHODOLOGY

The SCWA Environmental Consultants (SWCA) archeological survey reports employed standard archeological techniques following Arizona State Museum (ASM) guidelines for survey coverage and site-recording methodologies. The ASM has established standards for evaluating materials identified during archeological surveys. Properties of archeological interest, whether considered a site or isolated occurrence (IO), must contain the remains of past human activity that are at least 50 years old.

To qualify as a site, a property must contain, within an area no more than 50 feet in diameter, 30 or more artifacts of a single type. However, a site may contain all pieces originating from a single source (e.g., one broken bottle or ceramic vessel) or 20 or more artifacts when multiple types are present. The site can be larger than 50 feet in diameter as long as any 50-foot diameter portion of the site meets one of these conditions. Artifact finds that do not meet these criteria but are over 50 years old may be designated IOs. Archeological sites are accurately mapped and plotted using a handheld global positioning system (GPS) device, photographed, and recorded using the standard ASM form. Evidence for cultural resources was sought in the form of artifacts (e.g., ceramics, lithics, historical metals, or glass) or features (concentrations of fire-affected rock, charcoal-stained soil, prehistoric or historic structures, or other cultural anomalies). The archaeologists systematically surveyed 596 acres for cultural resources. Any identified artifacts were field-analyzed and returned to their original locations.

The survey entailed systematically walking the majority of the 700-acre Northeast Area Development Alternative APE (shown on Exhibit 3-5) in parallel transects spaced no more than 66 feet apart (Table 3-10). Areas not surveyed systematically include the recently surveyed ADOT parcel and previously recorded sites that were either determined to be ineligible for the NRHP as a result of earlier eligibility testing efforts—sites AZ U:10:64(ASM) and AZ U:10:67(ASM) —or were listed in the NRHP but subsequently delisted after multiple phases of testing and/or data recovery—sites AZ U:10:61(ASM), AZ U:10:65(ASM), and AZ U:10:66(ASM). These site areas were briefly visited, but they were not systematically surveyed. Areas of the Northeast Area Development Alternative APE consisting of, or immediately adjacent to, Runway 12L-30R were also not

surveyed, as they are in a highly disturbed area where the ground surface has been obscured by the placement of pavement.

The historic architectural survey report, conducted in September 2013, included a State of Arizona Historic Property Inventory Form evaluation for each existing building and structure in the Northeast Area Development Alternative APE. All buildings more than 45 years old were recorded and assessed for significance as historic resources based on their potential eligibility for listing on the NRHP.

4.6.2 THRESHOLDS OF SIGNIFICANCE

The FAA has not established a significance threshold for cultural resources. If the potential for an adverse effect on a cultural resource is identified, the effects of the action are evaluated and determined through the Section 106 consultation process with the SHPO and THPOs. Examples of adverse effects include physical destruction, damage, or alteration of a historic property; removal of the property from its historic location; change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance; introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features; neglect of a property that causes its deterioration; and transfer, lease, or sale of a property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.[25]

4.6.3 COMPARISON OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

4.6.3.1 Northeast Area Development Alternative

Under the No Action Alternative, ongoing land uses would continue. There would be no adverse effect to any identified significant, historic resources and no adverse effect to archeological or cultural resources.

Construction Impacts

The records search and archeological survey identified 15 archaeological sites within the Northeast Area Development Alternative APE. Additionally, 70 IOs were identified within this APE. Of the 15 archeological sites within the APE (refer to Table 3-10), nine sites and the 70 IOs are recommended or have been previously determined ineligible for listing in the NRHP. Four sites were tested in November 2015 and were found to be ineligible for NRHP consideration. One site, U:10:127(ASM), is listed in the NRHP, and one site, U:10:319(ASM), a potential artifact scatter has not been tested for NRHP eligibility. This site would be preserved in place by PMGAA and the Proposed Action would avoid any ground disturbance in the vicinity of U:10:319(ASM). The sites are buried resources and would not be adversely affected by construction noise. The Proposed Action would not affect the U:10:319(ASM) site.

No traditional cultural properties or Native American heritage were identified, or are known to exist, within the Northeast Area Development Alternative APE. Implementation of the Northeast Area Development Alternative would avoid the one site listed in the NRHP and the one site of indeterminate NRHP eligibility.

[25] Title 36 CFR 800.5, *Assessment of Adverse Effects.*

The FAA has determined that the proposed undertaking would not affect any historic properties listed or eligible for listing on the NRHP within the APE. . The FAA requested concurrence from the SHPO and the THPO on the FAA's determination of eligibility and finding of effect for the proposed undertaking. SHPO's concurrence with FAA's finding was received April 6, 2016. THPO's concurrence was received April 26, 2016. The concurrence letters are included in Appendix J.

Operational Impacts

No traditional cultural properties, Native American heritage sites, or other culturally important sites would be impacted by the operation of the Northeast Area Development Alternative. Thus, no adverse effects to historical, architectural, archeological, or cultural resources would occur. Per the letters from the SHPO and THPO (dated April 6, 2016 and April 26, 2016, respectively), no adverse effects to historical, architectural, archeological, or cultural resources would occur as a result of the proposed undertaking [Proposed Action] (Appendix D). No historic resources would be adversely affected by noise.

4.6.3.2 RTN7 Site Alternative

Under the No Action Alternative, ongoing land uses would continue. There would be no historic properties affected.

Construction Impacts

The RTN7 Site Alternative would be constructed adjacent to a previously recorded site, a portion of an RAAF runway, determined to be ineligible for the NRHP by FAA. Since the FAA has determined the Rittenhouse RAAF is not eligible for inclusion into the NRHP, the FAA reaffirmed its finding that the proposed construction of the ASR at the RTN7 Site Alternative would not affect any properties listed or eligible for listing on the NRHP under 36 CFR 800.4(d)(1). FAA sought and received SHPO's concurrence with FAA's finding on November 2, 2016. The correspondence is included in Appendix J.

The PMGAA and FAA are mindful of the BLM's concerns about undiscovered subsurface artifacts. Thus an Unanticipated Discovery Plan as outlined below is Section 4.6.3.3 will be implemented during construction to ensure proper treatment of any properties discovered during ground disturbing activities.

Operational Impacts

No traditional cultural properties, Native American heritage sites, or other culturally important sites would be impacted by the operation of the RTN7 Site Alternative.

4.6.3.3 Mitigation Measures

Both sites, U:10:127(ASM) and U:10:319(ASM), would be avoided and maintained in situ.

Unanticipated Discovery Plan

In the event an unanticipated discovery of previously unidentified archaeological resources is made during construction of the proposed undertaking, the FAA and the PMGAA will require the construction activities in the vicinity of the discovery to stop, and take all reasonable measures to avoid or minimize harm to the

property until the FAA and the PMGAA conclude consultation with Arizona State Parks - Office of Historic Preservation.

The inadvertent exposure of intact archaeological deposits is not anticipated, given the history of disturbance of the ground at Phoenix Mesa Gateway Airport for the proposed undertaking and at the Rittenhouse Auxiliary Army Airfield for the relocation of the Airport Surveillance Radar.

If the project's construction-related activities unearth human remains, ground-disturbing activities in the area of the discovery would immediately be halted by the FAA and the PMGAA while a temporary construction exclusion zone surrounding the site is established to allow for further examination and treatment of the find.

The FAA and the PMGAA would also immediately notify the Maricopa County Coroner's Office for work at the airport or the Pinal County Coroner's Office for work at Rittenhouse Auxiliary Army Air Field for the ASR by telephone should any remains be discovered. By law, within two working days of being notified, the Coroner would determine whether the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she would contact the Arizona State Historic Preservation Office, by telephone, within 24 hours of the determination.

The Arizona State Historic Preservation Office would then appoint a Most Likely Descendant of the human remains, and a burial treatment plan would be negotiated and implemented. The FAA and the PMGAA would be responsible for restricting all construction activity from the immediate vicinity of the human remains until treatment is complete.

Based on the SHPO's concurrence with the FAA's no adverse effects finding regarding the Proposed Action, no further mitigation measures would be required.

4.7 Land Use

4.7.1 METHODOLOGY

The AIP, 49 U.S.C. 47106(a)(1), states the FAA cannot approve funding for an airport project unless it is consistent with development plans of public agencies (existing at the time the project is approved) for the area in which the airport is located. The Proposed Action was reviewed for consistency with development plans for the City of Mesa, and Counties of Maricopa and Pinal.

Pursuant to 49 U.S.C. 47107(a)(10) of the 1982 Airport and Airway Improvement Act, PMGAA has provided written assurance to the FAA that appropriate action is being taken, to the extent reasonable, to restrict the use of land adjacent to, or in the immediate vicinity of, IWA to activities and purposes compatible with normal airport operations. A copy of the written assurance is provided in (Appendix E).

4.7.2 THRESHOLDS OF SIGNIFICANCE

The FAA has not established a significance threshold for land use; therefore, the determination of whether a significant impact exists for land use is often dependent on the significance thresholds in other impact categories, such as noise. This section identifies potential land use impacts from the Proposed Action relative to existing land use plans and policies applicable to implementation of the Proposed Action. Land use plans that apply include the following: City of Mesa General Plan, Phoenix-Mesa Gateway Airport Master Plan, Northeast Area Development Plan—Phoenix-Mesa Gateway Airport, Maricopa County Comprehensive Plan, Pinal County Comprehensive Plan, and the Mesa Gateway Strategic Development Plan. The analysis also includes site visits of the PPAs and surrounding communities.

4.7.3 COMPARISON OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

4.7.3.1 Northeast Area Development Alternative

The No Action Alternative would not result in the development of a new terminal, airport support facilities, parking lots, and roadway access to improve existing airport operations. The No Action Alternative would, however, be inconsistent with local land use plans. The Northeast Area Development Plan—Phoenix-Mesa Gateway Airport and Mesa Gateway Strategic Development Plan support the proposed improvements as integral components to making IWA an economic engine for the region. The City of Mesa 2040 General Plan and the IWA Master Plan emphasize growth of aviation-related employment opportunities. Therefore, the No Action Alternative would negatively impact implementation of local and regional land use plans for IWA and the surrounding area.

Construction Impacts

Construction of the proposed terminal, associated facilities, and airfield improvements would be consistent with current land use designations, as well as with the disturbed nature of the Northeast Area Development Alternative GDA. Though much of the area is currently vacant, it is actively managed per FAA regulations to ensure safe airport operations at IWA.

Operational Impacts

The proposed airside and landside facilities within the Northeast Area Development Alternative GDA would be located on existing IWA property and on undeveloped, vacant land identified in the City of Mesa 2040 General Plan as the Phoenix-Mesa Gateway Area where significant growth is expected. Use of this land for the proposed improvements is not only consistent with the plan, but also an integral part of the local land use strategy for the area. The proposed improvements would not divide or disrupt established communities. The FAA would review building plans to ensure that the proposed improvements do not obstruct navigable airspace or affect safety of aircraft and passengers. As such, the Northeast Area Development Alternative would not have a significant land use impact.

4.7.3.2 RTN7 Site Alternative

Under the No Action Alternative, the improvements associated with the RTN7 Site Alternative would not be constructed. The RTN7 Site Alternative is an essential part of the overall Proposed Action; therefore, the No

Action Alternative would not support the goals and objectives of local and regional land use plans that envision growth at and around IWA.

Construction Impacts

Under the RTN7 Site Alternative, construction activities would include excavation and grading for the access road, as well as construction of a 27-foot steel lattice tower, one-story masonry building, and generator shelter. These would be considered permitted uses in areas zoned General Rural.[26] The RTN7 Site Alternative would not cause any significant construction impacts to surrounding land uses.

Operational Impacts

The proposed improvements within the RTN7 Site Alternative GDA are compatible with the military land use designation in the Pinal County Comprehensive Plan.[27] Therefore, no significant land use compatibility impacts would occur. FAA guidance states that it is desirable that a minimum separation of 1,500 feet be provided between the ASR antenna and any above ground structures or radio frequency generating equipment that may cause reflections or otherwise interfere with radar/beacon operation. Although 1,500 feet is a desired minimum separation distance, each case is judged independently using the criteria in FAA Order 6310.6, *Primary/Secondary Terminal Radar Siting Handbook*. [28]

4.8 Natural Resources and Energy Supply

4.8.1 METHODOLOGY

Energy, fuel, and natural gas demands associated with the No Action Alternative and the Proposed Action were determined by evaluating the extent to which the Proposed Action's construction and operation would change demands for electricity, fuel, and water, as well as by assessing whether the change would cause demand to exceed available or future natural resource or energy supplies, as compared with the No Action Alternative. Significant impacts would occur when an action's construction or operation would cause demands to exceed the available, or future, natural resources or energy supplies.

4.8.2 THRESHOLDS OF SIGNIFICANCE

The FAA has not established a significance threshold for consumable natural resources and energy supply. Significant impacts would occur when an action's construction or operation would cause demand for scarce consumable natural resources and energy to exceed available or future supplies.

[26] Pinal County, Arizona, *Pinal County Development Services Code*, http://www.codepublishing.com/AZ/pinalcounty/ (accessed July 14, 1015).

[27] Pinal County, Arizona, *Pinal County Comprehensive Plan*, updated January 20, 2014.

[28] U.S. Department of Transportation, Federal Aviation Administration Order 6310.6, *Primary/Secondary Terminal Radar Siting Handbook*, July 20, 1976.

4.8.3 COMPARISON OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

4.8.3.1 Northeast Area Development Alternative

The No Action Alternative would not change or alter energy use or supply and, thus, would not significantly affect energy supply or natural resources.

Construction Impacts

Construction associated with the Northeast Area Development Alternative would require natural resources, including the following: petrochemical construction materials; lumber; sand and gravel; and steel, copper, and other metals. Fossil fuels for construction equipment and vehicles would also be consumed. Construction activities for the Northeast Area Development Alternative would follow up-to-date industry standards and all applicable federal, state, and local regulations. In addition, construction of the Northeast Area Development Alternative would require water for dust suppression. Minimal wastewater is expected to be generated during construction. These utility and service needs would be within the capacity of the respective utility and service systems, and they would not cause a significant impact. Therefore, the temporary increase in demand for natural resources and energy from construction activities is expected to be less than significant.

Construction of the Northeast Area Development Alternative would require the installation of new utility infrastructure. Service disruptions would be avoided, or limited to the shortest amount of time necessary, in order to connect new infrastructure. All utilities would be relocated or installed in close coordination with the respective service providers. Accordingly, construction impacts to utilities and service systems would not be significant.

There are no known mineral resources within the Northeast Area Development Alternative GDA; therefore, the Northeast Area Development Alternative would not be expected to impact mineral resources.

Operational Impacts

Implementation of the Northeast Area Development Alternative would include construction of a new 300,000-square-foot terminal complex, as well as ancillary facilities to replace the existing terminal at IWA. Utilities (e.g., waste, wastewater, electricity, and natural gas) would need to be provided in the Northeast Area Development Alternative to serve the new facilities. Passenger levels would remain the same as the No Action Alternative, since the Northeast Area Development Alternative is not a capacity-enhancing project. The following paragraphs in this section analyze the ability of local suppliers to provide these services.

The Northeast Area Development Plan included a preliminary water utility plan in order to determine the potential "tie-in" locations for the proposed water distribution system, as well as to estimate sizes of the infrastructure water lines. That study proposed a 16-inch water line loop in Gateway Boulevard, which would connect to the 24-inch water line in Ray Road and also to the 20-inch water line in Ellsworth Road. The remaining infrastructure loop was proposed to be a 12-inch water line that would also connect to the Ray Road and Ellsworth Road water lines. It should be noted that these sizes are estimates based on typical water

line sizes per the City of Mesa standards; a water model including fire flow analysis would be required to determine the final water line sizes. Fire flows generally determine the final infrastructure sizing.[29]

The Greenfield Water Reclamation Plant serves the wastewater needs of the Phoenix-Mesa Gateway Area. This facility was recently completed and is jointly owned by the City of Mesa and the Towns of Gilbert and Queen Creek. Mesa's current allocation is 4-million gallons per day (MGD). The ultimate capacity of this plant is estimated to be 52 MGD, with Mesa's allocation set at 24 MGD.[30] As the Northeast Area Development Alternative would replace the terminal on the west side of the airport, the wastewater demands would be similar to the No Action Alternative but originating from a different location. The Northeast Area Development Alternative would increase the available land for revenue-producing commercial development, which would create additional wastewater demands. The net increase in demand would not be a significant increase. There would be adequate capacity to treat wastewater from the Northeast Area Development Alternative.

The Salt River Project (SRP) supplies electricity to the airport area from five distribution substations. There are existing substations located adjacent to the study area with four more currently planned. The SRP has the capability of expanding facilities to accommodate growth in the greater Phoenix Mesa Gateway Area. The SRP's proposed Morong-McPherson 69 kilovolt (kV) line and increased transformer capacity in surrounding substations would continue to provide reliable electricity in Mesa.[31] In addition to the existing substations, the SRP has planned a new substation on the west side of Ellsworth Road to serve the project area. The new substation would require a site roughly 300 feet by 300 feet.

As discussed in Section 3.10.2.1, Southwest Gas has multiple high-pressure lines adjacent the Airport. The closest one to the Northeast Area Development Alternative is a 10-inch high pressure line running north-south along Ellsworth Road. With regard to future growth and development, Southwest Gas has the capability to accommodate future needs without any interruptions to service.[32]

Opportunities, such as solar power, green space and possible LEED elements, would also be considered in future planning activities as a means to help provide financial and environmental sustainability. As the terminal design progresses, renewable energy opportunities would be considered in the design where feasible and affordable. However, any potential renewable energy facilities on or near Airport property would need to adhere to FAA design criteria and could only be implemented as long as they did not cause glare or reflectivity issues for air traffic controllers and pilots or interfere with navigational facilities and radar coverage.

Analyses conducted to date demonstrate that operation of the Northeast Area Development Alternative would not have a significant impact on natural resources or energy supplies.

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29 Jacobs, *Final Technical Report Northeast Area Development Plan Phoenix-Mesa Gateway Airport*, June 2012.

30 Ibid.

31 Jacobs, *Final Technical Report Northeast Area Development Plan Phoenix-Mesa Gateway Airport*, June 2012.

32 Jacobs, *Final Technical Report Northeast Area Development Plan Phoenix-Mesa Gateway Airport*, June 2012.

4.8.3.2 RTN7 Site Alternative

The No Action Alternative would not have any impacts related to energy supply and natural resources.

Construction Impacts

Natural resources utilized for construction activities within the RTN7 Site Alternative GDA would include, but would not be limited to, those identified in Section 4.8.2.1, though in smaller quantities, because relocation of the ASR-8 to the RTN7 Site is significantly less complex than the relocation of the passenger terminal to the Northeast Area Development Alternative site.[33] All construction activities would comply with industry standards and applicable federal, state, and local regulations relative to energy management and natural resources. Therefore, the incremental increase in the demand for natural resources and energy from construction activities would be less than significant.

There are no known mineral resources within the RTN7 Site Alternative GDA; therefore, the RTN7 Site Alternative would have no impact on mineral resources.

Construction of the RTN7 Site Alternative would require the construction of a new road (approximately 16 feet wide and 1,250 feet long) to access the site from existing Ocotillo Road. New power and telecommunications service to the site would be installed via underground conduits along this new access road. The source for power and telecommunications would most likely be along Ocotillo Road. The exact location would be determined by the local power and phone companies.

Operational Impacts

Given that the proposed ASR-8 radar is similar to the existing radar, the amount of energy required to operate the proposed ASR-8 system within the RTN7 Site Alternative GDA would not be significantly greater than the No Action Alternative. Therefore, the RTN7 Site Alternative would not have a significant impact on natural resources or energy supplies.

4.9 Noise and Compatible Land Use

This section addresses the future aircraft noise environment and potential noise impacts related to the No Action Alternative and the Northeast Area Development Alternative in the area surrounding IWA; it also describes the methodology used to determine future aircraft noise exposure. The terms and metrics associated with aircraft noise relative to this analysis are discussed in detail in Appendix F.

4.9.1 METHODOLOGY

The noise analysis compared the Proposed Action with the No Action Alternative for the operational years of 2022 (first full year of operation post-construction) and 2027. More information regarding the modeling methodology and model inputs is in Section 3.11.3 and Appendix F.

[33] The Northeast Area Development Alternative DSA is approximately 700 acres; the RTN7 Site Alternative DSA is approximately 6 acres.

4.9.2 THRESHOLDS OF SIGNIFICANCE

FAA Orders 1050.1F, *Environmental Impacts: Policies and Procedures*, and 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, establish the FAA's Threshold of Significance for aviation noise impacts. In accordance with FAA Order 1050.1F, a Proposed Action would be considered to have a significant impact with regard to aviation noise, when compared to the No Action Alternative for the same timeframe, if it would:

- cause noise-sensitive areas exposed to noise at or above the DNL 65 dB noise exposure level to experience a noise increase of at least DNL 1.5 dB; or
- cause an increase of DNL 1.5 dB that introduces new noise-sensitive areas to exposure levels of DNL 65 dB or more.

4.9.3 COMPARISON OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

4.9.3.1 Northeast Area Development Alternative

Construction Impacts

Construction activities associated with implementation of the Northeast Area Development Alternative could result in the temporary exposure of IWA employees and patrons to the generation of ground-borne vibration and ground-borne noise. Construction activities would also include minor excavation. Because of the Northeast Area Development Alternative's location relative to the airfield and local roadways, the noise generated by construction activities would not be significantly greater than the noise currently experienced in the surrounding areas. The closest residence is north of SR 202, 500 feet northeast of the section of South Hawes Road that is within the GDA. Any ground-borne vibration or noise impacts resulting from construction activities would be temporary and would not have a significant effect, due to the distance between the Northeast Area Development Alternative site and the closest residence.

Operational Year 2022

Under the No Action Alternative, a new terminal building would not be constructed. The No Action Alternative would not affect (increase or decrease) the number of aircraft operations at IWA or the routing of aircraft in the air to and from IWA. The 2022 No Action Alternative DNL 65 dB noise contours are shown in **Exhibit 4-1**.

Table 4-8 shows that based on existing land uses, no residential units or other sensitive land uses, would be located within the No Action Alternative DNL 65 dB noise contour for the 2022 operational year.

Table 4-8: No Action Alternative—2022 Noise Exposure

LAND USE		DNL 65+DB 1/	DNL 70+ DB 2/	DNL 75 DB AND ABOVE 3/
Residential	**Population**	0	0	0
	Dwelling Units	0	0	0
School		0	0	0
House of Worship		0	0	0
Hospital		0	0	0
Recreation		0	0	0

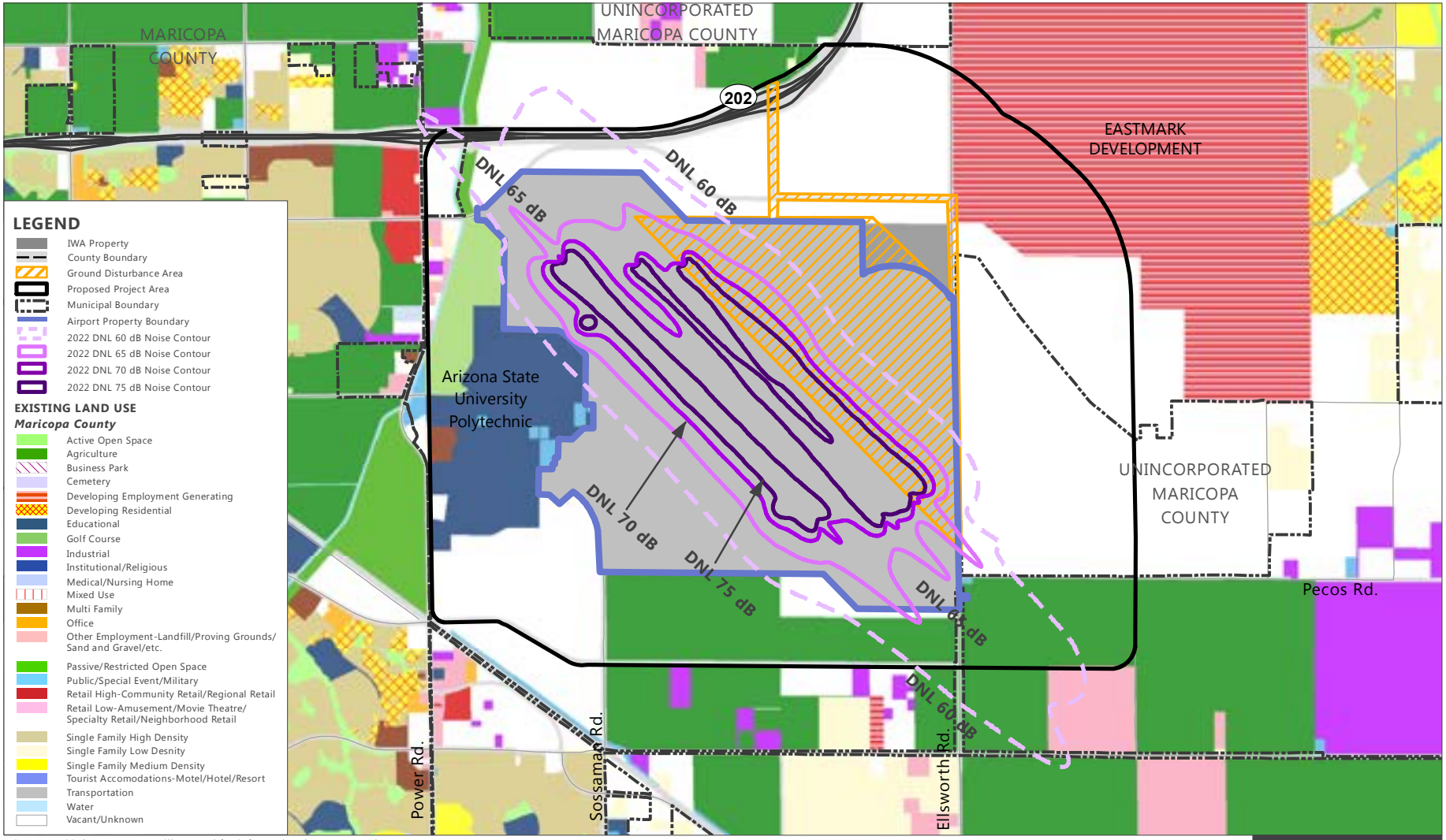
NOTES:

1/ The numbers presented in this group include sensitive uses that are exposed to DNL65 dB and above, including the numbers of the other groups in this table.

2/ These numbers are subsets of the DNL 65 dB and Above group.

3/ These numbers are subsets of the DNL 65 dB group and the DNL 70 dB group.

SOURCES: U.S. Census Bureau, *2010 Decennial Census Block Data*, September 2012; Ricondo & Associates, Inc., February 2016.
PREPARED BY: Ricondo & Associates, Inc., September 2016.



NOTE: DNL 60 dB contours are illustrated for informational purposes only.

SOURCE: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Data 2010 (base map layers); Maricopa County, Arizona, Maricopa Association of Governments, 2012 Existing Land Use GIS Shapefile, 2012; Pinal County, Land Use Categories, GIS Shapefile, 2015; U.S. Census, 2013 TIGER/Line Shapefiles, http://www.census.gov/cgi-bin/geo/shapefiles2013/main (accessed March 2014).

PREPARED BY: Ricondo & Associates, Inc., September 2016.

EXHIBIT 4-1

NORTH 0 4,500 ft.

No Action Alternative: 2022 DNL Noise Contours

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The Northeast Area Development Alternative for operational year 2022 would not result in any change in the number of operations, as compared to the No Action Alternative. However, the Northeast Area Development Alternative would result in slight modifications to aircraft operations at IWA in terms of taxi times and runway use. The Northeast Area Development Alternative would increase aircraft operations on Runway 12L-30R, the runway closest to where the proposed passenger terminal would be located. This would result in a slight shift in noise exposure to the east due to increased aircraft activity on the eastern side of IWA. **Exhibit 4-2** illustrates that the 2022 Northeast Area Development Alternative would create minor changes in noise exposure, as compared with the 2022 No Action Alternative.

These modifications in operations at IWA would not result in a significant change in noise exposure to residents and sensitive land uses, as compared with the No Action Alternative. Areas east of IWA that would experience an increase in noise exposure consist of vacant land, transportation facilities (SR 202 and SR 24), commercial land, and agricultural land. **Table 4-9** shows that based on existing land uses, no sensitive land uses would be located within the Northeast Area Development Alternative DNL 65 dB noise contour for the 2022 operational year.

Table 4-9: Northeast Area Development Alternative—2022 Noise Exposure

LAND USE		DNL 65+DB 1/	DNL 70+ DB 2/	DNL 75 DB AND ABOVE 3/
Residential	**Population**	0	0	0
	Dwelling Units	0	0	0
School		0	0	0
House of Worship		0	0	0
Hospital		0	0	0
Recreation		0	0	0

NOTES:

1/ The numbers presented in this group include sensitive uses that are exposed to DNL65 dB and above, including the numbers of the other groups in this table.

2/ These numbers are subsets of the DNL 65 dB and Above group.

3/ These numbers are subsets of the DNL 65 dB group and the DNL 70 dB group.

SOURCES: U.S. Census Bureau, *2010 Decennial Census Block Data*, September 2012; Ricondo & Associates, Inc., February 2016.
PREPARED BY: Ricondo & Associates, Inc., September 2016.

In accordance with FAA Order 1050.1F, a significant impact would occur if: 1) noise sensitive areas would experience an increase of DNL 1.5 dB or more within the DNL 65 dB noise contour, or 2) if the Proposed Action caused an increase of DNL 1.5 dB that introduces new noise-sensitive areas to exposure levels of DNL 65 dB or more, as compared with the No Action Alternative. For the Proposed Action for the operational year 2022, no sensitive land uses would experience an increase of DNL 1.5 dB within the DNL 65 dB noise contour, as compared with the No Action Alternative.

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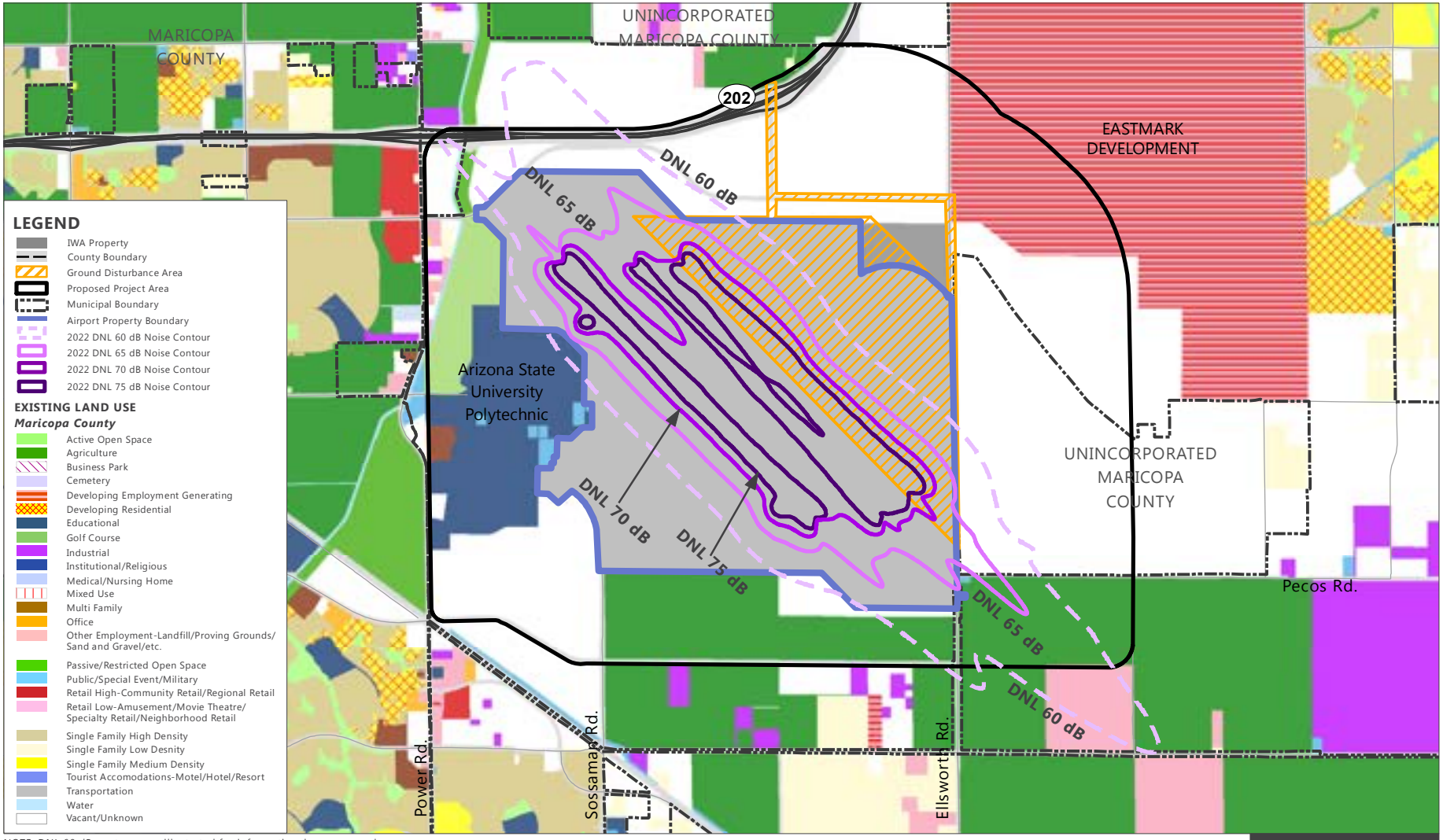

NOTE: DNL 60 dB contours are illustrated for informational purposes only.

SOURCE: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Data 2010 (base map layers); Maricopa County, Arizona, Maricopa Association of Governments, 2012 Existing Land Use GIS Shapefile, 2012; Pinal County, Land Use Categories, GIS Shapefile, 2015; U.S. Census, 2013 TIGER/Line Shapefiles, http://www.census.gov/cgi-bin/geo/shapefiles2013/main (accessed March 2014).

PREPARED BY: Ricondo & Associates, Inc., September 2016.

EXHIBIT 4-2

NORTH 0 4,500 ft.

Northeast Area Development Alternative: 2022 DNL Noise Contours

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Exhibit 4-3 illustrates the DNL 1.5 and higher increase area for operational year 2022. The primary areas outside of IWA property that would experience an increase of DNL 1.5 dB or higher in 2022, under the Northeast Area Development Alternative, are located southeast of IWA. According to the 2010 U.S. Census, this area is within Census Blocks 1057 and 1078 of Maricopa County Tract 8176, which has a total population of six people. However, analysis of land use data and aerial imagery of the area indicates that it is vacant land and agricultural fields. The Proposed Action would not introduce new noise sensitive areas to exposer levels of DNL 65 dB or more, as compared with the No Action Alternative.

Operational Year 2027

The No Action Alternative would not affect (increase or decrease) the number of aircraft operations at IWA or the routing of aircraft in the air to and from IWA. **Exhibit 4-4** illustrates the 2027 operational year for the No Action Alternative. **Table 4-10** shows that based on existing land uses, no residential units or other sensitive land uses, would be located within the No Action Alternative DNL 65 dB noise contour for the 2027 operational year.

Table 4-10: No Action Alternative—2027 Noise Exposure

LAND USE		DNL 65+DB[1/]	DNL 70+ DB[2/]	DNL 75 DB AND ABOVE [3/]
Residential	**Population**	0	0	0
	Dwelling Units	0	0	0
School		0	0	0
House of Worship		0	0	0
Hospital		0	0	0
Recreation		0	0	0

NOTES:

1/ The numbers presented in this group include sensitive uses that are exposed to DNL65 dB and above, including the numbers of the other groups in this table.

2/ These numbers are subsets of the DNL 65 dB and Above group.

3/ These numbers are subsets of the DNL 65 dB group and the DNL 70 dB group.

SOURCES: U.S. Census Bureau, *2010 Decennial Census Block Data*, September 2012; Ricondo & Associates, Inc., February 2016.
PREPARED BY: Ricondo & Associates, Inc., September 2016.

The Northeast Area Development Alternative for operational year 2027 would not result in any change in the number of operations, as compared to the No Action Alternative. Similar to operational year 2022, the Northeast Area Development Alternative would result in slight modifications to aircraft operations at IWA in terms of taxi times and increased use of Runway 12L-30R. **Exhibit 4-5** shows a shift in noise exposure to the east due to increased aircraft activity on the eastern side of IWA closest to the proposed passenger terminal location.

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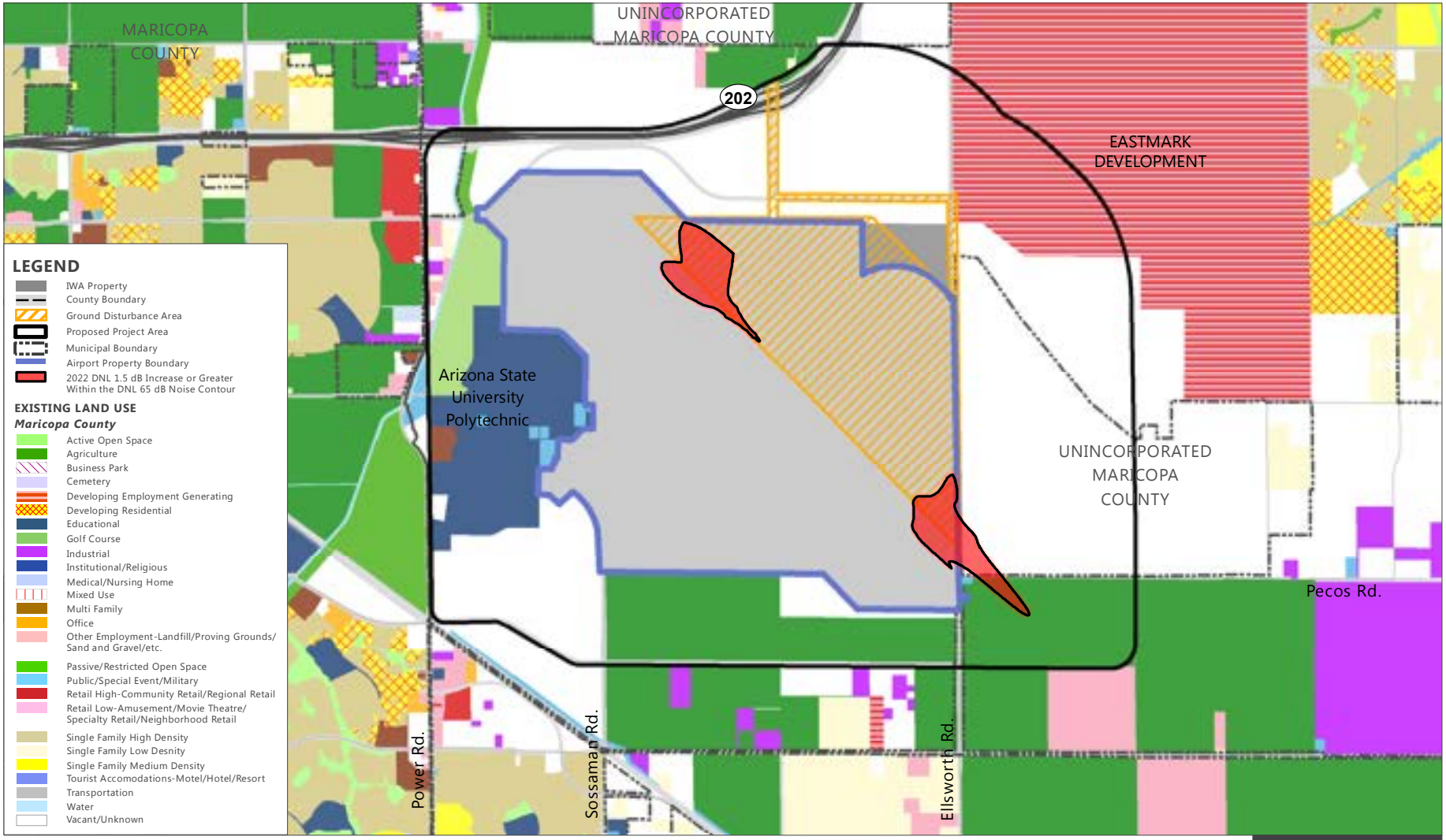

SOURCE: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Data 2010 (base map layers); Maricopa County, Arizona, Maricopa Association of Governments, 2012 Existing Land Use GIS Shapefile, 2012; Pinal County, Land Use Categories, GIS Shapefile, 2015; U.S. Census, 2013 TIGER/Line Shapefiles, http://www.census.gov/cgi-bin/geo/shapefiles2013/main (accessed March 2014).
PREPARED BY: Ricondo & Associates, Inc., September 2016.

EXHIBIT 4-3

NORTH 0 4,500 ft.

Northeast Area Development Alternative: 2022 DNL 1.5 dB Increase or Greater

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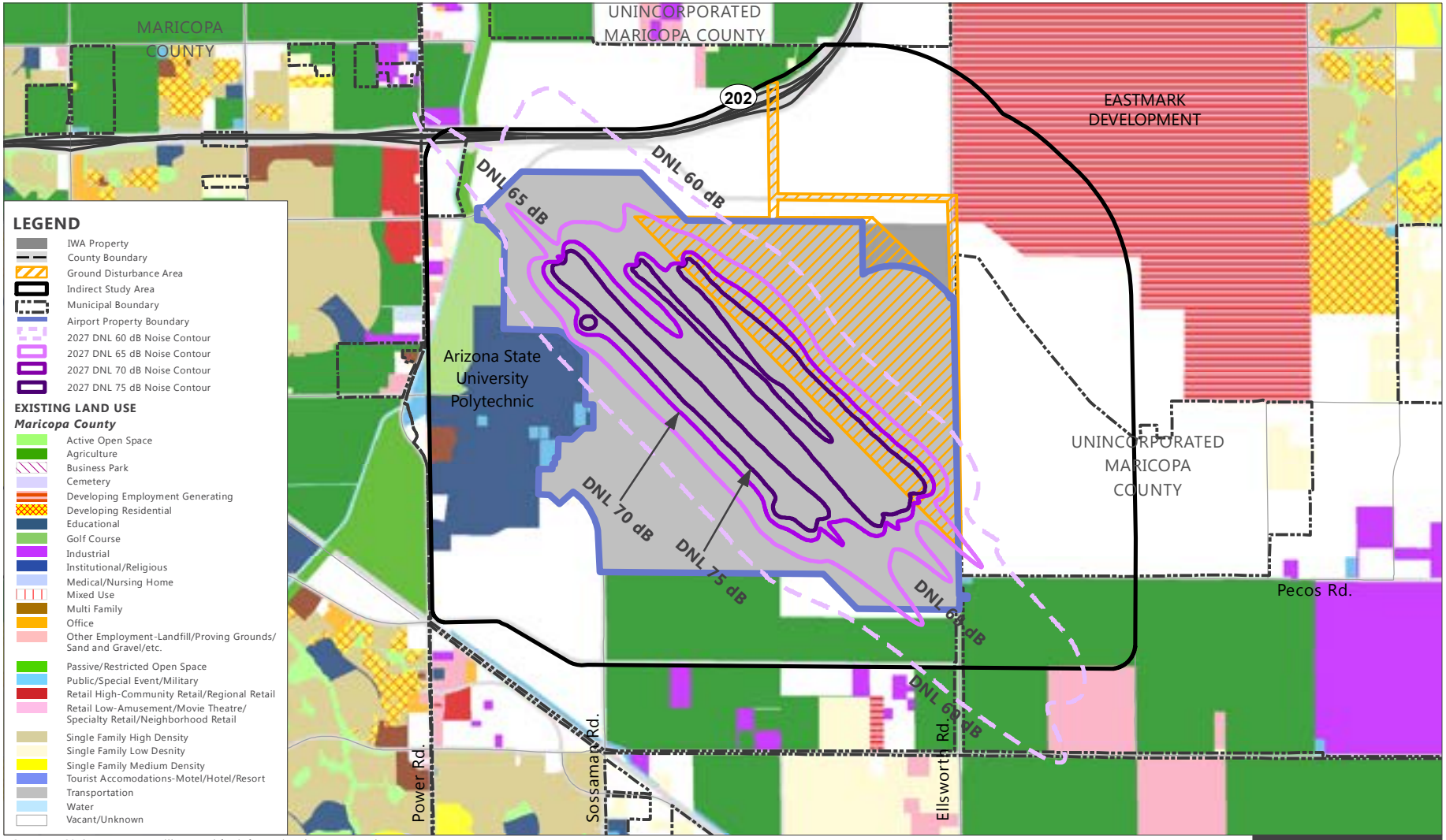

NOTE: DNL 60 dB contours are illustrated for informational purposes only.

SOURCE: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Data 2010 (base map layers); Maricopa County, Arizona, Maricopa Association of Governments, 2012 Existing Land Use GIS Shapefile, 2012; Pinal County, Land Use Categories, GIS Shapefile, 2015; U.S. Census, 2013 TIGER/Line Shapefiles, http://www.census.gov/cgi-bin/geo/shapefiles2013/main (accessed March 2014).

PREPARED BY: Ricondo & Associates, Inc., September 2016.

EXHIBIT 4-4

NORTH 0 4,500 ft.

No Action Alternative: 2027 DNL Noise Contours

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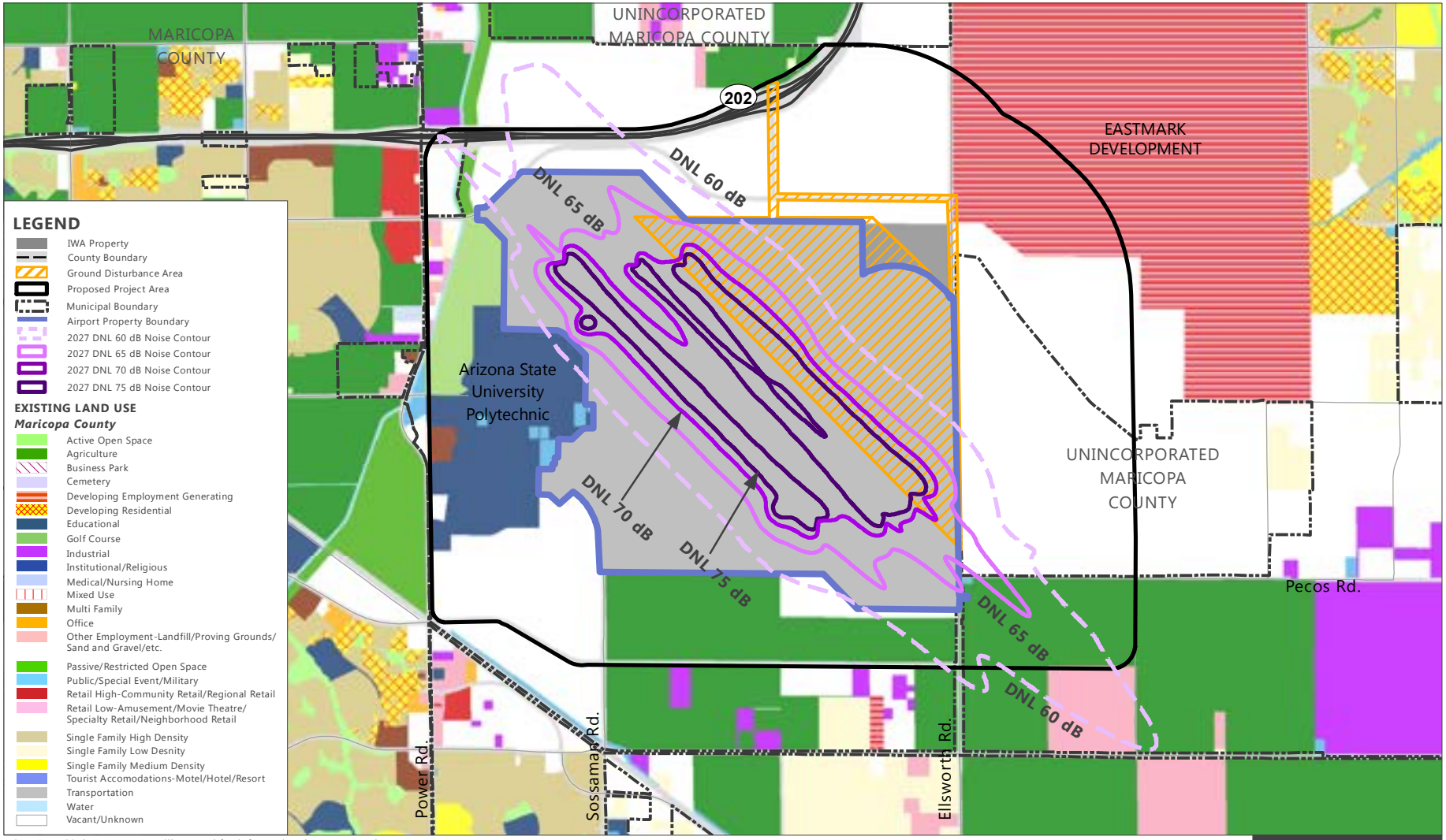

NOTE: DNL 60 dB contours are illustrated for informational purposes only.

SOURCE: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Data 2010 (base map layers); Maricopa County, Arizona, Maricopa Association of Governments, 2012 Existing Land Use GIS Shapefile, 2012; Pinal County, Land Use Categories, GIS Shapefile, 2015; U.S. Census, 2013 TIGER/Line Shapefiles, http://www.census.gov/cgi-bin/geo/shapefiles2013/main (accessed March 2014).

PREPARED BY: Ricondo & Associates, Inc., September 2016.

EXHIBIT 4-5

NORTH 0 4,500 ft.

Northeast Area Development Alternative: 2027 DNL Noise Contours

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The Northeast Area Development Alternative would not change noise exposure to residents and sensitive land uses, as compared with the No Action Alternative. Areas east of IWA that would experience an increase in noise exposure consist of vacant land, transportation facilities (SR 202 and SR 24), commercial land, and agricultural land. **Table 4-11** shows that based on existing land uses, no dwelling units or other sensitive land uses, would be located within the Northeast Area Development Alternative DNL 65 dB noise contour for the 2027 operational year.

Table 4-11: Northeast Area Development Alternative—2027 Noise Exposure

LAND USE		DNL 65+DB[1/]	DNL 70+ DB[2/]	DNL 75 DB AND ABOVE [3/]
Residential	**Population**	0	0	0
	Dwelling Units	0	0	0
School		0	0	0
House of Worship		0	0	0
Hospital		0	0	0
Recreation		0	0	0

NOTES:

1/ The numbers presented in this group include sensitive uses that are exposed to DNL 65 dB and above, including the numbers of the other groups in this table.

2/ These numbers are subsets of the DNL 65 dB and Above group.

3/ These numbers are subsets of the DNL 65 dB group and the DNL 70 dB group.

SOURCES: U.S. Census Bureau, *2010 Decennial Census Block Data*, September 2012; Ricondo & Associates, Inc., February 2016.
PREPARED BY: Ricondo & Associates, Inc., September 2016.

Exhibit 4-6 illustrates the DNL 1.5 and higher increase area for operational year 2027. The primary areas outside of IWA property that would experience an increase of DNL 1.5 dB or higher in 2027, under the Northeast Area Development Alternative, are located southeast of IWA in agricultural land. According to the 2010 U.S. Census, this area is within Census Blocks 1057 and 1078 of Maricopa County Tract 8176, which has a total population of six people. However, analysis of land use data and aerial imagery of the areas that experience an increase of DNL 1.5 dB or higher indicates the land is vacant land and agricultural fields. No new noise sensitive land uses would be impacted by noise for the operational year 2027, as compared with the No Action Alternative.

4.9.3.2 RTN7 Site Alternative

Under the No Action Alternative, there would be no change in the noise environment at noise-sensitive land uses surrounding the RTN7 Site. Significant construction and operational noise impacts would not occur.

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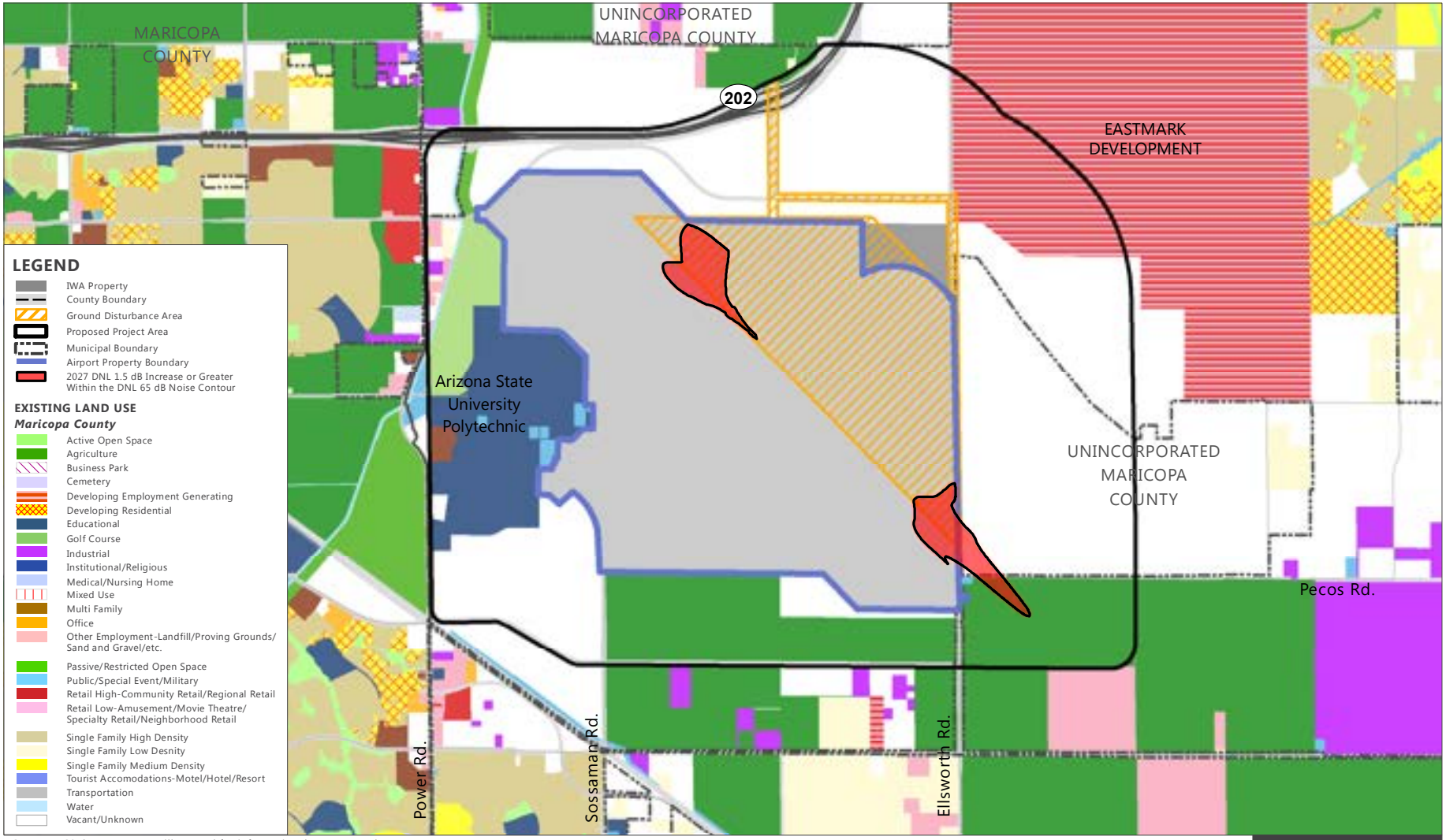

NOTE: DNL 60 dB contours are illustrated for informational purposes only.

SOURCE: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Data 2010 (base map layers); Maricopa County, Arizona, Maricopa Association of Governments, 2012 Existing Land Use GIS Shapefile, 2012; Pinal County, Land Use Categories, GIS Shapefile, 2015; U.S. Census, 2013 TIGER/Line Shapefiles, http://www.census.gov/cgi-bin/geo/shapefiles2013/main (accessed March 2014).

PREPARED BY: Ricondo & Associates, Inc., September 2016.

EXHIBIT 4-6

NORTH 0 4,500 ft.

Northeast Area Development Alternative: 2027 DNL 1.5 dB Increase or Greater

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Construction Impacts

Construction activities associated with implementation of the RTN7 Site Alternative would result in the minor generation of ground-borne vibration and ground-borne noise. Construction activities would also include minor excavation. The nearest noise sensitive land use is the residential neighborhood, located across Ocotillo Road, approximately 900 feet south of the RTN7 GDA. Due to the RTN7 Site Alternative's location relative to the local roadways, and the distance to the closest sensitive receptor (900 feet south), the noise generated by construction activities would not be significantly greater than the noise currently experienced in the surrounding areas. Any ground-borne vibration or noise impacts resulting from construction activities would be temporary and have no significant effect.

Operational Impacts

The nearest noise sensitive land use is the residential neighborhood, located across Ocotillo Road, approximately 900 feet south of the RTN7 GDA. The RTN7 facility would contain surveillance radar equipment and would not generate significant noise. Due to the RTN7 Site Alternative's location relative to the local roadways, and the quiet nature of the radar's operation, no noise impacts to surrounding sensitive land uses would occur as a result of the RTN7 Site Alternative.

4.10 Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

4.10.1 METHODOLOGY

4.10.1.1 Socioeconomics

Socioeconomic data, including demographics (race and ethnicity), housing characteristics, and employment data, was gathered from the 2010 U.S. Census for the three census tracts located partially or wholly within the PPAs (refer to Table 3-11 and Table 3-12). In addition, sensitive land uses were identified within the PPAs and within a quarter-mile using spatial data. Social impacts were determined through the evaluation of how the implementation of the No Action Alternative and the Proposed Action could impact sensitive populations and resources important to surrounding populations.

4.10.1.2 Environmental Justice

U.S. DOT Order 5610.2, *DOT Order to Address Environmental Justice in Minority Populations and Low-Income Populations* (April 15, 1997), directed the environmental justice analysis, as required under Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994). Environmental justice impacts were evaluated by determining whether the No Action Alternative and the Proposed Action would have disproportionately high and adverse human health or environmental impacts on minority and low-income populations. Also evaluated were impacts to resources important to communities of environmental justice concern.

A census tract has the potential to contain a community of environmental justice concern when the minority or low-income population of the analysis area is "meaningfully greater" than that of the surrounding areas. Poverty was determined using U.S. Department of Housing and Urban Development, Health and Human Services Poverty Guidelines, as used by the U.S. Census.

4.10.1.3 Children's Health and Safety Risks

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (April 21, 1997), requires federal agencies to prioritize the identification and assessment of environmental health and safety risks resulting from policies, programs, activities, and standards that may disproportionately affect children. Impacts associated with the Proposed Action and the No Action Alternative were assessed in regard to compliance with Executive Order 13045. The location of schools and daycare centers in the PPAs were identified, and any specific health concerns for children were qualitatively described.

4.10.1.4 Surface Transportation

Surface transportation was assessed to determine if the Proposed Action would cause increased traffic that would adversely affect the PPAs.

4.10.2 THRESHOLDS OF SIGNIFICANCE

A significant impact relative to socioeconomics, environmental justice, children's health and safety risks, and surface transportation would occur if the action would cause:

- extensive relocation when sufficient replacement housing is unavailable
- disruption or division of the physical arrangement of an established community
- extensive relocation of community businesses that would cause severe economic hardship for affected communities
- a substantial loss in community tax base
- disproportionately high and adverse human health or environmental impacts to minorities and low-income populations
- disproportionate health and safety risks to children
- a decrease in the level of service on adjacent and nearby roads to unacceptable conditions

4.10.3 COMPARISON OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

4.10.3.1 Northeast Area Development Alternative

The No Action Alternative does not include any property acquisition or construction and, therefore, would not result in the relocation of residences or businesses, alteration of traffic patterns, division of communities, disruption of planned development, or appreciable changes in employment. The quality of life and noise levels in surrounding areas would not be affected, and no impacts to low-income populations, minority populations, or children would occur.

Construction Impacts

- **Socioeconomic and Secondary (Induced) Impacts**. Employment within the Northeast Area Development Alternative PPA would not significantly change as a result of construction of the Northeast Area Development Alternative. Construction activities would occur on IWA property and would not require relocation of housing or businesses. Construction vehicles and construction worker vehicles would use major roads (Ray Road, Ellsworth Road, and Williams Field Road), and they would not require the construction of new roads that could relocate housing or businesses. The Northeast Area Development Alternative would extend Hawes Road and Williams Field Road into the site in order to provide access to the proposed facilities. Where the new access roads would cross either the Powerline Floodway or Ellsworth Channel, bridges would have to be constructed. Construction activities would provide opportunities for local employment, which may temporarily increase economic earning within the community. Overall, no significant socioeconomic impacts during construction would occur.
- **Environmental Justice**. The combined populations of the census tracts, which intersect the Northeast Area Development Alternative PPA, can be characterized as predominately White with a slightly smaller percentage of minority population than the City of Mesa and Maricopa County (refer to Table 3-11). The two census tracts within the Northeast Area Development Alternative PPA have a greater percentage of residents below the poverty level than the City of Mesa and Maricopa County (31.1 percent and 33.9 percent versus 16.3 percent for the City of Mesa and 17.1 percent for Maricopa County).

An analysis of air quality (see Section 4.1) and traffic indicates that no significant construction impacts are anticipated under the Northeast Area Development Alternative. No significant construction impacts related to hazardous materials (see Section 4.5), noise (see Section 4.9), lighting and visual character (see Section 4.11), or water resources (see Section 4.12) are anticipated. Therefore, no disproportionately high and adverse human health or environmental impacts to minority and low-income populations would occur during construction.

- **Children's Environmental Health and Safety Risks**. Schools identified in the PPA include the ASU–Polytechnic Campus and Chandler-Gilbert Community College. On the east side of the ASU-Polytechnic Campus is the ASU Preparatory Academy, which includes three charter schools, a preschool, elementary school, and high school, serving students preK through 12. The three facilities are located near the east boundary of the PPA. Analyses of air quality, noise, hazardous materials, and water resources indicate no significant construction impacts would occur as a result of the Northeast Area Development Alternative. Therefore, the Northeast Area Development Alternative would not result in significant environmental impacts that would affect children's health or pose safety risks.
- **Surface Traffic**. Construction activities would generate increased traffic associated with construction employees and deliveries in the vicinity of the on-site construction staging areas. Construction traffic would likely use SR 24 and Williams Field Road (extended) to access the site, and this would not significantly impact traffic on local roads.

Although there may be a short-term, localized increase in trips associated with these construction activities, the Northeast Area Development Alternative would not have long-term impacts on the roadways' levels of service, disrupt surrounding communities, or result in long-term impacts on local businesses. Thus, no significant construction traffic impacts would occur.

Operational Impacts

- **Socioeconomic and Secondary (Induced) Impacts**. The improvements associated with the Northeast Area Development Alternative would include the lease of approximately 20 acres for the relocation of the Ellsworth Channel. This property is currently owned by ADOT.[34] The proposed improvements would not displace residences, businesses, or community facilities. As stated in Section 1.4, the Northeast Area Development Alternative would provide opportunities for increased revenue generation via private commercial development. Therefore, no significant adverse socioeconomic impacts would occur.
- **Environmental Justice**. Census data was obtained to establish the demographic and socioeconomic baseline for the Airport environs (refer to Table 3-11 in Section 3.12.2.1). No significant environmental impacts would occur as a result of the Northeast Area Development Alternative's operations. The Northeast Area Development Alternative would have no greater impact on minority or low-income populations than any other populations in the Airport environs. Therefore, the Northeast Area Development Alternative would not result in a disproportionately high and adverse human health or environmental effect on minority or low-income populations.
- **Children's Environmental Health and Safety Risks**. Impacts of the Northeast Area Development Alternative and the No Action Alternative were assessed in regard to compliance with Executive Order 13045. A significant impact would occur if the action would cause disproportionate health and safety risks to children.

As described in Sections 4.1, Air Quality and 4.12, Water Resources, the Northeast Area Development Alternative would not result in significant air quality or water quality impacts. As described in Section 4.6, Hazardous Materials, Solid Waste, and Pollution Prevention, the Northeast Area Development Alternative would not result in the exposure of humans to hazardous substances. The Northeast Area Development Alternative would not result in significant operational noise impacts that would affect children's health or pose safety risks, and it would not result in environmental health and safety risks that may disproportionately affect children. Therefore, the Northeast Area Development Alternative would not result in significant operational environmental impacts that would affect children's health or pose safety risks.

- **Surface Transportation**. The NADP (June 2012) for Phoenix-Mesa Gateway Airport describes the traffic analysis conducted to determine the LOS on the Study Area roadways and intersections in the vicinity of the airport.[35] The traffic analysis, as presented in the report, was conducted utilizing the generally accepted principles and procedures in transportation planning for proposed developments.

[34] ADOT purchased this property as part of the State Route 24 project. The 20-plus acres are an uneconomical remnant that ADOT has agreed to lease long-term to the City of Mesa. The City of Mesa would lease the property to PMGAA for relocation of the Ellsworth Channel, as part of the proposed project.

[35] Jacobs, *Final Technical Report Northeast Area Development Plan Phoenix-Mesa Gateway Airport*, June 2012.

The analysis was conducted assuming a future passenger activity level between 5 and 10 million annual passengers (MAP) and approximately 8,277,900 square feet of retail, office, and mixed-use development within the Airport boundary.

However, the current proposal for the Northeast Area Development Alternative is significantly smaller than the area previously analyzed, and the passenger activity levels within the timeframes analyzed in this EA are also less than the assumed MAP levels. This analysis scaled down the previous traffic volumes analyzed to assess potential impacts from the current Northeast Area Development Alternative.

The NADP assessed the roadway and intersection capacities and reported the LOS for the horizon year 2030, with an assumed passenger activity level of 5 MAP and 7.9 million square feet of retail, office, and mixed-use collateral development.

The NADP describes two alternative on-airport roadway configurations identified as Alternative A and Alternative B. As shown on **Exhibit 4-7**, both alternatives were similar in design, with the exception of Hawes Road intersecting Ray Road at two different locations under Alternative B.

Traffic forecasts were generated as part of the NADP using, as a base, the TransCAD travel demand model developed by HDR for the Mesa Gateway Strategic Development Plan (MGSDP), which contains the Mesa Proving Grounds Master Transportation Plan socioeconomic and network data. The model was further refined with future land use and roadway improvements data obtained from the City of Mesa. The trips from the proposed collateral development land use, as well as the trips resulting from an increase in passenger activity levels, were also coded in the model.

The traffic analysis in the NADP was conducted using a micro-simulation model to determine the LOS for the Study Area intersections. The following intersections were analyzed as part of the NADP:

- Ray Road and Hawes Road
- Ray Road and Grand Canyon Drive
- Grand Canyon Drive and Mustang Street
- Grand Canyon Drive and Silver Street (Street D)
- Ray Road and Warner Road
- East Bound 202 Ramp and Hawes Road
- West Bound 202 Ramp and Hawes Road
- North Bound SR 24 Ramp and Williams Field Road
- South Bound SR 24 Ramp and Williams Field Road
- Williams Field Road and Ellsworth Road
- Grand Canyon Drive and Ellsworth Road
- SB SR 24 Ramp and Ellsworth Road
- NB SR 24 Ramp and Ellsworth Road
- Ray Road and Ellsworth Road

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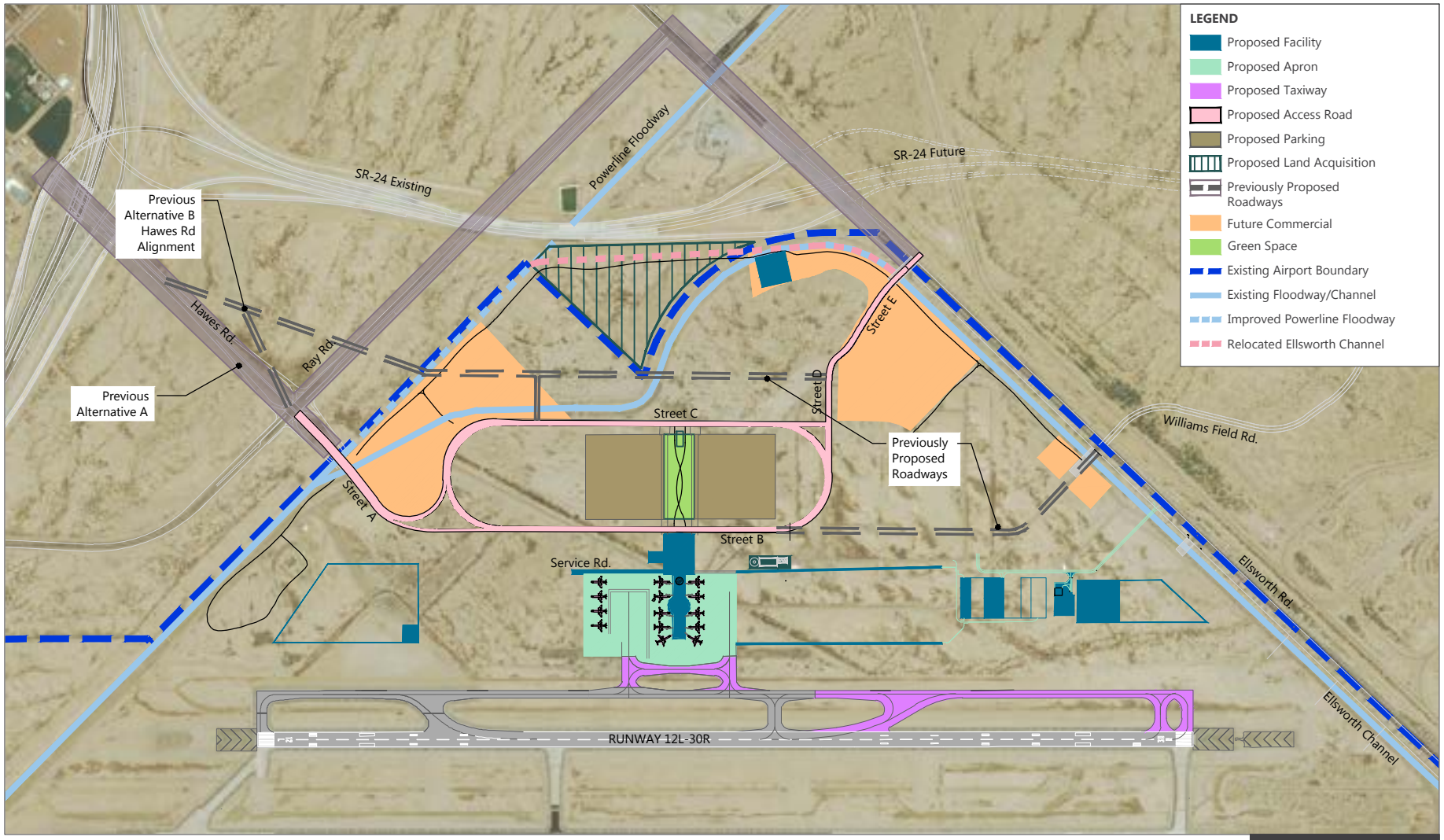

NOTE: The Proposed Action includes the relocation of the Airport Surveillance Radar to a new location southeast of the Airport in Pinal County (See Exhibits 1-5 and 1-6).

SOURCES: Coffman Associates, Inc., *Airport Master Plan for Phoenix -Mesa Gateway Airport,* Final Report, February 2009; U.S. Census, *2013 TIGER/Line Shapefiles* , http://www.census.gov/cgi-bin/geo/shapefiles2013/main (accessed March 2014); U.S. Department of Agriculture, *National Agriculture Imagery Program* , 2013 (Aerial Imagery), 2013; Ricondo & Associates, Inc., October 2013.

PREPARED BY: Ricondo & Associates, Inc., April 2016.

NORTH 0 1,500 ft.

EXHIBIT 4-7

Northeast Area Development Alternative with Previously Proposed Roadways

Drawing: Z:\PMGAA\CAD\IWA_NADP_EA_Proposed Action_20160817.dwg Layout: EX 4-7 Plotted: Dec 27, 2016, 01:02PM

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The performance of each intersection was measured using a letter grade LOS. The LOS is ranked from LOS A, which signifies little or no congestion and is the highest rank, to LOS F, which signifies significantly congested conditions. LOS D is typically considered adequate operation at signalized and un-signalized intersections in urban locations.[36]

With the exception of Ray Road and Hawes Road, all other intersections were reported to have performed with a LOS C or better, with a significant number performing at LOS A and LOS B in the horizon year 2030. The intersection of Ray Road and Hawes Road was reported to perform with a LOS D. With assumed activity levels of 5 MAP and 7.9 million square feet of collateral development from the 2012 NADP, there were no significant traffic impacts and mitigation was not required. The current proposal for the Northeast Area Development Alternative is significantly less than the 7.9 million square feet of collateral development analyzed in the 2012 NADP. The passenger activity levels are also estimated to be less than the previously assumed MAP level. The Northeast Area Development Alternative collateral development in the opening year (2022) would be approximately 7 million square feet less than what was planned for the 2030 scenario in the previous study. This translates to approximately 88 percent less development compared to the previous study. Furthermore, the FAA 2016 Terminal Area Forecast estimates an air passenger activity level of 1.6 MAP in 2022, compared to the 5 MAP activity levels assumed in the NADP. This is a reduction of approximately 68 percent in passenger activity levels compared to the previous study.

Traffic volumes resulting from planned development were generated based on the square feet of development and the Institute of Transportation Engineers' Trip Generation Manual. This method results in a linear relationship between the unit land usage and the anticipated trips as a result of the said land use. For example, if 100,000 square feet of a specific land use resulted in 10,000 trips, then it can be derived that if the land use square footage was reduced by 50 percent, the resulting trips will also decrease by 50 percent.

The traffic volumes generated by the Northeast Area Development Alternative would be much less than what was assumed for the NADP, which showed no traffic impacts. The FAA's threshold for a significant traffic impact is when the Proposed Action would have the potential to disrupt local traffic patterns and substantially reduce the LOS of roads serving an airport and its surrounding communities.[37] "Substantially reducing" is generally considered LOS E or LOS F.

In the previous study, all intersections performed with a LOS D or better, with a significant number performing at LOS A and LOS B. With the reduced collateral development levels, as well as the reduced passenger activity levels, the Northeast Area Development Alternative's reduction in traffic would result in a LOS that is better than the LOS D intersection LOS. Overall, no significant traffic impacts would occur.

The current transit access to IWA is on South Sossaman Road and includes a Valley Metro bus stop. Valley Metro and Maricopa Associations of Governments are aware of the anticipated growth of the Gateway Area and can address connectivity through updates to the Regional Transportation Plan. The PMGAA has also identified areas that can be reserved for transit use and connectivity to the terminal and parking areas.

[36] Phoenix-Mesa Gateway Airport, *Final Technical Report Northeast Area Development Plan*, June 2012.

[37] Federal Aviation Administration, *1050.1F Desk Reference*, July 2015.

Shuttle service from the Ray Road economy lot would shift to the future terminal to serve passengers and possibly employees. Carpool and ride share areas would also be considered. Although there is no commitment at this time, Valley Metro has sought out opportunities to meet the local demands of the Airport as well as the employees and universities located adjacent to the Airport. As the new terminal will be along a major north-south corridor, this route will be a common thoroughfare for traffic. PMGAA anticipates continued coordination with Valley Metro to meet future passenger and employee demand for public transit.

4.10.3.2 RTN7 Site Alternative

The No Action Alternative does not include any property acquisition or construction and, therefore, would not result in the relocation of residences or businesses, alteration of traffic patterns, division of communities, disruption of planned development, or appreciable changes in employment. The quality of life and noise levels in surrounding areas would not be affected, and no impacts to low-income populations, minority populations, or children would occur.

Construction Impacts

- **Socioeconomic and Secondary (Induced) Impacts**. Although construction would create some temporary construction jobs, employment would not significantly change as a result of the construction of the RTN7 Site Alternative. Construction activities would occur on the RTN7 Site and would not require relocation of housing or businesses. Construction vehicles and construction worker vehicles would use major roads (East Ocotillo Road and Schnepf Road), and they would require construction of one new access road from East Ocotillo Road, which would be restricted to authorized personnel only. Construction activities would be temporary and would not adversely impact the community tax base. Therefore, there would be no significant socioeconomic impacts during construction.
- **Environmental Justice**. The population of Census Tract 2.07, which intersects the RTN7 Site Alternative PPA, can be characterized as predominately White and having a similar percentage of minority population compared to Pinal County (refer to Table 3-13). The percentage of population living below the poverty level is also lower compared to Pinal County. An analysis of air quality (see Section 4.1) and traffic indicates that no significant construction impacts are anticipated under the RTN7 Site Alternative. No significant construction impacts related to hazardous materials (see Section 4.6), noise (see Section 4.9), lighting and visual character (see Section 4.11), or water resources (see Section 4.12) are anticipated. Therefore, no disproportionately high and adverse human health or environmental impacts to minority and low-income populations would occur during construction.
- **Children's Environmental Health and Safety Risk**. No significant environmental impacts would result from the construction of the RTN7 Site Alternative; therefore, the construction of the RTN7 Site Alternative would not adversely affect children's health and safety.
- **Surface Transportation**. Construction activities would generate increased traffic that is associated with construction employees and deliveries in the vicinity of the proposed staging areas. Potential construction haul routes would be located along East Ocotillo Road. This road would potentially experience a slight, temporary increase in traffic due to construction hauling and construction employee traffic.

Although there may be an increase in short-term, localized trips that are associated with these construction activities, the RTN7 Site Alternative would not have long-term impacts on the RTN7 Site Alternative PPA roadway LOS, disrupt surrounding communities, or result in long-term impacts on local businesses. Thus, no significant construction traffic impacts would occur.

Operational Impacts

- **Socioeconomic and Secondary (Induced) Impacts**. The improvements associated with the RTN7 Site Alternative would not require real estate acquisitions, and no displacement of residences, businesses, or community facilities/utilities would occur. Furthermore, no disruption to established communities would occur. The RTN7 Site Alternative would not result in any impact to the tax base. Therefore, there would be no significant socioeconomic impacts.
- **Environmental Justice**. Census data was obtained to establish the demographic and socioeconomic baseline for the area surrounding the RTN7 Site (refer to Table 3-13 in Section 3.12.2.2). No significant environmental impacts would occur as a result of the RTN7 Site Alternative's operation. The RTN7 Site Alternative would have no greater impact on minority or low-income populations than any other populations in the surrounding area. Therefore, the RTN7 Site Alternative would not result in a disproportionately high and adverse human health or environmental effect on minority or low-income populations.
- **Children's Environmental Health and Safety Risk**. The RTN7 Site Alternative would not result in significant air quality or water quality impacts, exposure of humans to hazardous substances, or significant operational noise impacts.

The RTN7 Site Alternative would not affect children's health or pose safety risks, and it would not result in environmental health and safety risks that may disproportionately affect children.

- **Surface Transportation**. The RTN7 Site Alternative would result in periodic FAA maintenance of the ASR-8 system, which would require occasional trips from East Ocotillo Road to the RTN7 Site Alternative. These limited and periodic trips would not significantly affect traffic levels on East Ocotillo Road. Therefore, no significant impacts related to surface traffic would be anticipated.

4.11 Visual Effects

4.11.1 METHODOLOGY

Light emission impacts associated with the No Action Alternative and the Proposed Action were determined by evaluating construction-related impacts, the extent to which airfield lighting would change, and the potential for the change to create an annoyance among sensitive land uses within the Northeast Area Development Alternative and RTN7 Site Alternative PPAs, which could interfere with normal activities or contrast with existing environments. The evaluation of visual impacts considered the potential changes in landscape and views within the Northeast Area Development Alternative and RTN7 Site Alternative PPAs, and it also considered whether conflicts with existing environments would occur.

4.11.2 THRESHOLDS OF SIGNIFICANCE

Per FAA Order 1050.1F, thresholds to determine the significance of light emissions and visual effects impacts are as follows:

- Light Emissions
  - The degree to which the action would have the potential to create annoyance or interfere with normal activities from light emissions; and
  - The degree to which the action would have the potential to affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources.
- Visual Effects
  - The degree to which the action would have the potential to affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources;
  - The degree to which the action would have the potential to contrast with the visual resources and/or visual character in the study area; and
  - The degree to which the action would have the potential to block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

4.11.3 COMPARISON OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

4.11.3.1 Northeast Area Development Alternative

The No Action Alternative would not result in any modifications to the Northeast Area Development Alternative PPA; therefore, there would be no light emissions or aesthetic impacts associated with this alternative.

Construction Impacts

- **Light Emissions**. Nighttime light emissions already occur within the Northeast Area Development Alternative GDA to support existing airport operations. Any use of nighttime construction lighting would be temporary and restricted to the areas of the proposed terminal development. Therefore, no significant impacts relative to light emissions would occur during construction.
- **Visual Impacts**. During construction, large trucks and other large-scale construction equipment would be present within the Northeast Area Development Alternative GDA. The construction activity would be short-term and temporary. Construction fencing would be used to screen construction equipment, materials and activity. The area adjacent to the GDA is either vacant or identified by the Maricopa Association of Governments as Developing Employment Generating (see Exhibit 3-6). No viewsheds of unique or critical value have been identified; therefore, no significant construction-related visual effects would occur.

Operational Impacts

- **Light Emissions**. The potential light emission impacts from the operation of the Northeast Area Development Alternative were determined by considering existing light sources at IWA (i.e., terminal, apron areas, runways, and taxiways) and assessing future lighting effects based on the proposed site plans. Additional lighting would be required for the following: the new terminal, airport and airline support facilities, an ARFF facility, parking lots, roadway access, and taxiway extension.

All of the additional lighting would occur within the Northeast Area Development Alternative GDA; therefore, it would not occur immediately adjacent to any residential neighborhoods. The closest residence to the Northeast Area Development Alternative is 500 feet northeast of the section of South Hawes Road that is within the GDA. New lighting fixtures associated with the Northeast Area Development Alternative would be directed downward to reduce light emissions and to prevent potential hazards to landing and departing aircraft. Therefore, implementation of the Northeast Area Development Alternative would not result in any significant light emission impacts on aircraft operations or on nearby residents.

- **Visual Impacts**. In terms of visual impacts, consideration was given to the extent to which changes in the various viewsheds would change with implementation of the Northeast Area Development Alternative. The existing site comprises undeveloped, vacant land with no characteristic viewsheds. The proposed terminal complex would be visually consistent with existing aviation-related structures at IWA. The nearest residential areas are 500 feet northeast of South Hawes Road and are not within immediate view of the Northeast Area Development Alternative GDA. Overall, implementation of the Northeast Area Development Alternative would not result in significant visual impacts.

4.11.3.2 RTN7 Site Alternative

The No Action Alternative would not result in any modifications within the RTN7 Site Alternative PPA; therefore, there would be no light emission or visual impacts associated with this alternative.

Construction Impacts

- **Light Emissions**. Construction of the RTN7 Site Alternative is anticipated to occur during daylight hours. Should any nighttime construction activities be required, the lighting would be temporary, and it would be restricted to the area proposed for the ASR-8 radar system within the RTN7 Site Alternative GDA, which is one-quarter mile north of the nearest residential area. Therefore, there would be no significant light emission impacts during construction.
- **Visual Impacts**. During construction, large trucks and other large-scale construction equipment would be present and visible from Ocotillo Road, which is one-quarter mile south of the RTN7 Site Alternative GDA. Construction fencing would be used to screen construction equipment, materials and activity. The existing ornamental trees and brick wall, which provide privacy and serve as a barrier for the homes adjacent Ocotillo Road, would limit the visibility of construction equipment and activity from the nearest residential backyards adjacent to the south side of Ocotillo Road. The visual impacts resulting from construction activity would be short-term and would not be significant.

Operational Impacts

- **Light Emissions**. The potential light emission impacts of the RTN7 Site Alternative were determined by considering the current lack of light sources within the RTN7 Site Alternative GDA, as well as by assessing future lighting effects based on the obstruction lighting and marking for the ASR-8 radar system. The Proposed Action would include a steel lattice tower up to 27 feet in height with obstruction lighting. All lighting for the ASR-8 radar system would meet specifications for obstruction light equipment outlined in FAA AC 150/5345-43G, as well as obstruction marking and lighting outlined in FAA AC 70/7460-1K.[38,39] A photograph of the existing IWA ASR-8 tower is shown as an example ASR-8 tower at night on **Exhibit 4-8**.

Exhibit 4-8: ASR-8 Example Photograph

SOURCE: Phoenix-Mesa Gateway Airport Authority, August 2016.
PREPARED BY: Ricondo & Associates, Inc., August 2016.

All lighting would be installed within the RTN7 Site Alternative GDA and would not be directed toward the residential neighborhoods one-quarter mile to the south. There are trees and an existing brick wall behind the homes along Ocotillo Road that serve as visual barriers to the road (see **Exhibit 4-9** below). The trees and wall would also limit the potential for light to negatively affect nearby residents. Therefore, implementation of the RTN7 Site Alternative would not result in any significant operational impacts related to light emission.

38 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5345-43G, *Specifications for Obstruction Lighting Equipment*, September 26, 2012.

39 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 70/7460-1K, *Obstruction Marking and Lighting*, February 1, 2007.

- **Visual Impacts**. In the analysis of visual impacts, consideration was given to the extent to which changes in the various viewsheds would change with implementation of the RTN7 Site Alternative. The existing site comprises undeveloped, vacant land with no characteristic viewsheds. The RTN7 Site Alternative would include construction of a one-story masonry building, a shelter for a diesel backup generator, a 1,000-gallon AST to provide fuel for the generator, a steel lattice tower up to 27 feet in height, and an access road. The antenna, building, generator, and fuel storage tank would be enclosed by a chain link security fence.

The backyards of the nearest residences are separated from Ocotillo Road by a line of ornamental trees and a 6-foot brick wall, which would limit or block the view of the RTN7 Site Alternative GDA, located a quarter-mile north of Ocotillo Road. While implementation of the RTN7 Site Alternative would alter the currently undeveloped viewshed, the effects would not be significant.

Exhibit 4-9: Existing Ocotillo Road, Neighborhood Wall and Landscaping Photograph

SOURCE: Phoenix-Mesa Gateway Airport Authority, August 2016.
Prepared By: Ricondo & Associates, Inc., August 2016.

4.12 Water Resources

4.12.1 METHODOLOGY

Records from the USFWS and field surveys conducted by AMEC for the Water Resources Technical Memorandum (Appendix G) were used to determine the presence of wetlands. Wetlands in or near the PPAs for both the Northeast Area Development Alternative and the RTN7 Site Alternative are displayed on Exhibit 3-12. Potential floodplain impacts were evaluated by comparing the location of Proposed Action elements with floodplain mapping prepared by FEMA. Field surveys conducted by AMEC for the Water Resources Technical Memorandum were used to determine the presence of WOTUS within the Northeast Area Development Alternative and the RTN7 Site Alternative GDAs. AMEC conducted document reviews for the

Water Resources Technical Memorandums, which were used to determine the groundwater resources within the Northeast Area Development Alternative and the RTN7 Site Alternative GDAs.

4.12.2 THRESHOLDS OF SIGNIFICANCE

FAA Order 1050.1F, which defines the water resources impact categories, specifies the consideration of wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers. As stated at the beginning of this chapter, Wild and Scenic Rivers are not present in either the Northeast Area Development Alternative PPA or the RTN7 Site Alternative. Thresholds of significance for other water resources include:

- A significant impact to wetlands would exist if the action would adversely affect a wetland's function to protect water quality and quantity.
- A significant impact to wetlands or floodplains would exist if the action would cause notable adverse impacts on natural and beneficial values of a wetland or floodplain.
- A significant impact to surface waters or groundwater would exist if the action would cause an exceedance of water quality standards established by federal, state, local, or tribal regulatory agencies or contaminate the public drinking water supply, including an aquifer used for public water supply, such that public health may be adversely affected.

4.12.3 COMPARISON OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

4.12.3.1 Wetlands

Northeast Area Development Alternative

The No Action Alternative would not involve grading, development, or changes within the Northeast Area Development Alternative GDA; therefore, no construction or operational impacts to wetlands would occur under the No Action Alternative.

Field surveys conducted for the Northeast Area Development Alternative did not identify any wetlands within the Northeast Area Development Alternative GDA. No jurisdictional wetlands would be impacted by the construction or operation of the Proposed Action.[40] WOTUS identified in a preliminary jurisdiction approved by the USACE are discussed in Section 4.13.3.3, Surface Water.

RTN7 Site Alternative

The No Action Alternative would not include grading, development, or changes within the RTN7 Site Alternative GDA; therefore, no construction or operational impacts to wetlands would occur under the No Action Alternative.

[40] AMEC, *Biological Resources – Affected Environment Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, October 2013.

No evidence of wetlands was observed during the field survey conducted by AMEC for the Water Resources Technical Memorandum; therefore, there would be no impacts to jurisdictional wetlands.[41]

4.12.3.2 Floodplains

Northeast Area Development Alternative

The No Action Alternative would not include any development; therefore, there would be no impact to floodplains.

As shown on Exhibit 3-14, the Northeast Area Development Alternative GDA is mapped as Zone D, which indicates possible, but undetermined, flood hazards, since no analysis of flood hazards has been conducted. The nearest designated 100-year floodplain area is the East Maricopa Floodway, approximately one mile west of the Northeast Area Development Alternative GDA. The Powerline Floodway and Ellsworth Channel would continue to provide surface water conveyance to the East Maricopa Floodway, as well as flood mitigation for IWA along Ellsworth Road and the northern boundary of the Northeast Area Development Alternative GDA. The development associated with the Northeast Area Development Alternative would include stormwater and drainage designs to ensure that any changes in drainage would not negatively impact the current conveyance and flood protection system. Neither the construction nor operation of the Northeast Area Development Alternative would adversely affect floodplains. The proposed relocation of Ellsworth Channel and the improvement to Powerline Floodway are discussed in Section 4.12.3.2, Surface Water.

RTN7 Site Alternative

The No Action Alternative would not include any development within or adjacent to a known 100-year floodplain; therefore, there would be no impacts to floodplains.

As shown on Exhibit 3-15, the RTN7 Site Alternative GDA is mapped as Zone D by FEMA, which indicates an area of undetermined, but possible, flood hazards. The Rittenhouse FRS is an earthen flood control dam that provides 100-year flood protection for the CAP Canal, which is approximately one-half mile east of the RTN7 Site Alternative GDA. Since the general flow of water runs from east to west, the Rittenhouse FRS also provides flood protection for the RTN7 Site Alternative GDA. Construction and operation of the RTN7 Site Alternative would not negatively impact the current conveyance and flood protection system.

4.12.3.3 Surface Water

Northeast Area Development Alternative

Under the No Action Alternative, there would be no change to the impervious surface area and no drainage system improvements; therefore, there would be no impacts to surface hydrology or drainage patterns. The No Action Alternative would not involve grading or earthwork; therefore, there would be no potential for downstream erosion or sedimentation or modified drainage patterns. Additionally, there would be no

[41] AMEC, *Biological Resources- Affected Environment Airport Surveillance Radar (ASR) Site Northeast Development Area Plan: Phoenix-Mesa Gateway Airport*, December 2014.

potential for pollution and contamination impacts, and there would be no need for sediment and erosion control.

- **Construction Impacts**. Proposed short-term grading, excavation, and construction activities would increase the potential for erosion and sedimentation. These activities have the potential to generate water pollutants, such as the following: sediments from grading/ground disturbance; fuels, oil, grease, and solvents from construction equipment fueling and servicing; metals from steel/iron work; paints; miscellaneous chemicals stored and used during construction; and trash and debris. The EPA regulates pollutant discharge through the National Pollutant Discharge Elimination System (NPDES). In Arizona, the NPDES is implemented by the ADEQ under the Arizona Pollutant Discharge Elimination System (AZPDES). Potential water quality impacts would be addressed through compliance with the construction activity requirements specified in the PMGAA SWPPP and the ADEQ Stormwater Construction General Permit (AZG2013-001), which authorizes stormwater discharge associated with construction activities. Proposed construction activities would also comply with the Maricopa County Stormwater Quality Management and Discharge Control Regulation to minimize or eliminate impacts from erosion and sedimentation.

The Northeast Area Development Alternative would also require the relocation of a portion of the Ellsworth Channel and the improvement of a portion of the Powerline Floodway. The Channel and Floodway are considered WOTUS under the jurisdiction of the USACE. Specifically, 2,900 feet of the Ellsworth Channel would be relocated. With the relocation, the Ellsworth Channel would intersect the Powerline Floodway 3,000 feet east of the current confluence. To accommodate the additional flow, 3,000 feet of the Powerline Floodway would be reconstructed and widened. The proposed relocation and improvements would require coordination with the Flood Control District of Maricopa County and the City of Mesa. Consultation would be required with the USACE for a CWA Section 404 permit for potential discharges, and consultation would also be required with the ADEQ for the accompanying CWA Sections 401 permit related to water quality. All necessary federal, state, local, and tribal permits related to surface water would be obtained prior to construction. The Northeast Area Development Alternative has been discussed and coordinated with the Flood Control District of Maricopa County to ensure that the proposed improvements meet current regulatory design guidelines. Compliance with all other appropriate federal, state, local, and tribal permits would avoid or reduce potential impacts related to surface water, and any impacts would not be significant.

- **Operational Impacts**. All proposed operational activities would be managed in accordance with the provisions and requirements of the existing AZPDES Multi-Sector General Permit (MSGP).[42] As part of the permit, the PMGAA maintains a SWPPP, which includes all major Airport tenants as co-permittees. Independently, any construction contractor would also be required to obtain and adhere to project-specific SWPPP requirements. Depending on the ultimate design of the proposed facilities, and any subsequent changes to the stormwater characteristics or outfalls, a modification to the existing stormwater permit and SWPPP may be required.

[42] Arizona Department of Environmental Quality, https://www.azdeq.gov/environ/water/permits/msgp.html, (accessed February 16, 2016).

The proposed additional impervious surface resulting from the Northeast Area Development Alternative would be designed to manage stormwater runoff in accordance with the storage and pre- and post-flow requirements of the AZPDES MSGP, as well as the guidance in FAA Advisory Circular, *Airport Drainage Design*, the PMGAA SWPPP, and Flood Control District of Maricopa County requirements.[43] The Northeast Area Development Alternative, including the terminal building, apron, roadways, surface lot auto parking, commercial development, taxiway, and other smaller miscellaneous features, increases the impervious surface area by 168 acres.

The parking facilities have not yet been designed. A quantified account of planned vehicle parking spaces for the proposed project is not yet available. Based on available acreage, approximately another 2,000 parking spaces could be constructed at the north end of the airport for long term parking in the Ray Road Economy Lot expansion, if needed to accommodate future demand. This lot would remain open and continue in use with the relocation of the passenger terminal complex.

The Proposed Action would include short term parking adjacent to the relocated terminal. Initially, a similar number of short-term spaces as existing (1,065), with a buffer to accommodate increased demand based on occupancy rates on existing spaces would be constructed. As a means of managing increased impervious surface area, parking structures would be considered if demand warrants additional parking and they're financially feasible.

The same numbers and types of aircraft operations would occur under the Northeast Area Development Alternative and the No Action Alternative; therefore, the total amount of any industry-specific pollutants to be controlled in the runoff would not increase as a result of the Northeast Area Development Alternative.

Compliance with all appropriate federal, state, local, and tribal permits would avoid or reduce potential impacts related to surface water, and any impacts would not be significant.

RTN7 Site Alternative

Under the No Action Alternative, there would be no change to the impervious surface area and no drainage system improvements; therefore, there would be no impacts to surface hydrology or drainage patterns.

The No Action Alternative would not involve grading; therefore, there would be no potential for downstream erosion or sedimentation or modified drainage patterns. No earthwork would be associated with the No Action Alternative and, accordingly, no potential exists for pollution and contamination impacts.

- **Construction Impacts**. Proposed short-term grading, excavation, and construction activities would increase the potential for erosion and sedimentation. These activities have the potential to generate water pollutants, such as the following: sediments from grading/ground disturbance; fuels, oil, grease, and solvents from construction equipment fueling and servicing; metals from steel/iron work; paints;

[43] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5320-5D, *Airport Drainage Design*, August 13, 2013.

miscellaneous chemicals stored and used during construction; and trash and debris. Potential water quality impacts would be addressed through compliance with the construction activity requirements specified in the ADEQ Stormwater Construction General Permit requirements.

Proposed construction activities would comply with the regulations in the AZPDES and the Pinal County Stormwater Quality Management and Discharge Control Regulation in order to minimize or eliminate potential impacts from erosion and sedimentation.

- **Operational Impacts**. The RTN7 Site Alternative would result in periodic FAA maintenance of the ASR-8 system, requiring limited vehicle traffic from East Ocotillo Road to the RTN7 Site. The proposed development would result in the addition of minimal impervious surfaces. Additionally, design elements related to containment and stormwater management would ensure that no significant impact to surface water would occur.

4.12.3.4 Groundwater

Northeast Area Development Alternative

The analysis of potential impacts to groundwater resources was prepared in accordance with the principal objectives of the Safe Drinking Water Act and the CWA. This section analyzes potential impacts to groundwater from the Northeast Area Development Alternative.

The No Action Alternative would not involve earthwork; therefore, no potential exists for the pollution or contamination of groundwater. Any existing groundwater issues related to former site uses would continue to be addressed through approved remediation measures.

- **Construction Impacts**. The groundwater table is located at approximately 140 to 160 feet below ground surface and would not be affected by construction.[44] Project construction would be conducted in accordance with applicable Occupational Safety and Health Administration (OSHA) standards related to (among other issues) the stability of excavations (e.g., 29 CFR Part 1926, *Occupational Health Standards-Excavations*). Conformance with these (and other appropriate) requirements would avoid or reduce potential impacts related to the stability of open excavations, and any impacts would not be significant.
- **Operational Impacts**. Operation of the Northeast Area Development Alternative would not require the use of groundwater resources. The improvements associated with the Northeast Area Development Alternative would not directly affect existing groundwater resources, and the amount of impervious surfaces added would not substantially interfere with groundwater recharge. Therefore, no adverse effects related to groundwater resources would occur if the Northeast Area Development Alternative is implemented.

[44] AMEC, *Water Resources – Affected Environment Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, January 2014.

RTN7 Site Alternative

The No Action Alternative would not involve earthwork; therefore, no potential exists for the pollution or contamination of groundwater resources.

- **Construction Impacts**. The depth to groundwater within the RTN7 Site Alternative GDA varies from 322 to 399 feet below ground surface.[45] Construction occurring within the RTN7 Site Alternative GDA is unlikely to reach the water table at that depth.
- **Operational Impacts**. Operation of the RTN7 Site Alternative would not require the use of groundwater resources, and the added amount of impervious surfaces would not substantially interfere with groundwater recharge. Therefore, no adverse effects related to groundwater resources would occur if the RTN7 Site Alternative is implemented.

4.12.3.5 Mitigation Measures

No significant impacts to wetlands, floodplains, or groundwater would occur under the Proposed Action; thus, mitigation measures would not be required.

With respect to surface water, the impacts to the Ellsworth Channel and the Powerline Floodway would require a Section 404 permit. Mitigation measures would be approved by the USACE as part of the permitting process. The PMGAA and the FAA would follow all permit requirements and provide mitigation as agreed upon with the USACE in the Section 404 permit.

4.13 Cumulative Impacts

CEQ Regulations, Section 1508.7, define cumulative impacts as the incremental effects of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of the agency (i.e., federal or nonfederal) or person undertaking such actions. In some cases, individually minor, but collectively significant, actions occurring over a defined period of time can cause cumulative impacts.

The past, present, and reasonably foreseeable actions (Cumulative Impact Projects) considered in this EA are identified in Section 3.15 (refer to Table 3-14 and Exhibit 3-16). For a project to have potential cumulative effects with the Proposed Action, the project must result in impacts on the same resources impacted by the Proposed Action. Construction-related impacts of the Cumulative Impact Projects were considered if the impacts occurred during the construction period for the Proposed Action. Non-construction impacts were also considered. The following actions were not considered in the cumulative-impacts assessment because no project schedule exists: Grand Canyon University – East Valley at Eastmark and AZ Army National Guard Armory.

[45] AMEC, *Water Resources – Affected Environment Airport Surveillance Radar (ASR) Site Northeast Area Development Plan: Phoenix-Mesa Gateway Airport*, November 2014.

The limited impacts associated with the construction of the Proposed Action would be mitigated to the fullest extent practicable through the implementation of on-site avoidance and minimization measures, as well as the BMPs discussed in this EA. The Proposed Action would neither result in significant operational changes nor increase the type or amount of activity at IWA, when compared to the No Action Alternative. Therefore, when considered with the other Cumulative Impact Projects identified in Table 3-14 of Section 3.15, implementation of the Proposed Action would not be expected to result in significant cumulative impacts.

The potential for the Proposed Action to cumulatively contribute to effects on resource categories discussed in this chapter with other past, present, and reasonably foreseeable future projects are described as follows:

- **Air Quality** – The Proposed Action would not significantly contribute to long-term operational changes at IWA; thus, it would not significantly change operational emissions. While construction emissions of the Proposed Action would result in a temporary increase in emissions, these emissions would be below the established General Conformity *de minimis* thresholds for all applicable criteria pollutants, conforming to the SIP and CAA. The Cumulative Impact Projects would not generally modify existing operational conditions at IWA. However, two projects scheduled for construction during the same timeframe as the Proposed Action, the Taxiway L Expansion and the Taxiway C Construction, would slightly change the taxi patterns of aircraft on the airfield. It is not expected that these changes would result in a significant increase in air quality emissions. Construction of all concurrent projects would result in short-term and temporary emissions, resulting from construction equipment and activities, but they are not expected to exceed NAAQS thresholds.
- **Biological Resources** – Under the Proposed Action, preconstruction surveys and avoidance and minimization measures would ensure any potential construction impacts would not be significant for plants protected under the Arizona Native Plant Law within the Northeast Development Alternative GDA and RTN7 Site Alternative GDA. No operational impacts to biological resources would occur as a result of the Proposed Action.

Cumulative Impact Projects would be constructed on the active IWA airfield, with most on paved or previously disturbed surfaces. The presence of protected plant or wildlife species would not be anticipated; however, preconstruction surveys would ensure appropriate measures are taken and permits are acquired to reduce the potential for cumulative construction impacts. No operational impacts would be expected to occur due to ongoing aircraft operations and active airfield maintenance.

- **Climate** – As discussed in Section 4.3, the Proposed Action would not significantly increase fuel burn GHG emissions compared to the No Action Alternative. Similarly, the Cumulative Impact Projects would not significantly increase fuel consumption, and GHG emission increases would not be significant.
- **Hazardous Material, Solid Waste, and Pollution Prevention** – Construction of the Proposed Action, as well as the Cumulative Impact Projects, would require the use of motor fuel, oil, and other petroleum-based products; however, construction plans would include provisions for appropriate handling of these materials. As operations under the Proposed Action would not increase the use of these hazardous materials, or generate additional solid waste, the Proposed Action would not result in

a significant cumulative impact on hazardous materials, pollution prevention, or solid waste. Compliance with the AZPDES and implementation of BMPs would further ensure that no significant cumulative impacts would occur.

Construction and operations of the Cumulative Impact Projects would result in the continued use of hazardous materials (e.g., motor fuels, oils, adhesives, and other petroleum-based products). Excavation during future actions may also uncover contaminated soil. Future project design features, along with compliance with the AZPDES, would reduce impacts from future projects with respect to hazardous materials, pollution prevention, and solid waste.

- **Historical, Architectural, Archeological, and Cultural Resources** – As discussed in Section 4.6, the Proposed Action would not affect any properties listed or eligible for listing on the NRHP.

The Cumulative Impact Projects would occur on previously disturbed or paved areas of the airport; therefore, there would be very little potential for any as-yet-unknown resources to be affected.

The RTN7 Site Alternative would be constructed adjacent to a previously recorded NRHP-eligible site; construction and placement of the new ASR-8 would not affect the remains of the abandoned runway or the IO within the RTN7 Site Alternative APE. The installation of an aerial surveillance radar at an auxiliary airfield would not alter the integrity of the site. Overall, no cumulative adverse effects would occur.

- **Land Use** – As discussed in Section 4.7, construction and operation of the Proposed Action would be consistent with local land use plans and land use designations. Most of the Cumulative Impact Projects would occur on existing IWA property and, as such, would be consistent with land use designations and local land use plans that support the continued operation of IWA. The completed SR 202 freeway connection provides a one-mile stretch via SR 25 to South Ellsworth Road. This connection would afford direct access to the proposed terminal complex from SR 202, which would alleviate the traffic congestion on South Sossaman Road related to airline passenger traffic identified in Section 1.2.2. Overall, no cumulative adverse impacts related to land use would occur.
- **Natural Resources and Energy Supply** – As noted in Section 4.8, the Proposed Action would not cause significant impact on natural resources or energy supplies. This EA assumes the Cumulative Impact Projects would use readily available materials for construction of the proposed improvements, and they would not require the use of scarce or rare resources. Operation-related impacts to natural resources and energy supply are not anticipated to occur.
- **Noise** – The Northeast Area Development Alternative would result in minor construction-related noise exposure to the IWA vicinity. Operation of the Northeast Area Development Alternative would decrease noise exposure to sensitive land uses for operational years 2022 and 2027, as compared with the No Action Alternative. Construction and operation of the RTN7 Site Alternative would not significantly increase noise in the vicinity of the GDA, as compared with surrounding noise sources. No noise impacts would occur as a result of the construction and operation of the Proposed Action.

The Cumulative Impact Projects could change the taxi patterns while various pavement improvements are under construction. Aircraft flight patterns or runway usage should not be affected by the Cumulative Impact Projects. A shift in taxi patterns would not affect the noise contours or areas impacted by noise. Construction noise from equipment would be expected, but this would be interior to the airport, short-term, and temporary. Cumulative noise impacts would not occur.

- **Socioeconomic, Environmental Justice, and Children's Environmental Health and Safety Risks** – As described in Section 4.10, the Proposed Action would not result in significant impacts to communities, transportation, employment, or environmental justice populations, and it would not increase risks to children's health and safety. The Cumulative Impact Projects would not affect off-airport development, result in noise impacts to noise-sensitive facilities, or cause a change in the number of aircraft operations at IWA. Actions proposed in the Cumulative Impact Projects are not expected to affect local or regional growth plans. They are not expected to affect the surrounding communities by causing shifts of, or growth in, the population, by increasing public service demands, or changing business or economic activity. The Cumulative Impact Projects would not require the relocation of residences or businesses; existing and planned communities would not be affected, and the disproportionate impacts on low-income or minority populations or children would not occur.
- **Visual Effects** – As discussed in Section 4.11, light and visual impacts from the construction of the Proposed Action would be temporary, and operational impacts would not be significant. Most of the Cumulative Impact Projects would occur on IWA property, and they would be visually consistent with existing aviation-related structures at IWA; associated lighting changes would not be discernible from existing lighting. Within the RTN7 Site Alternative GDA, the obstruction lighting at the top of the ASR-8 is not anticipated to create any adverse visual impacts on the residences located ¼-mile to the south of the proposed ASR-8. As the other projects identified in the cumulative impacts analysis are not located within view of the ASR-8 site, no cumulative lighting impacts would occur.
- **Water Resources** –The Northeast Area Development Alternative would also require the relocation of a portion of the Ellsworth Channel and the improvement of a portion of the Powerline Floodway. The Channel and Floodway are considered WOTUS under the jurisdiction of the USACE. To accommodate additional flow, 3,000 feet of the Powerline Floodway would be reconstructed and widened. The proposed relocation and improvements would require coordination with the Flood Control District of Maricopa County and the City of Mesa, as well as permits from the USACE and ADEQ. The relocation of a portion of Ellsworth Channel, the improvements to the Powerline Floodway, and the Airport's other proposed projects considered in this cumulative impacts analysis would be permitted and constructed to avoid or reduce potential impacts to water resources. Therefore, the Proposed Action would not cumulatively contribute to a significant effect on water resources.

5. Coordination and Public Involvement

5.1 Introduction

Under 40 CFR § 1501.4, federal agencies are required to involve environmental agencies, applicants, and the public, to the extent practicable, when preparing EAs. Therefore, when conducting the NEPA process for the preparation of an EA, the FAA and the airport sponsor are encouraged to begin early coordination with the proper federal, state, tribal, and local agencies, including surrounding municipalities, in order to determine any possible environmental concerns. Following the release of this Draft EA, a public hearing will be held to obtain input on the findings presented. The primary components of the agency coordination and public involvement program include the following:

- agency and public scoping;
- public information meeting;
- notification of the publication of the Draft EA for agency and public review in local newspapers;
- a public hearing scheduled for Tuesday, December 13, 2016; and
- preparation of a Final EA that includes responses to comments received on the Draft EA.

Keeping agencies and the public informed and gathering their input are essential components of any environmental study. The following sections summarize the agency coordination and public involvement program for this EA.

5.2 Agency Consultation

An agency-scoping meeting was held on September 12, 2013 from 10:00 a.m. to approximately 11:00 a.m. at the PMGAA's offices at the Airport. Letters describing the project were sent to 46 individuals, representing federal, state, and local agencies, as well as Native American tribes. Presentation boards describing the proposed project were displayed in the Board Room for review, and Airport and consultant staff were available to describe the project and answer questions. A presentation of the proposed project was also given.

Seven individuals (excluding PMGAA staff) representing five agencies or Native American tribes attended the agency-scoping meeting. Representatives from the following organizations were present:

- Ak-Chin Indian Community
- Arizona State Land Department
- Arizona Game and Fish Department
- Flood Control District of Maricopa County
- Gila River Indian Community

A summary of the scoping meeting, comments received, and a copy of the presentation materials and sign-in sheets are included in **Appendix I**.

5.3 Public Involvement

5.3.1 SCOPING MEETING

A public scoping meeting was held on September 12, 2013 from 5:00 p.m. to 8:00 p.m. at the Student Union – Cooley Ballroom at Arizona State University Polytechnic Campus. A public notice announcing the scoping meeting was published in the *Arizona Republic* on August 16, 2013. An e-mail notice describing the project and inviting the public, as well as interested parties was also sent directly to 123 individuals. Presentation boards describing the proposed project and the EA process were displayed in the ballroom for review, and Airport and consultant staff were available to describe the project and to answer questions.

Twenty-one (excluding PMGAA staff) members of the public, or individuals representing a variety of organizations, attended the public scoping meeting. The public scoping meeting summary and materials are also included in Appendix I.

5.3.2 PUBLIC INFORMATION MEETING

A public information meeting was held on April 7, 2016 from 6:30 p.m. to 8:30 p.m. in the Higley Room in Bridget Hall at the Chandler-Gilbert Community College—Williams (Gateway) Campus. A public notice announcing the public information meeting was published in the *Arizona Republic* on March 15, 2016. An e-mail notice describing the project and inviting the public, as well as interested parties was also sent directly to 362 individuals. Presentation boards describing the Purpose and Need, Alternatives, and the Proposed Action were displayed for review. Airport and consultant staff was on-hand to describe the project and to answer questions.

Fifteen people (excluding PMGAA staff and consultants) attended the meeting. Comment forms were available for meeting attendees. No comments were received at the meeting. Copies of the boards and sign-in sheets are included in Appendix I.

5.4 Review of Draft Environmental Assessment

The Draft EA was made available for review by the general public, government agencies, and interested parties for a period of 30 days prior to the date of the public hearing (December 13, 2016) and for 15 days after the date of the public hearing (for a total of 45 days). The Notice of Availability (NOA) of the Draft EA for review was published in the Arizona Business Gazette on November 10, 2016 (**Appendix K, Attachment K.1**). The NOA was sent to everyone included on the mailing list provided by PMGAA (**Appendix K, Attachment K.2**). The NOA was also posted to the PMGAA website, http://www.gatewayairport.com/ea. Copies of the Draft EA were made available for review at the locations listed in **Table 5-1**, including PMGAA offices and the FAA Airport District Office in Phoenix, Arizona.

Table 5-1: Locations Where Draft EA Was Available

LOCATION	ADDRESS	CITY	ZIP CODE
PMGAA Offices	5835 S. Sossaman Road	Mesa	85212
FAA ADO Office- Phoenix	3800 N. Central Avenue Suite 1025, 10th Floor	Phoenix	85012
FAA Western-Pacific Region – Office of the Airports Division – California	15000 Aviation Boulevard, Room 3012	Hawthorne	90261
City of Mesa Library	64 East 1st Street	Mesa	85201
Southeast Regional Library	775 N. Greenfield Road	Gilbert	85234
Queen Creek Library	21802 S. Ellsworth Road	Queen Creek	85142

SOURCE: Ricondo & Associates, Inc., April 28, 2016.
PREPARED BY: Ricondo & Associates, Inc., April 28, 2016.

Anyone wishing to comment on the Draft EA was offered the opportunity to do so in writing. The written comment deadline was 5:00 p.m. Mountain Standard (MST), Wednesday, December 28, 2016. Comments could be submitted by mail or email to:

Tony Bianchi
Phoenix-Mesa Gateway Airport Authority
5835 South Sossaman Road
Mesa, AZ 85212-6014

NADPEA@ricondo.com

Notice of a public workshop and public hearing held on December 13, 2016 was included in the NOA and posted on the PMGAA website. The workshop was held in the Saguaro Room of the Phoenix-Mesa Gateway Airport Administration Building from 5:30 p.m. to 6:00 p.m. Representatives of the PMGAA and its study team were available to explain the NEPA process, the environmental resources that may be affected by the

Proposed Action, and the estimated timeframe for completing the EA. The public hearing was held in the same room from 6:00 p.m. to 7:00 p.m. Three members of the public, as well as FAA and PMGAA staff attended the public meeting. No public testimony was given at the public hearing. The sign-in sheet, materials provided at the public workshop, and the public hearing transcript are included in **Appendix K, Attachment K-3**.

All comments related to the Draft EA were considered by the FAA and PMGAA in preparing the Final EA. **Table 5-2** is a consolidated list of the comments received. The comments and responses are included in **Appendix K, Attachment K-4**.

Table 5-2: Comments Received on the Draft EA

COMMENTER	TYPE OF CORRESPONDENCE	DOCUMENT ID	DATE
Comments Received from Tribal Nations			
Barnaby V. Lewis, Tribal Historic Preservation Officer, Gila River Indian Community	Email	T-1	11/15/2016
Comments Received from Federal Agencies			
Cheryl Lambert, Certified Conservation Planner, Natural Resources Conservation Service	Email	F-1	12/8/16
Carolyn Mulvihill, Acting Transportation Team Supervisor, Environmental Protection Agency	Email	F-2	12/19/16

SOURCE: Phoenix-Mesa Gateway Airport Authority, correspondence received on the Draft EA between November 10, 2016 and December 28, 2016.
PREPARED BY: Ricondo & Associates, Inc., December 2016.

5.5 Final Environmental Assessment

The Draft EA has been revised as necessary to address any inconsistencies or reflect updated information since publication of the Draft EA. The public and agencies will be notified of the availability of the Final EA for review. The Final EA will be submitted by PMGAA to the FAA for their review and determination of whether to issue a Finding of No Significant Impact/Record of Decision (FONSI/ROD) or to prepare an Environmental Impact Statement (EIS).

Copies of the Final EA will be available for review at the locations listed in Table 5-1, and include PMGAA offices, the FAA Airports District Office in Phoenix, Arizona, and the FAA Western-Pacific Regional Office in Hawthorne, California.

6. List of Preparers

The following individuals contributed to the preparation of this Environmental Assessment. This chapter includes the organizations for which the individuals work, brief synopses of their relative experience and qualifications, and their responsibilities in preparing this document.

6.1 Federal Aviation Administration Principal Reviewer

David B. Kessler, AICP, Regional Environmental Protection Specialist, Airports Division, Western-Pacific Region (B.A. Physical Geography [Geology Minor]; M.A. Physical Geography)

- **Qualifications**—Mr. Kessler has 34 years of experience. He is the Principal FAA Planner/Environmental Protection Specialist responsible for detailed FAA evaluation of federal Environmental Assessments and Environmental Impact Statements as well as coordination of comments from various federal and state agencies in the FAA's Western-Pacific Region.
- **Responsibilities**—Conducted the FAA's review of the Draft EA to ensure compliance with various U.S. Department of Transportation and FAA environmental orders, and various special purpose laws.

6.2 Phoenix-Mesa Gateway Airport Authority

Anthony Bianchi, GISP, Airport Planner

- **Qualifications—** More than 15 years of project management experience and analysis within the fields of planning, development, engineering, and information technology.
- **Responsibilities—** Land use, master and capital planning related duties to support airport operations, and coordination of development growth on, and around, the airport.

Stephanie Carver, Environmental & Archaeological Coordinator

- **Qualifications**—More than 20 years of environmental experience, working for state regulators on rule development and compliance; private industry managing environmental programs for all media, significant construction activities, Phase I and due diligence; and environmental and archaeological coordination for Phoenix-Mesa Gateway Airport.
- **Responsibilities**—Environmental management for the airport; EA review.

6.3 Phoenix-Mesa Gateway Airport Authority Consultant Team

John Williams, Senior Vice President

- **Qualifications**—Over 30 years of experience in airport environmental and facilities planning studies, with significant experience preparing and managing environmental assessments and environmental impact statements, airport master plans, and aviation activity forecasts.
- **Responsibilities**—Project management and quality assurance/quality control.

Stephen D. Culberson, Vice President

- **Qualifications**—More than 20 years of experience in airport environmental and planning analyses, with significant experience preparing and managing environmental assessments and environmental impact statements, airport master plans, and aviation activity forecasts.
- **Responsibilities**—Project management; NEPA documentation; analyses and documentation for the following EA components: purpose and need, alternatives, affected environment, and environmental consequences.

Virginia F. Jackson, Director

- **Qualifications**—More than 20 years of experience in airport environmental and planning analyses, with significant experience preparing and managing environmental assessments, airport noise analyses, and airport master plans.
- **Responsibilities** —NEPA documentation, including the purpose and need, alternatives, affected environment, and environmental consequences analyses.

Dharma Thapa, Director

- **Qualifications**—Over 20 years of experience in a variety of airport planning and environmental projects, focusing on simulation modeling, noise, and air quality analyses.
- **Responsibilities**—Noise analyses.

Vasanth Shenoy, Managing Consultant

- **Qualifications** —Over 11 years of experience in airport landside transportation planning and engineering, traffic engineering and design, operational analysis, traffic simulation, and intelligent transportation systems (ITS).
- **Responsibilities**—Traffic analyses.

Julie Car, Senior Consultant

- **Qualifications**—More than nine years of experience in aviation and environmental planning, with expertise in protected species, sensitive habitat, wetlands, and wildlife management.
- **Responsibilities**—Completed the NEPA analysis and documentation included in the biological resources, land use, energy supply and natural resources, visual effects, and water quality subsections

of the Affected Environment chapter; completed the Department of Transportation Section 4(f), hazardous materials, and historical, architectural, archeological, and cultural resources sections of the Environmental Consequences chapter of this EA.

Brian Philiben, Senior Consultant

- **Qualifications**—More than five years of environmental consulting experience, with particular expertise in land use planning.
- **Responsibilities**—Managed EA documentation, including the Purpose and Need and Alternatives sections, GIS analysis and exhibit production, as well as the maintenance of project records.

Richard Knox, Project Manager/Senior Environmental Planner

- **Qualifications**—More than 20 years of experience directing and performing environmental planning regulatory compliance for multifaceted interdisciplinary activities, with expertise in project management, technical writing, impact analysis, compensatory mitigation planning, master planning, recreational use planning, agency coordination, formal and informal consultation processes, and public participation activities.
- **Responsibilities**—Project management; NEPA documentation; technical quality review.

Theresa Price, Senior Biologist/Environmental Planner/404 Compliance Specialist

- **Qualifications**—Nine years of experience performing and directing biological resources surveys, habitat assessments and evaluations, wetland delineations, and Clean Water Act Section 404 compliance and permitting, in addition to experience performing NEPA evaluations, compliance, and coordination with federal and state agencies, local governments, and the public.
- **Responsibilities**—Biological Resources, Water Resources, and Clean Water Act Section 404 expertise; prepared affected environment and environmental consequences documentation for biological and water resources; coordination with U.S. Army Corps of Engineers and water resources-related permitting compliance/planning.

Serelle E. Laine, Senior Archaeologist/Section 106 Historic Preservation Specialist

- **Qualifications**—More than 25 years of experience supervising and directing cultural resource management, historic preservation, and compliance consultation with federal (Section 106) and state agencies, tribes, local governments, and the public, culminating in cultural resource clearances for environmental documents.
- **Responsibilities**—Cultural Resources Section 106 expertise; presentations on Section 106 process; technical/quality review of cultural resources documents and Section 106 consultation.

Patricia T. Powless, Project Archaeologist

- **Qualifications**—Twenty-eight years of experience in cultural resource management, with significant experience preparing and managing environmental assessments and environmental impact statements.

- **Responsibilities** —NEPA experience includes utilities and Department of Defense projects over the past 28 years for EIS-level reports, as well as subsequent technical support documents for the mitigation phase of projects; these support documents include archaeological and historic inventories, artifact analyses, results of testing, evaluation, and/or data recovery.

Michael Kenney, Vice President and Air Quality Scientist

- **Qualifications**—More than 30 years of experience with environmental assessments, with a special focus on airport air quality. Proficient with air monitoring, modeling, mitigation measures, and NEPA documentation. Expertise extends to greenhouse gases and hazardous air pollutants.
- **Responsibilities**—Task Manager for Air Quality, including technical analyses and documentation.

Paola Pringle, Air Quality Specialist

- **Qualifications**—More than 10 years of experience with conducting airport air quality assessments. Proficient with the use of relevant modeling tools, including the FAA's EDMS and AEDT and the U.S. EPA's MOVES and NONROAD.
- **Responsibilities**—Technical analysis for Air Quality, including data development and modeling.

Jerome Hesse, Cultural Resources Specialist

- **Qualifications**—Nineteen years of experience in cultural resources management, including historic properties inventory, NRHP eligibility determinations, and NHPA Section 106 consultation.
- **Responsibilities** —Principal investigator for NHPA Section 106 cultural resources inventory and technical report authorship.

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8. List of Abbreviations and Acronyms

A

AC – Advisory Circular

ACRP – Airport Cooperative Research Program

ADA – Arizona Department of Agriculture

ADEQ – Arizona Department of Environmental Quality

ADG – Airplane Design Group

ADOT – Arizona Department of Transportation

AEDT – Aviation Environmental Design Tool

AGFD – Arizona Game & Fish Department

AIP – Airport Improvement Program

ALP – Airport Layout Plan

ALS – Approach Light Systems

ALUCP – Airport Land Use Compatibility Plan

ARNG – Army National Guard

APE – Area of Potential Effect

ARC – Airport Reference Code

ARFF – Aircraft Rescue and Fire Fighting

AS – Archeological survey

ASM – Arizona State Museum

ASR – Airport Surveillance Radar

AST – Aboveground Storage Tank

ASU – Arizona State University

ATCT – Airport Traffic Control Tower

AZPDES – Arizona Pollution Discharge Elimination System

B

BCC – Bird of Conservation Concern

BLM – Bureau of Land Management

BMPs – Best Management Practices

C

CAA – Clean Air Act

CAAA – Clean Air Act Amendments of 1990

CAP – Central Arizona Project

CEQ – Council on Environmental Quality

CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act

CFR – Code of Federal Regulations

CH_4 – Methane

CO – Carbon Monoxide

CO_2 – Carbon Dioxide

CWA – Clean Water Act

CZMA – Coastal Zone Management Act

D

dB – decibel

dBA – A-weighted decibel

DNL – Day-Night Average Sound Level

DOT – Department of Transportation

DSA – Direct Study Area

E

EA – Environmental Assessment

EDMS – Emissions and Dispersion Modeling System

EPA – Environmental Protection Agency

EPCRA – Emergency Planning & Community Right to Know Act

ESA – Endangered Species Act

F

FAA – Federal Aviation Administration

FAR – Federal Aviation Regulations

FEMA – Federal Emergency Management Agency

FIRM – Flood Insurance Rate Map

FONSI – Finding of No Significant Impact

FR – Federal Register

FRS – Flood Retarding Structures

G

GDA – Ground Disturbance Area

GHG – Greenhouse Gas

GSE – Ground Support Equipment

GWRP – Greenfield Water Reclamation Plant

H

HAP – Hazardous Air Pollutant

HBI – Historic Buildings Inventory

HHWE – Household Hazardous Waste Element

HMTA – Hazardous Materials Transportation Act

HPIF – Historic Property Inventory Form

I

INM – Integrated Noise Model

IO – Isolated Occurrence

IPaC – Information for Planning and Conservation

IPCC – Intergovernmental Panel on Climate Change

ISA – Indirect Study Area

IWA – Phoenix-Mesa Gateway Airport

J

K

kV - Kilovolt

L

LEED – Leadership in Energy and Environmental Design

LOS – Level of Service

LUST – Leaking Underground Storage Tank

LWCF Act – Land and Water Conservation Fund Act of 1965

M

MAG – Maricopa Association of Governments

MCAQD – Maricopa County Air Quality Department

MBTA – Migratory Bird Treaty Act

MGD – Million gallons per day

MGSDP – Mesa Gateway Strategic Development Plan

MOU – Memorandum of Understanding

MOVES – Motor Vehicle Emissions Simulator

MS4 – Municipal Separate Storm Sewer Systems

MSW – Municipal Solid Waste

MT – Metric Tons

N

N_2O – Nitrous oxide

NAAQS – National Ambient Air Quality Standards

NADP – Northeast Area Development Plan

NCP – Noise Compatibility Program

NEM – Noise Exposure Map

NEPA – National Environmental Policy Act

NHPA – National Historic Preservation Act

NMFS – National Marine Fisheries Service

NO_2 – Nitrogen Dioxide

NO_X – Oxides of Nitrogen

NPDES – National Pollutant Discharge Elimination System

NPIAS – National Plan of Integrated Airport Systems

NPL – National Priorities List

NPS – National Park Service

NRHP – National Register of Historic Places

O

O_3 – Ozone

OSHA – Occupational Safety and Health Administration

P

Pb – Lead

PFC – Passenger Facility Charges

PHX – Phoenix Sky Harbor International Airport

PM_{10} – Particulate Matter

$PM_{2.5}$ – Fine Particulates

PMGAA – Phoenix-Mesa Gateway Airport Authority

PPA – Proposed Project Area

Q

R

RAAF – Rittenhouse Auxiliary Airfield

RCRA – Resource Conservation and Recovery Act

ROW – Right of Way

RSA – Runway Safety Area

RSS – Radar Support System

S

SDWA – Safe Drinking Water Act

SHPO – State Historic Preservation Officer

SIP – State Implementation Plan

SO_2 – Sulfur Dioxide

SO_X – Oxides of Sulfur

SPCC – Spill Prevention Control and Countermeasures

SRP – Salt River Project

SWPPP – Stormwater Pollution Prevention Plan

T

TAF – Terminal Area Forecast

THPO – Tribal Historic Preservation Officer

TRACON – Terminal Radar Approach Control

TRB – Transportation Research Board

TSA – Transportation Security Administration

U

USACE – United States Army Corps of Engineers

USAF – United States Air Force

U.S.C. – United States Code

USDA – United States Department of Agriculture

USFWS – United States Fish and Wildlife Service

USGS – United States Geological Survey

UST – Underground Storage Tank

V

V/C – Volume to Capacity Ratio

VFR – Visual Flight Rules

VOCs – Volatile Organic Compounds

W

WAFB – Williams Air Force Base

WHMP – Wildlife Hazard Management Plan

WOTUS – Waters of the United States

X

Y

Z

FINAL
ENVIRONMENTAL ASSESSMENT

PROPOSED NORTHEAST AREA DEVELOPMENT PLAN AND
ASSOCIATED IMPROVEMENTS PROJECT

APPENDICES: VOLUME 1

Phoenix-Mesa Gateway Airport
Mesa, Arizona

Prepared for:

PHOENIX-MESA GATEWAY AIRPORT AUTHORITY

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
As lead Federal Agency pursuant to the National Environmental Policy Act of 1969

Prepared by:

Ricondo & Associates, Inc.

January 2017

GENERAL INFORMATION ABOUT THIS DOCUMENT

WHAT'S IN THIS DOCUMENT? This document contains a Final Environmental Assessment (EA) for the Phoenix-Mesa Gateway Airport (IWA) proposed Northeast Area Development Plan and Associated Improvement Project (Proposed Action). The Proposed Action includes relocation of the passenger terminal complex and ancillary facilities to the northeast section of the airport, construction of associated infrastructure and site improvements, relocation of an airport surveillance radar (ASR-8) off-airport, and completion of site preparation for future revenue generating commercial development including retail and office space. This document discloses the analysis and findings of the potential impacts associated with the Phoenix-Mesa Gateway Airport Authority's (PMGAA) proposal and the No Action Alternative.

BACKGROUND. The project would provide a purpose-built replacement passenger terminal complex that will provide the users of Phoenix-Mesa Gateway Airport with a modern, efficient, and expandable passenger terminal complex at a level of service that is consistent and competitive with other air carrier airports in the southwestern United States.

The Draft EA was released for public and agency review on November 10, 2016. The notice of availability of the Draft EA was advertised in the Arizona Business Gazette newspaper to inform the general public and other interested parties.

The document presented herein represents the Final EA for the federal decision-making process, in fulfillment of FAA's policies and procedures relative to NEPA and other related federal requirements. Copies of the document are available for inspection at libraries in the cities of Mesa, Queen Creek, and Gilbert, PMGAA Administrative Offices, the FAA Airports District Office in Phoenix, and the FAA Western-Pacific Region Office in Hawthorne, CA. The addresses for these locations are provided in Chapter 5 of this Final EA.

WHAT SHOULD YOU DO? Read this Final EA to understand the actions that PMGAA and FAA intend to take relative to the Proposed Action at IWA.

WHAT HAPPENS AFTER THIS? Following review of the Final EA, the FAA will either issue a Finding of No Significant Impact/Record of Decision (FONSI/ROD) or decide to prepare an Environmental Impact Statement (EIS).

Appendix A

Terminal Complex Deficiencies

Appendix A Existing Facility Deficiencies

A.1 Terminal Building Inefficiencies

A.1.1 LEVEL OF SERVICE METHODOLOGY

In order to serve as a baseline for evaluating the needs of the Phoenix-Mesa Gateway Airport (IWA) terminal area, the *West Terminal Optimization Study* (the Study) was conducted; it included a detailed space inventory and a level of service (LOS) analysis to determine how various terminal elements function now and in the future.[1] LOS, in the context of terminal planning, is used to qualitatively or quantitatively describe the service provided to airport travelers at various points within the airport terminal building. This metric often correlates to the relative comfort, convenience, and ease of use of the various terminal facilities. It may also reflect the amount of waiting or processing time, or the length of queues that passengers encounter in the terminal facilities.

Table A-1 presents the LOS framework established by the International Air Transport Association (IATA) in its *Airport Development Reference Manual*.[2] The conditions presented in Table A-1 describe the operational efficiency of airport facilities and the level of passenger satisfaction and comfort for each assessment level. **Exhibit A-1** presents a graphic depiction of the LOS framework shown in Table A-1.

IATA and the Airports Council International (ACI) recommend LOS C as the minimum airport terminal design objective, because it represents good service at a reasonable cost. LOS A is seen as having no upper bound. The amount of space available per occupant when queues overflow is seen as the degradation between LOS C and LOS D. At LOS D, the facility can still operate, but it may operate with significant delays and lower passenger comfort standards, as the per-person square footage is further reduced.

[1] CH2M Hill, *West Terminal Optimization Study*, Phoenix-Mesa Gateway Airport, July 2014.

[2] International Air Transport Association, *Airport Development Reference Manual*, 9th Edition, January 2004.

Table A-1: IATA Passenger Processing LOS Framework

ASSESSMENT LEVEL	LEVEL OF SERVICE	CONDITIONS
A	Excellent	Free flow, no delays, and excellent levels of comfort.
B	High	Stable flow, very few delays, and high levels of comfort.
C	Good	Stable flow, acceptable delays, and good levels of comfort.
D	Adequate	Unstable flow, acceptable delays for short periods of time, and adequate levels of comfort.
E	Inadequate	Unstable flow, unacceptable delays, and inadequate levels of comfort.
F	Unacceptable	Cross-flows, system breakdowns, unacceptable delays, and unacceptable level of comfort.

SOURCES: International Air Transport Association, *Airport Development Reference Manual*, 9th Edition, Chapter F, "Airport Capacity," p. 179, January 2004; Transportation Research Board of the National Academies, Airport Cooperative Research Program, Report 25, *Airport Passenger Terminal Planning and Design*, Volume 1, Guidebook, pp. 148, 2010.

PREPARED BY: Ricondo & Associates, Inc., October 2013.

Exhibit A-1: Level of Service Depiction

SOURCE: CH2M Hill, *West Terminal Optimization Study,* Phoenix-Mesa Gateway Airport, July 2014.

PREPARED BY: Ricondo & Associates, May 2015.

The Study evaluated the LOS for the passenger processing functions. The Study defined the passenger processing functions to include: ticket counter positions, ticket counter queue area, Transportation Security Administration (TSA) security screening checkpoint (SSCP) lanes, SSCP queue area, outbound baggage area, baggage claim frontage, and concessions area. The function of each area is described in the following list:

- **Ticket Counter Positions**. This includes the number of positions from the front of the customer-facing side of the ticket counters. A maximum acceptable wait time of 20 minutes during the peak hour for ticketing queue was leveraged to drive the requirement for number of positions. At most times of the day, the anticipated wait times is less than 20 minutes.
- **Ticket Counter Queue Area**. This area is defined from the front of the customer-facing side of the ticket counters to the end of the stanchions.
- **SSCP Lanes**. This includes the number of lanes at the SSCP entering the secured area of the terminal. A maximum peak-hour wait time of 15 minutes was leveraged to drive the requirements for number of lanes.
- **SSCP Queue Area**. This area is identified for suitable queuing prior to passenger security screening into the secured area of the terminal.
- **Outbound Baggage Area**. This includes the area for outbound baggage at the entrance of the terminal. The requirements are consistent with industry planning parameters and are driven by a planning factor of 14 square feet of area per peak-hour originating passenger.
- **Baggage Claim Linear Frontage**. This comprises the linear space associated with the baggage claim area where passengers can wait and claim their luggage. The baggage claim linear frontage requirements are driven by a planning factor of 0.5 linear feet of baggage claim frontage per peak-hour terminating passenger.
- **Landside Concessions Area**. This area includes retail and storage space for news, gifts, and food and beverage vendors located in the nonsecure area of the terminal.
- **Secure Concessions Area**. This area includes retail and storage space for news, gifts, and food and beverage vendors located in the secure area of the terminal.

A.1.2 PASSENGER PROCESSING CAPACITY AND LEVEL OF SERVICE

Table A-2 identifies the existing conditions of the passenger terminal complex by functional area, as defined in the *West Terminal Optimization Study*, with facility requirements by terminal functional area at activity levels of 650,000 and 860,000 annual enplaned passengers.

Table A-2: Terminal Requirements Summary

FUNCTIONAL AREA	EXISTING TERMINAL	ACTIVITY LEVEL OF 650,000 ANNUAL ENPLANED PASSENGERS	SURPLUS / (DEFICIENCY)	ACTIVITY LEVEL OF 860,000 ANNUAL ENPLANED PASSENGERS	SURPLUS / (DEFICIENCY)
Ticket Counter Positions	32	16	16	16	16
Ticket Counter Queue Area (square feet)	7,330	1,920	5,410	2,160	5,170
SSCP Lanes (number)	4	4	0	4	0
SSCP Queue Area (square feet)	1,725	2,400	(675)	2,400	(675)
Outbound Baggage Area (square feet)	4,718	7,261	(2,543)	7,729	(3,011)
Baggage Claim Frontage (linear feet)	220	293	(73)	398	(178)
Landside Concessions Area (square feet)	1,048	819	229	1,036	12
Secure Concessions Area (square feet)	6,370	7,369	(999)	9,323	(2,953)

SOURCE: CH2M Hill,*West Terminal Optimization Study,* Phoenix-Mesa Gateway Airport, Table 2-4, "Terminal Capacity Summary," Table 2-12, "Landside Capacity Summary," May 2014.

PREPARED BY: Ricondo & Associates, Inc., September 2014.

Since traffic demand at each airport is dynamic and varies according to factors such as schedule, flight sector, aircraft size, and load factors, the LOS measures must consider these unique variables. The LOS calculation for the passenger processing functions was based on the Study's capacity analysis, which blends quantitative and qualitative metrics from industry and local standards, as well as with discussions with stakeholders. The LOS evaluation was based on the Airport's unique flight schedules and assumptions for terminal operations. A summary of the terminal LOS analysis for two different enplanement levels is depicted in **Table A-3**. As a frame of reference, in federal fiscal year 2014, the airport had over 660,000 enplanements.

Comparing the existing passenger terminal functional areas to an activity level of 650,000 annual enplaned passengers (an activity level exceeded at the Airport in 2012), it is evident that the terminal is deficient in SSCP queue area, outbound baggage area, baggage claim frontage, and secure concessions area, which are all located in the West Terminal Building. These deficiencies generally worsen as activity levels increase towards 860,000 enplanements per year.

The passenger processing LOS is below PMGAA's goal of LOS C in multiple areas, which results in passenger processing inefficiencies and longer-than-desirable wait times. Among the major deficiencies identified for terminal processing in future years are the outbound baggage and sortation area, baggage claim frontage, SSCP lanes and queue, and concessions. The most pressing needs, from a processing standpoint, are the outbound baggage and sortation areas and the baggage claim area. These areas are over capacity and function at a low level of service during peak periods. The ticket counters and ticket counter queue areas are the only terminal functions that have enough capacity to continue to process passengers at a high LOS as passenger demands increase.

Table A-3: Summary of Phoenix-Mesa Gateway Airport Passenger Terminal LOS Analysis

FUNCTIONAL AREA	ACTIVITY LEVEL OF 650,000 ANNUAL ENPLANED PASSENGERS	ACTIVITY LEVEL OF 860,000 ANNUAL ENPLANED PASSENGERS
Ticket Counter Positions	A	A
Ticket Counter Queue Area	A	A
SSCP Lanes	A	A
SSCP Queue Area	C	D
Outbound Baggage Area	D	F
Baggage Claim Linear Frontage	D	F
Landside Concessions Area	A	B
Secure Concessions Area	D	F

SOURCE: CH2M Hill,*West Terminal Optimization Study,* Phoenix-Mesa Gateway Airport, Figure 2-6, "Scenario 2 Terminal Program Stoplight Chart," Figure 2-8, "Scenario 1 Landside Program Stoplight Chart," May 2014.

PREPARED BY: Ricondo & Associates, Inc., April 2015.

A.2 Existing Ground Access and Parking

The existing ground access and parking facilities, otherwise referenced as landside functional areas, are located adjacent to the existing passenger terminal complex, on the western side of Airport property along South Sossaman Road, approximately equidistant between Ray Road and Pecos Road. A description of passenger terminal access and automobile parking is described in the following subsections.

A.2.1 GROUND ACCESS

South Sossaman Road is the main access road for passengers and employees utilizing the existing terminal area. South Sossaman Road is a four-lane road with median for 2.5 miles south of Ray Road; it merges to a two-lane roadway south of the passenger terminal complex. In addition to providing access to the passenger terminal complex, South Sossaman Road is also the primary access road for Arizona State University (ASU) Polytechnic Campus, Chandler-Gilbert Community College, ASU Polytechnic Campus Industrial Park, aircraft service centers, flight schools, executive hangars, and other facilities. Vehicles access the terminal area by turning left from South Sossaman Road (at the southern edge of the terminal area) and then turn left again to the Ticketing Terminal. The access road curves to the east toward the West Terminal and makes a tight turn to exit onto East Texas Avenue.

An access road off of South Sossaman Road provides access to the curbfront of the Ticketing Terminal, the long-term parking lots, and the rental car return lots. The access road includes two through lanes and one lane for passenger pickup and drop-off. The departures curbfront is adjacent to the Ticketing Terminal, while the arrivals curbfront is farther north, adjacent to the West Terminal. In addition to the primary curb, a

secondary outer curb west of the arrivals curbfront and south of East Texas Avenue provides staging for taxi cabs and shuttle buses. The total available curbfront is approximately 890 linear feet.

A.2.2 AUTOMOBILE PARKING

Employee, public, and rental car ready/return parking spaces are located around the passenger terminal complex to the north, south, and west. Approximately 90 free, short-term public parking spaces are located east of South Sossaman Road and west of the passenger terminal complex. A rental-car-ready parking lot is located in front (west) of the Ticketing Terminal between South Sossaman Road and the curbfront access road. The rental-car-ready lots contain about 150 spaces. A 180-space cell phone lot is also available and located southwest of the passenger terminal complex, west of South Sossaman Road. Approximately 800 long-term economy spaces are available at the lot located south of Hangar 24, and approximately 2,800 spaces are available in the north remote long-term economy parking lot located along East Ray Road, just east of South Sossaman Road. A portion of the aircraft parking apron has been fenced and converted to long-term economy parking. Having to convert useable airside to a landside parking function points to inadequate landside area and further restricts the future development of terminal facilities. Parking areas are shown on **Exhibit A-2**.

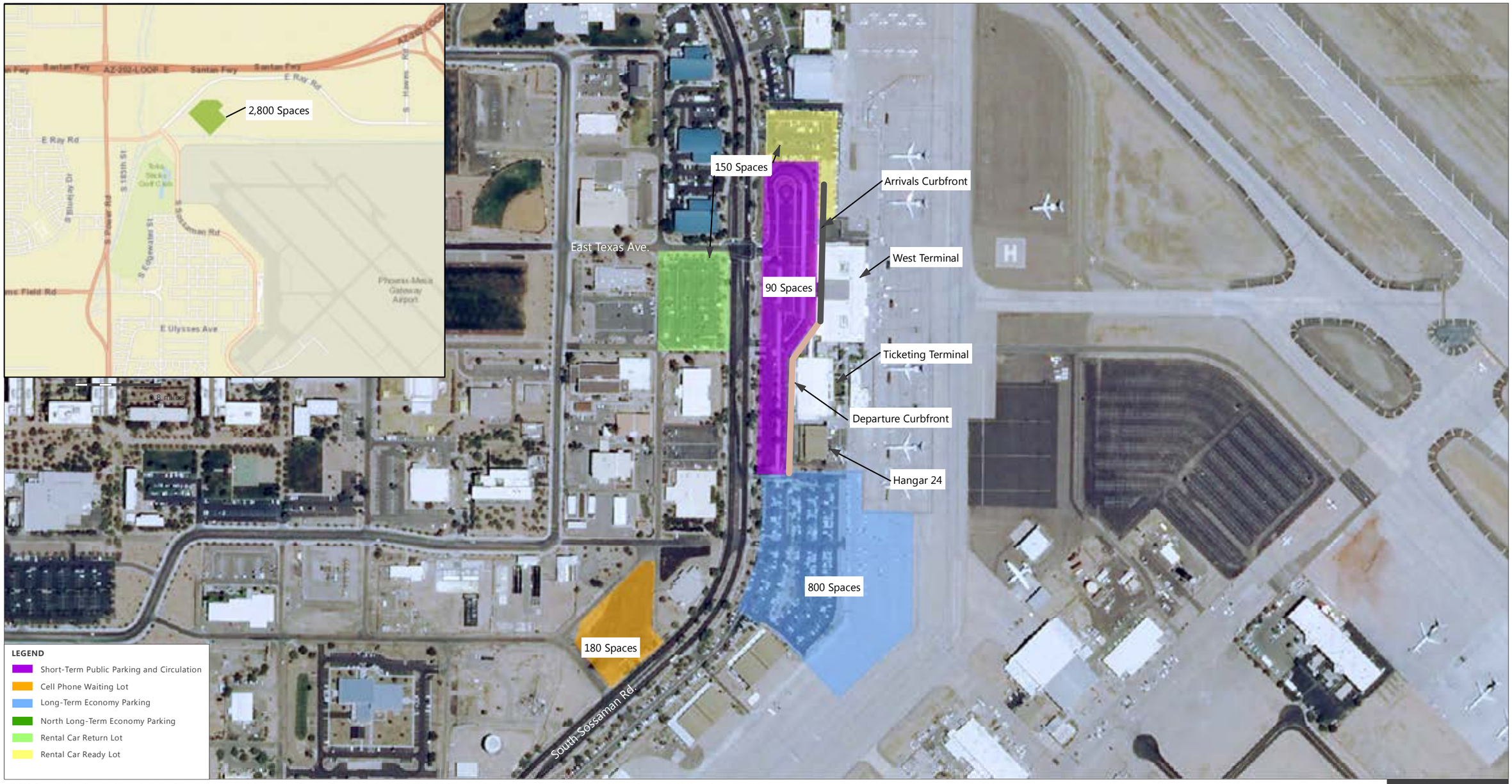
A.2.3 GROUND ACCESS INEFFICIENCIES

Landside facilities include automobile parking (i.e., hourly parking, daily terminal parking, rental-car-ready lot, rental-car-return lot, and employee parking), access roadways (i.e., departure curbs, private vehicle arrival curbs, commercial vehicle arrival curbs, and South Sossaman Road), and other nonterminal, support-related facilities.

Level of Service Methodology

The Study evaluated the LOS for the terminal landside functions. Terminal landside facilities analyzed in the Study comprise areas in direct proximity to the terminal and included the following: departures, private vehicle arrivals, and commercial vehicle curbsides; and hourly parking, daily parking, and rental car ready and return. South Sossaman Road, including the left-turn pocket from southbound South Sossaman Road into the Airport, was also evaluated. The function of each area is described in the following list:

- **Departure Curb**. This linear curbfront includes the area to drop off departing passengers at the terminal.
- **Private Vehicle Arrival Curb**. This linear curbfront includes the area for private vehicles to pick up arriving passengers at the terminal.
- **Commercial Vehicles Arrival Curb**. This linear curbfront includes the area for taxicabs, shared ride vans, limousines, and city buses to pick up arriving passengers at the terminal.
- **Hourly Parking**. This includes the number of daily parking positions for arriving and departing passengers at the Airport.
- **Rental-Car-Ready Lot**. This includes the number of parking positions to pick up rental cars at the Airport. The existing Lot is currently operating near capacity.



SOURCE: Phoenix-Mesa Gateway Airport Authority, Phoenix-Mesa Gateway Airport, West Terminal Optimization Study, May 2014; U.S. Department of Agriculture, National Agriculture Imagery Program, 2013 (Aerial Imagery), 2013; ESRI Basemap, Esri, DeLorme, HERE, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, March 2016.
PREPARED BY: Ricondo & Associates, Inc., April 2016.

EXHIBIT A-2

NORTH 0 430 ft.

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Automobile Parking

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- **Rental-Car-Return Lot**. This includes the number of parking positions to drop off rental cars at the Airport. The existing Lot is currently operating near capacity, with vehicles being moved quickly to the service areas.
- **Employee Parking**. This includes the number of parking positions for employees of PMGAA and all staff associated with the management and operation of the Airport.

Assumptions and methodologies for analyzing landside functional areas were based on a combination of data from the Phoenix-Mesa Gateway User Survey, conducted in April and May of 2012, and from a sample of observations at the Airport, as well as industry observations at similar airports. Traffic along South Sossaman Road into the Airport, evaluated as part of the landside functional area, is based on the City of Mesa's annual traffic count as well as the Maricopa Association of Governments (MAG) forecast traffic volume from the regional traffic model. Traffic along South Sossaman Road was evaluated using the City of Mesa's LOS roadway thresholds for capacity analysis.

The LOS definitions used for roadways under this Study, including South Sossaman Road, are consistent with the City of Mesa 2040 Transportation Plan, adopted November 2014, and are defined in **Table A-4**. The roadway LOS is determined based on the volume-to-capacity (V/C) ratio, which is defined as the existing or forecast volume of vehicles divided by the maximum vehicles (capacity) that a specific roadway segment can accommodate. An LOS with a grade A represents excellent, free-flow traffic conditions. An LOS with a grade F represents a critical failure of roadway conditions with slow speeds and considerable delays.

Table A-4: City of Mesa Transportation Plan Level of Service Framework

ASSESSMENT LEVEL	LEVEL OF SERVICE	CONDITIONS
A	Excellent	Represents free flow.
B	High	Is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable.
C	Good	Is in the range of stable flow but marks the beginning of the range in which the operation of individual users becomes more significantly affected by others.
D	Adequate	Represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the other driver or pedestrian experiences a general poor level of service of comfort and convenience.
E	Inadequate	Represents operating conditions at or near capacity level. All speeds are reduced to a low but relatively uniform value. LOS E is unstable and can quickly deteriorate to LOS F.
F	Unacceptable	Is used to define forced or breakdown flow. This condition exists whenever the amount of traffic approaching a point exceeds the amount that can traverse the point.

SOURCES: CH2M Hill, *West Terminal Optimization Study,* Phoenix-Mesa Gateway Airport, July 2014; City of Mesa, *Mesa 2040 Transportation Plan*, adopted November 17, 2014.
PREPARED BY: Ricondo & Associates, Inc., June 2015.

Similar to the roadways, LOS is typically calculated for terminal curbsides; as vehicle volumes and dwell times increase, the LOS deteriorates. Unlike the roadways, the curbside LOS definitions are unique to airports and are very dependent on the operations of the curbside and the curb length available for passenger pick-up and drop-off. The curbside LOS employed in the Study was based on industry standards and observations at a number of airports, and it is included in **Table A-5**.

Table A-5: Terminal Landside Facilities Level of Service Framework

ASSESSMENT LEVEL	LEVEL OF SERVICE	CONDITIONS
A	Excellent	Drivers experience free flow conditions and can park anywhere at the curbside without interference.
B	High	Drivers experience relatively free flow conditions and can park with some interference (if double parking is allowed, then double parking will begin to be observed).
C	Good	Drivers experience some unstable flow. This LOS is considered appropriate for Peak-period design conditions at most airports (if double parking is allowed, then double parking will become common).
D	Adequate	Drivers experience more unstable flow with some interference (if double parking is allowed, then triple parking may begin to be observed).
E	Inadequate	Drivers experience extremely unstable flow (if double parking is allowed, then frequent double and triple parking will be witnessed throughout the entire curbside area).
F	Unacceptable	Drivers experience extremely unstable flow (if double parking is allowed, then frequent double and triple parking will be witnessed throughout the entire curbside area).

SOURCES: International Air Transport Association, *Airport Development Reference Manual*, 9th Edition, Chapter F, "Airport Capacity," p. 179, January 2004; Transportation Research Board of the National Academies, Airport Cooperative Research Program, Report 25, *Airport Passenger Terminal Planning and Design*, Volume 1, Guidebook, pp. 148, 2010.

PREPARED BY: Ricondo & Associates, Inc., October 2013.

Landside Facility Requirements and Level of Service

Table A-6 provides the facility requirements of the existing passenger terminal complex by landside functional area, as identified in the Study.

Landside Level of Service

The Study blended quantitative and qualitative metrics derived from industry and local standards, as well as discussions with stakeholders and tenants, to determine the landside LOS for activity levels of 650,000 and 860,000 annual enplaned passengers. The LOS analysis for landside functional areas at the Airport is provided in **Table A-7**.

Among the major deficiencies in landside facilities at existing and higher passenger levels are the terminal area parking facilities, specifically the hourly parking lot exit, the private vehicle curbsides, and the left-turn pocket from South Sossaman Road into the terminal area.

Table A-6: Landside Facility Requirements Summary

FUNCTIONAL AREA	EXISTING	ACTIVITY LEVEL OF 650,000 ANNUAL ENPLANED PASSENGERS	SURPLUS / (DEFICIENCY)	ACTIVITY LEVEL OF 860,000 ANNUAL ENPLANED PASSENGERS	SURPLUS / (DEFICIENCY)
Departure Curb (linear feet)	456	415	41	440	16
Private Vehicle Arrival Curb (linear feet) 1/	512	500	12	500	12
Commercial Vehicles Arrivals Curb (linear feet)	506	355	151	360	146
Hourly Parking (number)	176	160	16	175	1
Daily Terminal Parking (number) 2/	840	735	105	1,000	(160)
Rental-Car-Ready Lot (number)	159	145	14	150	9
Rental-Car-Return Lot (number)	170	155	15	165	5
Employee Parking (number)	N/A 3/	100	N/A	135	N/A

NOTES

1/ Assumes current curbside operations. A change in operations could impact curbside requirements.

2/ Demand includes employee parking; breaking out employee parking will be analyzed during concept development.

3/ Distributing employee parking demands will be considered in future concept development.

SOURCE: CH2M Hill, *West Terminal Optimization Study,* Phoenix-Mesa Gateway Airport, Table 2-4, "Terminal Capacity Summary," Table 2-12, "Landside Capacity Summary," May 2014.

PREPARED BY: Ricondo & Associates, Inc., September 2014.

Table A-7: Summary of Landside Level of Service Analysis

FUNCTIONAL AREA	ACTIVITY LEVEL OF 650,000 ANNUAL ENPLANED PASSENGERS	ACTIVITY LEVEL OF 860,000 ANNUAL ENPLANED PASSENGERS
Curbside - Commercial	A	A
Daily Terminal Parking	C	D
Curbside - Departures	C	D
Hourly Parking	C	F
Rental-Car-Return Lot	C	C
Curbside - Private Vehicle Arrivals	D	F
Rental-Car-Ready Lot	C	C
South Sossaman Road (south of Airport)	A	B
South Sossaman Road (north of Airport)	B	B
South Sossaman Road (left turn into Airport)	F	F

SOURCE: CH2M Hill, *West Terminal Optimization Study,* Phoenix-Mesa Gateway Airport, Figure 2-6, "Scenario 2 Terminal Program Stoplight Chart," Figure 2-8, "Scenario 1 Landside Program Stoplight Chart," May 2014.

PREPARED BY: Ricondo & Associates, Inc., September 2014.

South Sossaman Road Level of Service

Currently, South Sossaman Road provides the only access into the Airport's terminal area, with limited right-of-way (ROW) expansion and accessible curb space. The most pressing landside LOS issue is the expected traffic congestion along segments of South Sossaman Road, which is forecast to increase over the next 10 years due to increased traffic associated with ASU Polytechnic Campus, Chandler-Gilbert Community College, ASU Polytechnic Campus Industrial Park, aircraft service centers, flight schools, executive hangars, and other entities, along with Airport growth. To evaluate the LOS, the Study used average daily weekday traffic volumes provided by the City of Mesa in its 2012 annual traffic count (2014 counts were not yet available). In addition, the MAG provided forecast traffic volumes for 2020 and 2025 along South Sossaman Road from the regional traffic model. The Study also reviewed the left-turn pocket from South Sossaman Road into the Airport. The Study forecast traffic volumes based on estimated vehicle trips generated by peak-hour traffic forecasts and Airport access patterns. While the Study notes that forecast daily traffic volumes for South Sossaman Road will be at an acceptable LOS, the left-turn pocket was determined to be LOS F.

Appendix B

ASR-8 Authorization Letter

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
Joint Force Headquarters - Arizona
5636 East McDowell Road
Phoenix, Arizona 85008-3495

REPLY TO
ATTENTION OF

11 July 2014

U.S. Department of Transportation
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Subject: ASR-8 Tower at Rittenhouse Site

This letter serves as authorization for the FAA to erect an ASR-8 radar tower within the Rittenhouse training area located in Queen Creek, Arizona.

The AZARNG concurs with proposed radar site with the understanding the northern edge of the radar system is no closer than N33°15.205 W111°31.197, and keeping a 500 meter standoff distance for general safety.

Sincerely,

ROBERT E. MOSCARELLO
COL, LG, AZARNG
Construction and Facilities Management Officer

Appendix C

Biological Resources

C.1 Biological Resources Technical Memorandum: Northeast Area Development Alternative

C.2 U.S. Fish and Wildlife Service Information for Planning and Conservation Trust Resource Report: Northeast Area Development Alternative

C.3 Biological Resources Technical Memorandum: RTN6 Site Alternative

C.4 U.S. Fish and Wildlife Service Information for Planning and Conservation Trust Resource Report: RTN6 Site Alternative

Appendix C.1

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Er pct p=OMNPÄX^ ééÉåÇãñ _FKqÜÉ ^ d ca= åäåÅÉ=båÎ âçåã ÉåÍ~ão ÉÎ ÉÎ ï =qççäÇÉåíÑÉÇ=çåÉ
ëéÉÅá~äëí~íì ë=ëéÉÅÅÉë çÅÅì êåÅÖ=ï áÜåÅ=P=ã áÉë=çÑíÜÉ=éêçÄÉÅÍ=ëáÉ=E^ d ca=OMNPXëÉÉ=^ ééÉåÇãñ ` FK
fåÑçêã ~íáçå=Ñçã =ÍÜÉëÉ=ëäíëí=ï ~ë=êÉÎ ÉÎ ï ÉÇ=Äó=^ j b` =ÄáçäçÖêíë=éêáçê=íç=ÅçåÇì ÅíåÖ=ÑÉäÇ
êÉÅçåå~äëë~åÅÉ=ëì êÉóëK

^ j b` ë ÇÉëêâíçé=êÉÎ ÉÎ ï =~åÇ=ëáÉ=çÄëÉêã ~íáçåë=ÅÇÉåíÑÉÇ=íÜÉ=éêçÄÉÅÍ=~êÉ~=~ë=çÅÅì êåÅÖ=ï áÜåÅ=íÜÉ
i çï ÉêÅ` çäçê~Çç=o âÉêÅ=s ~äÉó=ëì ÄÇâ êäáçå=çÑíÜÉ pçåçê~å=ÇÉëÉêã ëÅì Ä=ÄáçíÅ=Åçã ã ì åáó=éÉêê
_êçï å=EMVVQFK=qÜäë=ëì ÄÇâ êäáçå=äë=íÜÉ=ÇêÉëí=çÑíÜÉ=pçåçê~å=a ÉëÉêã=ëì ÄÇâ êäáçåëÍ=ëÉëì äáÅÖ=Ñçã =~
Åçã Äåå~íáçå=çÑíÜäÜÜ=~ååì ~äíÉã éÉêê~íì êÉë=~åÇ=äçï =~ååì ~äëêÉÅáéá~íáçå=E_êçï å=NVVQFK=mÉêÅååá~ä
éä~åí=ëéÉÅÅÉë=ÅÜ~ê~ÅíÉêâëíáÅ=çÑíÜäë=Åçã ã ì åáóÍ=~áÜçì ÖÜ=åçí=åÉÅÉëë~êâëó=éêÉëÉåí=ï áÜåÅ=íÜÉ
éêçÄÉÅÍ= ëáÉÍ= åÅåì ÇÉ= ÅÉçëçíÉ= Äì ëÜ=Er ~êêÉ~=íêáÇÉåí~í~FI Å~íJÅä~ï =~Å~ÅÁ~=E^ Å~ÅÁ~=ÖêÉÖÖêFI
Äì êçÄì ëÜ=Ee óã ÉåçÅÅÉ~=ë~äëçã=FI=ÇÉëÉêã=Äêççã =E_ ~ÅÅÜ~êêë=ë~êçíÜêçÇÉëFI=î ÉÎ ÉÍ=ã Éëèì áÉ
Emêçëçéëë=î ÉÎ íåÅ~FI=åçäï ççÇ=Er åÅÉó~=íÉëçí~FI=çÅçíäçç=Ec çì èì áÉêá~=ëéáÉåÇÉåëFI=ÄêêíáÉÄì ëÜ
Eb åÅÉêã~=ÑÜêêçë~FI=Äì É=é~äç î ÉêÇÉ Em~êêåëçåá~=Ñçêêç~FI ÑççíÜäëë é~äç î ÉêÇÉ EmK=ã áÅêçéÜóäë~FI
~åÇ=ë~ÖÌ ~êç E ~êêÉÖÖÉá~=ÖáÖ~åíÉ~FK

RKVI cfbi a=pfqb=fk s bpqfd^qfl k

^ j b` ëÅáÉåíëíëÍ=åÅåì ÇåÖ=~ ÄáçäçÖêíl éÉêÑçêã ÉÇ=~ ÑÉäÇ=åÎ ÉëíáÖ~íáçå çÑíÜÉ=éêçÄÉÅÍ=~êÉ~
ÉñÅåì ÇåÖ=bäëï çêÜÜ=o ç~Ç=åçêÜÜ=çÑíbäëï çêÜÜ= Ü~ååÉä=~åÇ=o ~ó=o ç~Ç çå ^ì ÖÌ ëí OSI OMNP ëÉÉ
^ ééÉåÇãñ a I=páÉ=mÜçíçÖê~éÜäÅ=i çÖFK=qÜÉ=éì êéçëÉ=çÑíÜÉ=ëì êÉó=ï ~ë=íç=ÇÉåíÑÉÇ=äççäçÖÅ~ä
êÉëçì êÅÉë=íÜ~í=çÅÅì ê=åÅ=íÜÉ=éêçÄÉÅÍ=~êÉ~I=åÅåì ÇåÖ=ÖÉåÉê~äî ÉÖÉí~íáçå=~åÇ=ï áÇäëÑÉI=ï Éíä=åÇëI=~åÇ
éêçíÉÅÍÉÇ=ëéÉÅÅÉë ~åÇ=Ü~Äá~íKqÜÉ=ëì êÉó=ÇáÇ=åçí=éêçî áÇÉ=NMM=éÉêÅÉåí Åçî Éê~ÖÉXê~íÜÉêI=íÜÉ
ã ~àçêáó=çÑíÜÉ=ëáÉ=ï ~ë=ëì êÉóÉÇ=Äó=î ÉÜäÅÉ=Ñçã =~ÅÅÉëëäÅÉ=êç~Çï ~óë ~åÇ ëéçí=éÉÇÉëíéá~å
ëì êÉóë ï ÉêÉ=éÉêÑçêã ÉÇ=åÅ=~êÉ~ë=íÜ~í=ÑÉ~íì êÉÇ=ì åÅì É=~ííêÅì íÉë=EÉKÖK=ÇÉåëÉ=î ÉÖÉí~íáçåI
ÉÎ áÇÉåÅÉ=çÑëì êÑ=ÅÉ=êì åçÑÑ ~åÇ=L çê~çíÜÉê=ÑÉ~íì êÉë=íÜ~í=~ééÉ~êÉÇ=ëáÖåáÑÅ~åí=íç=íÜÉ=ÉåÎ âçåã ÉåÍ
çÑíÜÉ=éêçÄÉÁí ëáÉFKcçäçï Jì é=ëáÉ=êÉÅçåå~äëë~åÅÉ=çÑbäëï çêÜÜ=o ç~Ç=åçêÜÜ=çÑbäëï çêÜÜ= Ü~ååÉä
o ~ó=o ç~ÇI=~åÇ=e ~ï ÉëëO ç~Ç=ï ~ë=éÉêÑçêã ÉÇ=çå= ÅíçÄÉê=PI=OMNP=íç=ÇÉåíÑÉÇ=ï ~íÉê=~åÇ=ÄáçäçÖêíë=
ëÉëçì êÅÉë=ï áÜåÅ=íÜÉ=êç~Çï ~ó=êêÖÜÜëëJçÑÜì ~ó=K= ÄëÉêã ~íáçåë=Ñçã =íÜÉ=ÑÉäÇ=ëáÉ=åÎ ÉëíáÖ~íáçåë=~êÉ
ÇêÅì ëëÉÇ=åÅ=íÜÉ Ñçêçï åÖëÉÅÍáçåë=çÑíÜäë=ã Éã çê~åÇì ã K

<u>s ÉÖÉí~íáçå</u>

^ =äëí=çÑî ÉÖÉí~íáçå=çÄëÉêã ÉÇ=åÅ=íÜÉ=éêçÄÉÅÍ=~êÉ~=äë=éêÉëëÉåíÉÇ=åÅ ^ ééÉåÇãñ=bKqÜäë=äë=~=åçåJ
åÅåì ëâî É=äëí=~åÇ=ã ì ÅÜ=çÑíÜÉ=î ÉÖÉí~íáçå=åÅ=íÜÉ=éêçÄÉÅÍ=~êÉ~=ï ~ë íóéáÅ~äçÑéêÉÎ áçì ëäó=Çäëíì êÄÉÇ
ÇÉëëÉêã=ä~åÇëÅ~éÉI ëì ÅÜ=~ë=íÜÉ=ÇÉåëÉ=ëí~åÇë=çÑ=Äì êêçÄì ëÜI=ÇÉëëÉêã=ÄêççãI o ì ëëá~å=íÜäëíáÉ
Ep~äëçä~=íê~ÖÌ ëFI ~åÇ=çíÜÉê=êì ÇÉê~ä ëéÉÅÅÉë åÅ=~êÉ~ë=ï ÜÉêÉ=åÅçÅÅ~íáçåë=çÑã ÉÅÜ~åÅÅ~äëì êÑ=ÅÉ
Çäëíì êÄ~åÅÉ=ï ÉêÉ=éêÉÎ ~äÉåíK= åÉ=ëÉÅáçåë=åÅ=íÜÉ=åçêÜÜÉ~ëí=éçêáçåë=çÑíÜÉ=éêçÄÉÅÍ ëáÉ ~éêÉ~êÉÇ=íç
Ü~î É=ÄÉÉå äÉëëë ãã é~ÅíÉÇ Äó=Öêçì åÇ=Çäëíì êÄ~åÅÉ ~åÇ=íÜÉ=î ÉÖÉí~íáçå=åÅ=íÜ~í=~êÉ~=ã çêÉ=Äçëëëáäó
êÉÑäÉÅíÉÇ=íÜÉ=ì åÇäëíì êÄÉÇ=éçêáçåë=çÑíÜÉ=ëì êêçì åÇåÖ=ä~åÇëÅ~éÉI ï áÜ=ëí~åÇë=çÑÅÉçëçíÉ=Äì ëÜI
ã Éëèì áÉI=~åÇ=Äêì ÅÅÑíáçå=íÜçêê Er ~ëíÉä=Éã çêóãK

t âçäÑÉ

a ì êåÖ íÜÉ=ÑÉäÇ=åî É ëíáÖ~íáçåI=^ j b` Äáçäçäçëíë çÄëÉêã É Ç=ï âçäÑÉ=~Åíâ áó=ï áÜåå=íÜÉ=éêçÄÉÅí=~êÉ~K
k ~íâ É=ï âçäÑÉ=çÄëÉêã É Ç=Çì êåÖ=íÜÉ=ëáÉ=î âëá=åÅì ÇÉÇ â~åÖ~êçç=ê~í=Ea áéçÇóã ë ëéKÑ=Ää~ÅâJí~âÉÇ
à~Åâê~ÄÄá= Ei É éì ë Å~âÑçéåáÅì ëÑ ÇÉëÉêã= Åçííçåí~âë= Ep óãî âä~Ö ë= ~ì Çì Äçåáâ êçÅâ= ëëì âëÉä
Ep éÉêã çéÜâì ë= î ~êáÉÖ~íì ëÑ êçì åÇJí~âÉÇ= Öêçì åÇ= ëëì âëÉä= Eu É êçëéÉêã çéÜâì ë= íÉêÉíáÅ~ì Çì ëÑ
òÉÄê~Jí~âÉÇ=äâo~êÇ=E ~âëë~ì êì ë=Çê~Åçåçáçé ëÑ=ÇÉëÉêã=ëéåó=äâo~êÇ=Ep ÅÉäçéçêì ë=ã ~Öëíéëí=êÉÖ~ä
Üçêåé Ç=äâo~êÇ=EmÜóåçëçã ~=ëçä~êÉÑ=íáÜÉê=ï Üáéí~âë=E^ëéáÇçëÅÉäë=íáÜêëÑ=ï ÉëíÉêå=Çá~ã çåÇÄ~Åâ
E êçí~ìë=~íêçñÑ=âÉëëÉêêåáÜÜÜï Ü~ï â=E ÜçêÇÉáÉë=~Åì íáéÉåáëÑ=ã çì êåáÖ=Ççî É=EwÉå~âÇ~ã ~Åêçì ê~Ñ
^ã É êåÅ~å=âÉëíãÉä=Ec ~äÅç=ëé~êì Éêâ ëÑ d ~ã ÄÉäë=ëì ~âë=Ei çéÜçêóñ=Ö~ã ÄÉäëÑ=~åÇ=~ é~âë=çÑ
Äì êêçï åÖ=çï äë E^íÜÉåÉ=Åì åáÅì ä~êá~=Üóéì Ö~É~F ~åÇ=íÜÉ=êë Äì êêçï KI åÉ=åÉëíI=äâÉäó=íç=Ü~î É=ÄÉÉå
Åçåëíã ÅíÉÇ=Äó=~=ã áÇJëâÉÇ=çê=ä~êÖÉêÜ~ï âI ï ~ë=åçíÉÇ=åë=~=Åçåëêíé=éáéÉ=åë=íÜÉ=åçêÜÉêå=éçêáçå
çÑ=íÜÉ=éêçÄÉÅí ëáÉI=ëì ÖÖÉëíåÖ=íÜ~í ` ççéÉêë=çê=êÉÇ=í~âÉÇ=Ü~ï âë=ã ~ó=Ü~î É=åÉëíÉÇ=ï áÜåå=íÜÉ
éêçÄÉÅí ëáÉKe çï É î É=åç=ëäÖåë=çÑëÉÅÉåí=åÉëí=çÅÅì é~íçåï É êÉ=çÄëÉêã É ÇKk ì ã Éêçì ë=çíÜÉê=ëã ~äã
ã ~ã ã ~äëI=ÄâÇëI=äâo~êÇë=~åÇ=ëå~âÉ=ëéÉÅáÉëë=~êÉ=ÉñéÉÅíÉÇ=íç=åÜ~Äá=íÜÉ=~êÉ~K

k çñçì ë=t ÉÉÇë

qÜÉ=^êêçå~=a É é~êã É åí=çÑ=^ÖêåÅì áì êÉ E^a ^F ã ~åí~åë=~=äëí=çÑ=êÉÖì ä~íÉÇ=~åÇ=êÉëíêåÅíÉÇ
åçñçì ë=ï ÉÉÇ=ëéÉÅáÉëK=p éÉÅáÉë=çå=íÜäë=äëí=~êÉ éêçÜÅáíÉÇ Ñçã =Éåíêó=åíç=íÜÉ=ëí~íÉ çê=~êÉ
Åçåíêçäëí É Ç=çê=èì ~ê~åíåÉÇ=íç=éêÉî É åí=ÑìãÜÉê=åÑÑëí~íçå=çê=Åçåí~ã åë~íçå=ï áÜåå=íÜÉ=ëí~íÉI
ÇÉéÉåÇåÖ=çå=íÜÉ=êë=äëíåÖ=ëí~íì ë E^a ^=OMNP~FKk ç ëí~íÉJäëíÉÇ=åçñçì ë=çê=åî ~ëî É=ï ÉÉÇë=ï ÉêÉ
çÄëÉêã É Ç=ï áÜåå=íÜÉ=éêçÄÉÅí=~êÉ~K

t Éíä~åÇë

qÜÉ r pct p k~íçå~ä=t Éíä~åÇë fåî É åíçêó Ek t fF áÇÉåíÑÉÇ=íï ç ÑÉëÜï ~íÉê=éçåÇë ï áÜåå=íÜÉ
éêçÄÉÅí ~êÉ~ ~åÇ=ëÉî É ê~äã çêÉ ëã ~äëéçåÇë=ï áÜåå=~ NJã áÉ=ê~Çì ë=çÑ=íÜÉ=éêçÄÉÅí=ëáÉ=Er pct p
OMNP~FKqÜÉ=kt f=ã ~éêåÖ=åÇáÅ~íÉÇ=çåÉ=éçåÇ=~í=íÜÉ=åçêÜÉ~ëí=ÅçêåÉê=çÑ=íÜÉ=åíÉëëÉÅíçå=çÑ
bäëï çêÜ=~åÇ=o ~ó=êç~Çë=~åÇ=~ëÉÅçåÇ=éçåÇ=~í=íÜÉ=åçêÜÉåÇ=çÑ=e ~ï Éë=o ç~Ç Ëë=^ éêÉåÇã=^ I
cáì êÉ=OFKr pd p=íçéçÖê~éÜëÅ=ã ~éë=~åÇ=~Éêá~äã ~ÖÉêó=êÉî É ÉÇ ÇáÇ=åçí=åÇáÅ~íÉ=~åó=ï Éíä~åÇë
çêëì êÑ=ÅÉ=ï ~íÉê=ã éçì åÇã ÉåíëK

qÜÉ=éêçÄÉÅí=ëáÉ=ï ~ë=ëì êÑ ÉóÉÇ=Ñçê=íÜÉ=éçíÉåíá~ä=éêÉëëÉåÅÉ=çÑ=ï Éíä~åÇë=Çì êåÖ=íÜÉ=ëáÉ
åî É ëíáÖ~íáçåK=k ç=ï Éíä~åÇë=ï ÉêÉ=çÄëÉêã É Ç=ï áÜåå=íÜÉ=éêçÄÉÅí ëáÉK^=ëíçêã ï ~íÉê=êÉíÉåíáçå=Ä~ëåë
ï ~ë=çÄëÉêã É Ç=~í=íÜÉ=åçêÜÉ~ëí=Åçêåé=çÑ=íÜÉ=åíÉëëÉÅíáçå=çÑ=b äëï çêÜ=~åÇ=o ~ó=êç~Çë=íÜ~í
~éêÉ~ëë=íç=Åçäëí É Ç=~í=íÜÉ=åçêÜÉ~ëí=Åçêåé=çÑ=íÜÉ=åíÉëëÉÅíçå=çÑ=b äëï çêÜ=~åÇ=o ~ó=êç~Çë=íÜ~í
ëáÉ=éÜçíçÖê~éÜëÑK=k ç=É î ÉÇÉåÅÉ=çÑ=íÜÉ=ÑÉëëÜï ~íÉê=éçåÇ=~ë=åçÇáÅ~íÉÇ=çå=r pct p=k t f=ã ~éë=ï ~ë
çÄëÉêã É Ç=~í=íÜäë=äçÅ~íçå=çê=åë=íÜÉ ãã É Ç=á~íÉ î ÅÅëëíçÅ=íÜÉ=åçêÜÉåÇ=çÑ=e ~ï Éë=o ç~Ç
ï ~ë=êÉëíêÅíÉÇ=Çì É=íç=ÜáÜÜï ~ó=Åçäëíã Åíçåçk=qÜÉ=éçåÇ=ÇÉåíáÑÉÇ=Äó=k t f=ã ~éë=~éêÉ~ëë=íç=ÄÉ
~ëëçÅá~íÉÇ=ï áÜ=íÜÉ=Ç~äó=Ñ=ã =åçêÜ=çÑ=pí~íÉ=o çì íÉ=OMO ~åÇ=íÜÉ éêÉëëÉåÅÉ=çÑ=íÜÉ=éçåÇ=ï ~ë
ì å~ÄáÉ=íç=ÄÉ=ÅçåÑëã É Ç=Çì êåÖ=íÜÉ=ëáÉ=åî É ëíáÖ~íçåK

SKMI pmb` fbp=fa bk qfcf ^qfl k

cÉÇÉê~ä=~åÇ=pí~íÉ=qÜÉ~íÉåÉÇ=~åÇ=båÇ~åÖÉêÉÇ=péÉÅÉë

^ÅÅçêÇåÖ=íç=íÜÉ=r pct pl íÉå ÉåÇ~åÖÉêÉÇ ëéÉÅÉë l çåÉ íÜÉ~íÉåÉÇ ëéÉÅÉë l ~åÇ ëãñ éêçéçëÉÇ çê Å~åÇâÇ~íÉ=ëéÉÅÉë Ü~î É=íÜÉ éçíÉåíá~ä íç çÅÅì ê=åå j ~êáÅçé~ ` çì åíó=Er pct p=OMNPÄX ^ééÉåÇãñ _FKpì á~ÄáÉ=Ü~Äá~í=Ñçê ÑÉÇÉê~äó ãäéíÉÇ=ëéÉÅÉë ï ~ë åçí çÄëÉêã ÉÇ=ï áÜåå=íÜÉ=ëì êã É ó ~êÉ~=~åÇ=ëì á~ÄáÉ=Ü~Äá~í Ñçê=íÜçëÉ=ëéÉÅÉë âë=åçí=äãÉäó=íç=ÉÑãëí=åå=íÜÉ=ÖÉåÉê~äéêçÄÉÅí=~êÉ~K

få=~ÇÇáçåçl=íÜÉ=^dca=l åäåÉ=båî âçåã Éåí~äo Éî ÉÇ=qçççäçÇÉåíÅÉÇ=çåÉ=ëéÉÅá~äëí~íì ë=ëéÉÅÉë l ï ÉëíÉêå=Äì êêçï åÖçï ä ÇçÅì ã ÉåíÉÇ=~ë=çÅÅì êêåÖ=ï áÜåå=P=ã áÉë=çÑíÜÉ=éêçÄÉÅí=~êÉ~=E^dca=OMNOX ^ééÉåÇãñ ` FK_ì êêçï åÖçï äë=~êÉ=Äì êêÉåíäó=äëíÉÇ=~ë=~=ëéÉÅÉë=çÑÅçåÅÉêå=Äó=íÜÉ r pct p ~åÇ ~êÉ=~äëç=éêçíÉÅíÉÇ=ì åÇÉê=íÜÉ=j áÜê~íçêó=_ áÅÇ=qêÉ~íó=^Åí=Ej _q^F=Er pct p=OMNPÅFKqÜÉ=j _q^=äë ÇáëÅì ëëÉÇ=åå=ã çêÉ=ÇÉí~äë=åå=íÜÉ=Ñçê äçï åÖçë l ÄëÉÅíáçå *j áÖê~íçêó=_ áÅÇ=péÉÅÉë*K ^äÜçì ÖÜ Äì êêçï åÖçï äë=~êÉ=åçí=äëíÉÇ ~ë=íÜÉ~íÉåÉÇ=çê=ÉåÇ~åÖÉêÉÇ Äó=íÜÉ=ëí~íÉl íÜÉó ~êÉ åÇÉåíÅÉÇ=~ë ëéÉÅá~äëí~íì ë=ëéÉÅÉë Äó íÜÉ ^dcal ã ÉêáíåÖ ÖêÉ~íÉê ÅçåëÉêã ~íáçå=ÉÑÑçêë E^dca=OMNOFK t ÉëíÉêå=Äì êêçï åÖçï äë=~êÉ=Åçã ã çåäó=Ñçì åÇ=ì áÜåå=íÜÉ=ê~ÖêáÅì áì ê~äëá~åÇë=~åÇ=ì êÄ~å=ÇÉî Éäçéã Éåíl ÄçíÜ=çÑ=ï ÜåÅÜ=~êÉ=Ñçì åÇ=ï áÜåå=íÜÉ=î åÅåáó=çÑíÜÉ=éêçÄÉÅí ëáÉK qï ç=Äì êêçï åÖçï äë=~åÇ=~ Äì êêçï åÖçï äÄì êêçï ï áÜåå=~éáÉ=çÑÇÉÄêë=ï ÉêÉ çÄëÉêã ÉÇ=ï áÜåå=íÜÉ=éêçÄÉÅí ëáÉ Çì êåÖ=ÑÉáÇ êÉÅçåå~äëë~åÅÉKdî Éå=íÜÉ=éêÉëëÉåÅÉ=çÑÄì êêçï åÖçï äë=~åÇ=Äì êêçï ël ÑìêÜÉê=ëì êã Éóë=Ñçê=~Åíî É Äì êêçï ë=ã ~ó=ÄÉ=êÉëì êã ÉÇ=éêáçê=íç=Åçåëíã Åíáçå=~Åíî áÉëKfå=~ÇÇáçåçl=ãÑåÉëíáÖé~ãë ~êÉ=Ñçì åÇ=íç çÅÅì ê=çå=ëáÉl=íÜÉó ã ~ó=åÉÉÇ=íç=ÄÉ=êÉäçÅ~íÉÇ=Äó=~=ì ~ãÑÉÇ=Åçåíê~Åíçê=çê=Åçåëíã Åíáçå=ã ~ó=åÉÉÇ íç=ÄÉ=ÇÉä~óÉÇ=íç=~ÅÅçã ã çÇ~íÉ éÉêáçÇë=çÑ~Åíî É=åÉëíáÖK

nì ~ãÑÉÇ=^j b` =ÄáçäçÖëíë êÉî Éî ÉÇ=ÄçíÜ äëíë çÑëéÉÅá~äëí~íì ë=ëéÉÅÉë=Er pct p=~åÇ=^dcaF ~åÇ=ÇÉíÉêã åÉÇ=íÜ~í=~ÇÇáçåçå~ä=~å~äëäë çÑëÑÉÇÉê~äó=äëíÉÇ=ëéÉÅÉë ï ~ë åçí åÉÉÇÉÇK qÜÉ NT ëéÉÅÉë=åÅì ÇÉÇ=çå=íÜÉ=r pct p=äëí=Ñçêj ~êáÅçé~ ` çì åíó=ï ÉêÉ=ÉñÅì ÇÉÇ=Ñçã =ÑìêÜÉê=Éî ~ä ~íáçå ~åÇ=~êÉ=~ÇÇêÉëëÉÇ=åå ^ééÉåÇãñ=cl=ï áÜ=íÜÉ=ì ëíÑÅÅ~íáçå=Ñçê=ÉñÅì ëáçå=çÑÉ~ÅÜ=ëéÉÅÉëK

mêçíÉÅíÉÇ=k ~íî É=mä~åíë

qÜÉ=^a^=ÉåÑçêÅÉë=íÜÉ=^êêçå~=k ~íî É=mä~åí=i ~ï =E^êêçå~=o Éî äëÉÇ=pí~íì íÉ=qáäÉ=PI= Ü~éíÉê=TFI ì åÇÉê=ï ÜåÅÜ=éä~åíë=Å~åáçí=ÄÉ=êÉã çî ÉÇ=Ñçã =~åó=ä~åÇë ï ÜÉíÜÉê=íÜÉó=~êÉ~çï åÉÇ Äó=~=éêî ~íÉ åÇîáçì ~äçêã ~å~ÖÉÇ=Äó=~=Öçî ÉêãÉ ÉåíÉ=ÖÉåÅó ï áÜçì í=éÉêã äëéáçå=~åÇ=~éÉêã á=Ñçã =íÜÉ=^a^ E^a^=OMNPÄFKbáÜÜí éä~åíë éêçíÉÅíÉÇ=ì åÇÉê=íÜÉ=^êêçå~=k ~íî É=mä~åí=i ~ï Eî ÉãÉí=ã Éëèì áÉl=Äì É é~äç=î ÉêÇÉl=Ñçç íÜãëë=é~äç=î ÉêÇÉl=ë~Öì ~êçl=ÅÜ~åÅÑçã á=ÅÜçäç=l=Ä~êêÉäÅ~Åíì ël=Åçî ÅÅÑçáçå=íÜçêÅl=~åÇ çÅçíãëçF ï ÉêÉ çÄëÉêã ÉÇ=ï áÜåå=íÜÉ=éêçÄÉÅí=ëáÉK=^ÇÇáçå~ä=ëéÉÅÉë=íÜ~í=ã ~ó=çÅÅì ê=ï áÜåå=íÜÉ éêçÄÉÅí=~êÉ~=~åÇ=éêçíÉÅíÉÇ=ì åÇÉê=íÜÉ=^êêçå~=k ~íî É=mä~åí=i ~ï =åÅì ÇÉ=ÇÉëÉêã=ï ëëçï =E Ü~ëçéëëë ëëÅÉ~êêëFI ~äë~Å~Åíì ë=ëéÉÅÉë l=ói ÅÅ~=Ev ì ÅÅ~ ëéKFI=~Ö~î É=E^Ö~î É ëéKFI=~åÇ=~äë=ã ÉÃ ÄÉêë=çÑíÜÉ i ëëÅ~ÅÉ~É=Ñ~ã êëK=^ ~êÉ=ëÜçì äÇ=ÄÉ=í~âÉå=ï áÜ=~äëíÉÉ=ëéÉÅÉë=åÅì ÇåÖ=ã Éëèì áÉl é~äç=î ÉêÇÉl ~åÇ ÇÉëÉêã=ï ëëçï K=mêçÄÉÅíë åî çã åÖ=íÜÉ=éçíÉåíá~äëÉã çî ~äçÑéä~åíë éêçíÉÅíÉÇ=ì åÇÉê=^êêçå~=k ~íî É mä~åí=i ~ï ~êÉ=ëì ÄáÉÅí=íç=êÉî ÉÇ=~åÇ=êÉÅçã ã ÉåÇ~íáçåë=Äó=íÜÉ=^a^Kk ~íî É=éä~åí=ëì êã Éóë=çê åî ÉåíçêÖó=ã ~ó=ÄÉ=êÉëì êã ÉÇ=éêáçê=íç=~åó=ÖêçÅì åÇçëîì êÄåÖ=~Åíî áÉÇë=ÑÅå~íî É=éä~åíë=ï çì äÇ=ÄÉ ã é~ÅíÉÇK

j ãÖÊ~íçêó= ãÇ=péÉÅáÉë

k~íáçåï ãÇÉ=ÅçåÅÉêå=Éñãëíë=çî ÉêÇÉÅáãåãÖ~åì ã ÄÉêë=çÑã ~åó=åÉçíêçéáÅ~äÅãÇ=éçéì ä~íáçåëK=j ~åó
åÉçíêçéáÅ~äÅãÇë=íÜ~í=ã ãÖê~íÉ=íÜêçì ÖÜ=^êêçå~=~ãÉ=éêçíÉÅíÉÇ=ì åÇÉê=íÜÉ j _q^=çÑNVNU Eqáã É NSI
r åáÉÇ=pí~íÉë=` çÇÉ=m~ëë=TMP=íÜêçì ÖÜ=TNCFI=~ë=~ã ÉåÇÉÇI=~åÇ=bñÉÅì íâ É=I êÇÉê=NPNUSK=qÜÉ
r pct p=ÉåÑçêÅÉë=íÜÉ=j _q^I=ï ÜåÅÜ=éêçÜÅÄáë=åÇâ áÇì ~äë=íç=Çç=~åó=çÑíÜÉ=ÑçäçÇ ãÖÖW

> éì êëì ÉI=Üì åíI=í~âÉI=Å~éíì êÉI=âäãI=~ííÉã éí=íç=í~âÉI=Å~éíì êÉ=çê=âäãI=éçëëÉëëI=çÑÑÉê
> Ñçêë~ãÉI=ëÉäãI=çÑÑÉê=íç=éì êÅÜ~ëÉI=éì êÅÜ~ëÉI=ÇÉäãÉê=Ñçêë=Üáé=ã ÉåíI=ëÜáéI=Å~ì ëÉ=íç=ÄÉ
> ëÜáéÉÇI=ÇÉäãÉê=Ñçêë=íê~åëéçéã~íáçåI=íê~åëéçéãI=Å~ì ëÉ=íç=ÄÉ=íê~åëéçéãÉÇI=Å~êêóI=çê
> Å~ì ëÉ=íç=ÄÉ=Å~êêáÉÇ=Äó=~åó=ã É~åë=ï Ü~íÉî ÉêI=êÉÅÉâ É=Ñçêë=Üáé=ã ÉåíI=íê~åëéçéã~íáçå
> çê=Å~êêá~ÖÉI=çê=ÉñéçéãI=~í=~åó=íãã ÉI=çê=åë=~åó=ã ~ååÉêI=~åó=ã ãÖê~íçêó=ÄãÇI=åÅì ÇåÖ
> ~åó=é~éãI=åÉëíI=çê=ÉÖÖçÑ~åó=ëì ÄÜ=ÄãÇ=Er åáÉÇ=pí~íÉë= çÇÉ=OMNPFK

qÜÉ=r pct p=ã ~åí~åë=~=ãëí=çÑÄãÇë=éêçíÉÅíÉÇ=ì åÇÉê=íÜÉ=j _q^=Er pct p=OMNPÅFKqÜÉ=éêçãÉÅí
~éÉ~=ãÉë=ï áÜåë=íÜÉ=ÄãÇ=ã ãÖê~íçêó=êçì íÉ=âåçï å=~ë=íÜÉ=m~ÅãÑÅ=cãóï ~ól=~åÇ=ã çéÉ=íÜ~å=PRMÄãÇ
ëéÅÅÉë=íê~î ÉãÄï áÜåë=íÜãë=ã ãÖê~íçå=êçì íÉ=Em~ÅãÑÅ=cãóï ~ó= çì åÅãÄOMNPFK=íÜÉêÉÑçêÉI=Å~êÉ=ëÜçì ãÇ
ÄÉ=í~âÉå=íç=ã åãã ãÖÉ=íÜÉ=êêâçÑåà êó=íç=ã ãÖê~íçêó=ÄãÇ=ëéÅÅÉëI=åÅì ÇåÖ=Äì êêçï åÖ=çï ëëI=Çì êåÖ
Åçåëíêã ÅíáçÅ=~ÅíâãÅÉëK=_ãÇë=êêçíÉÅíÉÇ=ì åÇÉê=j _q^=åÅì ÇÉ=~ãÄÅçã ã çå=ëçåÖÄãÇëI=ê~éíçëëI
ï ~íÉãÑçï ãI=ëÜçêÉÄãÇëI=ëÉ~ÄãÇë=~åÇ=ï ~ÇåÖ=ÄãÇëK^=Åçã éãÉíÉ=ãëíåÖ=çÑêçíÉÅíÉÇ=ÄãÇ=ëéÅÅÉë
ì åÇÉê=íÜÉ=j _q^=Å~å=ÄÉ=ÑçìåÇ=í=íÜÉ=r pct p=ï ÉÄëãÉ
EÜíéWï ï ï KÑI ëKÖçî Lã ãÖê~íçêóÄãÇëIëÉÖì ä~íáçåëéçãÅÅÉëIã Äí~Lã ÄíåíêçKÜíã ãFK

THWI `l k`irpflk

_~ëÉÇ~çå=íÜÉ=ëÉëì ãë=çÑíÜÉ=ÑÉäÇ=åî ÉëíãÖ~íáçå=çÑíÜÉ=éêçÅÉÅí=~ëÉ~I=íÜÉ=Ñçäçï åÖ ëéÅÅá~äëí~íì ë
ëéÅÅÉë=ï ~ë çÄëÉëã ÉÇ ~í íÜÉ=éêçÅÉÅí ëáÉWï ÉëíÉëå=Äì êêçï åÖ=çï ãI=~=ÑÉÇÉê~äëéÅÅÉë=çÑÅçåÅÉêå
~äëç=éêçíÉÅíÉÇ=ì åÇÉê=íÜÉ=j _q^Kdâ ÉÅ=íÜÉ=éêÉëÉåÅÉ=çÑÄì êêçï åÖ=çï äë=~åÇ çÅÅì éãÉÇ Äì êêçï ëI
ÑíãÜÉêë=ëì ãÉóë=Ñçê=~ÅíâÉ=Äì êêçï ë=ã ~ó=ÄÉ=ëÉëì ãÉÇ=éêçê=íç=ÅçåëíêãÅíáçå=~ÅíâãÅÉë ~åÇ=~ó
åÉëíåÖ=é~ãëI=ÑéêÉëÉåíI ã ~ó=åÉÉÇ=íç=ÄÉ=ëÉäçÅ~íÉÇ=Äó=~èì ~äÑÉÇ=ÅçåíêçÅíáçå=~ÅíâãÅÉë ~ó
åÉÉÇ=íç=ÄÉ=ÇÉä~óÉÇ=íç=~ÅÅçã ã çÇ~íÉ éÉêçÇë=çÑ~ÅíâÉ=åÉëíåÖK

k ç ~ÇÇáçå~ä ëéÅÅá~äëí~íì ë=ëéÅÅÉë çê=Ü~Äá~í íÜ~í=ï çì äÇ=ëì éêçã ~ÇÇáçå~ä ëéÅÅá~äëí~íì ë
ëéÅÅÉë ï ÉëÉ=çÄëÉã ÉÇ=ï áÜåë=íÜÉ=êêçÅÉÅí=~ëÉ~=Çì êåÖ=ÑÉäÇ=çÄëÉã ~íáçåëK e çï ÉîÉ=~ëÉ~=ë=çÑ
ã ~ëÖåë~äÜ~Äá~í=ÑçêçíÜÉêï áÇäÑÉ=ëéÅÅÉë=åÅì ÇåÖ=ã ãÖê~íçêó=ÄãÇëI Éñãëí ï áÜåë=~åÇ ~Çà~ÅÉåí=íç
íÜÉ=êêçÅÉÅí ëáÉK=pì ÅÜ=~ëÉ~=ë=ÖÉåÉê~äó Åçåëëëí=çÑíÜÉ éêÉîáçì ëäó=Çëíì êÄÉÇ éêçéÉãÉë íç=íÜÉ É~ëí
~åÇ=åçãÜçÑíÜÉ=êêçÅÉÅí ëáÉ ~åÇ=íÜÉ=~ÖëåÅì áì ê~äéçéÉãÉë íç=íÜÉ ëçì íÜçÑíÜÉ=êêçÅÉÅí ëáÉK

bãÖÜí éä~åíë êêçíÉÅíÉÇ=ì åÇÉê=íÜÉ=^êêçå~=k ~íâ É=mä~åí=i ~ï Eì ÉâÉí=ã Éëëì áÉI Äâ É=é~äç=î ÉêÇÉI
ÑççíÜëëë=é~äç=î ÉêÇÉI=ë~Ö ~êçI=ÅÜ~åJÑã á=ÅÜçäë=I=Ä~êêÉä=Å~Åì ëI Åã ÅåÑãáçå=íÜçêåI ~åÇ=çÅçíëëçF
ï ÉêÉ çÄëÉã ÉÇ=ï áÜåë=íÜÉ=êêçÅÉÅí=~ëÉ~K=mêçÅÉÅíë=ãî çã åÖ íÜÉ=éçíÉåíá~äëÉã çî ~äçÑíÜëëÉ ~åÇ=~äë
éä~åí=ëéÅÅÉë=éêçíÉÅíÉÇ=ì åÇÉê=íÜÉ=^êêçå~=k ~íâ É=mä~åí=i ~ï ~ëÉ=ëì ÄâÉÅí=íç=ëÉîãÉ=~åÇ
ëÉÅçã ã ÉåÇ~íáçåë=Äó=íÜÉ=^a^Kmêçê=íç=~åó=ä~åÇ=Çëíì êÄ~åÅÉI=é~ãëÅì ä~êëó=~åó=íÜ~í=ï ãëë~ÑÑÉÅí
éä~åí=ëÑÑÉI=ÅççêÇåë=íáçå=ï áÜ=íÜÉ=^a^=ëÜçì äÇ=çÅÅì ê=íç=ÇÉíÉëã åÉ=íÜÉ=éçíÉåíá~äëÉÇ=Ñçê=Çì ëÉÇ
Äçí~åÅ~äéÉÅçåëíêã Åíáçå=ëì ãÉóë=íç=ÇÉåíÑÑ=éä~åí=ëéÅÅÉë=íÜ~í=ï çì äÇ=ÄÉ=~ÑÑÉÅíÉÇ=Äó=éêçÅÉÅí
~ÅíâãÅÉëK

UKVI obcbobk` bp

^ êâçåçå~=a Éé~éíã Éáí=çÑ^ ÖáÅì äì êÉ E^ a ^ FK=OMNP~K o PJQJOOQJ o ÉÖì ä~íÉÇ=~åÇ=o ÉëíêáÅíÉÇ=k çñáçì ë
t ÉÉÇëK^ î ~âä~ÄäÉ=~í ÜííéWÜí ï ï K~òÇ~KÖçî Lmp a Lo ÉÖì ä~íÉÇo ÉëíêáÅíÉÇk çñáçì ët ÉÉÇëK~ëéñK
t ÉÄëäÉ=~ÅÅÉëëÉÇ=gì åÉ TI=OMNPK

||||||| K OMNPÄK= = mêçíÉÅíÉÇ= k ~íâî É= mä~åíë= _ó= ` ~íÉÖçêáÉëK ^ î ~âä~ÄäÉ= ~í
ÜííéWÜí ï ï K~òÇ~KÖçî Lb p a Léêçíéä~åíäêíK~ëéñK t ÉÄëäÉ=~ÅÅÉëëÉÇ=gì åÉ=TI=OMNPK

^ êâçåçå~=a Éé~éíã Éáí=çÑt ~íÉê=o Éëçì êÅÉëK=OMNPK=d êçì åÇì ~íÉê=p áÉ=fåî Éåíçêó d êçì åÇì ~íÉê
a ~í~K=^ î ~âä~ÄäÉ=~í ÜííéëWÜÖêï ÉÄK~òï ~íÉêKÖçî Lü ~íÉêëÉëçì êÅÉÇ~í~Ld t pfK~ëéñK=t ÉÄëäÉ
~ÅÅÉëëÉÇ=çå=t ÅíçÄÉê=NI=OMNPK

^ êâçåçå~=d ~ã É=~åÇ=cäëÜ=a Éé~éíã Éáí=E^ d ca FK= =OMNPK= =^ êâçåçå~=d ~ã É=~åÇ=cäëÜ=I åäëåÉ
båî âçåã Éáí~ä=o ÉÎ äÉï =qççäK mêçäÉÅí=p É~êÅÜ=fa W/OMNONOMRMNVNUVK ^ î ~âä~ÄäÉ=~í
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êçï åI=a ~î áÇI=ÉÇK=NVVOK * áçíáÅ=` çã ã ì ääáÉëWáçì íÜï ÉëíÉêå=r ääáÉÇ=p í~íÉë=~åÇ=k çéÜï ÉëíÉêå*
j ÉñáÅçK=r ääî Éëëáó=çÑ=r í~Ü=mÉëëI=p ~ä=t ~âÉ= áóK=PQO=éé K

` ÉåíÉê=ÑçêÇ=_ áçäçÖáÅ~ä=a äî Éêëáó=K=OMNPK qì Åëçå=pÜçî Éäk çëÉÇ=på~âÉ=E *Ÿáçå~ÅíäÉ=çÅÅäéá~äëë*
âä~ì ÄÉêâK=^ î ~âä~ÄäÉ=~í ÜííéWÜí ï ï *K*Äáçäçäáó~äÇäî Éêëáó=K=çêÜëéÉÅäÉëlÉéíäÉëlqì Åëçå| ëÜçî Éäl
åçëÉÇ| ëå~âÉLå~íì ê~ä| Ü=êíçêóKÜíã äK=t ÉÄëäÉ=~ÅÅÉëëÉÇ=t ÅíçÄÉê=NI=OMNPK

cäççÇ=` çåíêçä=a äëíêáÅí=çÑ=j ~êáÅçé~=` çì åíóK=OMNPI=e äëíçêáÅ~ä=^ Éêá~ä=mÜçíçÖê~éÜë=Ç~íÉÇ=NVPTI
NVQVI= NVTVI= NVVPI= ~åÇ= NVVS= íÜêçì ÖÜ= OMNMK= ^ î ~âä~ÄäÉ= ~í
ÜííéWÜí ï ï KÑÅÇKä ~êáÅçé~KÖçî Ld fp Lã ~éëK~ëéñK=t ÉÄëäÉ=^ ÅÅÉëëÉÇ=t ÅíçÄÉê=OMNPK

k ~íì ê~ä=o Éëçì êÅÉë= çåëÉêî ~íçå=p Éêî áÉVp ÉÉ r ääáÉÇ=p í~íÉë a Éé~éíã Éáí=çÑ^ ÖáÅì äì êÉI=k ~íì ê~ä
o Éëçì êÅÉë= çåëÉêî ~íçå=p Éêî áÉK

m~ÅäáÅ= cäëï ~ó= ` çì åÅäáK= = OMNPK= = j áÖê~íçêó= _ äÇ= j ~å~ÖÉã ÉáíK ^ î ~âä~ÄäÉ= ~í
ÜííéWÜé~ÅäáÅäëï ~óKÖçî LíåÇÉñK~ëéK t ÉÄëäÉ=~ÅÅÉëëÉÇ p ÉéíÉã ÄÉê=ORI=OMNPK

r ääáÉÇ=p í~íÉë= çÇÉK=OMNPK=qáäÉ=NSI=r ääáÉÇ=p í~íÉë= çÇÉ=m~êíë=TMPJTNOK=j áÖê~íçêó=_ äÇ=qêÉ~íó
^ ÅíK=NVNUK ^ î ~âä~ÄäÉ=~í ÜííéWÜí ï ï Kä~ï KÅçêäÉäáKÉÇì Lì ëÅçÇÉLíÉñíLNSLÅÜ~éíÉêJTK t ÉÄëäÉ
~ÅÅÉëëÉÇ p ÉéíÉã ÄÉê=ORI=OMNPK

r ääáÉÇ=p í~íÉë=a Éé~éíã Éáí=çÑ=^ ÖáÅì äì êÉ=k ~íì ê~ä=o Éëçì êÅÉë=` çåëÉêî ~íçå=p Éêî áÉ=Ek o ` pFK
OMNPK t ÉÄ=p çâäpì êî Éó ^ Öì âä~J` ~êÉÑáÉÉ=^ êÉ~I=^ êâçåçå~I m~êíë=çÑ=j ~êáÅçé~=~åÇ=mäá~ä
` çì åíáÉëK ^ î ~âä~ÄäÉ= ~í ÜííéWÜí ÉÄëçääì êî ÉóKäêÅëK ëÇ~KÖçî L~éélt ÉÄp çäpì êî ÉóK~ëéñK
t ÉÄëäÉ=~ÅÅÉëëÉÇ p ÉéíÉã ÄÉê=ORI=OMNPK

r ääáÉÇ=p í~íÉë=cäëÜ=~åÇ=t äçäÑÑ=p Éêî áÉ=Er pct pFK OMNP~K=k ~íçå~ä=t Éíä~åÇë=fåî Éåíçêó K
^ î ~âä~ÄäÉ=~í ÜííéWÜí ï ï KÑI ëKÖçî Lü Éíä~åÇëLa ~í~Lj ~éé ÉêKÜíã äK=t ÉÄëäÉ=~ÅÅÉëëÉÇ=t ÅíçÄÉê
NI=OMNPK

||||||| K OMNPÄK qÜêÉ~íÉåÉÇ=~åÇ=båÇ~åÖÉêÉÇ=péÉÅáÉë=Ñçêj ~êáÅçé~ ` çì åíóI=^êáÖçå~K i âëí éêáÅí= Ç~íÉÅÅ cÉÄêì ~êó= RI= OMNPK ^î~âä~ÄäÉ= ~í ÜííéÅÅï ï ï KÑÅ ëKÖçî Lëçì íÜï ÉëíLÉëL~êáÖçå~LqÜêÉ~íÉåÉÇKÜíã @ çì åíói âëíK t ÉÄëäÉ ~ÅÅÉëëÉÇ pÉéíÉã ÄÉê=ORI OMNPK

||||||| K OMNPÅK= = _âÇë= mêçíÉÅíÉÇ= Äó= íÜÉ= j åÜê~íçêó= _âÇ= qêÉ~íó= ^ÅíK ^î~âä~ÄäÉ= ~í ÜííéÅÅï ÉÄëçäëì êî ÉóKäêÅëK ëÇ~KÖçî L~éélt ÉÄpçäpì êî ÉóK~ëéñK= = t ÉÄëäÉ= ~ÅÅÉëëÉÇ pÉéíÉã ÄÉê=ORI=OMNPK

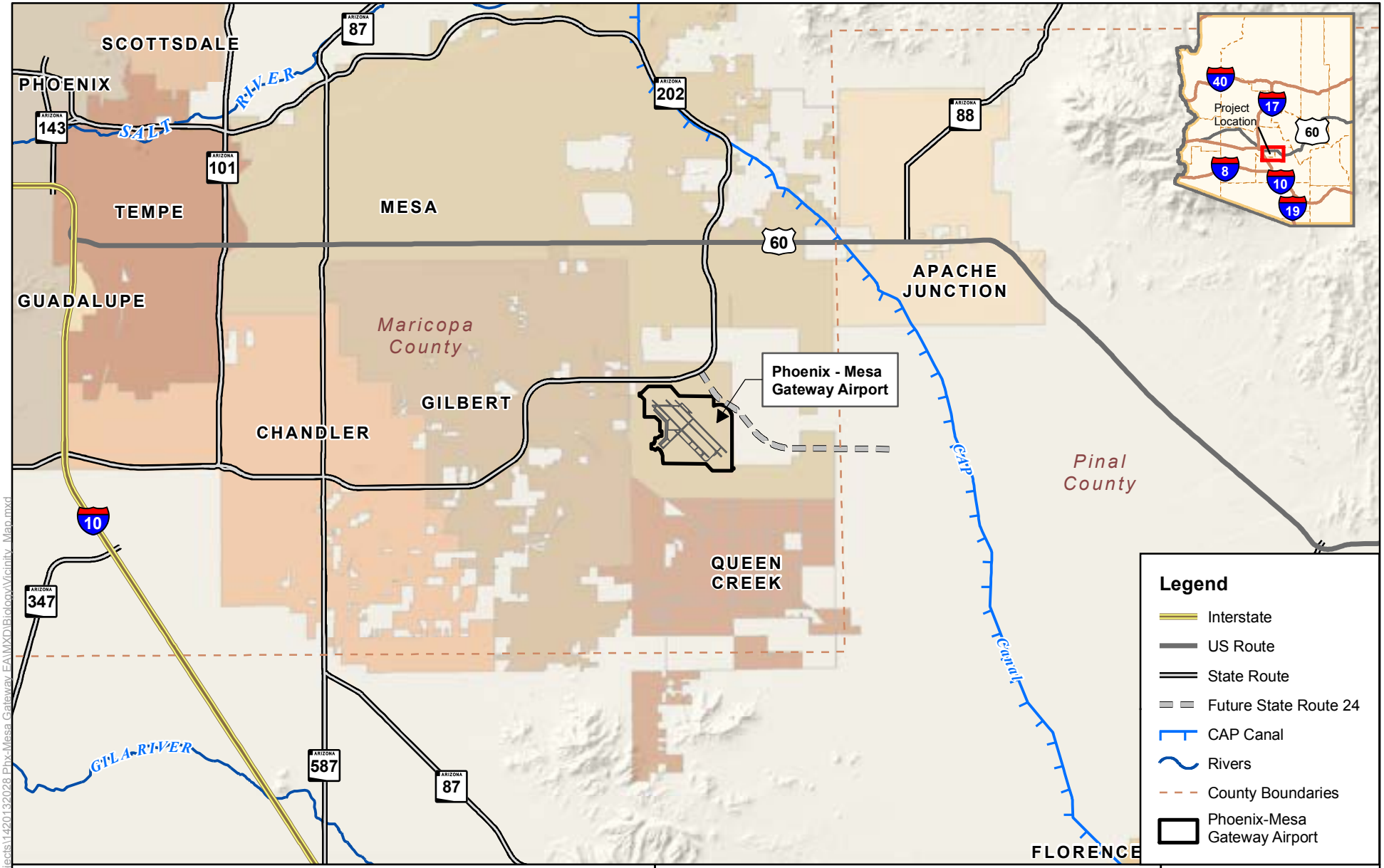
||||||| K OMNPÇK ` ~åÇäÇ~íÉ=péÉÅáÉë pÉÅíäçå=Q=çÑíÜÉ=båÇ~åÖÉêÉÇ=péÉÅáÉë=^ÅíK=^î~âä~ÄäÉ=~í ÜííéÅÅï ï ï KÑÅ ëKÖçî LÉåÇ~åÖÉêÉÇLÉë~JäáÄê~êóLéÇÑÅ~åÇäÇ~íÉ| ëéÉÅáÉëK=ÇÑK= = t ÉÄëäÉ ~ÅÅÉëëÉÇ=pÉéíÉã ÄÉê=ORI=OMNPK

r åáíÉÇ=pí~íÉë=d ÉçäçÖáÅ~äpì êî Éó=Er pd pFK OMNNK *e áÖáÉó/=^êáÖçå~* TKRJ áåì íÉ=n ì ~Çê~åÖÉ=j ~éK

t ÉëíÉêå=o ÉÖçå~ä=` äáä ~íÉ=` ÉåíÉêK=OMNPK=mÉêçÇ=çÑ=o ÉÅçêÇ=j çåíÜäó=` äáä ~íÉ=pì ã ã ~êóI ` Ü~åÇäÉê=e ÉäÜÜíëI=^êáÖçå~ EMONRNQFK=mÉêçÇ=çÑ=o ÉÅçêÇVNNVUN íç OMNMK ^î~âä~ÄäÉ=~í ÜííéÅÅï ï ï K êÅÅKÇêäKÉÇì LÅÖáÄäåLÄäj ^fk KeÄ ~òNRNQK=t ÉÄëäÉ=~ÅÅÉëëÉÇ pÉéíÉã ÄÉê=OSI OMNPK

^ mmbk a fu=^

cfd r obp



0 2 4 8 Miles

Job No.	1420132028
PM:	KR
Date:	10/8/2013
Scale:	1" = 4 miles

N

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Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Vicinity Map

FIGURE 1

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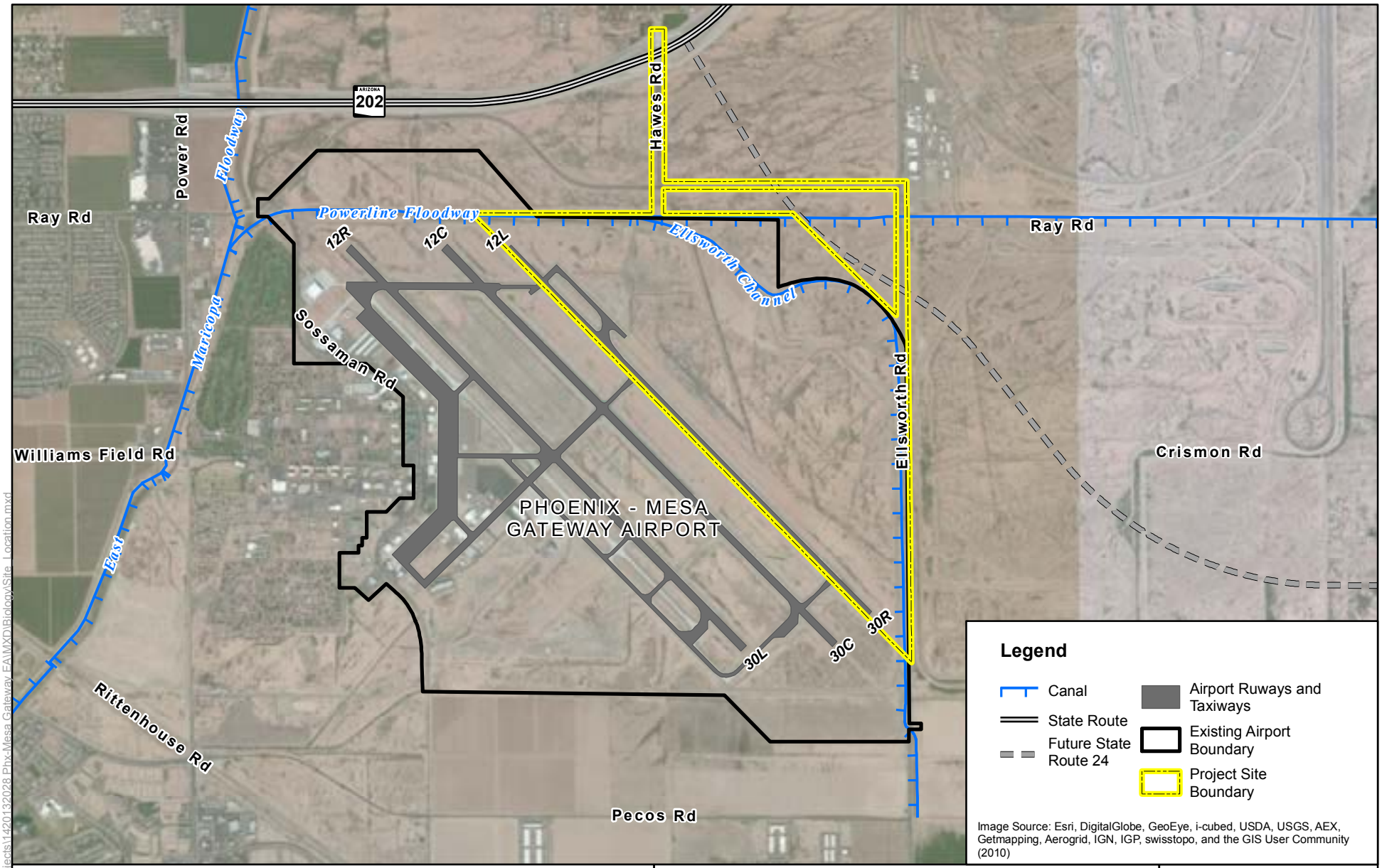

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Job No.	1420132028
PM:	KR
Date:	10/8/2013
Scale:	1" = 3000'

N

The map shown here has been created with all due and reasonable care and is strictly for use with AMEC Project Number 1420132028. This map has not been certified by a licensed land surveyor, and any third party use of this map comes without warranties of any kind. AMEC assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Project Site Location

FIGURE
2

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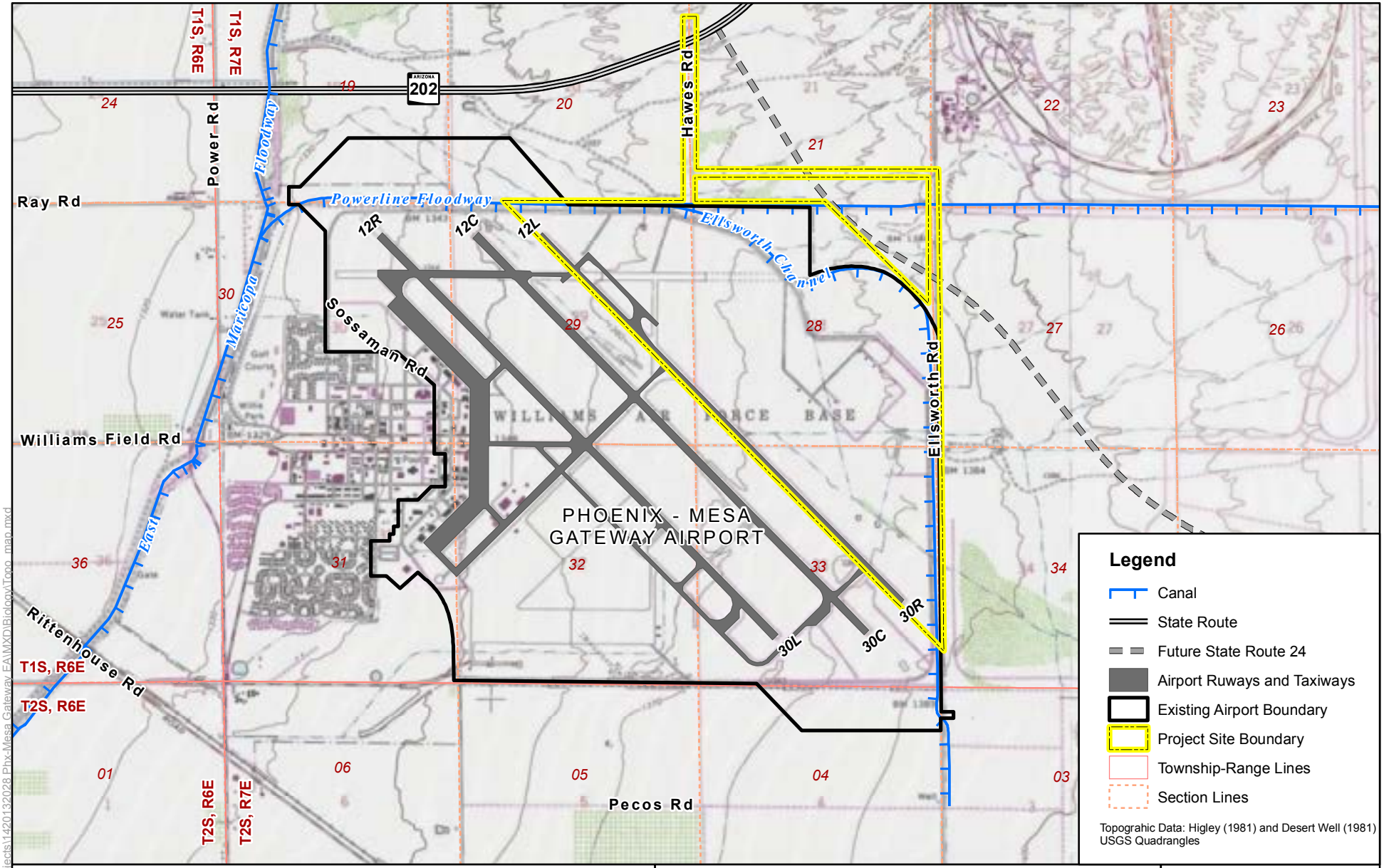

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Job No.	1420132028
PM:	KR
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Scale:	1" = 3000'

N

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Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Topographic Map

FIGURE
3

amec

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Maricopa County

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Acuna cactus	*Echinomastus erectocentrus var. acunensis*	Proposed Endangered	Less than 12 inches tall; spine clusters borne on tubercles, each with a groove on the upper surface. 2-3 central spines and 12 radial spines. Radial spines are dirty white with maroon tips. Flowers pink to purple.	Maricopa, Pima, Pinal	1,198 to 3,773 ft	Well drained knolls and gravel ridges in Sonoran desertscrub.	Immature plants distinctly different from mature plants. Immatures are disc-shaped or spherical and have no central spines until they are about 1.5 inches. Critical habitat is being proposed for a total of 53,720 ac in Maricopa, Pima, and Pinal counties (77 FR 60510).
Arizona cliffrose	*Purshia subintegra*	Endangered	Evergreen shrub of the rose family (Roseaceae). Bark pale gray and shreddy. Young twigs covered with dense hairs. Leaves have 1-5 lobes and edges curl downward (revolute). Flowers: 5 petals, white or yellow <0.5 inches long.	Graham, Maricopa, Mohave, Yavapai	< 4,000 ft	White limestone soils derived from tertiary lakebed deposits.	Occurs across central Arizona: in the Burro Creek drainage, near Bylas, near Cottonwood in the Verde Valley, and at Horseshoe Lake.
California Least Tern	*Sterna antillarum browni*	Endangered	Smallest of the North American terns. Body length is 21-24 cm (8-9 inches) with a wingspan of 45-51 cm (18-20 inches). Has black crown and loral stripe on head, snowy white forehead and underside, and gray upperparts. Outer two primaries black, yellow or orange bill with black tip, and orange legs. Males have a wider dark loral stripe but sexes mostly distinguished by behavior.	Maricopa, Mohave, Pima	< 2,000 ft	Open, bare or sparsely vegetated sand, sandbars, gravel pits, or exposed flats along shorelines of inland rivers, lakes, reservoirs, or drainage systems.	Breeding occasionally documented in Arizona; migrants may occur more frequently. Feeds primarily on fish in shallow waters and secondarily on invertebrates. Nests in a simple scrape on sandy or gravelly soil.

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Desert pupfish	*Cyprinodon macularius*	Endangered	Small (2 inches) smoothly rounded body shape with narrow vertical bars on the sides. Breeding males blue on head and sides with yellow on tail. Females and juveniles tan to olive colored back and silvery sides.	Cochise, Graham, Maricopa, Pima, Pinal, Santa Cruz, Yavapai	< 4,000 ft	Shallow springs, small streams, and marshes. Tolerates saline and warm water.	Two subspecies are recognized: Desert Pupfish (C.m. macularis) and Quitobaquito Pupfish (C.m. eremus). Critical habitat includes Quitobaquito Springs, Pima County, portions of San Felipe Creek, Carrizo Wash, and Fish Creek Wash, Imperial County, California.
Gila topminnow	*Poeciliopsis occidentalis occidentalis*	Endangered	Small (2 inches), guppy-like, live bearing, lacks dark spots on its fins. Breeding males are jet black with yellow fins.	Cochise, Gila, Graham, La Paz, Maricopa, Pima, Pinal, Santa Cruz, Yavapai	< 4,500 ft	Small streams, springs, and cienegas vegetated shallows.	Species historically also occurred in backwaters of large rivers but is currently isolated to small streams and springs.
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	Endangered	Elongated muzzle, small leaf nose, and long tongue. Yellowish brown or gray above and cinnamon brown below. Tail minute and appears to be lacking. Easily disturbed.	Cochise, Gila, Graham, Greenlee, Maricopa, Pima, Pinal, Santa Cruz, Yuma	1,600-7,500 ft	Desert scrub habitat with agave and columnar cacti present as food plants.	Day roosts in caves and abandoned tunnels. Forages at night on nectar, pollen, and fruit of paniculate agaves and columnar cacti. This species is migratory and is present in Arizona usually from April to September and south of the border the remainder of the year.
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	Medium sized with dark eyes and no ear tufts. Brownish and heavily spotted with white or beige.	Apache, Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Mohave, Navajo, Pima, Pinal, Santa Cruz, Yavapai	4,100-9,000 ft	Nests in canyons and dense forests with multi-layered foliage structure.	Generally nest in older forests of mixed conifer or ponderosa pine/gambel oak type, in canyons, and use variety of habitats for foraging. Sites with cool microclimates appear to be of importance or are preferred. Critical habitat was finalized on August 31, 2004 (69 FR 53182) in Arizona in Apache, Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Navajo, Pima, Pinal, Santa Cruz, and Yavapai counties.
Razorback sucker	*Xyrauchen texanus*	Endangered	Large, up to 3 feet long and up to 6 lbs, high sharp-edged keel-like hump behind the head. Head flattened on top. Olive-brown above to yellowish below.	Coconino, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Pinal, Yavapai, Yuma	< 6,000 ft	Riverine and lacustrine areas, generally not in fast moving water and may use backwaters.	Big River fish also found in Horseshoe reservoir (Maricopa County). Critical habitat includes the 100-year floodplain of the river through the Grand Canyon from confluence with Paria River to Hoover Dam; Hoover Dam to Davis Dam; Parker Dam to Imperial Dam. Also Gila River from Arizona/New Mexico border to Coolidge Dam; and Salt River from Hwy 60/SR77 Bridge to Roosevelt Dam; Verde River from FS boundary to Horseshoe Lake (59 FR 13374).

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Sonoran pronghorn	*Antilocapra americana sonoriensis*	Endangered	Upperparts tan; underparts, rump, and two bands across the neck are white. Male has two black cheek pouches. Hoofed with slightly curved black horns having a single prong. Smallest and palest of the pronghorn subspecies.	Maricopa, Pima, Yuma	2,000-4,000 ft	Broad intermountain alluvial valleys with creosote-bursage and palo verde-mixed cacti associations.	Typically, bajadas are used as fawning areas and sandy dune areas provide food seasonally. Cacti (jumping cholla) appears to make up substantial part of diet. This subspecies also occurs in Mexico.
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Small passerine (about 6 inches) grayish-green back and wings, whitish throat, light olive-gray breast and pale yellowish belly. Two wingbars visible. Eye-ring faint or absent.	Apache, Cochise, Coconino, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Navajo, Pima, Pinal, Santa Cruz, Yavapai, Yuma	< 8,500 ft	Cottonwood/willow and tamarisk vegetation communities along rivers and streams.	Riparian-obligate bird that occupies migratory/breeding habitat from late April-Sept. Critical habitat was finalized on October 19, 2005 in Apache, Cochise, Gila, Graham, Greenlee, Maricopa, Mohave, Pima, Pinal, and Yavapai counties (70 FR 60886). Revised critical habitat was proposed August 15, 2011 (76 FR 50542) and includes river segments in counties currently designated plus those in La Paz, Santa Cruz, and Yuma counties. The 2005 critical habitat designation remains in effect until the current proposal is finalized. Training seminar/permits required for those conducting call playback surveys.
Woundfin	*Plagopterus argentissimus*	Endangered	Small (4 inches) silver minnow with fairly large fins and a sharp dorsal fin spine.	Maricopa, Mohave	< 4,500 ft	Inhabits shallow, warm, turbid, fast-flowing water. Tolerates high salinity.	Native population only in Virgin River. Designated critical habitat includes the Virgin River and its 100-year floodplain (65 FR 4140). Experimental non-essential populations (50 FR 30188) designated in portions of the Verde, Gila, San Francisco, and Hassayampa rivers and Tonto Creek. Species also occurs in Washington County, UT and Clark County, NV.
Yuma clapper rail	*Rallus longirostris yumanensis*	Endangered	Water bird with long legs and short tail. Long, slender decurved bill. Mottled brown or gray on its rump. Flanks and undersides are dark gray with narrow vertical stripes producing a barring effect.	Gila, La Paz, Maricopa, Mohave, Pinal, Yuma	< 4,500 ft	Fresh water and brackish marshes.	Species is associated with dense emergent riparian vegetation. Requires wet substrate (mudflat, sandbar) with dense herbaceous or woody vegetation for nesting and foraging. Channelization and marsh destruction are primary sources of habitat loss.

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Roundtail chub	*Gila robusta*	Candidate	Member of the minnow family Cyprinidae and characterized by streamlined body shape. Color usually olive gray with silvery sides and a white belly. Breeding males develop red or orange coloration on the lower half of the cheeks and on the bases of paired fins. Individuals may reach 49.0 cm (19.3 in) but usually average 25-30 cm (9.8 - 11.8 in).	Apache, Coconino, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Navajo, Pinal, Yavapai	1,000-7,500 ft.	Cool to warm waters of rivers and streams, often occupy the deepest pools and eddies of large streams.	Historical range of roundtail chub included both the upper and lower Colorado River basins. A 2009 status review determined that the lower Colorado River basin roundtail chub population segment (Arizona and New Mexico) qualifies as a distinct vertebrate population segment (DPS). Populations in the Little Colorado, Bill Williams, and Gila River basins are considered candidate species.
Sonoran desert tortoise	*Gopherus morafkai*	Candidate	Large herbivorous reptile with domed shell and round stumpy hind legs. The carapace is a dull brown or grey color and the plastron is unhinged, often pale yellow in coloration. Sonoran desert tortoises generally have a flatter carapace than tortoises in the Mohave population. Active in spring and during the monsoon; dormant in winter and mid-summer months.	Cochise, Gila, Graham, La Paz, Maricopa, Mohave, Pima, Pinal, Santa Cruz, Yavapai, Yuma	< 7,800 ft	Primarily rocky (often steep) hillsides and bajadas of Mohave and Sonoran desertscub but may encroach into desert grassland, juniper woodland, interior chaparral habitats, and even pine communities. Washes and valley bottoms may be used in dispersal.	Desert tortoises that occur east and south of the Colorado River in Arizona are known as the Sonoran desert tortoise. Individuals are found throughout their historic range; but populations are becoming increasingly fragmented due to threats to their habitat in valley bottoms, which are used for dispersal and exchange of genetic material.
Sprague's pipit	*Anthus spragueii*	Candidate	Small, sparrow-sized bird (10-15 cm in length), with buff and blackish streaking on the crown, nape, and underparts. Has a short bill with a blackish upper mandible, a buffy face with a large eye ring, white outer tail feathers and pale to yellowish legs.	Cochise, Maricopa, La Paz, Santa Cruz, Yuma	<5,000 ft	Strong preference to native grasslands with vegetation of intermediate height and lacking woody shrubs.	Rare in Arizona. Few individuals of this elusive species have been sighted during October through March. Native grass fields are rare in Arizona but cultivated, dry Bermuda grass, alfalfa fields mixed with patches of dry grass, or fallow fields appear to support the species during wintering. They will not use mowed or burned areas until the vegetation has had a chance to grow. There are no breeding records in Arizona.

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Tucson shovel-nosed snake	*Chionactis occipitalis klauberi*	Candidate	Small snake (10-17 inches total length) in the family Colubridae, with a shovel-shaped snout and an inset lower jaw. Overall coloring mimics coral snakes, with pale yellow to cream-colored body, 21 or more black or brown saddle-like bands across the back, and orange-red saddle-like bands in between. The subspecies is distinguished from the other subspecies in that these secondary orange-red crossbands are suffused with dark pigment, making them appear brown or partly black, and the black and red crossbands do not encircle the entire body.	Maricopa, Pima, Pinal	785-1,662 ft	Sonoran Desertscrub; associated with soft, sandy soils having sparse gravel.	Found in creosote-mesquite floodplain environments, finds refuge under desert shrubs,active during crepuscular (dawn and dusk) and daylight hours.
Yellow-billed cuckoo	*Coccyzus americanus*	Candidate	Medium-sized bird with a slender, long-tailed profile, slightly down-curved bill that is blue-black with yellow on the lower half. Plumage is grayish-brown above and white below, with rufous primary flight feathers.	Apache, Cochise, Coconino, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Navajo, Pima, Pinal, Santa Cruz, Yavapai, Yuma	< 6,500 ft	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries).	Neotropical migrant that winters primarily in South America and breeds primarily in the U.S. (but also in southern Canada and northern Mexico). As a migrant it is rarely detected; can occur outside of riparian areas. Cuckoos are found nesting statewide, mostly below 5,000 feet in central, western, and southeastern Arizona. Concern for cuckoos are primarily focused upon alterations to its nesting and foraging habitat. Nesting cuckoos are associated with relatively dense, wooded, streamside riparian habitat, with varying combinations of Fremont cottonwood, willow, velvet ash, Arizona walnut, mesquite, and tamarisk. Some cuckoos have also been detected nesting in velvet mesquite, netleaf hackberry, Arizona sycamore, Arizona alder, and some exotic neighborhood shade trees.

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
American peregrine falcon	*Falco pereginus anatum*	Delisted	A crow-sized falcon with slate blue-gray on the back and wings, and white on the underside; a black head with vertical "bandit's mask" pattern over the eyes; long pointed wings; and a long wailing call made during breeding. Very adept flyers and hunters, reaching diving speeds of 200 mph.	Apache, Cochise, Coconino, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Navajo, Pima, Pinal, Santa Cruz, Yavapai, Yuma	3,500-9,000 ft	Areas with rocky, steep cliffs, primarily near water, where prey (primarily shorebirds, songbirds, and waterfowl) concentrations are high. Nests are found on ledges of cliffs, and sometimes on man-made structures such as office towers and bridge abutments.	Species recovered with over 1,650 breeding birds in the US and Canada.
Arizona agave	*Agave arizonica*	Delisted	Member of the agave family. Has rosettes of bright green leaves, 17-24cm long and 2-4cm wide, broadest in the middle. Flowers are small, pale yellow, and jar shaped.	Gila, Maricopa, Yavapai	3,600-5,800 ft	Occurs on open slopes in chaparral or juniper grasslands. Prefers shallow, cobbled, and gravelly soils on steep slopes.	Arizona agave is a hybrid produced by a crossing of two other common agave species (A. chrysantha x A. toumeyana ssp. toumeyana).
Bald eagle	*Haliaeetus leucocephalus*	Delisted	Large, adults have white head and tail. Height 28 to 38 inches; wingspan 66 to 96 inches. Juveniles and subadults are dark brown with varying degrees of white mottling on chest, wings, and head.	Apache, Coconino, Gila, Graham, La Paz, Maricopa, Mohave, Pinal, and Yavapai	Varies	Large trees or cliffs near water (reservoirs, rivers, and streams) with abundant prey.	Nationwide and throughout the State of Arizona, the bald eagle is currently not listed under the Endangered Species Act. On September 30, 2010, the U.S. District Court dissolved an injunction that led to the bald eagle in the Sonoran Desert Area of central Arizona being placed on the Endangered Species list in 2008. This determination is presently (January 2011) under judicial consideration. Bald eagles are protected under the Bald and Golden Eagle Protection Act (Eagle Act) and other Federal and state statutes. The word "disturb" under the Eagle Act was recently clarified, as well as the implementation of new regulations requiring permits to incidentally "take" eagles. Retrieve more information on management and life history at http://SWBEMC.org.

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
California brown pelican	*Pelecanus occidentalis californicus*	Delisted	Large, dark gray-brown water bird with webbed feet, pouch underneath its long bill, and wingspan of 7 ft. Adults have a white head and neck, brownish black breast, and silver gray upper parts.	Gila, La Paz, Maricopa, Mohave, Pinal, Yuma	Varies	Coastal land and islands; species found occasionally around Arizona's lakes and rivers.	Considered an uncommon transient in Arizona. Most observations recorded along the Colorado River and in the Gila Valley. Individuals known to wander up from Mexico in summer and fall. No breeding has been documented in Arizona. Delisted on November 17, 2009 (74 FR 59444).

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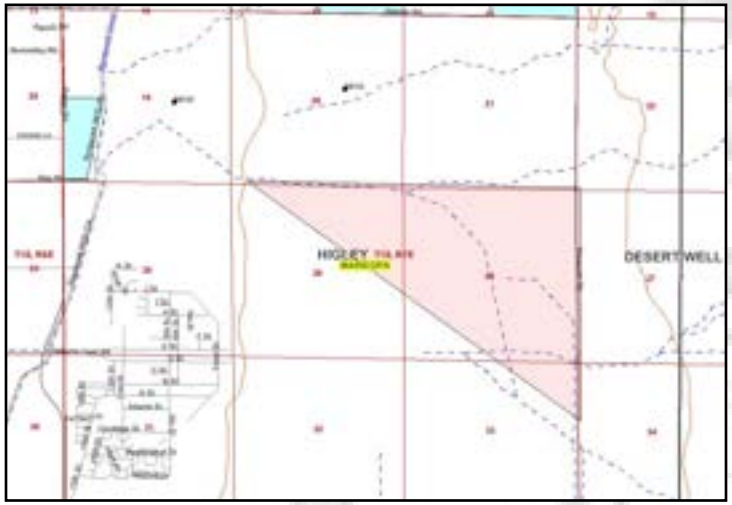
Arizona's On-line Environmental Review Tool
Search ID: 20121205019189
Project Name: PMGAA
Date: 12/5/2012 3:01:23 PM

Project Location



Project Name: PMGAA
Submitted By: Theresa Price
On behalf of: CONSULTING
Project Search ID: 20121205019189
Date: 12/5/2012 3:01:19 PM
Project Category: Transportation & Infrastructure,Airports,Construction of new runways, terminals/concourses, other facilities
Project Coordinates (UTM Zone 12-NAD 83): 439852.563, 3686394.607 meter
Project Area: 831.354 acres
Project Perimeter: 9107.818 meter
County: MARICOPA
USGS 7.5 Minute Quadrangle ID: 1351
Quadrangle Name: HIGLEY
Project locality is currently being scoped

Location Accuracy Disclaimer

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:

Name	Common Name	FWS	USFS	BLM	State
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S	

 APPLICATION INITIALS: _____

Please review the entire receipt for project type recommendations and/or species or location information and retain a copy for future reference. If any of the information you provided did not accurately reflect this project, or if project plans change, another review should be conducted, as this determination may not be valid.

Arizona's On-line Environmental Review Tool:

1. This On-line Environmental Review Tool inquiry has generated recommendations regarding the potential impacts of your project on Special Status Species (SSS) and other wildlife of Arizona. SSS include all U.S. Fish and Wildlife Service federally listed, U.S. Bureau of Land Management sensitive, U.S. Forest Service sensitive, and Arizona Game and Fish Department (Department) recognized species of concern.
2. These recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation). These recommendations are preliminary in scope, designed to provide early considerations for all species of wildlife, pertinent to the project type you entered.
3. This receipt, generated by the automated On-line Environmental Review Tool does not constitute an official project review by Department biologists and planners. Further coordination may be necessary as appropriate under the National Environmental Policy Act (NEPA) and/or the Endangered Species Act (ESA).

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority over all federally listed species under the ESA. Contact USFWS Ecological Services Offices: http://arizonaes.fws.gov/.

Phoenix Main Office
2321 W. Royal Palm Road, Suite 103
Phoenix, AZ 85021
Phone 602-242-0210
Fax 602-242-2513

Tucson Sub-Office
201 North Bonita, Suite 141
Tucson, AZ 85745
Phone 520-670-6144
Fax 520-670-6154

Flagstaff Sub-Office
323 N. Leroux Street, Suite 101
Flagstaff, AZ 86001
Phone 928-226-0614
Fax 928-226-1099

Disclaimer:

1. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area.
2. The Department's Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there.
3. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HDMS data contains information about species occurrences that have actually been reported to the Department.

Arizona Game and Fish Department Mission

To conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and

 APPLICATION INITIALS: _____

management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.

Project Category: Transportation & Infrastructure,Airports,Construction of new runways, terminals/concourses, other facilities

Project Type Recommendations:

Based on the project type entered; coordination with Arizona Department of Environmental Quality may be required (http://www.azdeq.gov/).

Based on the project type entered; coordination with County Flood Control districts may be required.

Based on the project type entered; coordination with State Historic Preservation Office may be required http://azstateparks.com/SHPO/index.html

Based on the project type entered; coordination with U.S. Army Corps of Engineers may be required (http://www.spl.usace.army.mil/regulatory/phonedir.html)

Based on the project type entered; coordination with U.S. Fish and Wildlife Service (Migratory Bird Treaty Act) may be required (http://arizonaes.fws.gov/)

Consider designs and tower modifications that reduce or eliminate impacts to migratory birds. Please refer to the U.S. Fish and Wildlife Service's page on cellular towers in Arizona http://www.fws.gov/arizonaes/CellTower.htm. On this page there are guidelines for tower siting, construction, operation, and decommissioning. Also see the Service's Interim Guidelines for Recommendations on Communications Tower Siting, Construction, Operation, and Decommissioning, http://www.fws.gov/habitatconservation/communicationtowers.htm.

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (including spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project

Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

Planning: consider impacts of lighting intensity on mammals and birds and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

The Department requests further coordination to provide project/species specific recommendations, please contact Project Evaluation Program directly.

Project Location and/or Species recommendations:

Heritage Data Management System records indicate that western burrowing owls have been documented within the vicinity of your project area (refer to the species list on page 1 of the receipt). Please review the relocation procedures recommended for burrowing owls found on the Environmental Review Home Page: http://mirror-pole.com/burr_owl/bur_owl1.htm.

Recommendations Disclaimer:

1. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project.
2. These recommendations are proposed actions or guidelines to be considered during **preliminary project development**.
3. Additional site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. The Department is interested in the conservation of all fish and wildlife resources, including those Special Status Species listed on this receipt, and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
6. **Further coordination requires the submittal of this initialed and signed Environmental Review Receipt with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map).**
7. Upon receiving information by AZGFD, please allow 30 days for completion of project reviews. Mail requests to:

Project Evaluation Program, Habitat Branch
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086-5000
Phone Number: (623) 236-7600
Fax Number: (623) 236-7366

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 APPLICATION INITIALS: _____

time you do not wish to accept the Terms, you may choose not to use the website.

1. This Environmental Review and project planning website was developed and intended for the purpose of screening projects for potential impacts on resources of special concern. By indicating your agreement to the terms of use for this website, you warrant that you will not use this website for any other purpose.
2. Unauthorized attempts to upload information or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act .
3. The Department reserves the right at any time, without notice, to enhance, modify, alter, or suspend the website and to terminate or restrict your access to the website.
4. This Environmental Review is based on the project study area that was entered. The review must be redone if the project study area, location, or the type of project changes. If additional information becomes available, this review may need to be reconsidered.
5. A signed and initialed copy of the Environmental Review Receipt indicates that the entire receipt has been read by the signer of the Environmental Review Receipt.

Security:

The Environmental Review and project planning web application operates on a complex State computer system. This system is monitored to ensure proper operation, to verify the functioning of applicable security features, and for other like purposes. Anyone using this system expressly consents to such monitoring and is advised that if such monitoring reveals possible evidence of criminal activity, system personnel may provide the evidence of such monitoring to law enforcement officials. Unauthorized attempts to upload or change information; to defeat or circumvent security measures; or to utilize this system for other than its intended purposes are prohibited.

This website maintains a record of each environmental review search result as well as all contact information. This information is maintained for internal tracking purposes. Information collected in this application will not be shared outside of the purposes of the Department.

If the Environmental Review Receipt and supporting material are not mailed to the Department or other appropriate agencies within six (6) months of the Project Review Receipt date, the receipt is considered to be null and void, and a new review must be initiated.

Print this Environmental Review Receipt using your Internet browser's print function and keep it for your records. Signature of this receipt indicates the signer has read and understands the information provided.

Signature:_____

Date: _____

Proposed Date of Implementation: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization:_____

 APPLICATION INITIALS: _____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

 APPLICATION INITIALS: _____

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FAMILY	SCIENTIFIC NAME		COMMON NAME
Amaranthaceae	*Amaranthus*	*palmeri*	carelessweed
Asteraceae	*Encelia*	*farinosa*	brittlebush / incienso
Asteraceae	*Gutierrezia*	*sarothrae*	broom snakeweed
Asteraceae	*Hymenoclea*	*salsola*	burrobrush
Asteraceae	*Lygodesmia*	*juncea*	rush skeletonplant
Asteraceae	*Senecio*	*longilobus*	smooth threadleaf ragwort
Boraginaceae	*Amsinckia*	*menziesii*	common fiddleneck
Boraginaceae	*Pectocarya*	*heterocarpa*	chuckwalla combseed
Boraginaceae	*Pectocarya*	*recurvata*	curve-nut combseed
Brassicacceae	*Sisymbrium*	*altissimum*	tumblemustard
Brassicaceae	*Lepidium*	*lasiocarpum*	shaggyfruit pepperweed
Cactaceae	*Carnegiea*	*gigantea*	saguaro
Cactaceae	*Cylindropuntia*	*fulgida*	jumping cholla
Cactaceae	*Ferocactus*	*cylindraceus*	California barrel cactus
Caryophyllaceae	*Herniaria*	*hirsuta*	hairy rupturewort
Chenopodiaceae	*Atriplex*	*canescens*	saltbush
Chenopodiaceae	*Salsola*	*tragus*	Russian thistle / tumble weed
Eurphorbiaceae	*Chamaesyce*	*melanadenia*	red-gland spurge
Fabaceae	*Parkinsonia*	*florida*	blue palo verde
Fabaceae	*Parkinsonia*	*microphylla*	foothills palo verde
Fabaceae	*Prosopis*	*velutina*	velvet mesquite
Fouquieriaceae	*Fouquieria*	*splendens*	ocotillo
Lamiaceae	*Hyptis*	*emoryi*	desert lavender
Malvaceae	*Sphaeralcea*	*rusbyi*	Rusby's globemallow
Nyctaginaceae	*Boerhavia*	*erecta*	erect spiderling
Nyctaginaceae	*Boerhavia*	*intermedia*	fivewing spiderling
Pedaliaceae	*Proboscidea*	*parviflora*	devil's claw / desert unicorn-plant
Plantaginaceae	*Plantago*	*elongata*	prairie plantain
Plantaginaceae	*Plantago*	*ovata*	desert Indianwheat
Poaceae	*Bothriochloa*	*barbinodis*	cane bluestem
Poaceae	*Bromus*	*rubens*	red brome
Poaceae	*Pleuraphis*	*mutica*	tobosa grass
Poaceae	*Schismus*	*barbatus*	Mediterranean grass
Poaceae	*Sporobolus*	*cryptandrus*	sand dropseed
Polygonaceae	*Eriogonum*	sp.	buckwheat
Portulacaceae	*Portulaca*	*oleracea*	little hogweed
Rhamnaceae	*Ziziphus*	*obtusifolia*	graythorn / lotebush
Simaroubaceae	*Castela*	*emoryi*	crucifixion thorn
Solanaceae	*Lycium*	*berlandieri*	Berlandier's wolfberry
Zygophillaceae	*Larrea*	*tridentata*	creosote bush

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Appendix C.2

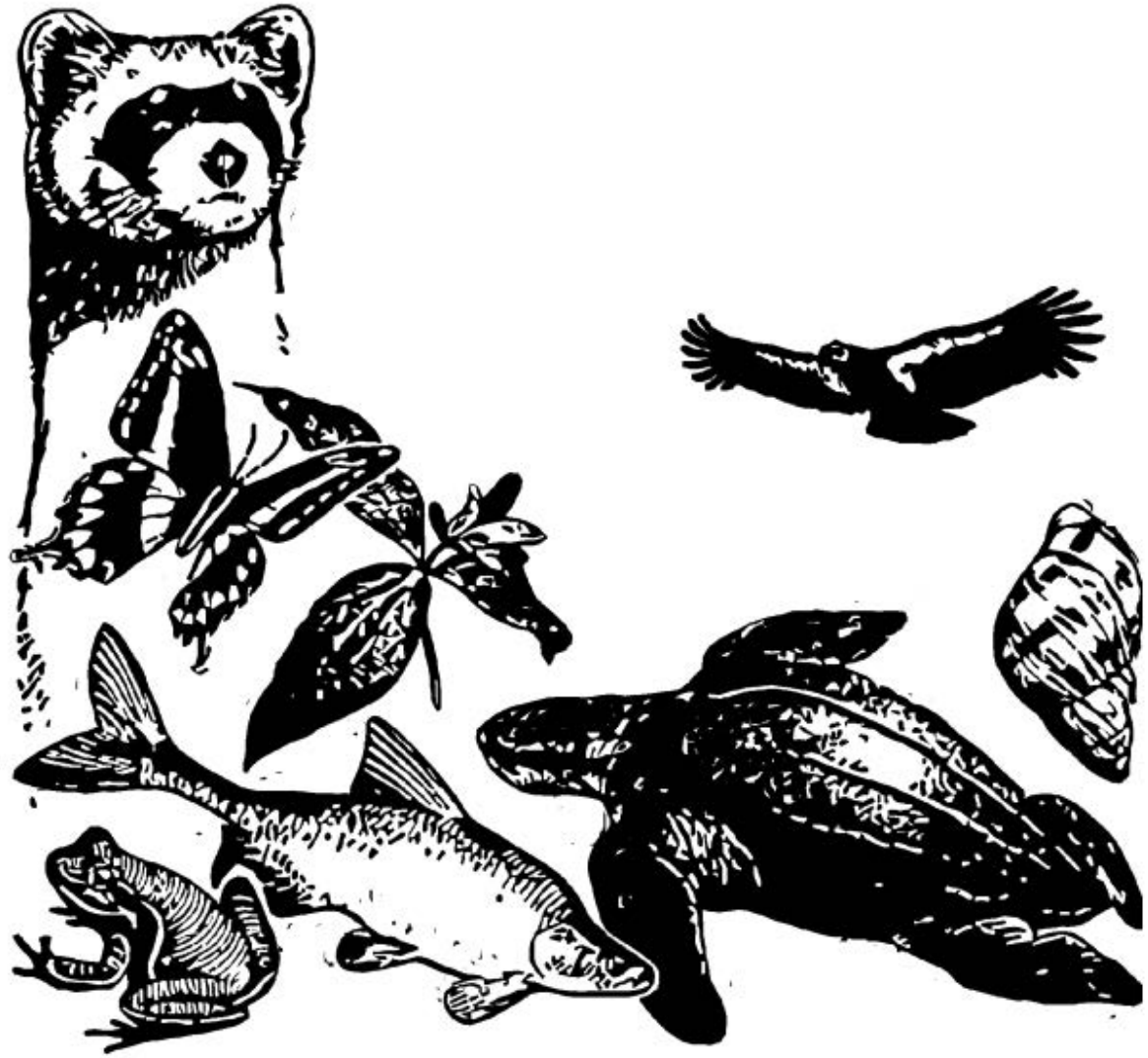
U.S. Fish & Wildlife Service

Phoenix-Mesa Gateway Airport EA - Northeast Area Development Alternative

IPaC Trust Resource Report

Generated January 11, 2016 03:45 PM MST, IPaC v2.3.2

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (http://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

US Fish & Wildlife Service

IPaC Trust Resource Report

NAME

Phoenix-Mesa Gateway Airport EA - Northeast Area Development Alternative

LOCATION

Maricopa County, Arizona

IPAC LINK

http://ecos.fws.gov/ipac/project/TQM4B-LCUA5-FHLC6-Q64GS-P7BDCM

U.S. Fish & Wildlife Contact Information

Trust resources in this location are managed by:

Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021-4915
(602) 242-0210

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require FWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list from the Regulatory Documents section in IPaC.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Birds

California Least Tern Sterna antillarum browni — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B03X

Sprague's Pipit Anthus spragueii — Candidate

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0GD

Yellow-billed Cuckoo Coccyzus americanus — Threatened

CRITICAL HABITAT
There is **proposed** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06R

Fishes

Roundtail Chub Gila robusta — Proposed Threatened

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E02Z

Mammals

Lesser Long-nosed Bat Leptonycteris curasoae yerbabuenae Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0AD

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/akn-histogram-tools.php

The following species of migratory birds could potentially be affected by activities in this location:

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Bell's Vireo Vireo bellii — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JX

Bendire's Thrasher Toxostoma bendirei — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0IF

Black-chinned Sparrow Spizella atrogularis — Bird of conservation concern
Seasons: Wintering, Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0IR

Brewer's Sparrow Spizella breweri — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HA

Burrowing Owl Athene cunicularia — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0NC

Chestnut-collared Longspur Calcarius ornatus — Bird of conservation concern
Season: Wintering

Common Black-hawk Buteogallus anthracinus — Bird of conservation concern
Season: Breeding

Costa's Hummingbird Calypte costae — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JE

Elf Owl Micrathene whitneyi — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0GV

Gila Woodpecker Melanerpes uropygialis — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EH

Gilded Flicker Colaptes chrysoides — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EG

Golden Eagle Aquila chrysaetos — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DV

Lawrence's Goldfinch Carduelis lawrencei — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0J8

Le Conte's Thrasher toxostoma lecontei — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0GE

Lewis's Woodpecker Melanerpes lewis — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HQ

Loggerhead Shrike Lanius ludovicianus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY

Long-billed Curlew Numenius americanus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06S

Lucy's Warbler Vermivora luciae — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DL

Mountain Plover Charadrius montanus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B078

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Pinyon Jay Gymnorhinus cyanocephalus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0I0

Prairie Falcon Falco mexicanus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0ER

Red-faced Warbler Cardellina rubrifrons — Bird of conservation concern
Season: Breeding

Rufous-crowned Sparrow Aimophila ruficeps — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0MX

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Sonoran Yellow Warbler Dendroica petechia ssp. sonorana — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F7

Swainson's Hawk Buteo swainsoni — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B070

Western Grebe aechmophorus occidentalis — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EA

Willow Flycatcher Empidonax traillii — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F6

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuges in this location

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

This location overlaps all or part of the following wetlands:

Freshwater Pond

PUB 7.38 acres

Riverine

R4SB 125.0 acres

A full description for each wetland code can be found at the National Wetlands Inventory website: http://107.20.228.18/decoders/wetlands.aspx

Appendix C.3

Technical Memorandum

Biological Resources – Affected Environment
Airport Surveillance Radar (ASR) Site
Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Prepared For:

Phoenix-Mesa Gateway Airport Authority
and
Ricondo & Associates, Inc.

Submitted by:

AMEC Environment & Infrastructure, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

December 2014

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1.0 PROJECT DESCRIPTION

The Phoenix-Mesa Gateway Airport Authority (PMGAA) is proposing to relocate the passenger terminal and associated facilities at the Phoenix-Mesa Gateway Airport (Airport). As part of the proposed action, the existing Airport Surveillance Radar (ASR) that is currently located on airport property will need to be relocated to an off-site location. The proposed ASR relocation site is located within the Rittenhouse Training Area in northern Pinal County, Arizona, southeast of the Airport. An Environmental Assessment (EA) is being prepared for this development project in accordance with the National Environmental Policy Act (NEPA) and FAA guidelines.

AMEC Environment & Infrastructure, Inc. (AMEC) was tasked to document the biological resources of the proposed ASR project site, including vegetation and wildlife species present and habitat of the area. This report presents a summary of findings from background research and field site reconnaissance for the proposed ASR location.

2.0 PROJECT LOCATION

The ASR project site consists of approximately 6 acres located approximately 7.8 nautical miles southeast of the Airport Traffic Control Tower (see Appendix A, Figure 1) at Phoenix-Mesa Gateway Airport. The project site is within the Rittenhouse Training Area, an approximately 480-acre Arizona Army National Guard (AZARNG) facility located in Queen Creek, Pinal County, Arizona (EA Engineering, Science, and Technology, Inc., 2008). The Rittenhouse Training Area previously operated as an auxiliary air field and heliport associated with Williams Air Force Base and is currently bordered to the south by East Ocotillo Road, North Schnepf Road to the west, Central Arizona Project (CAP) Canal to the east, and open desert to the north (see Appendix A, Figure 2).

The project site is located in Section 15, Township 2S, Range 8E, Gila and Salt River Baseline and Meridian, Pinal County, Arizona (see Appendix A, Figure 3). The project area is included on the *Desert Well, Arizona* and *Sacaton NE, Arizona* United States Geological Survey (USGS) 7.5-minute topographic maps (USGS 2011a, b; 1971a, b). The land on which the proposed ASR site is located is currently owned by the Bureau of Land Management (BLM) and is leased to the AZARNG.

Throughout this Biological Resources Evaluation the term “project site” is used to represent the approximate 6 acres within the survey boundaries, including the proposed access road (see Appendix A, Figure 2), while the term “project area” includes the entire survey area and surrounding lands outside but adjacent to the project site. The term “project vicinity” is used to denote a more expansive landscape context.

3.0 PHYSICAL SITE DESCRIPTION

Topography and Soil Resources

The project area lies within the Higley Basin, an alluvium-filled structural depression in the Salt River Valley Basin (the basin), in the eastern portion of the Basin and Range Physiographic Province of south central Arizona. The topography is characterized by north to northwest trending wide, flat, alluvium-filled basins surrounded by steep, rugged, low-relief mountain ranges. The Higley Basin is bounded by the Usery and Goldfield Mountains to the north, the

Superstition Mountains to the east, the Santan Mountains to the south, and the South Mountains to the west. Elevation of the project area ranges from approximately 1,530 to 1,570 feet above mean sea level (amsl).

Soils within the project area are generally defined as unconsolidated alluvial deposits and consist primarily of Dateland loam and Denure sandy loam (United States Department of Agriculture, Natural Resources Conservation Service [NRCS] 2014). Dateland loam soils are derived from mixed fan alluvium and occur on fan terraces on slopes of 0 to 2 percent. These soils are considered well drained. Denure sandy loam soils are also derived from mixed fan alluvium and generally occur on fan terraces. These soils are considered well drained and occur on slopes of 1 to 3 percent.

The majority of soils in the project area are considered prime farmland if irrigated (NRCS 2014); however, no evidence of agricultural use was observed at the project site in historical aerial photographs reviewed, dating back to 1937 (Flood Control District of Maricopa County 2014; USGS 1971). According to the NRCS soil survey, no hydric soils have been identified in the project area.

Climate

The climate in Chandler Heights, located approximately seven (7) miles southwest of the project site, is arid (approximately 9.4 inches of precipitation annually, primarily in the form of rain), with an annual average maximum temperature of 84.6 degrees Fahrenheit (° F) and an annual average minimum temperature of 57.0° F recorded in Chandler Heights, Arizona (Western Regional Climate Center 2014).

Water Resources

The project area occurs within the Middle Gila River Watershed. The CAP Canal project forms the east boundary of the project area and Rittenhouse Flood Retarding Structure (FRS) is located approximately 0.5 mile east of the project area (see Appendix A, Figure 2). The Flood Control District of Maricopa County maintains the Rittenhouse FRS, which runs east of and parallel to the CAP Canal. The Rittenhouse FRS provides flood control for the CAP Canal, as well as downstream portions of Maricopa County. No perennial surface water sources are located in the vicinity of the project site. Based on the topography of the project area, surface water is generally expected to flow to the west and/or infiltrate into the subsurface.

4.0 LITERATURE AND DATABASE REVIEW

Background research for the project area was performed prior to field surveys, including a review of information from the U.S. Fish and Wildlife Service (USFWS) and Arizona Game and Fish Department (AGFD). According to the USFWS, a total of six threatened, endangered, or candidate species have the potential to occur in the project vicinity (USFWS 2014b; Appendix B). The AGFD Online Environmental Review Tool identified one special status species occurring within 3 miles of the project site (AGFD 2014; see Appendix C). Information from these lists was reviewed by AMEC biologists prior to conducting field reconnaissance surveys.

AMEC's desktop review and site observations identified the project area as occurring within the Lower Colorado River Valley subdivision of the Sonoran desert scrub biotic community per Brown (1994). This subdivision is the driest of the Sonoran Desert subdivisions, resulting from a combination of high annual temperatures and low annual precipitation (Brown 1994). Perennial plant species characteristic of this community, although not necessarily present within the project site, include creosote bush (*Larrea tridentata*), cat-claw acacia (*Acacia greggii*), burrobush (*Hymenoclea salsola*), desert broom (*Baccharis sarothroides*), velvet mesquite (*Prosopis velutina*), ironwood (*Olneya tesota*), ocotillo (*Fouquieria splendens*), brittlebush (*Encelia farinosa*), blue palo verde (*Parkinsonia florida*), foothills palo verde (*P. microphylla*), and saguaro (*Carnegeia gigantea*).

5.0 FIELD SITE INVESTIGATION

AMEC scientists, including a biologist, performed a field investigation of the project area on October 15, 2014 (see Appendix D, Site Photographic Log). The purpose of the survey was to identify biological resources that occur in the project area, including general vegetation and wildlife, wetlands, and protected species and habitat. The site was surveyed on foot; observations from the field site investigations are discussed in the following sections of this memorandum.

Vegetation

The project site is characterized by plant species typical of the Lower Colorado River Valley subdivision of the Sonoran desert scrub biotic community as described by Brown (1994). The project site is located adjacent to a former airfield and much of the vegetation in the project area is typical of previously disturbed desert landscape. Species observed in the project area include creosote bush (*Larrea tridentata*), velvet mesquite (*Prosopis velutina*), woolly tidestromia (*Tidestromia lanuginosa*), turpentine bush (*Ericameria laricifolia*), burrobush (*Hymenoclea salsola*), desert broom (*Baccharis sarothroides*), chinchweed (*Pectis papposa*), devil's claw (*Proboscidea parviflora*), triangle leaf bursage (*Ambrosia deltoidea*), canyon ragweed (*Ambrosia ambrosioides*), desert globe mallow (*Sphaeralcea ambigua*), red brome (*Bromus rubens*), khakiweed (*Alternanthera pungens*), and redstem stork's bill (*Erodium cicutarium*).

Wildlife

During the field investigation, AMEC biologists observed wildlife activity within the project area. Native wildlife observed during the site visit included kangaroo rat (*Dipodyms* sp.) and desert spiny lizard (*Sceloporus magister*). Numerous other small mammals, birds, lizards and snake species are expected to inhabit the area, such as black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), round-tailed ground squirrel (*Xerospermophilus tereticaudus*), zebra-tailed lizard (*Callisaurus draconoides*), regal horned lizard (*Phrynosoma solare*), tiger whiptail (*Aspidoscelis tigris*), western diamondback (*Crotalus atrox*), lesser nighthawk (*Chordeiles acutipennis*), mourning dove (*Zenaida macroura*), American kestrel (*Falco sparverius*), Gambel's quail (*Lophortyx gambelii*), and burrowing owl (*Athene cunicularia hypugaea*). No nests or burrowing owl burrows were observed at the project site during the field investigation.

Noxious Weeds

The Arizona Department of Agriculture (ADA) maintains a list of regulated and restricted noxious weed species that can be found in the Arizona Administrative Code Title 3, Chapter 4, Article 2, Sections R3-4-244 *Regulated and Restricted Noxious Weeds* and R3-4-245 *Prohibited Noxious Weeds*. Species on this list are prohibited from entry into the state or are controlled or quarantined to prevent further infestation or contamination within the state, depending on their listing status. No state-listed noxious or invasive weeds were observed within the project area.

Wetlands

The USFWS National Wetlands Inventory (NWI) did not identify any wetlands within the project area; however, NWI did indicate the following three small freshwater ponds within a 1-mile radius of the project site (USFWS 2014a): a small pond is located within a mixed agricultural/ residential area west of the project site; a second small pond is located north of the project site and former airfield, within what appears as a constructed drainage channel that conveys water north of the project area; and the third small pond is located east of the project site and CAP Canal, along what appears as a natural ephemeral drainage (see Appendix A, Figure 2). USGS topographic maps and aerial imagery reviewed did not indicate any wetlands or surface water impoundments in the project area.

The project site was surveyed for the potential presence of wetlands during the site investigation. No wetlands were observed within the project site.

6.0 SPECIES IDENTIFICATION

Federal and State Threatened and Endangered Species

The USFWS Information, Plannning, and Conservation System (IPaC) was queried for threatened and endangered species information for the project vicinity. According to the USFWS IPaC list, two endangered species, two threatened species, and two candidate species have the potential to occur in the project vicinity; no critical habitat was identified within the project vicinity (USFWS 2014b; Appendix B). Suitable habitat for federally listed species was not observed within the survey area and suitable habitat for those species is not likely to exist in the general project area.

In addition, the AGFD Environmental Online Review Tool identified one special status species, Tucson shovel-nosed snake, documented as occurring within 3 miles of the project area (AGFD 2014; Appendix C). However, the USFWS removed the Tucson shovel-nosed snake from the Endangered Species Act Candidate list on September 23, 2014. Therefore, this species was eliminated from further analysis for this project. During the field investigation, no evidence of Tucson shovel-nosed snake or suitable habitat for this species was observed.

Qualified AMEC biologists reviewed both lists of special status species (USFWS and AGFD) and determined that additional analysis of federally listed species was not needed. The six species included on the USFWS list for the project vicinity were excluded from further evaluation and are addressed in Appendix E, with the justification for exclusion of each species.

Protected Native Plants

The ADA enforces the Arizona Native Plant Law (Arizona Revised Statute Title 3, Chapter 3, Article 11), under which plants cannot be removed from any lands—whether they are owned by a private individual or managed by a government agency—without permission and a permit from the ADA (ADA 2014). Velvet mesquite is a protected native plant and was observed at the project site. Additional plants protected under the Arizona Native Plant Law (e.g., palo verde, saguaro, chain-fruit cholla, barrel cactus, crucifixion thorn, and ocotillo) were observed within the project area. Additional species that may occur within the project area and protected under the Arizona Native Plant Law include desert willow (*Chilopsis linearis*), all cactus species, yucca (*Yucca* sp.), agave (*Agave* sp.), and all members of the Liliaceae family. Care should be taken with all tree species including mesquite, palo verde, and desert willow. Projects involving the potential removal of plants protected under Arizona Native Plant Law are subject to review and recommendations by the ADA. Native plant surveys or inventory may be required prior to any ground-disturbing activities if native plants would be impacted.

Migratory Bird Species

Nationwide concern exists over declining numbers of many neotropical bird populations. Many neotropical birds that migrate through Arizona are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (Title 16, United States Code Parts 703 through 712), as amended, and Executive Order 13186. The USFWS enforces the MBTA, which prohibits individuals to do any of the following:

> …pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, including any part, nest, or egg of any such bird (United States Code 2014).

The USFWS maintains a list of birds protected under the MBTA (USFWS 2013). The project area lies within the bird migratory route known as the Pacific Flyway, and more than 350 bird species travel within this migration route (Pacific Flyway Council 2014); therefore, care should be taken to minimize the risk of injury to migratory bird species, including burrowing owls, during construction activities. Birds protected under MBTA include all common songbirds, raptors, waterfowl, shorebirds, seabirds and wading birds. A complete listing of protected bird species under the MBTA can be found at the USFWS website (http://www.fws.gov/migratorybirds/regulationspolicies/mbta/mbtintro.html).

7.0 CONCLUSION

No special status species or habitat that would support additional special status species were observed within the project area during field observations. However, areas of marginal habitat for other wildlife species, including migratory birds, exist adjacent to the project area. Such areas generally consist of previously disturbed desert lands to the north and east of the project site, the CAP Canal and ephemeral drainages east of the project site, as well as agricultural fields southwest of the project site.

One plant, velvet mesquite, protected under the Arizona Native Plant Law was observed within the project area. Projects involving the potential removal of these and all plant species protected under the Arizona Native Plant Law are subject to review and recommendations by the ADA. Prior to any land disturbance, particularly any that will affect plant life, coordination with the ADA should occur to determine the potential need for focused botanical preconstruction surveys to identify plant species that would be affected by project activities.

8.0 REFERENCES

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United States Geological Survey (USGS). 2011a. *Desert Well, Arizona* 7.5-Minute Quadrangle Map.

United States Geological Survey (USGS). 2011b. *Sacaton NE, Arizona* 7.5-Minute Quadrangle Map.

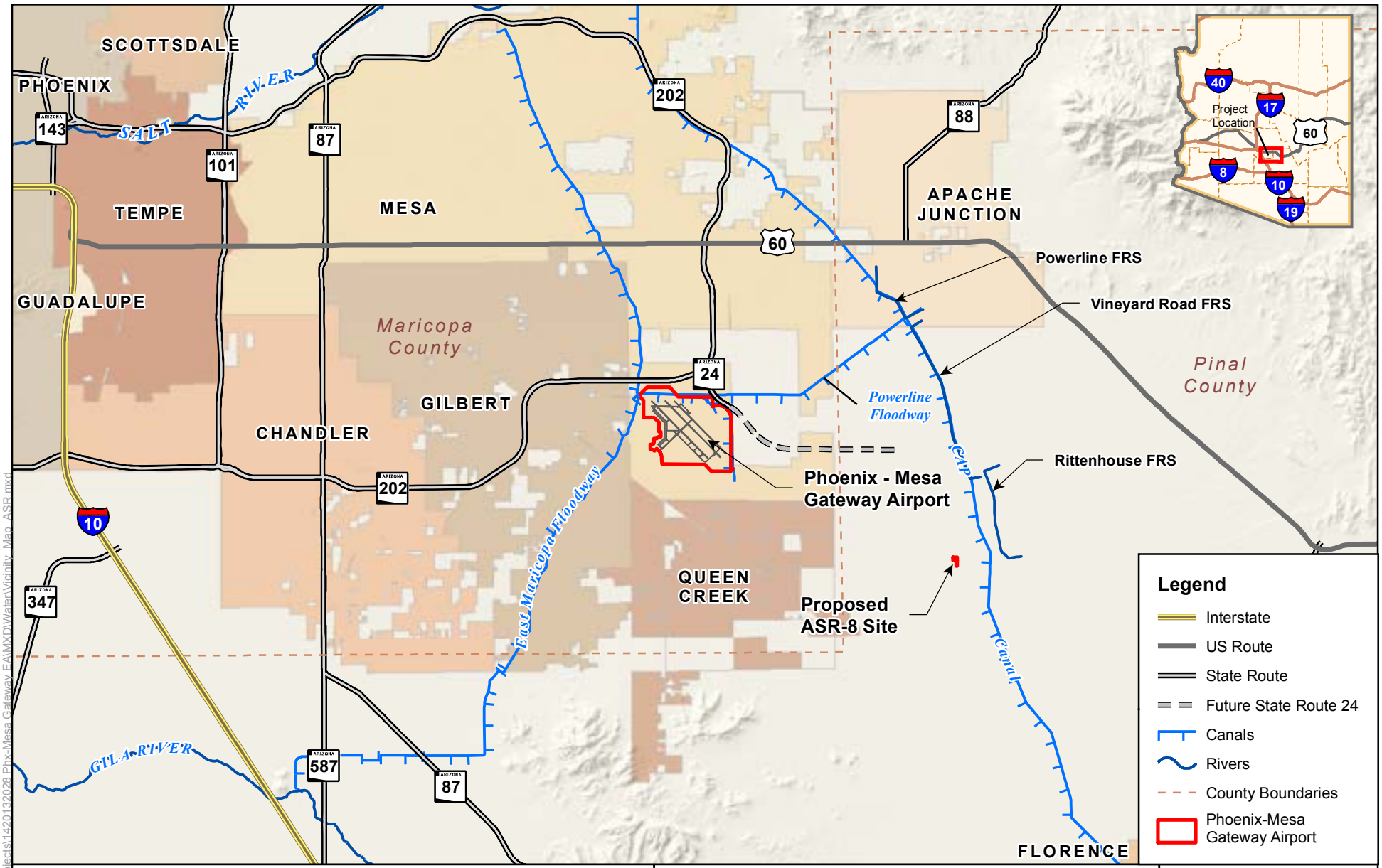
United States Geological Survey (USGS). 1971a. *Desert Well, Arizona* 7.5-Minute Quadrangle Map.

United States Geological Survey (USGS). 1971b. *Sacaton NE, Arizona* 7.5-Minute Quadrangle Map.

Western Regional Climate Center. 2014. Period of Record Monthly Climate Summary, Chandler Heights, Arizona (021514). Period of Record: 1981 to 2010. Available at http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?az1514. Website accessed November 14, 2014.

APPENDIX A

FIGURES



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Date:	11/24/2014
Scale:	1" = 4 miles

N

The map shown here has been created with all due and reasonable care and is strictly for use with AMEC Project Number 1420132028. This map has not been certified by a licensed land surveyor, and any third party use of this map comes without warranties of any kind. AMEC assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Vicinity Map

FIGURE 1

amec

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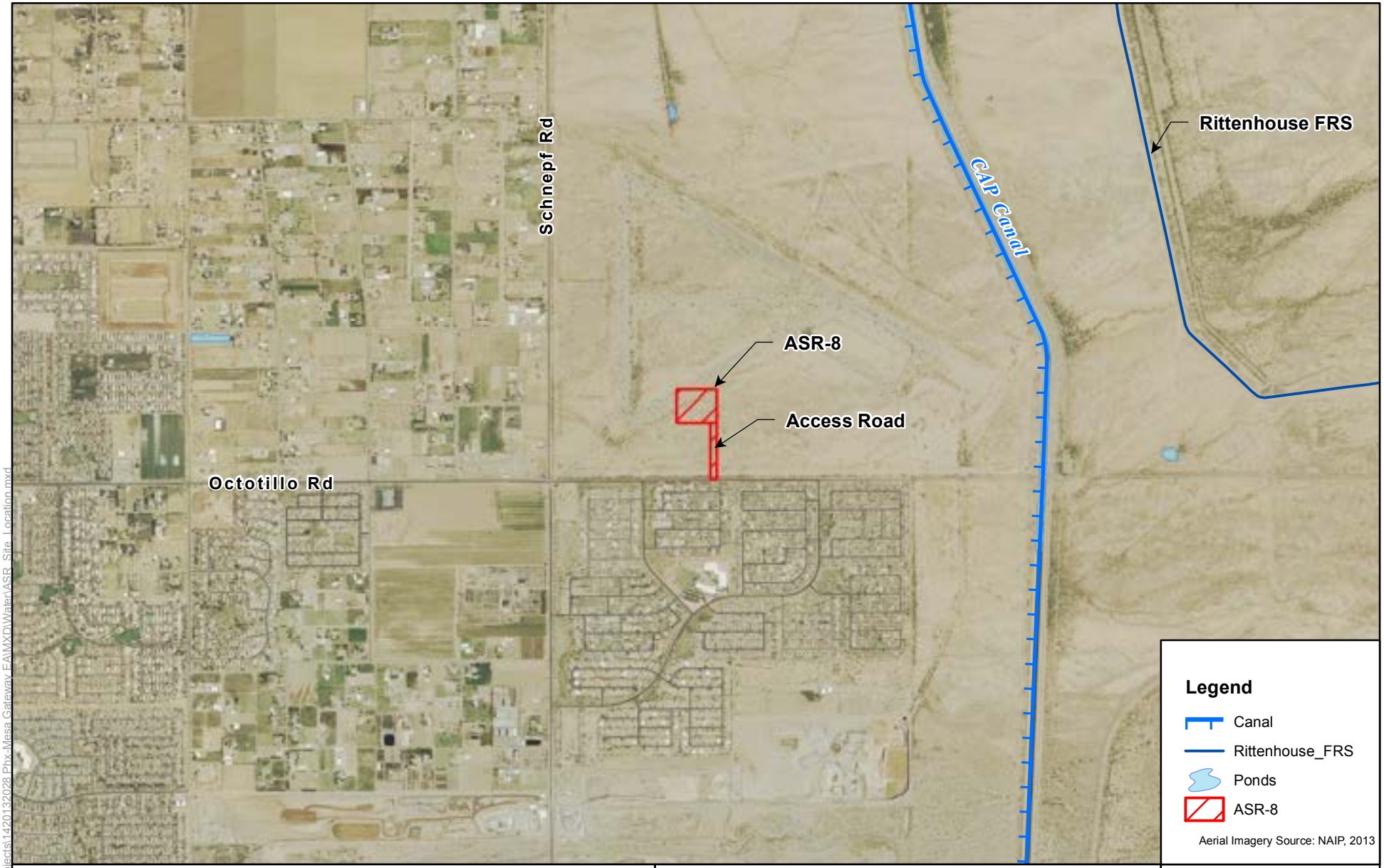

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Date:	11/7/2014
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Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Project Site Location

FIGURE
2

amec

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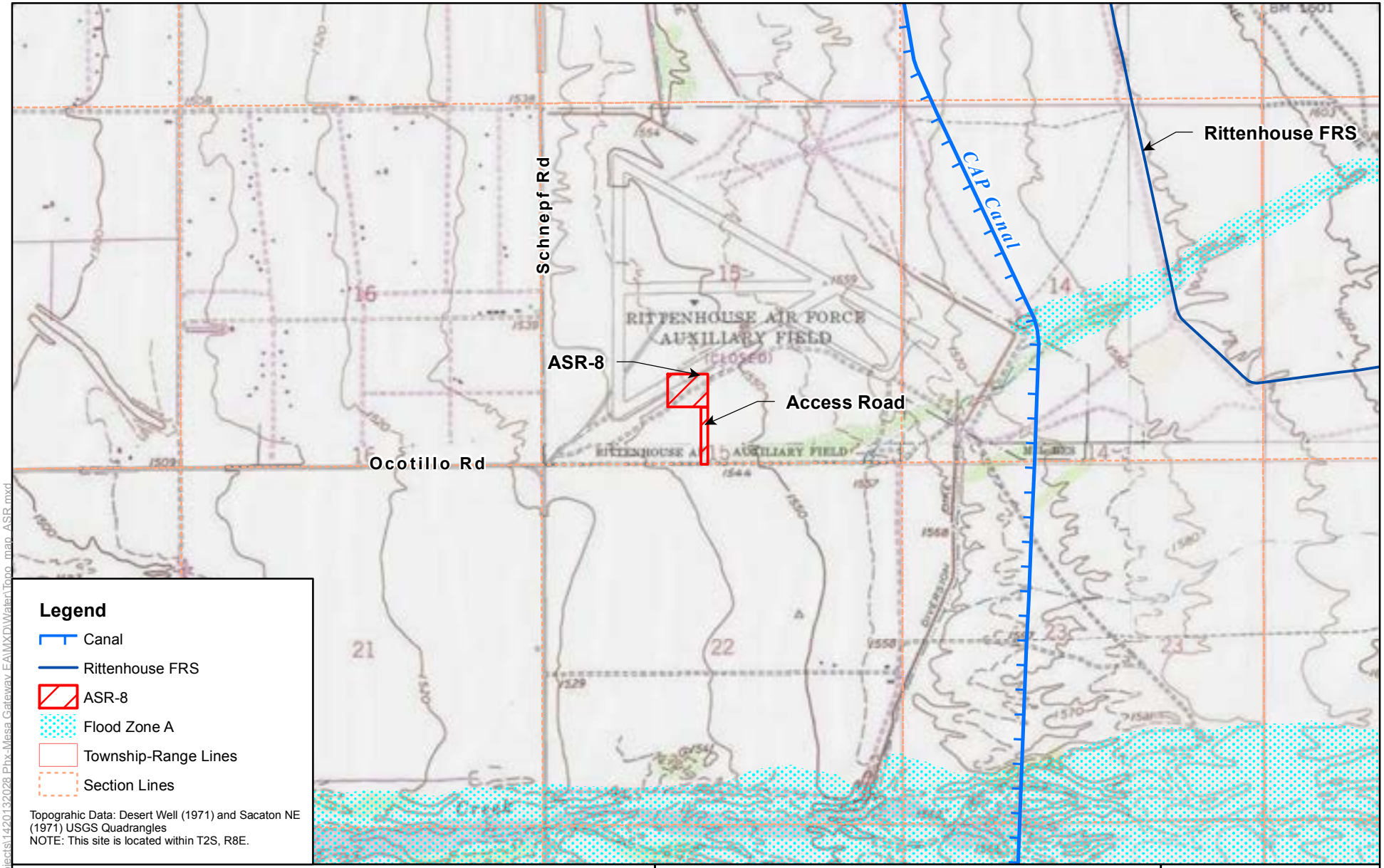

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Job No.	1420132028
PM:	KR
Date:	11/24/2014
Scale:	1" = 2000'

N

The map shown here has been created with all due and reasonable care and is strictly for use with AMEC Project Number 1420132028. This map has not been certified by a licensed land surveyor, and any third party use of this map comes without warranties of any kind. AMEC assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Topographic Map

FIGURE
3

amec

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APPENDIX B

USFWS INFORMATION, PLANNING, AND CONSERVATION (IPAC) SYSTEM SPECIES LIST FOR PROPOSED ASR PROJECT VICINITY

U.S. Fish and Wildlife Service

Trust Resources List

This resource list is to be used for planning purposes only — it is not an official species list.

Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

Arizona Ecological Services Field Office
2321 WEST ROYAL PALM ROAD, SUITE 103
PHOENIX, AZ 85021
(602) 242-0210
http://www.fws.gov/southwest/es/arizona/
http://www.fws.gov/southwest/es/EndangeredSpecies/lists/

Project Name:

ASR

U.S. Fish and Wildlife Service

Trust Resources List

Project Location Map:

Project Counties:

Pinal, AZ

Geographic coordinates (Open Geospatial Consortium Well-Known Text, NAD83):

MULTIPOLYGON (((-111.5242579 33.2531216, -111.5209105 33.2530535, -111.5209963 33.2511872, -111.5227988 33.251259, -111.5227129 33.2490339, -111.5242579 33.2490303, -111.5242579 33.2531216)))

Project Type:

Transportation

U.S. Fish and Wildlife Service

Trust Resources List

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of **6** threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section below for critical habitat that lies within your project area. Please contact the designated FWS office if you have questions.

Species that should be considered in an effects analysis for your project:

Birds	Status		Has Critical Habitat	Contact
Southwestern Willow flycatcher (*Empidonax traillii extimus*) Population: Entire	Endangered	species info	Final designated critical habitat	Arizona Ecological Services Field Office
Yellow-Billed Cuckoo (*Coccyzus americanus*) Population: Western U.S. DPS	Threatened	species info	Proposed critical habitat	Arizona Ecological Services Field Office
Fishes				
Roundtail chub (*Gila robusta*) Population: Lower Colorado River Basin DPS	Candidate	species info		Arizona Ecological Services Field Office
Mammals				
Lesser Long-Nosed bat (*Leptonycteris curasoae yerbabuenae*) Population: Entire	Endangered	species info		Arizona Ecological Services Field Office
Reptiles				
Northern Mexican gartersnake (*Thamnophis eques megalops*)	Threatened	species info	Proposed critical habitat	Arizona Ecological Services Field Office
Sonoran desert tortoise (*Gopherus morafkai*) Population:	Candidate	species info		Arizona Ecological Services Field Office

Critical habitats within your project area:

There are no critical habitats within your project area.

U.S. Fish and Wildlife Service

Trust Resources List

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program).

There are no refuges found within the vicinity of your project.

FWS Migratory Birds (USFWS Migratory Bird Program).

The protection of birds is regulated by the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. For more information regarding these Acts see: http://www.fws.gov/migratorybirds/RegulationsandPolicies.html.

All project proponents are responsible for complying with the appropriate regulations protecting birds when planning and developing a project. To meet these conservation obligations, proponents should identify potential or existing project-related impacts to migratory birds and their habitat and develop and implement conservation measures that avoid, minimize, or compensate for these impacts. The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

For information about Birds of Conservation Concern, go to:
http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BCC.html.

To search and view summaries of year-round bird occurrence data within your project area, go to the Avian Knowledge Network Histogram Tool links in the Bird Conservation Tools section at: http://www.fws.gov/migratorybirds/CCMB2.htm.

For information about conservation measures that help avoid or minimize impacts to birds, please visit:
http://www.fws.gov/migratorybirds/CCMB2.htm.

Migratory birds of concern that may be affected by your project:
There are **25** birds on your Migratory birds of concern list. The underlying data layers used to generate the migratory bird list of concern will continue to be updated regularly as new and better information is obtained. User feedback is one method of identifying any needed improvements. Therefore, users are encouraged to submit comments about any questions regarding species ranges (e.g., a bird on the USFWS BCC list you know does not occur in the specified location appears on the list, or a BCC species that you know does occur there is not appearing on the list). Comments should be sent to the ECOS Help Desk.

Trust Resources List

Species Name	Bird of Conservation Concern (BCC)	Species Profile	Seasonal Occurrence in Project Area
Bald eagle (*Haliaeetus leucocephalus*)	Yes	species info	Wintering
Bell's Vireo (*Vireo bellii*)	Yes	species info	Breeding
Bendire's Thrasher (*Toxostoma bendirei*)	Yes	species info	Year-round
Black-chinned Sparrow (*Spizella atrogularis*)	Yes	species info	Breeding
Brewer's Sparrow (*Spizella breweri*)	Yes	species info	Wintering
Burrowing Owl (*Athene cunicularia*)	Yes	species info	Year-round
Chestnut-collared Longspur (*Calcarius ornatus*)	Yes	species info	Wintering
Common Black-Hawk (*Buteogallus anthracinus*)	Yes	species info	Breeding
Elf Owl (*Micrathene whitneyi*)	Yes	species info	Breeding
Flammulated owl (*Otus flammeolus*)	Yes	species info	Breeding
Gila Woodpecker (*Melanerpes uropygialis*)	Yes	species info	Year-round
Gilded Flicker (*Colaptes chrysoides*)	Yes	species info	Year-round
Golden eagle (*Aquila chrysaetos*)	Yes	species info	Year-round
Le Conte's thrasher (*toxostoma lecontei*)	Yes	species info	Breeding
Lewis's Woodpecker (*Melanerpes lewis*)	Yes	species info	Wintering
Loggerhead Shrike (*Lanius ludovicianus*)	Yes	species info	Year-round
Lucy's warbler (*Vermivora luciae*)	Yes	species info	Breeding
Mountain plover (*Charadrius montanus*)	Yes	species info	Wintering
Peregrine Falcon (*Falco peregrinus*)	Yes	species info	Year-round
Prairie Falcon (*Falco mexicanus*)	Yes	species info	Year-round
Red-faced Warbler (*Cardellina rubrifrons*)	Yes	species info	Breeding

Trust Resources List

Short-eared Owl (*Asio flammeus*)	Yes	species info	Wintering
Sonoran Yellow Warbler (*Dendroica petechia ssp. sonorana*)	Yes	species info	Breeding
Swainson's hawk (*Buteo swainsoni*)	Yes	species info	Breeding
Williamson's Sapsucker (*Sphyrapicus thyroideus*)	Yes	species info	Wintering

NWI Wetlands (USFWS National Wetlands Inventory).

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

Data Limitations, Exclusions and Precautions
The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery and/or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

U.S. Fish and Wildlife Service

Trust Resources List

Exclusions - Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Precautions - Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC is unable to display wetland information at this time.

APPENDIX C

ARIZONA GAME AND FISH ONLINE ENVIRONMENTAL REVIEW TOOL

Arizona Environmental Online Review Tool Report

Arizona Game and Fish Department Mission
To conserve Arizona's diverse wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations.

Project Name:
PMGAA ASR

Project Description:
Proposed radar site per FAA requirements.

Project Type:
Transportation & Infrastructure, Airports, Construction of new runways, terminals/concourses, other facilities

Contact Person:
Theresa Price

Organization:
AMEC

On Behalf Of:
CONSULTING

Project ID:
HGIS-00091

Please review the entire report for project type and/or species recommendations for the location information entered. Please retain a copy for future reference.

Disclaimer:

1. This Environmental Review is based on the project study area that was entered. The report must be updated if the project study area, location, or the type of project changes.
2. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area. This review is also not intended to replace environmental consultation (including federal consultation under the Endangered Species Act), land use permitting, or the Departments review of site-specific projects.
3. The Departments Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. HDMS data contains information about species occurrences that have actually been reported to the Department. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HabiMap Arizona data, specifically Species of Greatest Conservation Need (SGCN) under our State Wildlife Action Plan (SWAP) and Species of Economic and Recreational Importance (SERI), represent potential species distribution models for the State of Arizona which are subject to ongoing change, modification and refinement. The status of a wildlife resource can change quickly, and the availability of new data will necessitate a refined assessment.

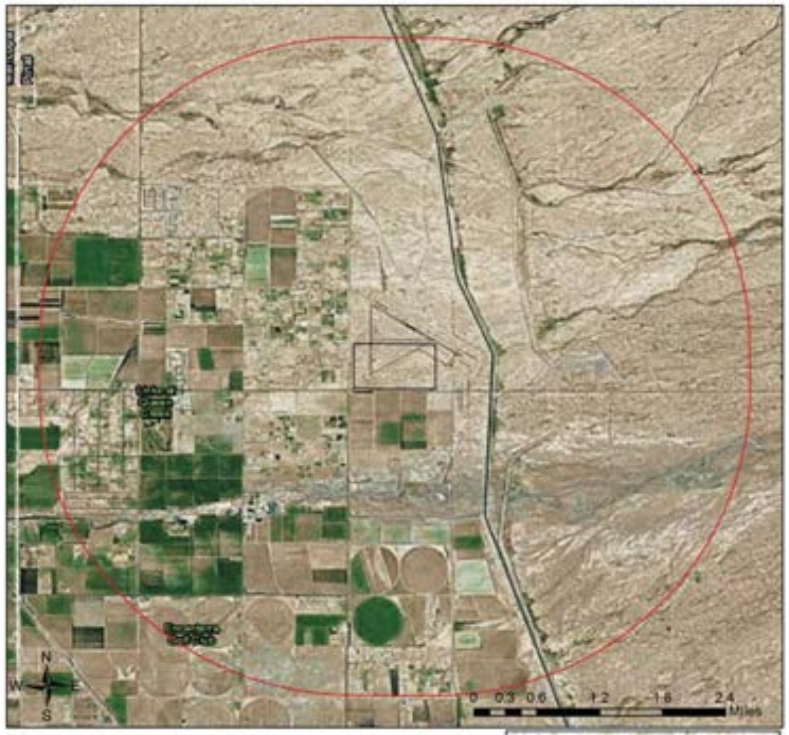
Locations Accuracy Disclaimer:
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

Recommendations Disclaimer:

1. The Department is interested in the conservation of all fish and wildlife resources, including those species listed in this report and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
2. Recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation).
3. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project. These recommendations are preliminary in scope, designed to provide early considerations on all species of wildlife.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. Further coordination with the Department requires the submittal of this Environmental Review Report with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map). Once AGFD had received the information, please allow 30 days for completion of project reviews. Send requests to:
   Project Evaluation Program, Habitat Branch
   Arizona Game and Fish Department
   5000 West Carefree Highway
   Phoenix, Arizona 85086-5000
   Phone Number: (623) 236-7600
   Fax Number: (623) 236-7366
   Or
   PEP@azgfd.gov
6. Coordination may also be necessary under the National Environmental Policy Act (NEPA) and/or Endangered Species Act (ESA). Site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies

PMGAA ASR

Aerial Image Basemap With Locator Map



Project Boundary

Buffered Project Boundary

Project Size (acres): 219.14

Lat/Long (DD): 33.2524 / -111.5208

County(s): Pinal

AGFD Region(s): Mesa

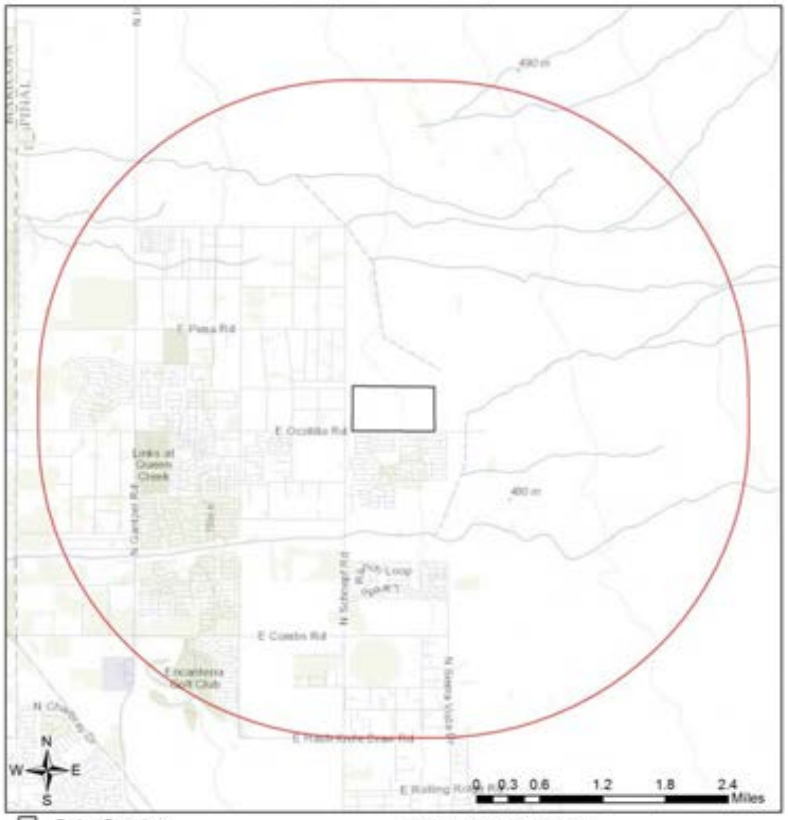
Township/Range(s): T2S, R8E

USGS Quad(s): DESERT WELL; SACATON NE

Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong),

PMGAA ASR

Web Map As Submitted By User



- Project Boundary
- Buffered Project Boundary

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Township/Range(s): T2S, R8E
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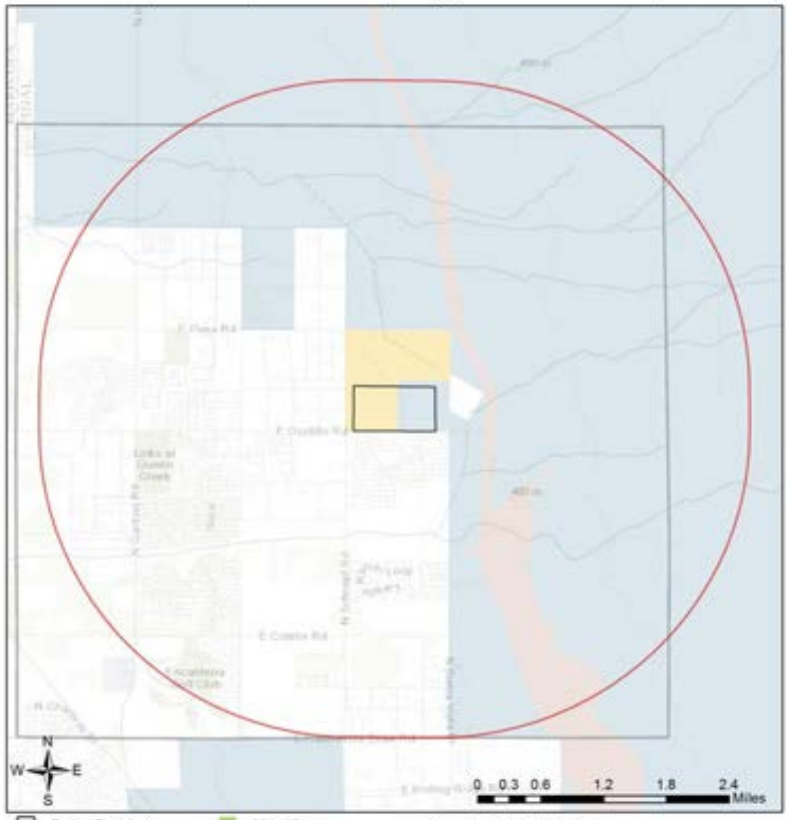
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

PMGAA ASR

Topo Basemap With Township/Ranges and Land Ownership



- Project Boundary
- Buffered Project Boundary
- Township/Ranges
- AZ Game and Fish Dept.
- BLM
- BOR
- Indian Res.
- Military
- Mixed/Other
- National Park/Mon.
- Private
- State and Regional Parks
- State Trust
- US Forest Service
- Wildlife Area/Refuge

Project Size (acres): 219.14
Lat/Long (DD): 33.2524 / -111.5208
County(s): Pinal
AGFD Region(s): Mesa
Township/Range(s): T2S, R8E
USGS Quad(s): DESERT WELL; SACATON NE

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Special Status Species and Special Areas Documented within 3 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	State	SGCN
Chionactis occipitalis klauberi	Tucson Shovel-nosed Snake	C*				1A

Note: Status code definitions can be found at http://www.azgfd.gov/w_c/edits/hdms_status_definitions.shtml.

Species of Greatest Conservation Need
Predicted within Project Vicinity based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	State	SGCN
Aix sponsa	Wood Duck					1B
Ammospermophilus harrisii	Harris' Antelope Squirrel					1B
Aquila chrysaetos	Golden Eagle	BGA		S		1B
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		1B
Botaurus lentiginosus	American Bittern				WSC	1B
Buteo regalis	Ferruginous Hawk	SC		S	WSC	1B
Chilomeniscus stramineus	Variable Sandsnake					1B
Chionactis occipitalis klauberi	Tucson Shovel-nosed Snake	C*				1A
Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)	LT	S		WSC	1A
Colaptes chrysoides	Gilded Flicker			S		1B
Coluber bilineatus	Sonoran Whipsnake					1B
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC	S	S		1B
Crotalus tigris	Tiger Rattlesnake					1B
Euderma maculatum	Spotted Bat	SC	S	S	WSC	1B
Eumops perotis californicus	Greater Western Bonneted Bat	SC		S		1B
Falco peregrinus anatum	American Peregrine Falcon	SC	S	S	WSC	1A
Gopherus morafkai	Sonoran Desert Tortoise	C*	S		WSC	1A
Haliaeetus leucocephalus	Bald Eagle	SC, BGA	S	S	WSC	1A
Heloderma suspectum	Gila Monster					1A
Incilius alvarius	Sonoran Desert Toad					1B
Kinosternon sonoriense sonoriense	Desert Mud Turtle			S		1B
Lasiurus blossevillii	Western Red Bat		S		WSC	1B
Lasiurus xanthinus	Western Yellow Bat		S		WSC	1B
Leopardus pardalis	Ocelot	LE			WSC	1A
Leptonycteris curasoae yerbabuenae	Lesser Long-nosed Bat	LE			WSC	1A
Lepus alleni	Antelope Jackrabbit					1B
Macrotus californicus	California Leaf-nosed Bat	SC		S	WSC	1B
Melanerpes uropygialis	Gila Woodpecker					1B
Melospiza lincolnii	Lincoln's Sparrow					1B
Melozone aberti	Abert's Towhee		S			1B
Micruroides euryxanthus	Sonoran Coralsnake					1B

Species of Greatest Conservation Need
Predicted within Project Vicinity based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	State	SGCN
Myotis occultus	Arizona Myotis	SC		S		1B
Myotis velifer	Cave Myotis	SC		S		1B
Myotis yumanensis	Yuma Myotis	SC				1B
Nyctinomops femorosaccus	Pocketed Free-tailed Bat					1B
Panthera onca	Jaguar	LE			WSC	1A
Passerculus sandwichensis	Savannah Sparrow					1B
Perognathus amplus	Arizona Pocket Mouse					1B
Phrynosoma solare	Regal Horned Lizard					1B
Phyllorhynchus browni	Saddled Leaf-nosed Snake					1B
Progne subis hesperia	Desert Purple Martin			S		1B
Setophaga petechia	Yellow Warbler					1B
Tadarida brasiliensis	Brazilian Free-tailed Bat					1B
Toxostoma lecontei	Le Conte's Thrasher					1B
Troglodytes pacificus	Pacific Wren					1B
Vireo bellii arizonae	Arizona Bell's Vireo					1B
Vulpes macrotis	Kit Fox					1B

Species of Economic and Recreation Importance Predicted within Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	State	SGCN
Callipepla gambelii	Gambel's Quail					
Odocoileus hemionus	Mule Deer					
Pecari tajacu	Javelina					
Zenaida asiatica	White-winged Dove					

Project Type: Transportation & Infrastructure, Airports, Construction of new runways, terminals/concourses, other facilities

Project Type Recommendations:

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife.

Consider impacts of outdoor lighting on wildlife and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use. Use only the minimum amount of light needed for safety. Narrow spectrum bulbs should be used as often as possible to lower the range of species affected by lighting. All lighting should be shielded, cantered, or cut to ensure that light reaches only areas needing illumination.

Consider tower designs and/or modifications that reduce or eliminate impacts to migratory birds (i.e. free standing, minimally lighted structures).

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (include spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

Based on the project type entered, coordination with State Historic Preservation Office may be required (http://azstateparks.com/SHPO/index.html).

Based on the project type entered, coordination with Arizona Department of Environmental Quality may be required (http://www.azdeq.gov/).

Based on the project type entered, coordination with U.S. Army Corps of Engineers may be required (http://www.usace.army.mil/)

Based on the project type entered, coordination with County Flood Control district(s) may be required.

Based on the project type entered, coordination with U.S. Fish and Wildlife Service (Migratory Bird Treaty Act) may be required (http://www.fws.gov/southwest/es/arizona/).

The Department requests further coordination to provide project/species specific recommendations, please contact Project Evaluation Program directly. PEP@azgfd.gov

Project Location and/or Species Recommendations:

HDMS records indicate that one or more listed, proposed, or candidate species or Critical Habitat (Designated or Proposed) have been documented in the vicinity of your project. The Endangered Species Act (ESA) gives the US Fish and Wildlife Service (USFWS) regulatory authority over all federally listed species. Please contact USFWS Ecological Services Offices at http://www.fws.gov/southwest/es/arizona/ or:

Phoenix Main Office	Tucson Sub-Office	Flagstaff Sub-Office
2321 W. Royal Palm Rd, Suite 103	201 N. Bonita Suite 141	SW Forest Science Complex
Phoenix, AZ 85021	Tucson, AZ 85745	2500 S. Pine Knoll Dr.
Phone: 602-242-0210	Phone: 520-670-6144	Flagstaff, AZ 86001
Fax: 602-242-2513	Fax: 520-670-6155	Phone: 928-556-2157
		Fax: 928-556-2121

APPENDIX D

SITE PHOTOGRAPHIC LOG

Photo 1. View of area of proposed access road to the ASR project site from the southern portion of the access road, facing north.

Photo 2. View of ASR project site; photo taken from the northeast portion of the project site, facing southwest.

Photo 3. View of northern portion of ASR project site; photo taken from the northwest portion of the project site, facing south.

Photo 4. View from the southwest portion of the project site, facing west.

APPENDIX E

USFWS THREATENED, ENDANGERED AND PROPOSED SPECIES EXCLUDED FROM FURTHER ANALYSIS

USFWS Threatened, Endangered and Candidate Species for ASR Project Vicinity, Pinal County, Arizona Excluded from Further Analysis			
Common/Scientific Name	**Federal Status**	**Habitat Requirement/Habitat Description**	**Exclusion Justification**
Fish			
Roundtail chub (*Gila robusta*)	Candidate	The roundtail chub occurs in the deepest pools and eddies of large streams and rivers at elevations between 1,000 and 7,500 feet amsl. This species occurs within the upper and lower Colorado, Little Colorado, Bill Williams and Gila river basins.	No suitable habitat in the project area.
Reptiles			
Sonoran desert tortoise (*Gopherus morafkai*)	Candidate	Sonoran desert tortoise occur primarily in rocky (often steep) hillsides and bajadas of Mohave and Sonoran desertscrub, but may encroach into desert grassland, juniper woodland, interior chaparral habitats, and even pine communities. Washes and valley bottoms may be useful in dispersal.	No suitable habitat in the project area. Heavily disturbed flat site with low vegetation density, surrounded by developed lands.
Northern Mexican gartersnake (*Thamnophis eques megalops*)	Threatened	The northern Mexican gartersnake is strongly associated with areas of permanent water with vegetation. Such areas can include stock tanks, ponds, streams, and riparian woodlands, including mesquite grassland and desert areas along valleys and streams. This snake preys on native fish and leopard frogs, amphibians, earthworms, and various other small animals near streams, lakes, and irrigation ditches. In Mexico, this snake is most active between March and November. The range for this species extends from central and southeastern Arizona and southwestern New Mexico southward through several Mexican states including but not limited to Sonora, Chihuahua, and Durango.	No suitable habitat in the project area. Heavily disturbed site surrounded by developed lands; no perennial water bodies on project site.

USFWS Threatened, Endangered and Candidate Species for ASR Project Vicinity, Pinal County, Arizona Excluded from Further Analysis			
Common/Scientific Name	**Federal Status**	**Habitat Requirement/Habitat Description**	**Exclusion Justification**
Birds			
Southwestern willow flycatcher (*Empidonax traillii extimus*)	Endangered	The southwestern willow flycatcher is a riparian obligate species that forages and nests in cottonwood-willow riparian habitats, open second-growth shrub thickets, swamps, and open woodlands. They nest primarily in riparian thickets, especially willow trees and shrubs. Southwestern willow flycatchers range from Southern California east across Nevada, Arizona, Utah and New Mexico to Texas. In Arizona, these flycatchers have been known to breed locally along the Colorado and Little Colorado rivers; along the middle Gila, Salt, and Verde rivers; the middle to lower San Pedro River; and the upper San Francisco River near Alpine.	No suitable habitat in the project area.
Yellow-billed cuckoo (*Coccyzus americanus*)	Candidate	The yellow-billed cuckoo occurs within large blocks of dense, wooded, streamside habitat (cottonwood, willow or tamarisk galleries) at elevations at or below 6,500 feet amsl. This species occurs throughout Arizona along major rivers and streams.	No suitable habitat in the project area.
Mammals			
Lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*)	Endangered	Habitat for this species generally consists of desertscrub where agave and columnar cacti are present that serve as food plants. Roosting during the day often occurs in caves and abandoned tunnels. Foraging at night typically occurs on nectar, pollen, and fruit of paniculate agaves and columnar cacti. This species is migratory and present in Arizona usually from April to September, staying south of the US/Mexico border for the remainder of the year.	No suitable habitat in the project area - no columnar cacti or paniculate agaves were observed in project area to provide foraging habitat.

Source: USFWS 2014b (Appendix B).

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Appendix C.4

U.S. Fish & Wildlife Service

Phoenix-Mesa Gateway Airport EA - RTN6 Alternative

IPaC Trust Resource Report

Generated January 11, 2016 03:33 PM MST, IPaC v2.3.2

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.

IPaC - Information for Planning and Conservation (http://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

US Fish & Wildlife Service

IPaC Trust Resource Report

NAME

Phoenix-Mesa Gateway Airport EA - RTN6 Alternative

LOCATION

Pinal County, Arizona

IPAC LINK

http://ecos.fws.gov/ipac/project/I4I4F-ANNWF-AZNEI-7LPCX-O2QJNU

U.S. Fish & Wildlife Contact Information

Trust resources in this location are managed by:

Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021-4915
(602) 242-0210

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require FWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list from the Regulatory Documents section in IPaC.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Birds

Yellow-billed Cuckoo Coccyzus americanus — Threatened

CRITICAL HABITAT
There is **proposed** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06R

Fishes

Roundtail Chub Gila robusta — Proposed Threatened

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E02Z

Mammals

Lesser Long-nosed Bat Leptonycteris curasoae yerbabuenae — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0AD

Reptiles

Northern Mexican Gartersnake Thamnophis eques megalops — Threatened

CRITICAL HABITAT
There is **proposed** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=C04Q

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/akn-histogram-tools.php

The following species of migratory birds could potentially be affected by activities in this location:

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Bell's Vireo Vireo bellii — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JX

Bendire's Thrasher Toxostoma bendirei — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0IF

Black-chinned Sparrow Spizella atrogularis — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0IR

Brewer's Sparrow Spizella breweri — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HA

Burrowing Owl Athene cunicularia — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0NC

Chestnut-collared Longspur Calcarius ornatus — Bird of conservation concern
Season: Wintering

Common Black-hawk Buteogallus anthracinus — Bird of conservation concern
Season: Breeding

Costa's Hummingbird Calypte costae — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JE

Elf Owl Micrathene whitneyi — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0GV

Gila Woodpecker Melanerpes uropygialis — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EH

Gilded Flicker Colaptes chrysoides — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EG

Golden Eagle Aquila chrysaetos — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DV

Lawrence's Goldfinch Carduelis lawrencei — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0J8

Le Conte's Thrasher toxostoma lecontei — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0GE

Lewis's Woodpecker Melanerpes lewis — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HQ

Loggerhead Shrike Lanius ludovicianus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY

Long-billed Curlew Numenius americanus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06S

Lucy's Warbler Vermivora luciae — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DL

Mountain Plover Charadrius montanus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B078

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Pinyon Jay Gymnorhinus cyanocephalus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0I0

Prairie Falcon Falco mexicanus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0ER

Red-faced Warbler Cardellina rubrifrons — Bird of conservation concern
Season: Breeding

Rufous-crowned Sparrow Aimophila ruficeps — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0MX

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Sonoran Yellow Warbler Dendroica petechia ssp. sonorana — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F7

Swainson's Hawk Buteo swainsoni — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B070

Western Grebe aechmophorus occidentalis — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EA

Willow Flycatcher Empidonax traillii — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F6

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

Refuge data is unavailable at this time.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

There are no wetlands in this location

Appendix D

Historical, Archaeological, Architectural, and Cultural Resources

D.1 Archaeological Survey: Northeast Area Development Alternative

D.2 Historic Buildings Inventory: Northeast Area Development Alternative

D.3 National Register of Historic Places Eligibility Testing: Northeast Area Development Alternative

D.4 Archaeological Survey: RTN6 Site Alternative

Appendix D.1

Archaeological Survey for the Phoenix-Mesa Gateway Northeast Area Development Plan, Mesa, Maricopa County, Arizona

Prepared for

Phoenix-Mesa Gateway Airport Authority

Prepared by

SWCA Environmental Consultants

January 2014

ARCHAEOLOGICAL SURVEY FOR THE PHOENIX-MESA GATEWAY NORTHEAST AREA DEVELOPMENT PLAN, MESA, MARICOPA COUNTY, ARIZONA

Prepared for

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SWCA Project No. 25809

SWCA Cultural Resources Report No. 14-20

January 2014

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PROJECT ABSTRACT

Report Title. Archaeological Survey for the Phoenix-Mesa Gateway Northeast Area Development Plan, Mesa, Maricopa County, Arizona

Report Date. January 2014

Agency Name. Federal Aviation Authority (FAA) (lead federal agency), U.S. Air Force (USAF), Arizona Department of Transportation (ADOT), City of Mesa

Permit Number. Arizona Antiquities Act Blanket Permit No. 2013-030bl

Project Description. Phoenix-Mesa Gateway Airport Authority (PMGAA) proposes the Northeast Area Development Plan (NADP), a phased development program for the Phoenix-Mesa Gateway Airport that would incrementally expand airport passenger terminal capacity to match facility needs as commercial airline traffic and passengers increase. The proposed facilities would be located northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel, south of Ray Road and west of Ellsworth Road. The project would also include the acquisition via a lease agreement of a 30-acre parcel of land that is owned and administered by ADOT, as well as associated improvements to City of Mesa–administered Hawes, Ray, and Ellsworth Roads.

The NADP requires approval from the FAA; therefore, it constitutes a federal undertaking subject to Section 106 of the National Historic Preservation Act of 1966, as amended. Additionally, the project is subject to the terms and conditions of a Programmatic Agreement (PA) between the USAF, the State Historic Preservation Office, and the Advisory Council on Historic Preservation regarding the treatment of historic properties on land that was formerly Williams Air Force Base (WAFB), including the entirety of the location of Phoenix-Mesa Gateway Airport (formerly known as Williams Gateway Airport). Previous cultural resources studies conducted in advance of the USAF's disposal of WAFB resulted in the identification of multiple historic properties and the development and execution of the PA.

The NADP Area of Potential Effects (APE) includes the approximately 700-acre parcel of PMGAA airport property located northeast of Runway 12L-30R, the 30-acre ADOT parcel proposed for lease, and sections of Hawes, Ray, and Ellsworth Roads right-of-ways that would include utility improvements supporting NADP. Ricondo and Associates, Inc.—the aviation consulting firm providing environmental planning services for PMGAA—contracted SWCA Environmental Consultants (SWCA) to conduct cultural resources surveys of the APE. Specifically, SWCA was tasked with conducting an archaeological survey and a historic buildings survey, updating the condition of previously known sites, evaluating all identified cultural resources for their eligibility to be listed on the National Register of Historic Places (NRHP), and assessing the effects of the project on NRHP-eligible properties. This report summarizes the results of the archaeological survey; the historic buildings inventory and summary report has been prepared as a separate document to address the standing architecture.

Project Number. Arizona State Museum (ASM) Accession No. 2013-0499

Land Ownership. PMGAA, ADOT, City of Mesa road right-of-way

Project Location. The project area is located in Sections 20, 21, 28, 29, and 33, Township 1 South, Range 7 East, Maricopa County, Arizona, Gila and Salt River Baseline and Meridian, on the U.S. Geological Survey Higley, Arizona, 7.5-minute quadrangle.

Number of Acres Surveyed. 596 acres

National Register of Historic Places (NRHP)-Listed Properties. One site—previously recorded site AZ U:10:127(ASM).

NRHP-Ineligible Properties. Nine sites—previously recorded sites AZ U:10:61(ASM), AZ U:10:64(ASM), AZ U:10:65(ASM), AZ U:10:66(ASM), AZ U:10:67(ASM), and AZ U:10:259(ASM); newly recorded sites AZ U:10:314(ASM), AZ U:10:315(ASM), and AZ U:10:318(ASM); and 70 isolated occurrences (IOs).

Properties of Indeterminate NRHP Eligibility. Five sites—newly recorded sites AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:319(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM).

Recommendations. SWCA's archaeological survey of the APE conducted for PMGAA resulted in the identification and recording of eight newly identified sites, seven previously recorded sites, and 70 IOs. One of the sites—AZ U:10:127(ASM)—is listed in the NRHP. Nine sites— previously recorded sites AZ U:10:61(ASM), AZ U:10:64(ASM), AZ U:10:65(ASM), AZ U:10:66(ASM), AZ U:10:67(ASM), and AZ U:10:259(ASM); and newly recorded sites AZ U:10:314(ASM), AZ U:10:315(ASM), and AZ U:10:318(ASM)—and the 70 IOs are recommended or have been previously determined ineligible for listing in the NRHP. Five sites—newly recorded sites AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:319(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM)—are of indeterminate NRHP eligibility.

Archaeological testing is recommended at the five sites of indeterminate eligibility for the purpose of determining the NRHP eligibility of these sites. For those sites determined to be eligible for the NRHP as a result of the testing, avoidance would be recommended, or if not feasible, a program of data recovery implemented to mitigate the adverse effects of development.

Multiple archaeological testing and data recovery projects have taken place at NRHP-listed AZ U:10:127(ASM). The entirety of the site within the NADP APE has been previously tested, identifying one area (Locus 2) containing buried archaeological features and requiring additional excavation mitigation if it cannot be avoided. Additionally, one cremation burial was identified within the site during a testing project in 1993 and was left in place. This feature should similarly be avoided or properly excavated and repatriated is avoidance is not feasible.

No further archaeological work is recommended for sites AZ U:10:61(ASM), AZ U:10:64(ASM), AZ U:10:65(ASM), AZ U:10:66(ASM), AZ U:10:67(ASM), AZ U:10:259(ASM), AZ U:10:314(ASM), AZ U:10:315(ASM), and AZ U:10:318(ASM) or for the 70 IOs. Nevertheless, unanticipated discoveries of cultural resources must be reported and handled in agreement with the terms of the PA. State burial laws still apply requiring that any discovery of human remains or sacred objects be reported. A burial agreement was executed in 1996 that applies to human remains discoveries on lands acquired from the disposal of WAFB, which constitutes a very high percentage of the NADP APE.

INTRODUCTION

Phoenix-Mesa Gateway Airport Authority (PMGAA) proposes the Northeast Area Development Plan (NADP), a phased development program for the Phoenix-Mesa Gateway Airport (the Airport) that would incrementally expand airport passenger terminal capacity to match facility needs as commercial airline traffic and passengers increase. The proposed facilities would be located northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel, south of Ray Road and west of Ellsworth Road. The project would also include the acquisition via a lease agreement of a 30-acre parcel of land that is owned and administered by the Arizona Department of Transportation (ADOT), as well as associated improvements to City of Mesa–administered Hawes, Ray, and Ellsworth Roads (Figure 1).

The NADP requires approval from the Federal Aviation Administration (FAA); therefore, it constitutes a federal undertaking subject to Section 106 of the National Historic Preservation Act of 1966, as amended. Additionally, the project is subject to the terms and conditions of a Programmatic Agreement (PA) between the U.S. Air Force (USAF), the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation regarding the treatment of historic properties on land that was formerly Williams Air Force Base (WAFB), including the entirety of the location of Phoenix-Mesa Gateway Airport (formerly known as Williams Gateway Airport). Previous cultural resources studies conducted in advance of the USAF's disposal of WAFB resulted in the identification of multiple historic properties and the development and execution of the PA.

The NADP Area of Potential Effects (APE) includes the approximately 700-acre parcel of PMGAA airport property located northeast of Runway 12L-30R, the 30-acre ADOT parcel proposed for lease, and sections of Hawes, Ray, and Ellsworth Roads right-of-ways that would include utility improvements supporting the NADP (Figure 2). Ricondo and Associates, Inc.—the aviation consulting firm providing environmental planning services for PMGAA—contracted SWCA Environmental Consultants (SWCA) to conduct cultural resources surveys of the APE. Specifically, SWCA was tasked with conducting an archaeological survey and a historic buildings survey, updating the condition of previously known sites, evaluating all identified cultural resources for their eligibility to be listed in the National Register of Historic Places (NRHP), and assessing the effects of the project on NRHP-eligible properties. This report summarizes the results of the archaeological survey; the historic buildings inventory and summary report has been prepared as a separate document to address the standing architecture (Steely 2013).

PROJECT LOCATION

The NADP APE is located in the city of Mesa, in the southeast Phoenix metropolitan area, in Sections 20, 21, 28, 29, and 33, Township 1 South, Range 7 East, Maricopa County, Arizona, Gila and Salt River Baseline and Meridian, on the U.S. Geological Survey (USGS) Higley, Arizona, 7.5-minute quadrangle (Figure 3). The APE includes land owned or administered by PMGAA, ADOT, and the City of Mesa (road right-of-way).

Figure 1. Project location.

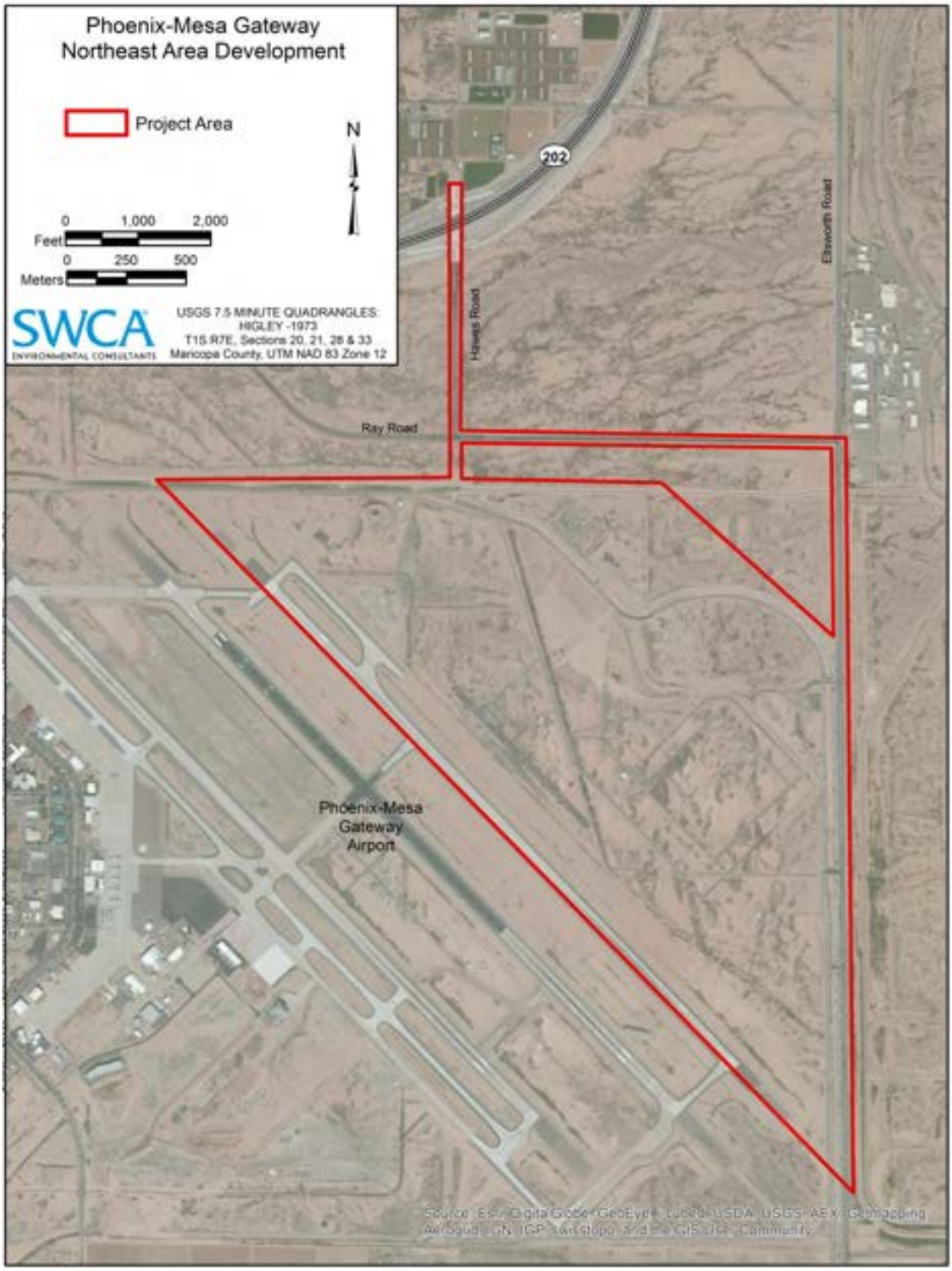

Figure 2. Northeast Area Development Plan APE.

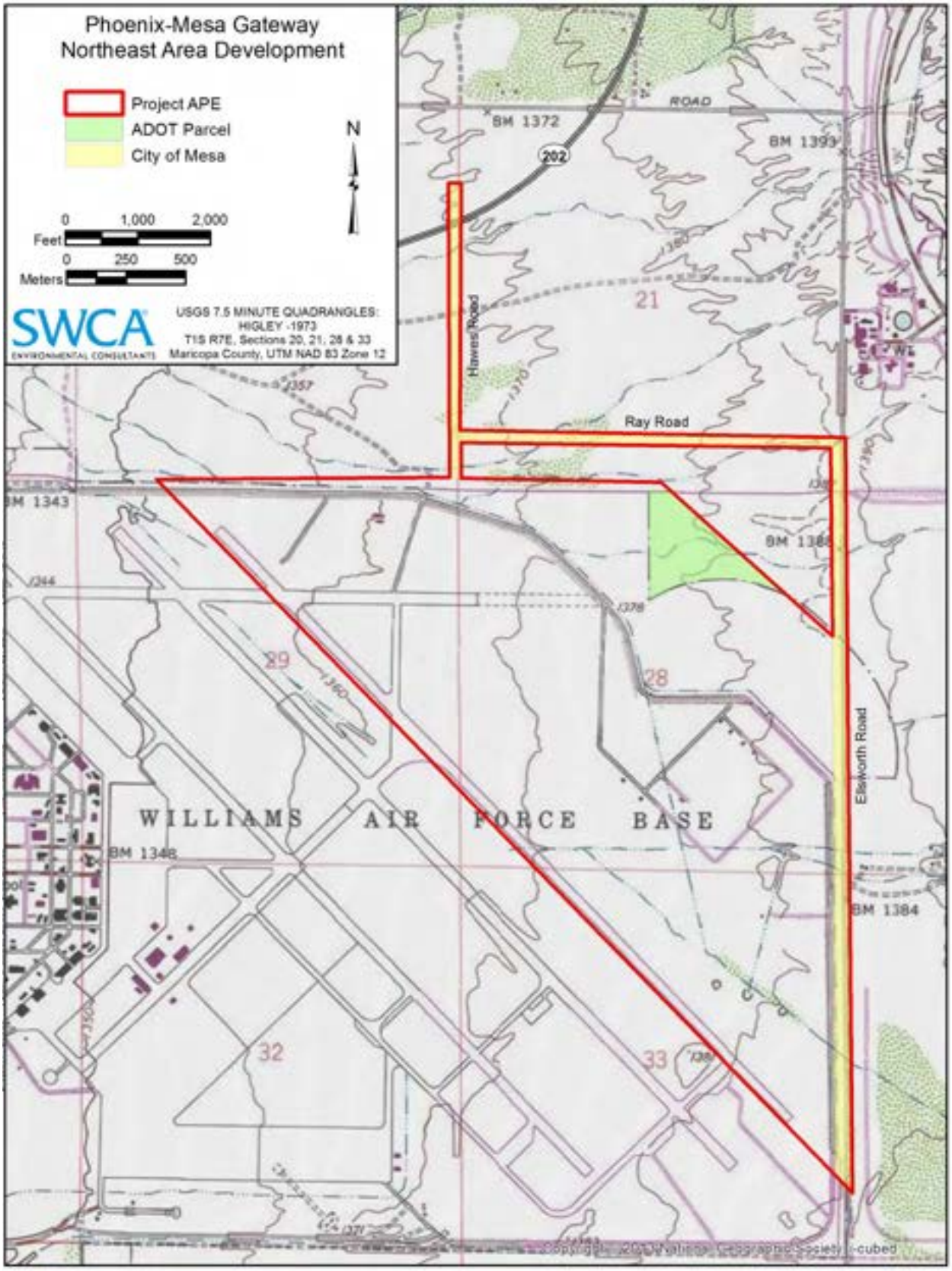

Figure 3. Northeast Area Development Plan APE and land ownership.

ENVIRONMENTAL SETTING

Phoenix-Mesa Gateway Airport is located in the southeastern part of the Phoenix Valley about 13 kilometers (km) (8 miles) north of the Santan Mountains and 21 km (13 miles) southwest of the Superstition Mountains. It is located along the northern edge of the Queen Creek delta—a broad alluvial fan fed by Queen Creek—where it abuts lower piedmont alluvium deposited by numerous, smaller unnamed drainages. The topography is nearly flat, sloping very gently to the west. Much of the Queen Creek delta was converted to farmland in historic times, and more recently to large residential developments. To this day, abundant farmland remains in cultivation just south of the airport.

Native vegetation in the project area is characteristic of the Lower Colorado River Subdivision of the Sonoran Desert (Brown 1994), although little native vegetation (primarily creosote bush-bursage and paloverde-cacti biotic communities) remains on the airport property. Annual average precipitation in this area is less than 20 centimeters (cm) (8 inches), most of which falls during summer monsoon thunderstorms. A second, less-severe period of precipitation occurs during the winter. Summer temperatures regularly exceed 38 degrees Celsius (100 degrees Fahrenheit) while winters are generally mild with few frost days.

CULTURE HISTORY

Although the region has a prehistory stretching back more than 10,000 years, to date the archaeological sites on the Airport appear to be associated with the later ceramic period Hohokam occupation of the area.

Paleoindian and Archaic Periods

The earliest documented human occupation of the Southwest occurred during the Paleoindian period, which is "well-documented from about 11,000 years ago to about 7,500 years ago" (Cordell 1997:99). Many Paleoindian sites have been identified in southern Arizona (Mabry 1998). However, evidence of Paleoindian occupation in central and south-central Arizona is relatively sparse and consists of isolated projectile points (Crownover 1994; Huckell 1982).

The Archaic succeeded the Paleoindian period and dates from around 5,500 B.C. to about A.D. 200 (Cordell 1997). The terminating dates are highly variable and are generally determined by the appearance of agriculture. Late Archaic sites have been investigated immediately north of the Phoenix Basin in the McDowell Mountains and Paradise Valley (Hackbarth 1999; RECON 1987; Stubing and Mitchell 1999).

Hohokam

The best-documented and most widespread archaeological remains in the Phoenix Basin are attributed to the Hohokam, prehistoric desert farmers who occupied much of central and southern Arizona (e.g., Bayman 2001; Crown and Judge 1991; Fish 1989; Gumerman 1991; Haury 1976). Although not necessarily recognizable as Hohokam, the earliest archaeological manifestation that probably gave rise to the Hohokam cultural tradition is assigned to the Red Mountain phase (A.D. 1–500) of the Pioneer period (A.D. 1–750) (Cable and Doyel 1987; Dean 1991; Hackbarth 1992, 2001; Morris 1969). Evidence from Red Mountain phase sites indicates that people subsisted on a mix of wild resources and agricultural products. Corn was the dominant crop, along with beans, squash, and cotton. The first evidence for canal irrigation along the Salt River is attributed to this time, A.D. 400 (Ackerly and Henderson 1989). Identified house forms include small circular and "bean-shaped" pit houses (Mabry 2000).

The period between A.D. 500 and 650 is defined as the Vahki phase. It appears that by this time, irrigation had become well established. Vahki phase canals have been identified at Snaketown (Haury 1976), as well as along the edges of the Salt River floodplain (Ackerly and Henderson 1989). Domestic architecture consists of square and rectangular pit houses of various sizes (Ciolek-Torrello et al. 2000; Crary and Craig 2001).

The late Pioneer period, A.D. 650 to 750, saw the appearance of decorated pottery in southern Arizona. Hohokam decorated pottery is characterized by red-painted designs on a light-colored buff or brown background (Abbott 2001; Haury 1976). The earliest decorated pottery types include Estrella, Sweetwater, and Snaketown Red-on-buff (Wallace 2001). House types associated with the late Pioneer period vary greatly. Small, domed field houses made from bent poles and covered with brush served as temporary shelters at agricultural fields or at resource procurement and processing sites. Few artifacts are associated with the remains of these structures. Late Pioneer period habitation sites, on the other hand, contained moderate -size pit structures with square or rectangular floor plans and formal, plastered hearths. These were far more substantial than the field houses and were occupied for extended periods.

Late Pioneer period subsistence practices included dependence upon a mixture of wild resources and agricultural produce. The use of canals continued and irrigation expanded from the floodplains to include lands on terraces above rivers (Ackerly and Henderson 1989). Along with the continued use of floodplain fields, the canals allowed irrigation water to reach the terraces above the river.

The Gila Butte and Santa Cruz phases make up the Colonial period (A.D. 750–950). This was a time of expansion and elaboration of Hohokam culture. There were more sites and their distribution across the landscape increased considerably. Colonial period Hohokam artifacts have been found as far north as Prescott in north-central Arizona, south into northern Mexico, to the west of Gila Bend in southwestern Arizona, and east into New Mexico (Haury 1976). Abbott (1994, 2001) argues that the center for most of the decorated buff ware vessels produced during this time was in the area of the middle Gila River valley. Not only did the Hohokam expand their territory, their contact with their neighbors also increased. Intrusive ceramics from the north, east, and west have been found in Hohokam sites dating to this time. In fact, it is argued that Colonial period Hohokam social organization was tied to the exchange of ritual and subsistence goods (e.g., Doyel 1985). Across Arizona, interaction spheres dominated the social landscape and facilitated exchange across the region. It is during this time that the Hohokam achieved their highest level in the production of arts and crafts. Ceramics were well made and elaborately decorated, as was shell jewelry.

The large, square communal structures found in earlier times ceased to be built during the Colonial period. Instead, ball courts, which were probably first built in the early A.D. 800s, became the dominant form of public architecture (Wallace 2001). Their appearance in southern Arizona is thought to mark the emergence of a regional system with religious, economic, and political links that crosscut geographical boundaries (Abbott 2001; Wilcox and Shenk 1977). Subsistence remained based on a mixture of wild resources and agricultural crops, although some wild species (e.g., little barley) were so intensively exploited that they appear to become as important as some of the domesticates (Bohrer 1987). The use of irrigation expanded significantly with the construction and maintenance of canals having a significant impact on Hohokam social and political organization (e.g., Abbott 2000). Canal systems, many of which remained in use for generations, were constructed throughout the Salt and Gila River valleys (e.g., Breternitz 1991; Howard 1990; Howard and Huckleberry 1991).

With the onset of the Sedentary period (Sacaton phase, A.D. 950–1150), there was a decline in the quality of Hohokam material culture, especially in the production of ceramics and shell ornaments. Ball courts were still the dominant form of public architecture during the Early Sedentary period; however, by its end, few were being built. As the construction of ball courts diminished, the construction of capped

mounds or platform mounds became more common. Platform mounds were built near village centers around plazas that are surrounded by domestic features. House types exhibit significant variability and are aggregated within courtyard groups or village segments (Wilcox et al. 1981).

Subsistence continued to be based on agriculture, although there was some emphasis on the collection of certain wild plant species, in particular cholla. The production of cotton (its fiber for use in the weaving of textiles and its seeds as food) was also of major importance.

By the end of the Sedentary period, a major reorganization of Hohokam society had occurred. After a period of intensive growth and expansion, many village sites and areas were abandoned. Populations tended to begin to concentrate in larger villages along the Salt River. These changes in the social and political environment were reflected in concomitant changes in public architecture and ceramic production and shell ornament manufacturing. Additionally, there was an increase in population and increasing concentration of the population.

The Sedentary period is followed by the Classic period, which is divided into the Soho (A.D. 1150–1300) and the Civano phases (A.D. 1300–1450). Differences in ceramic decoration and architectural styles separate these two phases. Although they occur in lower frequencies, red-on-buff ceramics continue to be produced during the Soho phase. Red wares become increasingly common and the introduction of long-necked jars marks a clear contrast with the earlier ceramic styles. Structures with post-reinforced adobe walls and surface structures were common during the Soho phase. However, during the Civano phase, adobe compounds—often containing small plazas—and adobe structures were built and used to the near exclusion of semi-subterranean structures. Puddled and coursed adobe construction generally replaced the use of structures with pole-reinforced walls, and the number and proximity of rooms within compounds increased.

Public architecture also underwent a change in the early Classic period. There was a significant increase in the construction and use of platform mounds during the Classic period (Gregory et al. 1988). At the same time, the construction of ball courts declined to its lowest point. The apex of public architecture was achieved in the Civano phase with the building of “big houses.” The only remaining example of a big house is found today at Casa Grande Ruins on the outskirts of Coolidge. These structures likely served multiple functions. It is argued that they were clear symbols of elite status in Hohokam society (Wilcox and Shenk 1977). Big houses often co-occurred with platform mounds, with the two being separated by a site's central plaza. The appearance of the big house is as mysterious as their disappearance. Their construction and use may have been the result of changes within Hohokam society, and their abandonment may have been tied to attacks from outsiders (e.g., Teague 1989; Wilcox and Shenk 1977).

Red wares and the disappearance of plain wares mark the Civano phase, although plain wares continue to dominate the total ceramic assemblage. Polychrome pottery (in particular, Gila and Tonto polychromes) and local imitations were present after A.D. 1320 (Reid and Whittlesey 1992).

Canal irrigation continued to be very important during the Civano phase. The Civano phase Hohokam depended greatly upon corn, beans, and squash as the mainstays of their diet. Corn was certainly the most common domesticate, although the abundance of agave at many sites indicates it too played a significant role in Civano phase subsistence activities. At some sites, during the late Classic period, the use of agave became increasingly important and the availability of agricultural produce declined (e.g., Miller 1994).

Hohokam social organization during the Civano phase was clearly different from what preceded it and from what was to follow. Population size and density at many of the large sites in the Salt River valley reached never-before-seen levels. Although the level of social and political organization actually achieved by the Hohokam is open to much debate, some increase in social complexity was undoubtedly necessary

to manage the higher population densities that developed. This may have been expressed in the construction and use of platform mounds and big houses.

The post-Classic period (A.D. 1450–1540) in the Phoenix Basin, referred to by some as the Polvorón phase, is somewhat of a hazy gap between the late Classic period Hohokam and the arrival of the first Europeans (Bayman 2001). Nevertheless, the traits used to identify the Polvorón phase include jacal structures, polychrome ceramics, and the presence of an abundance of obsidian. However, many argue that these characteristics are not sufficient to distinguish the Polvorón phase from the late Civano phase. Additionally, chronological dates currently available for the Polvorón phase are imprecise, thus making it difficult to distinguish Civano and Polvorón phase sites from one another (see Dean 1991:87).

By the late Civano phase the success the Hohokam had enjoyed had vanished. High population densities, depletion of food resources, decline in agricultural productivity, disease and malnutrition, flooding, drought, and the collapse of many irrigation systems are cited for the collapse of the Hohokam (e.g., Bayman 2001; Van Gerven and Sheridan 1994). Nevertheless, Bayman (2001) points out that the Hohokam may have persisted until the early 1500s, and that the debate over the cause or causes for the decline and disappearance of the Hohokam is far from resolved. Some have even argued that Hohokam and Salado peoples may have directly encountered the Spanish (Reff 1992).

Following the collapse of the Hohokam regional system, Akimel O'odham (Pima) and Tohono O'odham (Papago) groups lived in the middle Gila River valley. For unknown reasons, the Salt River valley was either used sparingly or was abandoned following the Hohokam collapse. Akimel O'odham and Tohono O'odham groups lived in small rancherías, subsisting on agricultural products, wild plant foods, and game. The Pee Posh (Maricopa), who were migrants from the Gulf of California area, formed an alliance with the Pima in the early 1800s and have lived in the Salt-Gila Basin ever since. All these groups continue to occupy the area, living on several reservations.

Historic Period

Spanish, Mexican, and Euro-American factions began to arrive in appreciable numbers in the eighteenth century. Most of these early expeditions followed either the Santa Cruz or San Pedro Rivers up to the Gila River before turning westward. The ensuing period of historical exploitation was marked by mining, ranching, and homesteading interests. These historical pursuits included the construction of new canals, as well as the reuse of prehistoric ones.

Sylvester Pattie and James Ohio Pattie were the first Euro-Americans to pass through the Phoenix Basin in 1826. On February 2, 1848, the Treaty of Guadalupe Hidalgo was signed. Its provisions called for Mexico to cede 55 percent of its territory (present-day Arizona, California, New Mexico, and parts of Texas, Colorado, Nevada, and Utah) in exchange for $15 million in compensation. Thus, in 1848, the United States acquired most of what is now Arizona, and the rest was bought with the Gadsden Purchase in 1854. Through the mid-1800s, numerous Euro-American explorers and surveyors crossed Arizona, but again, the Phoenix Basin was bypassed (Cross et al. 1960; Trimble 1977; Wagoner 1989; Walker and Bufkin 1979).

The early development and growth of central Arizona during the late 1800s and early 1900s was a direct response to national economic stimuli. The discovery of gold in the Bradshaw Mountains in 1863 drew miners, the military, ranchers, and entrepreneurs to the region (Mawn 1977; Zarbin 1978). In 1889, Phoenix became the permanent capital, and in 1912, Arizona became a state (Luckingham 1989).

Phoenix

The genesis of modern Phoenix lies with Jack Swilling of Wickenburg. After organizing the Swilling Irrigation Canal Company, Jack Swilling moved to the valley in 1867 and began opening a canal to divert water from the Salt River (Zarbin 1997). Most canals in the Phoenix Basin were constructed and operated by companies. Approximately 15 major canals had appeared by 1888, with more than 400,000 acres under cultivation. Components of these systems were acquired by the federal government beginning in 1902, and under a 1917 agreement, the system is now managed by the Salt River Project.

By 1868, a small colony had arisen about 4 miles east of where Phoenix is centered today. On May 4, 1868, Phoenix was officially recognized when it became an election precinct within Yavapai County. A post office was established on June 15 of the same year, with Jack Swilling as the postmaster. In the early 1870s, the town center officially shifted to the area around present-day Washington Street and Central Avenue. By 1880, Phoenix had a population of approximately 1,700 and Mesa about 1,000, and Hayden's Ferry, later to become known as Tempe, was emerging as a farming and trading center. The entire area developed into an extensive farmland of citrus orchards and cotton and lettuce fields. Territorial Governor John C. Fremont signed a bill incorporating the City of Phoenix on February 25, 1881.

The southern transcontinental railroad (Southern Pacific) ran considerably south of Phoenix. However, goods were transported to the Phoenix area via freight teams. It was not until July 1887 that the railroad arrived in Phoenix. In 1895, a second railroad linked Phoenix with the northern Arizona transcontinental railroad (Atlantic-Pacific). These railroads greatly reduced the costs of goods coming into the area. Construction of flood controls on Cave Creek prompted further development of the western valley in the early 1900s (Hackbarth 1995). During the 1870s and 1880s, demand for Arizona's gold and silver grew, as did the demand for the valley's agricultural produce (Morrow 1943).

In the 1880s, Phoenix began to take on the aura of a city, as sewer and water systems were begun and roadways expanded. In the late 1890s and early 1900s, national demand for Arizona's resources once again stimulated economic growth in the area (Morrow 1943). The construction of Roosevelt Dam in the early 1900s resulted in a boom in agriculture in the Phoenix Basin (Luckingham 1989), and the Enlarged Homestead Act of 1909 encouraged settlement of the arid lands around Phoenix.

The Higley area, which later became part of Gilbert, Mesa, Queen Creek, and the Phoenix-Mesa Gateway Airport, was primarily settled after about 1900. Several families moved to the area near Higley and Williams Field Road to farm or raise livestock under the National Homestead Act of 1862, the Desert Lands Act of 1877, the Enlarged Homestead Act of 1909, and later the Stock-Raising Homestead Act of 1916 (the Dry Farming Homestead Act) (Bureau of Land Management 2009; Stein 1990:4–6). Higley was named after Stephen Weaver Higley, a railroad man who helped build the Santa Fe Railway (Pickett 1996:264; Queen Creek 2009). Higley, who was an owner of the *Arizona Republican* newspaper, bought 8,300 acres of land where Higley is today with the idea of farming the land. The first post office at Higley was established in the Higley general store in 1910, on the original townsite of 40 acres.

Williams Air Force Base

Williams Field of World War II was one of hundreds of training and defense airfields constructed in the continental United States for the 1940s war effort (Thole 1996:147–155). The twin-engine fighter-aircraft pilot training field in Arizona's Salt River Valley desert near Higley, Chandler, and Mesa was completed in December 1941, just before the United States entered the war. Williams Field joined some 15 Army Air Fields newly built in Arizona to train the war's pilots, mechanics, gunnery technicians, flight controllers, and other aviation soldiers. The U.S. Army Air Corps named the field in February 1942 for an

Arizona-native military pilot, Charles Linton Williams, killed in 1927 during training in Hawaii (Woodward et al. 1992:8–9,12).

In July 1945, the final year of World War II, Williams Field hosted the Army Air Force's first pilot-training program for the new Lockheed P-80 Shooting Star single-engine, single-seat jet fighter aircraft (Woodward et al. 1992:10). When the war ended in September 1945 and the vast majority of military training bases demobilized across the nation, Williams Field remained in service, in large part because of its next-generation jet-aircraft training role and its year-round favorable flying weather (USAF Civil Engineer Center 2013).

Following creation of the USAF in 1947, the newly renamed Williams Air Force Base hosted the USAF's only advanced single-engine jet program, under command of the 3525th Pilot Training Wing. With advent of the Cold War in 1948 during the Soviet Union's Berlin blockade and U.S.-assisted airlift, WAFB became part of a revived national system of fighter-aircraft training programs. In 1949, WAFB trainees first flew the new T-33 two-seat jet trainer, based on the P-80 frame and engine. The Korean War, beginning in 1950, galvanized WAFB's continuing role in the larger global Cold War over the next three decades, supplying pilots for other European emergencies, the Cuban missile crisis, Viet Nam, and finally the accelerated arms race of the 1980s (USAF Civil Engineer Center 2013).

With the fall of the Berlin Wall in 1989, and the successful Iraq War and collapse of the Soviet Union both in 1991, the U.S. Department of Defense celebrated victory in the Cold War and updated its service doctrines. In 1990, Congress initiated the Base Realignment and Closure (BRAC) Act, which scheduled WAFB for closure in 1993.

PREVIOUS RESEARCH

AZSITE and National Register of Historic Places Research

Before fieldwork, SWCA consulted the AZSITE database, which includes records from the Arizona State Museum (ASM), Arizona State University, and the Bureau of Land Management, for previously conducted surveys and previously recorded sites in the project area and within a 1-mile radius of the project area. The National Park Service National Register Information Systems Database was also consulted for NRHP-listed properties or districts within a 1-mile (1.6-km) radius of project area. Additionally, archaeological reports prepared for the State Route 24 Gateway Freeway project were also reviewed (Langan 2011; Langan and Rehar 2010).

The records search indicates that 24 archaeological projects have been conducted within 1 mile (1.6 km) of the NADP APE (Table 1; Figure 4). Approximately 75 percent of the land within a 1-mile (1.6-km) radius of the project area has been archaeologically surveyed, including the entirety of the NADP APE.

The records search identified 32 archaeological sites within 1 mile (1.6 km) of the NADP APE, as well as one building that is listed in the NRHP (Table 2; see Figure 4). These sites comprise primarily limited activity prehistoric Hohokam sites, although larger Hohokam agricultural hamlets and habitation sites as well as historic homesteading sites are also represented. The NRHP-listed historic building is a historic hangar associated with the former WAFB (Hangar S-46), located along South Sossaman Road.
The building is a "demountable hangar" constructed by Del Webb Construction Company in January 1942. The structure was designed by the U.S. Army Corps of Engineers, Los Angeles office in June 1941. The hangar was listed under Criteria A—under the areas of significance of Community Planning and Development and Military, and Criteria C—under the area of significance of Engineering. The hangar has been reused for storage of customers' transient aircraft. The hangar is outside the NADP APE.

Table 1. Previous Archaeological Surveys within a 1-mile (1.6-km) Radius of the Project Area

Agency Number	Survey Name	Institution
1980-217.ASM	Proposed Alcohol Distillery	Complete Archaeological Service Associates
1984-112.ASM	HTL State Land Survey	Archaeological Consulting Services, Ltd. (ACS)
1986-238.ASM	Southwest Loop Highway	Dames & Moore, Inc.
1987-153.ASM	Williams Air Force Base Monitoring	ASM
1992-331.ASM	Williams Air Force Base Testing	SWCA
1993-299.ASM	200 Acres near Ray and Hawes Roads, City of Mesa	SWCA
1994-308.ASM	Ellsworth Road between Warner and Guadalupe	Soils Systems, Inc.
1997-502.ASM	Williams Gateway Airport Data Recovery	Dames & Moore, Inc.
1998-420.ASM	Ellsworth (Baseline to Germann) Environmental Overview	Logan Simpson Design, Inc.
1999-25.ASM	Santan Freeway: Price-Superstition Freeways	ACS
2000-23.ASM	Elliot Road Detention Basin and Outfall Channel	Scientific Archaeological Services
2000-525.ASM	Ellsworth Road Survey	SWCA
2001-627.ASM	Casey to Cooley Survey	Desert Archaeology, Inc.
2002-108.ASM	Germann 80 Acre Survey	SWCA
2004-758.ASM	Warner-Ellsworth Substation Survey	Desert Archaeology, Inc.
2004-1791.ASM	230 Acres at Hawes and 202 (Future)	SWCA
2005-1295.ASM	Williams Gateway Airport VORTAC Monitoring	ACS
2007-114.ASM	GM Proving Ground Survey	Northland Research, Inc.
2010-0010.ASM	SR 802; Williams Gateway Freeway, SR 202 to Ironwood Drive	AZTEC Engineering
2011-0301.ASM	SR 24; Gateway Freeway, SR 202 to Ironwood Drive	AZTEC Engineering
2011-616.ASM	MCDOT Phase 1 Roads	Soils Systems, Inc.
7.2513.SHPO	Unknown	–
7.3348.SHPO	Ellsworth Road Survey	–
78-057.ASU	Unknown	–

Table 2. Previously Recorded Archaeological Sites within a 1-mile (1.6-km) Radius of the Project Area

Site Number	Site Description	NRHP Eligibility*
AZ U:10:25(ASU)	Historical house foundation with can scatter	Not evaluated
AZ U:10:26(ASM)	Multicomponent site comprising Hohokam artifact scatter with thermal features and historical field irrigation system with trash	Not individually eligible (SHPO)
AZ U:10:28(ASM)	Prehistoric Hohokam ceramic and flaked stone artifact scatter	Not individually eligible (SHPO)
AZ U:10:29(ASM)	Historic farmstead	Not evaluated
AZ U:10:30(ASM)	Prehistoric Hohokam ceramic and flaked stone artifact scatter	Not evaluated
AZ U:10:56(ASM)	Prehistoric Hohokam ceramic and flaked stone artifact scatter	Individually eligible (SHPO)
AZ U:10:57(ASM)	Prehistoric Hohokam ceramic, flaked stone, and shell artifact scatter	Individually eligible (SHPO)

Table 2. Previously Recorded Archaeological Sites within a 1-mile (1.6-km) Radius of the Project Area (Continued)

Site Number	Site Description	NRHP Eligibility*
AZ U:10:58(ASM)	Prehistoric Hohokam ceramic and flaked stone artifact scatter	Individually eligible (SHPO)
AZ U:10:59(ASM)	Prehistoric Hohokam ceramic and flaked stone artifact scatter	Individually eligible (SHPO)
AZ U:10:60(ASM)	Prehistoric Hohokam ceramic and flaked stone artifact scatter	Eligible (SHPO)
AZ U:10:61(ASM)	Multicomponent site comprising Hohokam artifact scatter and historic homestead	Delisted
AZ U:10:62(ASM)	Prehistoric Hohokam ceramic, flaked stone, and ground stone artifact scatter	Unknown
AZ U:10:63(ASM)	Prehistoric ceramic and flaked stone artifact scatter with bedrock grinding feature and projectile point; eroding out of bank	Not evaluated
AZ U:10:64(ASM)	Multicomponent site comprising Hohokam artifact scatter and historical trash scatter with barbed-wire fence	Not individually eligible (SHPO)
AZ U:10:65(ASM)	Limited activity Hohokam site	Delisted
AZ U:10:66(ASM)	Limited activity Hohokam site	Delisted
AZ U:10:67(ASM)	Limited activity Hohokam site	Not individually eligible (SHPO)
AZ U:10:68(ASM)	Multicomponent site comprising Hohokam artifact scatter and historic homesteading component	Delisted
AZ U:10:69/127(ASM)	Large Hohokam farmstead/habitation	Listed (SHPO)
AZ U:10:74(ASM)	Prehistoric Hohokam ceramic and flaked stone artifact scatter	Not evaluated
AZ U:10:77(ASM)	Linear depression recorded as possible archaeological feature but later determined to be a natural channel	Delisted
AZ U:10:87(ASM)	Historical trash scatter and concrete footings features	Not evaluated
AZ U:10:88(ASM)	Historical trash scatter/probable homesteading debris	Not evaluated
AZ U:10:89(ASM)	Prehistoric Hohokam ceramic scatter with sparse flaked stone and ground stone	Not individually eligible (SHPO)
AZ U:10:225(ASM)	Prehistoric Hohokam artifact scatter	Not evaluated
AZ U:10:229(ASM)	Prehistoric Hohokam hamlet or small village	Not evaluated
AZ U:10:230(ASM)	Early 1950s General Motors proving grounds	Not evaluated
AZ U:10:259(ASM)	Prehistoric Hohokam ceramic and flaked stone artifact scatter	Eligible (SHPO) (has undergone recent data recovery)
AZ U:10:260(ASM)	Prehistoric Hohokam artifact scatter	Indeterminate (Langan and Rehar 2010)
AZ U:10:268(ASM)	Prehistoric Hohokam artifact scatter and Historic-era Euro-American artifact scatter	Indeterminate (Langan and Rehar 2010)
AZ U:10:275(ASM)	Prehistoric Hohokam habitation site	Eligible (Langan and Rehar 2010)
AZ U:10:289(ASM)	Historical livestock tanks	Not eligible (Langan 2011)
Hangar S-46	World War II-era demountable hangar	Listed

Shading indicates a site within the current project area

* Data were obtained from AZSITE and may represent SHPO determinations or recorder recommendations.

Historical Map Research

General Land Office Map Research

In addition to the archaeological records search, General Land Office (GLO) maps were also consulted for the project area. Two GLO maps of Township 1 South, Range 7 East are available. One map, filed in 1870, is featureless. The map filed in 1913 depicts substantial changes resulting from homesteading within the APE, manifested on the map by cultural features including roads, houses, wells, and a fenced area.

Historical Topographic Map Research

Four historical topographic maps are available for the APE and were also consulted for historical features in or near the project area. The 1904 Desert Well, AZ 15-minute topographic quadrangle depicts a series of northwest-southeast-trending, parallel roads crossing through the north half of Section 29, the south half of Section 28, and the northeast quarter of Section 33. No other features are present. Three 7.5-minute quadrangles are available for the project area: Higley, AZ, dated 1956 (topographic quadrangle), 1971 (orthophoto quadrangle), and a 1981 photorevision of the 1956 topographic map. The 1956 quadrangle depicts WAFB and associated facilities occupying Sections 28, 29, and 33. The 1971 orthophotoquad shows the southeast extension of the runways, a new runway (currently Runway 12L-30R), and modifications to the perimeter flood-control structures. The 1981 map is similar to the 1971 orthophoto, except fewer roads are shown in the NADP APE.

Flood-Control Structure Research

Phoenix-Mesa Gateway Airport is located at the interface between the Queen Creek delta and the lower bajada of the Superstition Mountains. Historically, the delta area was prone to flooding when Queen Creek and Sonoqui Wash overtopped their channels and when sheet flooding resulted on the lower bajada in response to heavy rains in the Superstition Mountains. Keane (2000:149–156) summarizes some of the early attempts at managing floodwaters in the Queen Creek delta and provides several photographs of the historic August 19–20, 1954 flood that caused extreme damage to irrigation structures of the Queen Creek Irrigation District and the Roosevelt Water Conservation District, as well as to WAFB, where a 7-foot-tall earthen dike was both overtopped and breached. Although damaging floods occurred on the Queen Creek delta every 2 years or so, none had caused such devastation as this flood (Keane 2000:151). In response to the flood, the Whitlow Ranch Dam—a project that had been under consideration by the U.S. Corps of Engineers since the mid 1940s—was finally constructed on Queen Creek in 1960. More recently, and perhaps having a greater effect on WAFB, the Soil Conservation Service constructed the Powerline Dam (also known as the Powerline Flood Retarding Structure) on the bajada about 10 km (6 miles) northeast of WAFB in 1967, and the Powerline Floodway, which today borders the north end of the Airport, in 1968 (Flood Control District of Maricopa County 2005). Construction of the Ellsworth Channel, which borders the northeast and east sides of the Airport, likely occurred in conjunction with the Powerline Floodway, into which it flowed. The 1971 Higley 7.5-minute orthophoto quadrangle shows a precursor to today's Ellsworth Channel bordering the northeast end of WAFB, but not clearly extending south along Ellsworth Road. In response to flooding along Ellsworth Road, the channel was the subject of significant improvements and some realignment in the mid-2000s.

Previous Archaeological Research within the Area of Potential Effects

Previous Work at Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport has a long history of archaeological investigations, ranging from inventory work to data recovery programs. As early as 1974, the National Park Service conducted an intensive pedestrian survey of the property for the Arizona Air National Guard (Clonts 1974). Substantial cultural materials were recorded in the vicinity of the site known today as AZ U:10:127(ASM).

In 1993, Williams Air Force Base was officially closed pursuant to the BRAC Act and the recommendations of the Defense Base Closure and Realignment Commission. Although subsequently operated as Williams Gateway Airport after the closure of Williams Air Force Base, the property remained under USAF ownership until May 1998. The base closure was a federal undertaking, which required the USAF to consider the effects of their actions on historic properties. To address these obligations, the USAF sponsored a series of inventories to identify significant archaeological sites and historic buildings and structures. In total, these studies documented 23 historic properties (nine archaeological sites and 14 historic buildings or structures) throughout the former WAFB (Greenwald et al. 1994; Woodward et al. 1992). Four of the archaeological sites are located in the NADP APE. Additionally, several archaeological sites were found, but determined not to be historic properties (i.e., they were determined ineligible for listing in the NRHP and received no additional preservation efforts). Two of these sites are located in the NADP APE.

In order to manage the effects on the historic properties, a PA between the USAF, the SHPO, the Advisory Council on Historic Preservation, and concurring parties (which included the Gila River Indian Community, Salt River Pima-Maricopa Indian Community, Ak-Chin Indian Community, Tohono O'odham Nation, Hopi Tribe, Arizona State University, Maricopa Community College District, Salt River Project, Bureau of Land Management, and PMGAA [formerly Williams Gateway Airport Authority]) was negotiated and executed in May 1995. In accordance with the PA, an umbrella Historic Properties Treatment Plan was developed for the protection, preservation, and investigation of the historic properties on the WAFB (SWCA and Ryden Architects 1995).

Following the execution of the PA and in accordance with the Historic Properties Treatment Plan, several archaeological testing projects were conducted in response to ground disturbances in and near NRHP-listed archaeological sites. Table 3 summarizes those projects that took place at the Airport within the NADP APE. Additional information specific to the excavation histories of individual archaeological sites is provided in the Project Results section.

Table 3. Notable Archaeological Projects at the Airport within the NADP APE

Project Name	Project Description	Reference
Williams AFB Base Closure	Archaeological survey and testing and a historic building survey of WAFB to support the USAF in its Section 106 review responsibilities associated with closure and reuse of the base. Archaeological survey and testing resulted in the identification of nine archaeological sites eligible for the NRHP [four in the NADP APE] and three sites ineligible for the NRHP [three in or partially in the NADP APE]. The historic buildings survey identified 14 NRHP-eligible buildings or structures [none in the NADP APE]. These studies led to the development of a Programmatic Agreement and Historic Properties Treatment Plan. These properties were listed in the NRHP in 1995.	Woodward et al. 1992 Greenwald et al. 1994 SWCA and Ryden Architects 1995
New Radar Facility	Archaeological testing of AZ U:10:65(ASM) prior to construction of a new radar facility.	Stubing and Mitchell 1996

Table 3. Notable Archaeological Projects at the Airport within the NADP APE (Continued)

Project Name	Project Description	Reference
Reconstruction and Extension of Runway 12L-30R	Archaeological testing and data recovery at sites AZ U:10:65(ASM), AZ U:10:66(ASM), AZ U:10:68(ASM) [not in NADP APE], AZ U:10:77(ASM) [not in NAPD APE], and AZ U:10:127(ASM) prior to runway extension. AZ U:10:77(ASM) was determined to be a natural drainage feature.	Vargas and Bruder 1997 Hill and Bruder 2000
Creosote Removal	Additional test excavations within AZ U:10:127(ASM) along margins of runways.	Bauer et al. 2000
Archaeological Testing for East Side Development	Test excavations at AZ U:10:65(ASM) and AZ U:10:66(ASM)	Doyel 2002
Security Fence Access Road Monitoring	Monitoring at AZ U:10:65(ASM)	Foster 2008
Delisting of AZ U:10:65(ASM) and AZ U:10:66(ASM)	NRHP amendment forms to remove AZ U:10:65(ASM) and AZ U:10:66(ASM) were prepared, and approved by SHPO and the Keeper of the NRHP. Sites were removed from the NRHP on July 17, 2009.	NRHP forms
Archival Research and Delisting of AZ U:10:61(ASM)	Archival research was conducted to reveal the data potential of the historic component—the only eligible/listed component—of AZ U:10:61(ASM). This was followed by an NRHP amendment to remove AZ U:10:61(ASM) from the NRHP. The site was removed from the NRHP on February 2, 2011.	Tremblay 2009 NRHP forms

Previous Work for the State Route 24 Gateway Freeway Project

Acquisition via lease of approximately 30 acres of ADOT land is proposed for the NADP. This parcel has been subjected to prior cultural resources studies associated with the ADOT State Route 24 Gateway Freeway project. The parcel was surveyed in its entirety as a result of two surveys conducted by AZTEC Engineering (Langan 2011; Langan and Rehar 2010). One archaeological site—AZ U:10:259(ASM), a Hohokam artifact scatter—was found as a result of these surveys, extending partly within the current NADP APE. Based on survey observations, the NRHP eligibility of the site could not be determined and a program of eligibility testing was prescribed. In 2011, Archaeological Consulting Services, Ltd. (ACS), conducted eligibility testing at the site and determined it to contain intact buried archaeological features indicative of a small habitation site (Punzmann and Luhnow 2011). As a result, the site was determined eligible for the NRHP, and a phase of data recovery excavation followed to mitigate the adverse effects on the site from the construction of State Route 24 (Luhnow 2012). The data recovery excavations were described as having exhausted the site's data potential, and no further archaeological work at the site was recommended (Luhnow 2012:vi). The part of the site within the NADP APE contained no features when tested by ACS in 2011.

PROJECT METHODS

SWCA archaeologists Alan Bartholomew, Jimmy Shrieve, Maggie Evancho, and Heather West, and AMEC Environmental archaeologist Hoski Schaafsma surveyed the project area between October 21–24 and October 28–30, 2013, resulting in a total of 28 person–field days. General conditions for the survey were ideal, and ground visibility was close to 100 percent. The survey was conducted using standard archaeological techniques following ASM guidelines for survey coverage and site recording methodologies. According to the standards for pedestrian survey established by ASM, a person conducting a pedestrian survey can achieve 100 percent coverage of a parcel by walking a series of systematic transects spaced no more than 20 meters (m) (66 feet) apart.

The survey entailed systematically walking the majority of the 700-acre APE in parallel transects spaced no more than 20 m (66 feet) apart. Areas not surveyed systematically for the NADP project include the recently surveyed ADOT parcel and the previously recorded site areas of those sites that were either determined to be ineligible for the NRHP as a result of earlier eligibility testing efforts (sites AZ U:10:64[ASM] and AZ U:10:67[ASM]) or that were listed in the NRHP but subsequently delisted after multiple phases of testing and/or data recovery (sites AZ U:10:61[ASM], AZ U:10:65[ASM], and AZ U:10:66[ASM]). These site areas were briefly visited, but not systematically surveyed. Areas of the APE consisting of or dangerously close to Runway 12L-30R were also not surveyed.

Evidence for cultural resources was sought in the form of artifacts (e.g., ceramics, lithics, historical metals, or glass) or features (concentrations of fire-affected rock, charcoal-stained soil, prehistoric or historic structures, or other cultural anomalies). The archaeologists systematically surveyed 596 acres.

The ASM has established standards for evaluating materials identified during archaeological surveys. Briefly, properties of archaeological interest must contain the remains of past human activity that are at least 50 years old. Beyond this, two classes of findings are recognized, the site and the isolated occurrence (IO). To qualify as a site, a property must contain, within an area no more than 50 feet in diameter, 30 or more artifacts of a single type, unless all pieces originate from a single source (e.g., one broken bottle or ceramic vessel); or 20 or more artifacts when multiple types are present, or any number of artifacts, when a single fixed feature is present; or multiple fixed features, with or without any associated artifacts. The site can be larger than 50 feet in diameter as long as any 50-foot-diameter portion of the site meets one of these conditions. Artifact finds that do not meet these criteria but that are over 50 years old may be designated IOs. Archaeological sites are accurately mapped and plotted using a handheld global positioning system (GPS) device, photographed, and recorded using the standard ASM form. The precise locations of the IOs are point located and recorded using a handheld GPS unit. Any identified artifacts were field-analyzed and then returned to their original locations.

National Register of Historic Places Criteria for Evaluation

Four criteria are applied in the evaluation of cultural properties for inclusion in the NRHP (36 Code of Federal Regulations 60.4). Normally, a significant property must be at least 50 years old and meet at least one of these four criteria to be considered eligible for listing in the NRHP. According to the NRHP criteria, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
B. that are associated with the lives of persons significant in our past; or
C. that embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguished entity whose components may lack individual distinction; or
D. that have yielded, or may be likely to yield, information important in prehistory or history.

PROJECT RESULTS

The survey of the project area resulted in the identification of eight previously unrecorded archaeological sites, seven previously recorded sites, and 70 IOs (Figure 5). The sites are all prehistoric Hohokam artifact scatters. Some of the sites also have historic-era refuse. A description of the sites and a discussion of their significance follow.

AZ U:10:61(ASM)

Site Type: Features and artifact scatter
Function: Unknown (Hohokam); homestead (Euro-American)
Cultural Affiliation: Hohokam, Euro-American
Temporal Affiliation: Prehistoric, Historic
Dimensions: 680 × 230 m
Elevation: 1,384 feet amsl
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA
NRHP Status: Determined ineligible; delisted

AZ U:10:61(ASM) was initially recorded as a light scatter of prehistoric artifacts, a possible historic-era canal, and several shards of historical purple glass (Greenwald et al. 1994:39). The site was estimated to contain 150 artifacts, including plain ware and red-on-buff ware sherds, flaked stone, and fire-cracked rock. Subsurface testing was recommended to determine the site's eligibility for the NRHP (Greenwald et al. 1994:53–54).

Twenty-two backhoe trenches were excavated in and around the boundary of the site. No buried prehistoric features were found, and the prehistoric component of the site was determined to be ineligible for the NRHP. The historic period component of the site, however, was significantly expanded to include several canals, fence line segments, and artifact scatters (Greenwald et al. 1994:137–146). Archival investigations provided evidence that these features were likely associated with the early twentieth century John B. Canup homestead or other nearby homesteads (Greenwald et al. 1994:229), and the historic component of the site was determined eligible for and listed in the NRHP under Criteria A and D. As a result of the testing program, the site boundary was significantly altered to include only the historic component.

In 2000, Dames & Moore, in support of the reconstruction and extension of Runway 12L-30R, noted that the visible elements of AZ U:10:61(ASM) do not convey its significance as a historic homestead, and that the site did not warrant listing in the NRHP under Criterion A. Consequently, the NRHP nomination was amended to eliminate the listing under Criterion A, and in October 2001, the Keeper of the National Register approved listing AZ U:10:61(ASM) only under Criterion D.

In 2009, SWCA conducted additional archival work regarding the historic-era occupants of the site, and identified John W. McEntire as another homesteader potentially associated with the site (Tremblay 2009). The historical canals were reinterpreted to be either shallow eroded road segments or natural washes. Based on the thoroughness of the archival research, no further work was recommended for the site. SHPO reviewed and approved SWCA's findings, and concurred that the data potential of AZ U:10:61(ASM) had been exhausted. An NRHP amendment form to remove AZ U:10:61(ASM) from the NRHP was prepared and submitted to the SHPO Historic Sites Review Committee. The removal of the site was approved by the Committee, and the amendment was sent to the Keeper of the National Register. The Keeper approved the amendment and removed AZ U:10:61(ASM) from the NRHP on February 3, 2011 (National Park Service 2011).

SWCA Environmental Consultants 2013 Survey

Because AZ U:10:61(ASM) had been previously recorded and subjected to a program of eligibility testing, and because the prehistoric component had been determined ineligible for the NRHP as a result of the testing, and the historic component of the site recently delisted from the NRHP, SWCA excluded the site area from systematic resurvey. The exclusion area, however, was based on the previously NRHP-listed historic component of the site, and not the significantly different original site boundary that included the light prehistoric artifact scatter. During the resurvey, SWCA archaeologists identified what was thought initially to be a small new prehistoric site, but which turns out to be the northeastern part of the site as originally recorded. SWCA recorded the finding as site PMGA10 (Figure 6).

PMGA10 is a light concentration of prehistoric artifacts in a 150 × 60–m area. The artifact assemblage consists of 138 plain ware sherds, 12 buff ware sherds, one quartzite flake, and a fragment of a vesicular basalt metate. Two of the backhoe trenches (BHTs 6A and 6B) that were excavated during the eligibility testing of AZ U:10:61(ASM) lie within PGMA10. No subsurface archaeological deposits were found in either test trench.

Interpretation and National Register of Historic Places Eligibility

AZ U:10:61(ASM) is the remains of the John W. McEntire and John B. Canup homesteads. Although the site was initially listed in the NRHP under Criteria A and D, it was subsequently delisted because its visible components do not convey its significance as a homestead, and because thorough archival research has exhausted the information potential of the site. The site contains a prehistoric Hohokam component that was determined ineligible for the NRHP as a result of eligibility testing.

SWCA's 2013 observations do not support reconsideration of the site's current ineligible status.
No further work is recommended.

AZ U:10:64(ASM)

Site Type: Artifact scatter
Function: Unknown
Cultural Affiliation: Hohokam, Euro-American
Temporal Affiliation: Prehistoric, Historic
Dimensions: 555 × 200 m
Elevation: 1,371 feet amsl
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA
NRHP Status: Determined ineligible

AZ U:10:64(ASM) was initially recorded as a light scatter of prehistoric artifacts over approximately 17 acres along with a much smaller concentration of historic-era material (Greenwald et al. 1994:42).
The prehistoric assemblage was estimated to contain 75–100 plain ware sherds, 5–10 lithic flakes, one core, and one ground stone fragment. The historic component contained shards of purple, green, and aqua glass bottles and pieces of a porcelain teacup and saucer. Subsurface testing was recommended to determine the site's eligibility for the NRHP (Greenwald et al. 1994:54).

Twenty-three backhoe trenches were excavated in and around the boundary of the site. No buried archaeological features were found, and the site was determined ineligible for the NRHP (Greenwald et al. 1994:154–157).

SWCA Environmental Consultants 2013 Survey

Because AZ U:10:64(ASM) had been previously recorded and subjected to a program of eligibility testing, and because the prehistoric component had been determined ineligible for the NRHP as a result of the testing, SWCA excluded the site area from systematic resurvey. However, SWCA archaeologists identified what was initially thought to be a new small historic site, but which was later determined to represent the southernmost portion of AZ U:10:64(ASM). SWCA recorded the finding as site PMGA9 (Figure 7).

PMGA9 is a small concentration of historical artifacts. The artifact assemblage consists of 300–400 shards of brown, green, and colorless glass fragments; a milk glass face cream jar; metal cans, including 15 sanitary cans, an evaporated milk can, an oil can, a lard bucket, and a metal bucket; a bicycle seat; and a table leg. No prehistoric artifacts were found in PMGA9.

Two of the backhoe trenches (BHTs 13E and 13F) that were excavated during the eligibility testing of AZ U:10:64(ASM) lie just on either side of PGMA9. No subsurface archaeological deposits were found in these test trenches.

Interpretation and National Register of Historic Places Eligibility

AZ U:10:64(ASM) appears to represent limited prehistoric use of the area and historic-era trash disposal. The site has been previously subjected to a program of eligibility testing and was determined ineligible for the NRHP. SWCA's observations made during survey support the determination that the site is not eligible for the NRHP. The newly identified historical trash may be associated with the Canup or McEntire homesteads, but do not convey the historic significance the homesteads. No further work is recommended.

AZ U:10:65(ASM)

Site Type: Features and artifact scatter
Function: Resource procurement and processing
Cultural Affiliation: Hohokam
Temporal Affiliation: Prehistoric
Dimensions: 380 × 225 m
Elevation: 1,370 feet amsl
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA
NRHP Status: Determined ineligible; delisted

AZ U:10:65(ASM) was initially recorded as a large prehistoric artifact scatter containing an estimated 150 artifacts clustered primarily in three concentrations (Greenwald et al. 1994:46). The artifact assemblage contained plain ware sherds and decorated wares and flaked stone. One semicircular

arrangement of large rounded boulders was also noted. Subsurface testing was recommended to determine the site's eligibility for the NRHP (Greenwald et al. 1994:54).

Twenty-one backhoe trenches were excavated in and around the boundary of the site. Five prehistoric features (a bell-shaped pit, two borrow pits, and two small pits) and one probable historical pit feature were found as a result of the testing. Additionally, approximately 300 ceramic sherds, one piece of flaked stone, and one piece of ground stone were collected. The site was determined eligible for and ultimately listed in the NRHP.

In 1996, SWCA conducted testing on a portion of the site prior to planned improvements to the airport's radar facility (Stubing and Mitchell 1996). SWCA excavated 161 linear meters of trench around the radar facility. No subsurface cultural deposits—neither features nor artifacts—were encountered during testing. Only 35 artifacts were collected from the surface.

Dames & Moore tested a small portion of the northwest edge of the site in 1997 (Hill and Bruder 2000). Twenty-eight artifacts were collected from the surface, including a few pieces of historic metal. Dames & Moore excavated thirteen 7.5-m-long backhoe trenches in and within 15 m (50 feet) of the northwest boundary of the site. No subsurface artifacts or features were encountered.

URS intensively tested the site in 2000 (Doyel 2002). In total 2,049 artifacts were collected from the site, most from the surface. Artifacts were found in eight concentrations on the surface and consisted mainly of ceramics. URS excavated 89 trenches averaging 7.7 m in length for a total of 682 linear meters of trenches. URS reassessed five of SWCA's 1994 features and discovered four more features (Features 7–10). URS interpreted Feature 1 (the bell-shaped pit) as a hearth rather than a pit; it was destroyed during trenching. Feature 2, a borrow pit, was as described by SWCA. URS did not attempt to relocate Feature 3, the other borrow pit. Features 4 and 5, which were both interpreted originally as pits of unknown function, were determined to not be pits. Feature 6, which had been interpreted as a pit, was redefined as a possible midden or poorly preserved house. Features 7, 8, 9, and 10 were all newly discovered features, but lacked preservation. Feature 7 was a possible trash pit without clear pit outlines. Feature 8 was a possible midden or house with artifacts, but could also have been a natural depression. Feature 9 was a small charcoal and ash lens, and Feature 10 was a possible hearth. Of the 2,049 artifacts collected at AZ U:10:65(ASM), only 349 (17%) were from subsurface contexts. Analysis of ceramics indicate that the site was used primarily in the Santa Cruz and Sacton phases of the Sedentary period.

Out of 1,436 linear meters of backhoe trenches, only 10 features have been recorded at AZ U:10:65 (ASM). All of the features are poorly preserved, and some may not be cultural in origin. Wind erosion and use of the area by the USAF removed large amounts of soil, adversely affecting any potential features that may have been located near the surface. The extensive testing conducted at the site effectively exhausted the limited research potential of the site. As a result, PMGAA requested that the site be removed from the NRHP. In May 2008, SHPO concurred that the site should be removed from the NRHP, and on July 17, 2009, the site was formally removed from the NRHP.

SWCA Environmental Consultants 2013 Survey

Because AZ U:10:65(ASM) has been previously investigated as a result of multiple excavation projects, and because the site has been determined to no longer be eligible for the NRHP, SWCA excluded the site area from the systematic survey effort. However, SWCA archaeologists identified what was initially thought to be a new small prehistoric site, but which was later determined to represent the northernmost part of AZ U:10:65(ASM). SWCA recorded the finding as site PMGA7 (Figures 8 and 9).

Figure 9. AZ U:10:65(ASM)

PGMA7 is an artifact scatter that measures approximately 65 × 37 m and contains 61 ceramic sherds, five flakes, a marine shell bracelet fragment, and a fragment of a ceramic scoop. BHT 85 from URS's 2002 test investigations (Doyel 2002) falls within PGMA7 and contained no archaeological features.

Interpretation and National Register of Historic Places Eligibility

AZ U:10:65(ASM) appears to be a limited-use site dating from the Late Colonial through Classic periods. The site has been intensively surface collected and tested for subsurface components. Testing revealed few archaeological features, all in poor condition. The extensive testing conducted at the site effectively exhausted the limited research potential of the site. As a result, PMGAA requested that the site be removed from the NRHP. In May 2008, SHPO concurred that the site should be removed from the NRHP, and on July 17, 2009, the site was formally removed from the NRHP. SWCA's 2013 survey observations do not support reconsideration of the site's current ineligible status. No further work is recommended.

AZ U:10:66(ASM)

Site Type: Features and artifact scatter

Function: Resource procurement and processing, agricultural, habitation

Cultural Affiliation: Hohokam, Euro-American

Temporal Affiliation: Prehistoric, Historic

Dimensions: 340 × 230 m

Elevation: 1,365 feet amsl

Vegetation: creosote, shrubs, grasses

Land Ownership: PMGAA

NRHP Status: Determined ineligible; delisted

AZ U:10:66(ASM) was initially recorded as a large, light prehistoric artifact scatter with features, including a large horno (Feature 1), a flat-lying rock cluster (Feature 2), a drainage (Feature 3), as well as two metal cans, a pail, and some modern construction debris (Greenwald et al. 1994:46). The site was recommended eligible for the NRHP, and a program of subsurface testing was implemented to assess the site's extent (Greenwald et al. 1994:167).

Twenty-five backhoe trenches were excavated in and around the boundary of the site. Two prehistoric features (a borrow pit [Feature 4] and a charcoal/ash lens [Feature 5]) were found as a result of the testing. Additionally, 12 ceramic sherds, three pieces of flaked stone, and one piece of ground stone were collected. The site was ultimately listed in the NRHP, although with a much-reduced site boundary reflecting the results of the testing.

In 1997, prior to extension of and improvements to Runway 12L-30R, archaeologists from Dames & Moore collected 144 surface artifacts and excavated 105 linear meters of trenches in the southern portion of the site (Hill and Bruder 2000). In addition, an archaeologist monitored the excavation of a 272-m-long utility trench by construction crews. No subsurface cultural features or artifacts were recorded in any of the trenching. Dames & Moore unsuccessfully attempted to find Feature 5, the charcoal/ash lens recorded by SWCA, and stated that Feature 1 was the "only definitive cultural feature identified at the site" (Hill and Bruder 2000:72).

In 2000, URS conducted test excavations and surface collection across the entire site (Doyel 2002). A total of 606 linear meters of backhoe trenches was excavated during their investigations. Feature 1, the horno, was investigated with three trenches and determined to consist mainly of fire-cracked rock and adobe chunks; very little ash and/or charcoal was observed. Portions of Feature 1 were lined with a hard-packed 10-cm-thick rind of burned sediment. Unfortunately, most of Feature 1 had been disturbed by animal activity; the uppermost 60 cm of the horno was severely disturbed, and what remained below 60 cm was fragmentary. URS examined Feature 2, the cobble cluster, and noted that there was very little evidence for a cultural origin of the feature. URS also collected 533 artifacts from the surface, most of which were ceramic sherds. Sherds were also collected from Feature 1, most of which were Santa Cruz Red-on-buff and Sacaton Red-on-buff sherds.

Out of more than 1,336 linear meters of archaeological test trenches and 272 linear meters of monitored utility trench, only five features have been identified at the site: an horno (Feature 1), a cobble cluster (Feature 2), a drainage (Feature 3), a borrow pit (Feature 4), and a charcoal/ash lens (Feature 5). Two of these feature—the cobble cluster and the drainage—are non-cultural features, and a third feature, the charcoal/ash lens, could not be found during subsequent investigations. URS investigated the horno in 2000 and found it to be severely disturbed and lacking integrity. All three projects also collected and analyzed most of the artifacts present on the surface. Temporally, the site appears to have been used from the Colonial through the Classic periods. The extensive testing conducted at the site effectively exhausted the limited research potential of the site. As a result, PMGAA requested that the site be removed from the NRHP. In May 2008, SHPO concurred that the site should be removed from the NRHP, and on July 17, 2009, the site was formally removed from the NRHP.

SWCA Environmental Consultants 2013 Survey

Because AZ U:10:66(ASM) has been previously investigated as a result of multiple excavation projects, and because the site has been determined to no longer be eligible for the NRHP, SWCA excluded the site area from the systematic survey effort. However, SWCA archaeologists identified what was initially thought to be two new small prehistoric sites adjacent to AZ U:10:66(ASM). SWCA recorded the findings as sites PMGA1 and PGMA5. Further analysis indicated that PMGA1 and PMGA5 are within the original site boundary that was later reduced in size following SWCA's 1994 testing phase (Figure 10).

PMGA1 is a light artifact scatter of approximately 100 ceramic sherds, 30 flaked stone artifacts, three historic-era artifacts, and three rock features distributed over a 170 × 80–m area. The rock features are deflated and dispersed clusters of rock. They measure 4.5 × 2.9 m, 5.5-m-diameter, and 5.0 × 4.5 m, respectively. They are in poor condition. The ceramic assemblage includes micaceous and non-micaceous plain ware sherds and buff ware sherds. The flaked stone assemblage included one edge-modified flake. The historical artifacts include one rusty beverage can, a horseshoe, and a colorless 1923 DR. PEPPER soda bottle. SWCA's 1993 archaeological test trench BHT 5A appears to have been excavated in the center of PMGA1, and BHT 4A was excavated at the western boundary of PMGA5 (see Greenwald et al. 1994:170). No features were found in either test trench.

PMGA5 is a light artifact scatter of approximately 225 ceramic sherds and three flakes distributed over a 100 × 30–m area. Ceramic wares include mostly plain ware and buff ware sherds, although a few red-on-buff ware and Salt Red sherds were noted. One very thick plain ware rim sherd appears to be from a large jar, possibly an olla. SWCA's archaeological test trenches BHT 2B and BHT 9D appear to have been excavated within or along the boundary of PGMA5 (see Figure 13, also Greenwald et al. 1994:170). No features were found in either test trench.

Interpretation and National Register of Historic Places Eligibility

AZ U:10:66(ASM) appears to be a limited-use site dating from the Colonial through Classic periods. The site has been intensively surface collected and tested for subsurface components. Testing revealed few archaeological features, all in poor condition. The extensive testing conducted at the site effectively exhausted the limited research potential of the site. As a result, PMGAA requested that the site be removed from the NRHP. In May 2008, SHPO concurred that the site should be removed from the NRHP, and on July 17, 2009, the site was formally removed from the NRHP. SWCA's 2013 survey observations do not support reconsideration of the site's current ineligible status. No further work is recommended.

AZ U:10:67(ASM)

Site Type: Features and artifact scatter
Function: Unknown
Cultural Affiliation: Hohokam, Euro-American
Temporal Affiliation: Prehistoric, Historic
Dimensions: 450 × 290 m
Elevation: 1,360 feet amsl
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA
NRHP Status: Determined ineligible

AZ U:10:67(ASM) was initially recorded as a large, light prehistoric artifact scatter consisting of a Sacaton Red-on-buff pot break, a dispersed scatter of no more than 200 ceramic sherds, approximately 10 pieces of flaked stone, and a scatter of fire-cracked rock (Greenwald et al. 1994:49, 177). A program of subsurface testing was implemented to determine the site's eligibility for the NRHP (Greenwald et al. 1994:177–181). Twenty-nine backhoe trenches were excavated in and around the boundary of the site. No subsurface cultural deposits were found, and the site was subsequently determined ineligible for the NRHP.

SWCA Environmental Consultants 2013 Survey

Because AZ U:10:67(ASM) had been previously recorded and subjected to a program of eligibility testing, and because the site had been determined ineligible for the NRHP as a result of the testing, SWCA excluded the site area from resurvey. During the resurvey, SWCA archaeologists identified what was initially thought to be a new small prehistoric site overlapping the east end of AZ U:10:67(ASM). This site was designated PMGA4. PMGA4 was later determined to correspond to the artifact concentration depicted at the east end of the site as mapped in Greenwald et al. (1994:Figure3.10) (Figure 11).

PMGA4 is a light artifact scatter comprising an estimated 100 ceramic sherds, 10 flakes, four historic-era artifacts, and three possible features in a 100 × 90–m area. Ceramic wares include plain ware, buff ware, red-on-buff ware, and red ware. The historical artifacts include fragments from a COCA COLA bottle and three pieces of a white ware ceramic vessel. The three features are ephemeral charcoal stains. Two of the features are small stains with burned wood and charcoal. They measure 0.88 × 0.56 m and 0.23 × 0.44 m, respectively. The third is a larger ephemeral stain that measures 8.0 × 2.0 m. None of the stains have artifacts associated with them. Their cultural and temporal origins are uncertain.

The PMGA4 site area was previously tested in 1993 as part of AZ U:10:67(ASM). Five archaeological test trenches were excavated within PMGA4, including BHTs 6A, 6A', 10A, 10B, and 10C. None of the test trenches contained subsurface cultural deposits (Greenwald et al. 1994:179–181).

Interpretation and National Register of Historic Places Eligibility

AZ U:10:67(ASM) appears to be a limited activity site. The site has been previously subjected to a program of eligibility testing and was determined to be ineligible for the NRHP. SWCA's observations made during survey support the determination that the site is not eligible for the NRHP. No further work is recommended.

AZ U:10:127(ASM)

Site Type: Artifact scatter with features

Function: Resource procurement and processing, habitation(?)

Cultural Affiliation: Hohokam, Euro-American

Temporal Affiliation: Prehistoric (Sedentary–Classic periods), Historic (Early Twentieth Century)

Dimensions: 1,600 × 1,200 m

Elevation: 1,380 feet amsl

Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA
NRHP Status: Listed

AZ U:10:127(ASM) is a large Hohokam site thought to be associated with wild-plant food procurement and processing. The site may have contained seasonal farmsteads and perhaps more substantial habitation structures, but most of the site is in a poor state of preservation, as prior investigations have shown it to be highly eroded. Most of the site area lies outside of the NADP APE, underneath and south of the Airport runways.

The site was originally recorded in 1973 as AZ U:10:25(ASU) during a survey and testing program at the nearby Midvale site (Weaver 1973:81). At that time, the site was characterized as a Classic period artifact scatter with trash mounds dispersed over a 371-acre area. In subsequent years, several more substantial archaeological investigations have been conducted at the site (Figure 12).

SWCA Environmental Consultants 1992–1993 Investigations

In 1992–1993, SWCA surveyed and subsequently tested the site (Greenwald et al. 1994). As a result of these efforts the site was determined eligible for and later listed in the NRHP under Criterion D. SWCA's surface survey documented thousands of artifacts scattered over 452 acres, and 13 surface features comprising charcoal stains, roasting pits, hearths, possible pit houses, and pot breaks (Anduze et al. 1994:37). The majority of diagnostic artifacts suggested primarily a Colonial Period through Classic period occupation, as well as limited, more recent O'odham ceramics and historical early twentieth century trash. The primary goal of the testing was to better define the site's boundaries. In addition to the program of backhoe trenching, SWCA also identified and recorded two areas of the site as "compounds," each with a low mound or rise, artifact concentrations and fire-cracked rock scatters, and low berms representing possible compound walls. Compound 2 also included a large depression that was interpreted as a possible reservoir or borrow area (Neal et al. 1994:124).

SWCA's testing involved the excavation of 97 trenches, in which 12 subsurface features were found. These features included one pit with burning, two pits of unknown function, six buried surfaces, and one cremation burial. The cremation burial was the only feature found during SWCA's investigations that is located within the NADP APE. The burial was left buried in place after its discovery.

Dames & Moore 1997 Investigations

In 1997, Dames & Moore conducted archaeological investigations in support of the extension of Runway 12L-30R. Data recovery was conducted in two phases. The testing phase included the excavation of 461 trenches, investigation of surface features, and artifact collection (Vargas and Bruder 1997). Testing identified four loci of artifacts and features plus four isolated features, including a burial, an horno, a historical canal, and a possible prehistoric agricultural field (Vargas and Bruder 1997:25–36). Locus 4 corresponded to SWCA's Compound 2. Dames & Moore's efforts focused on these four loci and subsurface features.

Locus 1 is just north of Taxiway 10, between the middle and outer runways. Testing identified four atypical pit house features, filled with alluvial sands and gravels and sparse artifacts. Phase 2 data recovery revealed that the features were not cultural in origin; rather, they are post-Hohokam occupation erosion channels associated with the network of branching channels that dissect the lower reaches of the

alluvial fan upon which the site lies. One feature was ultimately determined to result from the pouring of concrete, probably dating to the construction of the runway (Hill and Bruder 2000:126).

Locus 2 is at the eastern margin of the airport property, just north of the south end of the outer runway. Testing identified nine features, including three possible pit houses, four middens, a pot bust, and a feature of indeterminate function. Locus 2 was interpreted as a possible pit house courtyard group, although heavy disturbances such as animal burrowing and sheet- wash erosion hindered interpretations (Vargas and Bruder 1997:29). Locus 2 was not subjected to Phase 2 data recovery as it was ultimately not within the APE for the runway improvements. Locus 2 is the only locus of the site located within the current APE.

Locus 3 is south of Taxiway 10 between the middle and outer runways. Testing failed to identify any subsurface features at this locus. Locus 3 was not subjected to Phase 2 data recovery excavation, as it was not within the APE for the runway improvements.

Locus 4 is in the southeastern corner of the airport property, southeast of the outer runway in the area previously designated "Compound 2." Testing identified a very dense concentration of surface artifacts—including prehistoric artifacts and historical trash, although no subsurface features were encountered during trenching within the locus. Just north of and outside the locus, an ash stain was documented. Phase 2 data recovery efforts revealed no new subsurface cultural features, and the ashy feature was determined to be a natural accumulation of charcoal (Hill and Bruder 2000:129).

Several features were encountered in trenches outside of the four designated site loci during testing. Features encountered in trenches included a Classic Period horno immediately west of the outside runway and just south of Taxiway 10, a historical canal located immediately east of the outside runway, a prehistoric inhumation burial (probable Sedentary Period) found immediately east of the outside runway and ultimately repatriated to the Gila River Indian Community, and a possible prehistoric agricultural field located just southeast of the south end of the outer runway (Hill and Bruder 2000:117–122). Isolated features were further investigated during Phase 2 data recovery, which revealed no additional features in the vicinity of the horno but confirmed its Classic period age (Hill and Bruder 2000:133–134). One additional inhumation burial was encountered during investigation of the previously identified burial, and a small, disturbed thermal feature was also found and attributed to either cholla processing or a modern grass fire. Finally, investigations in the agricultural field area revealed no subsurface features, and the historical canal was relocated and confirmed.

An important conclusion of these investigations was that flooding on Queen Creek delta caused considerable erosions of features, destroying subsurface deposits and features over much of the site area (Hill and Bruder 2000:149–156). Dense surface concentrations of artifacts are likely lag deposits, representing only remnants of the features and deposits that once were present.

Dames & Moore 1998–1999 Investigations

In 1998 and early 1999, archaeologists from Dames & Moore returned to the site to conduct additional test excavations in advance of vegetation removal activities along and near the margins of the runways within AZ U:10:127(ASM) (Bauer et al. 2000). Testing consisted of the excavation of 394 trenches, including 89 trenches in Locus 4 (Compound 2), 168 trenches in Compound 1, 137 trenches in the northeast corner of the site, four trenches in the southeast corner of the site, and four trenches in the southwest portion of the site. Only two features were found, including one modern hearth and one bowl-shaped ashy stain. Numerous artifact concentrations were observed on that surface, and thousands of artifacts were collected. The slightly elevated compound areas were determined to be areas of high bioturbation. The 1998–1999 investigations provided further evidence of the extremely eroded nature of the site.

SWCA Environmental Consultants 2002 Investigations

In 2002, archaeologists from SWCA conducted field reconnaissance of the southwestern part of the site prior to the installation of a compass rose (Foster 2002). Prior investigators had concluded that no additional test trenching was needed in this area, but surface collection of artifacts had been recommended (Bauer et al. 2000:Figure 8-1). SWCA archaeologists identified only a light scatter of artifacts in this marginal area of the site and recommended, ultimately with SHPO concurrence, that further study of the area would be of no scientific value.

Various Monitoring Projects

In 2011–2012, PMGAA conducted several activities within the boundary of AZ U:10:127(ASM). Runway repairs and replacement, utility installations, and associated geotechnical boring necessitated three episodes of archaeological monitoring (Ferland 2011; Tremblay 2012; Walsh 2013). These monitoring projects did not locate any intact features or significant cultural deposits.

SWCA Environmental Consultants 2013 Survey

SWCA's survey of AZ U:10:127(ASM) focused on the Locus 2 area of the site. The entirety of the site within the NADP has been intensively tested as a result of SWCA's 1992–1993 work (which focused mostly along the site margins), and Dames & Moore's two testing projects in the late 1990s. Based on these studies, the only area of the site within the NADP requiring additional archaeological investigations was Locus 2. Archaeological testing in Locus 2 identified three possible pit houses and associated features. Locus 2 was subsequently removed from the Runway 12L-30R expansion APE and never subjected to Phase 2 data recovery excavations.

SWCA found Locus 2 to be a multicomponent prehistoric and historical artifact scatter comprising features, flaked stone, ceramics, shell, ground stone, and historic-era trash (Figure 13). The site is generally as previously described; however, two historical trash scatters were not mentioned in previous recordings. These trash scatters should be considered non-contributing elements to the site's overall NRHP listing status. Artifacts within three high-density artifact concentrations were inventoried and/or sample inventoried within observation units for in-field analysis; additionally, various artifacts outside of concentrations were point located.

Artifact concentration (AC) 1 contains five flaked stone artifacts (four pieces of flaking debris and one core; rhyolite, quartzite, and basalt), a basalt hammer stone, a vesicular basalt mano fragment, and approximately 500 ceramic sherds (85 percent plain ware, 14 percent red ware, 1 percent red-on-buff), including a large olla rim sherd. The scattered remains of a possible thermal roasting feature (Feature 1) were recorded.

AC 2 comprises 16 pieces of flaking debris of predominately non-cortical chalcedony and quartzite, one obsidian biface reduction flake, one fragmentary chert biface midsection, and approximately 75 ceramic artifacts (predominately plain ware [including a single Wingfield Plain sherd], followed by buff ware and red ware).

AC 3 contains thousands of artifacts surrounding a large mound (Figure 14). Previous test excavations of the mound suggest it formed as a result of extensive animal burrowing (Hill and Bruder 2000:110). Artifacts include hundreds of fragments of shell, thousands of ceramic sherds, and hundreds of flaked stone artifacts. Additional artifacts of note include one obsidian pressure flake, a large Gila Polychrome rim sherd, a large red-on-buff olla rim sherd, a shell fragment, two vesicular basalt manos (one whole, one fragmentary), and a rhyolite bifacial mano. AC 3 is the area of Locus 2 in which Hill and Bruder (2000) identified buried features.

Figure 14. AZ U:10:127(ASM)

Two historical trash scatters were newly recorded within this portion of AZ U:10:127(ASM). Trash scatter 1 comprises approximately 300 metal and predominately glass artifacts, including crushed cans (hole-in-top, sanitary), clear Mason jars and jar fragments with lids, more than 200 shards of clear glass, blue and aqua glass, opaque aquamarine glass plate fragments, and one blue glass base embossed with GENUINE PHILLIPS.

Trash scatter 2 comprises approximately 170 metal and glass artifacts, including roughly 100 unidentifiable metal can fragments, church key–opened steel beverage cans (4 ¾ × 2 5/8 inches), hole-in-top cans, a tall sanitary can, a crushed coffee can, brown PUREX glass shards, and a clear glass base with a HAZEL ATLAS maker's mark.

Interpretation and National Register of Historic Places Eligibility

AZ U:10:127(ASM) is a large Hohokam site thought to be associated with wild-plant food procurement and processing. The site may have contained seasonal farmsteads and perhaps more substantial habitation structures, but most of the site is in a poor state of preservation, as prior investigations have shown it to be highly eroded. Most of the site area lies outside of the NADP APE, underneath and south of the Airport runways; however, the NADP APE contains Locus 2, an area known to contain buried features.

AZ U:10:127(ASM) is listed in the NRHP. SWCA's observations of the site within the NADP APE indicate that it is in much the same condition as when last investigated in the late 1990s. Locus 2 is likely to still contain buried cultural deposits of significance and should remain on the NRHP.

AZ U:10:259(ASM)

Site Type: Features and artifact scatter
Function: Habitation
Cultural Affiliation: Hohokam
Temporal Affiliation: Prehistoric
Dimensions: 176 × 105 m
Elevation: 1,387 feet amsl
Vegetation: creosote, shrubs, grasses
Land Ownership: ADOT
NRHP Status: Ineligible (determined eligible, subsequently underwent full data recovery, thus currently ineligible)

AZ U:10:259(ASM) was first recorded by AZTEC Engineering during an intensive Class III pedestrian survey of the proposed State Route 24 corridor for ADOT (Langan and Rehar 2010). The site was described as a Hohokam artifact scatter with approximately 300 ceramic sherds and 15 lithic artifacts in an area measuring 176 × 105 m. No surface features were identified. The surface ceramic assemblage was dominated by Gila Plain, Gila variety sherds. Red-on-buff sherds, including Santa Cruz and Sacaton types, were described as relatively abundant, as were sherds from large utility vessels. A diverse range of lithic material types, including chert, chalcedony, fine-grained basalt, rhyolite, and quartzite, also was present (Langan and Rehar 2010).

The majority of artifacts were located in a 20 × 10–m area designated as AC 1. A 1 × 10–m observational unit placed within this area documented 35 plain ware sherds, five red-on-buff sherds, and two pieces of chipped stone. Outside AC 1, artifact density was greatly diminished; an additional observational unit documented only two red-on-buff sherds (Langan and Rehar 2010). Because of the active geological environment of the bajada where the site is located, the context of the surface artifacts observed at AZ U:10:259(ASM) could not be confidently assessed as representative of in situ deposits. Therefore, AZTEC Engineering recommended NRHP eligibility testing to determine the presence of and assess the condition of any subsurface deposits.

In 2011, ACS conducted eligibility testing at the site and recommended the site eligible for the NRHP (Punzmann and Luhnow 2011) (Figure 15). Three subsurface features were found associated with AC 1. A second concentration (AC 2) was identified but failed to produce buried features. No subsurface features were identified in the portion of the site that lies within the NADP APE. Phase 2 data recovery was recommended and completed only for the northeast portion of the site, focusing on the area where subsurface features had been found during testing, and therefore, outside of the NADP APE. The data recovery investigation identified a total of 21 subsurface features, and 27 subfeatures, including both architectural and extramural features, indicating a period of permanent habitation at the site (Luhnow 2012) (Figure 16). Architectural features consisted of two house-in-pits with 20 associated subfeatures; extramural features consisted of an activity surface with seven associated subfeatures, 14 extramural pits, three ash lenses, and an isolated post hole.

Interpretation and National Register of Historic Places Eligibility

AZ U:10:259(ASM), determined eligible for the NRHP, is a small habitation site dating to the Colonial and Sedentary periods. At the time of this reporting, only limited results provided in the end-of-fieldwork preliminary report were available. Data analysis by ACS is underway and is expected to yield additional information on the site's significance under Criterion D.

One hundred percent of the area that tested positive for intact subsurface deposits was investigated by Phase 2 fieldwork. The Phase 2 investigations at AZ U:10:259(ASM) have exhausted the site's data potential; no further archaeological work is recommended, and the site should now be considered ineligible for the NRHP. However, although no evidence of burials was identified in the investigations, given the residential nature of the occupation, the potential still exists for human remains to be present within the site area.

AZ U:10:314(ASM)

Site Type: Artifact scatter
Function: Unknown
Cultural Affiliation: Hohokam, Euro-American
Temporal Affiliation: Prehistoric, Historic
Dimensions: 50 × 38 m
Elevation: 1,370 feet amsl
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA
NRHP Status: Recommended not eligible

AZ U:10:314(ASM) is a newly recorded light artifact scatter containing prehistoric ceramic and flaked stone artifacts and sparse historic-era artifacts (Figures 17 and 18). The artifact assemblage includes approximately 50 ceramic sherds and 10 pieces of flaked stone debitage. The ceramics consist mostly of micaceous sand-tempered plain ware sherds and a few sand-tempered buff ware sherds, non-micaceous plain ware sherds, and plain ware sherds with a red interior slip. The flaked stone assemblage consists of basalt and rhyolite flaking debris. Cortical flakes are more abundant than non-cortical flakes.
The historical artifact assemblage consists of two sun-colored amethyst glass shards, two sanitary cans, and two steel beverage cans.

Interpretation and National Register of Historic Places Eligibility

AZ U:10:314(ASM) is an artifact scatter of approximately 50 sherds and 10 flaked stone artifacts. Artifact density is very low, and the site only marginally meets the definition of "site" as defined by the ASM. Nearby sites AZ U:10:67(ASM) and AZ U:10:66(ASM), both with significantly more artifacts on the surface, yielded little information of significance when subjected to testing and data recovery investigations. Therefore, it is likely that AZ U:10:314(ASM) also does not contain buried archaeological deposits of significance. AZ U:10:314(ASM) is recommended ineligible for the NRHP.

Figure 18. AZ U:10:314(ASM)

AZ U:10:315(ASM)

Site Type: Artifact scatter
Function: Trash disposal
Cultural Affiliation: Euro-American, Hohokam
Temporal Affiliation: Historic, Prehistoric
Dimensions: 34 × 33 m
Elevation: 1,370 feet amsl
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA
NRHP Status: Recommended Not Eligible

AZ U:10:315(ASM) is a small historical trash scatter and two prehistoric ceramic artifacts (Figure 19). Artifacts recorded include approximately 450 artifacts, comprising roughly 20 historical sun-colored amethyst glass shards, 350 shards of colorless, green, and brown glass (including two COCA COLA bottle shards), 60 historical white glazed ceramics (plates/dinnerware), three solder-dot/solder-seam cans, a three-tined fork, three wire-cut nails, a hinge from an ornate Dutch oven, and two prehistoric plain ware ceramics. One hundred percent of the site was inventoried.

Interpretation and National Register of Historic Places Eligibility

The artifact assemblage likely represents a single dumping episode of late historic-era trash. The artifacts cannot be directly associated with persons or events of historical significance. Because of its limited research potential and inability to convey historical significance, AZ U:10:315(ASM) is recommended ineligible for the NRHP.

AZ U:10:316(ASM)

Site Type: Artifact scatter
Function: Unknown function
Cultural Affiliation: Hohokam
Temporal Affiliation: Prehistoric
Dimensions: 43 × 28 m
Elevation: 1,369 feet amsl
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA
NRHP Status: Unknown; requires testing

AZ U:10:316(ASM) is a light scatter of prehistoric artifacts (Figures 20 and 21). An estimated 150 artifacts are present, including ceramic sherds, flaked stone, and ground stone. The ceramic assemblage includes approximately 140 predominately plain ware ceramic sherds, with several buff ware, red-on-buff ware, and Salt Red sherds also noted. The flaked stone assemblage consists of fewer than 10 pieces of rhyolite, basalt, and chert flaking debris. Two pieces of ground stone were noted, including one slate tabular tool fragment and a small rhyolite polishing stone.

Interpretation and National Register of Historic Places Eligibility

AZ U:10:316(ASM) is a small, but varied artifact scatter of ceramic, flaked stone, and ground stone artifacts. Although archaeological testing at most of the sites in the NADP APE has yielded little in terms of buried deposits of significance, the assemblage at AZ U:10:316(ASM) warrants testing for NRHP eligibility. Vegetation is sparse and the site is likely eroded, but there are no obvious disturbances within the site boundary.

AZ U:10:317(ASM)

Site Type: Artifact scatter
Function: Unknown
Cultural Affiliation: Hohokam, Euro-American
Temporal Affiliation: Prehistoric, Historic
Dimensions: 115 × 40 m
Elevation: 1,380 feet amsl
Vegetation: creosote, shrubs, grasses

Figure 21. AZ U:10:316(ASM)

Land Ownership: PMGAA
NRHP Status: Unknown; requires testing

AZ U:10:317(ASM) is a light scatter of prehistoric and historic-era artifacts located about 130 m north of AZ U:10:127(ASM) (Figures 22 and 23). The prehistoric assemblage includes approximately 130 ceramic sherds, fewer than 10 pieces of chipped stone flaking debris, and a single granite ground stone metate fragment. Roughly two-thirds of the sherds are plain ware or buff ware sherds. Several red-on-buff ware, Salt Red, and Gila Polychrome sherds were also noted. Flaked stone artifacts include quartzite, jasper, and rhyolite debitage. Historical artifacts include four COCA COLA bottle fragments and three whiteware dinner plate pieces.

Interpretation and National Register of Historic Places Eligibility

AZ U:10:317(ASM) is a small, but varied artifact scatter of ceramic, flaked stone, and ground stone artifacts. The ceramic assemblage includes Classic period sherds, suggesting that site is associated with AZ U:10:127(ASM) to the south. Although archaeological testing at most of the sites in the NADP APE has yielded little in terms of buried deposits of significance, the assemblage at AZ U:10:317(ASM) warrants testing for NRHP eligibility. Vegetation is sparse and the site is likely eroded, but there are no obvious disturbances within the site boundary.

Figure 23. AZ U:10:317(ASM)

AZ U:10:318(ASM)

Site Type: Artifact scatter
Function: Unknown
Cultural Affiliation: Hohokam
Temporal Affiliation: Prehistoric
Dimensions: 70 × 36 m
Elevation: 1,375 feet amsl
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA
NRHP Status: Recommended ineligible

AZ U:10:318(ASM) is a light scatter of prehistoric artifacts located in the former WAFB ordnance area (Figures 24 and 25). Approximately 160 ceramic sherds are present, approximately 80 percent of which are plain ware and 20 percent are buff ware. One cortical rhyolite flake was also noted.

Interpretation and National Register of Historic Places Eligibility

AZ U:10:318(ASM) is a light scatter of sherds and one flake in the former ordnance area of WAFB. In addition to the erosion that has affected much of the airport property, the area in and around AZ U:10:318(ASM) has been disturbed by prior USAF activities. Considering the limited variability in

Figure 25. AZ U:10:318(ASM)

the artifact assemblage, the low-density nature of the scatter, and the prior disturbances to the site area, AZ U:10:318(ASM) is unlikely to contain buried archaeological deposits of significance. Therefore, the site is recommended ineligible for the NRHP.

AZ U:10:319(ASM)

Site Type: Artifact scatter
Function: Unknown, habitation?
Cultural Affiliation: Hohokam
Temporal Affiliation: Prehistoric
Dimensions: 420 × 170 m
Elevation: 1,383 feet amsl
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA
NRHP Status: Unknown; requires testing

AZ U:10:319(ASM) is a large prehistoric artifact scatter of ceramic, flaked stone, and ground stone comprising an estimated 3,000–3,500 artifacts. The site is located south of the floodwater channel that borders much of the north and east boundaries of the Airport, but north of the former location of the channel that was abandoned and replaced with the current channel in 2006 (Figures 26 and 27). As a result, this area was not as intensively used by WAFB and appears to be in better condition than most of the former WAFB property. Seven distinct areas of dense concentrations of artifacts are present and were mapped and inventoried as Loci A–G.

Figure 27. AZ U:10:319(ASM)

The artifact assemblage comprises some 3,000–3,500 artifacts. Approximately 25 percent of the prehistoric assemblage was inventoried (Table 4). Ceramic sherds dominate the assemblage and include plain ware, red-on-buff ware, buff ware, and red ware. Diagnostic wares include Wingfield Plain, Salt Red, and Gila Red, the latter two of which indicate a Classic period occupation. Considering most of the surrounding prehistoric sites contain pre-Classic wares, it is likely that some of the non-typed wares date to the Colonial and/or Sedentary periods. Several artifacts were point-located outside the seven loci, including seven vesicular basalt metate fragments, one rhyolite core, and one basalt tested cobble. Three shards of blue glass from an aircraft light were also found.

Table 4. Artifacts Inventoried at AZ U:10:319(ASM)

Locus	Size	Estimated Percentage Inventoried	Ceramics	Flaked Stone	Ground Stone
A	14 × 10 m	25%	44 plain ware 3 buff/red-on-buff ware 1 red ware	0	0
B	13 × 12 m	25%	46 plain ware 8 buff/red-on-buff ware 8 Wingfield Plain	3 flakes	0
C	17 × 12 m	25%	21 plain ware 28 buff/red-on-buff ware 7 Wingfield Plain	5 flakes	0
D	40 × 34 m	25%	33 plain ware 15 buff/red-on-buff ware 1 Wingfield Plain	2 flakes	1 mano fragment

Table 4. Artifacts Inventoried at AZ U:10:319(ASM), Continued

Locus	Size	Estimated Percentage Inventoried	Ceramics	Flaked Stone	Ground Stone
E	36 × 15 m	25%	23 plain ware 15 buff/red-on-buff ware 135 Wingfield Plain 1 Salt Red	1 flake	2 metate fragments
F	30 × 18 m	25%	29 plain ware 11 buff/red-on-buff ware 45 red ware	3 flakes	1 mano
G	56 × 44 m	25%	202 plain ware 49 buff/red-on-buff ware 1 Wingfield Plain 27 red ware 8 Salt Red 1 Gila Red	22 flakes	1 abrader (3 pieces)

Interpretation and National Register of Historic Places Eligibility

AZ U:10:319(ASM) is a large artifact scatter that may represent the remains of a Hohokam habitation. Compared to many of the sites on the former WAFB property, the site appears less disturbed by historical and modern disturbances and may contain buried deposits. Site AZ U:10:259(ASM), the nearest previously investigated site, is located 300 m to the north on ADOT property and proved to contain intact buried features, including pit houses, when subjected to test excavations. A similar program of testing is recommended for AZ U:10:319(ASM) to determine whether the site contains intact buried features that would contain information significant to our understanding of prehistory. Until that time, the site should be considered to be of indeterminate NRHP eligibility.

AZ U:10:320(ASM)

Site Type: Artifact scatter
Function: Unknown
Cultural Affiliation: Hohokam
Temporal Affiliation: Prehistoric
Dimensions: 194 × 47 m
Elevation: 1,384 feet amsl
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA
NRHP Status: Unknown; requires testing

AZ U:10:320(ASM) is a large, low-density artifact scatter located southeast of and adjacent to the floodwater channel that borders much of the north and east boundaries of the Airport, and northeast of AZ U:10:319(ASM) (Figures 28 and 29). The artifact assemblage consists of about 150 artifacts, including mostly plain ware sherds, about 10 red-on-buff ware sherds, two Wingfield Plain sherds, 10 non-cortical rhyolite and basalt flakes, two rhyolite choppers, two basalt core-hammer stones, one granite hammer stone, and one vesicular basalt metate fragment.

Figure 29. AZ U:10:320(ASM)

Interpretation and National Register of Historic Places Eligibility

AZ U:10:320(ASM) is a light, but varied artifact scatter of ceramic, flaked stone, and ground stone artifacts. Compared to many of the sites on the former WAFB property, the site appears less disturbed by historical and modern disturbances and may contain buried deposits. A program of testing is recommended for AZ U:10:320(ASM) to determine whether the site contains intact buried features that would contain information significant in prehistory. Until that time, the site should be considered to be of indeterminate NRHP eligibility.

AZ U:10:321(ASM)

Site Type: Artifact scatter
Function: Unknown
Cultural Affiliation: Hohokam
Temporal Affiliation: Prehistoric
Dimensions: 75 × 25 m
Elevation: 1,387 feet amsl
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA
NRHP Status: Unknown; requires testing

AZ U:10:321(ASM) is a large, dispersed artifact scatter located west of the floodwater channel that borders the east boundary of the Airport, but northeast of the former location of the channel that was abandoned and replaced with the current channel in 2006 (Figures 30 and 31). The artifact assemblage includes about 50 ceramic sherds, two rhyolite non-cortical flakes, and a stone bead fragment. Ceramic wares include about 30 buff ware sherds, 17 plain ware sherds, and three Salt Red sherds. The stone bead is a fragmentary, two-dimensional disk bead manufactured from a salmon-colored argillite (Figure 32). It exhibits a central drill hole and is broken in half. Most of the artifacts are located in the north half of the site.

Interpretation and National Register of Historic Places Eligibility

AZ U:10:321(ASM) is a light, but varied artifact scatter of unknown function. Compared to many of the sites on the former WAFB property, the site appears less disturbed by historical and modern disturbances and may contain buried deposits. A program of testing is recommended for AZ U:10:321(ASM) to determine whether the site contains intact buried features that would contain information significant in prehistory. Until that time, the site should be considered to be of indeterminate NRHP eligibility.

Figure 31. AZ U:10:321(ASM)

Figure 32. AZ U:10:321(ASM)

Isolated Occurrences

Seventy IOs of artifacts or features were recorded during survey of the project area (Table 5). Prehistoric plain ware ceramic sherds comprise the vast majority of the IOs. Various historic-era artifacts or features were also recorded.

Table 5. Isolated Occurrences

IO	Description
1	Unifacial rhyolite mano
2	Chert secondary flake, basalt secondary flake
3	Two quartzite secondary flakes
4	Eight micaceous plain ware sherds, one buff ware sherd
5	Three sun-colored amethyst glass shards, seven micaceous plain ware sherds
6	12 micaceous plain ware sherds, vesicular basalt metate fragment
7	Historical rock pile feature, micaceous plain ware sherd
8	Five micaceous plain ware sherds, vesicular basalt trough metate fragment
9	Three micaceous plain ware sherds, Gila shoulder
10	Basalt core chopper, 16 micaceous plain ware sherds
11	Two red-on-buff sherds, 10 micaceous plain ware sherds
12	Micaceous plain ware sherd, two buff ware sherds
13	Micaceous plain ware sherd, incised plain ware sherd
14	Rhyolite tertiary flake
15	Pot drop – 100 micaceous plain ware sherds
16	12 micaceous plain ware sherds, six buff ware sherds
17	Six micaceous plain ware sherds, one polished plain ware sherd, three buff ware sherds
18	10 red ware sherds, one buff ware sherd, pot drop – 75 micaceous plain ware sherds
19	One red ware sherd, three micaceous plain ware sherds
20	12 micaceous plain ware sherds
21	One micaceous plain ware sherd
22	10 micaceous plain ware sherds
23	Seven micaceous plain ware sherds
24	12 micaceous plain ware sherds
25	15 micaceous plain ware sherds, basalt secondary flake
26	One micaceous plain ware sherd
27	One red ware sherd
28	Four micaceous plain ware sherds, two sun-colored amethyst glass shards
29	Two micaceous plain ware sherds
30	Four micaceous plain ware sherds, buff ware sherd
31	Two micaceous plain ware sherds
32	One micaceous plain ware sherd

Table 5. Isolated Occurrences (Continued)

IO	Description
33	Two micaceous plain ware sherds
34	Two micaceous plain ware sherds
35	Three micaceous plain ware sherds
36	Six micaceous plain ware sherds
37	One Salt Red sherd
38	Four micaceous plain ware sherds – refit
39	Two micaceous plain ware sherds, six buff ware – refit
40	One micaceous plain ware sherd
41	12 micaceous plain ware sherds
42	One red-on-buff sherd, five buff ware sherds
43	12 micaceous plain ware sherds, one red-on-buff sherd, three buff ware sherds
44	One micaceous plain ware sherd
45	Five micaceous plain ware sherds, chert secondary flake; four green mason jar shards
46	One red-on-buff sherd
47	One micaceous plain ware sherd, one chert secondary flake
48	One micaceous plain ware sherd
49	One micaceous plain ware sherd
50	Three micaceous plain ware sherds
51	Three micaceous plain ware sherds, buff ware sherd
52	One key-opened potted meat tin, five brown bottle glass shards
53	One micaceous plain ware sherd
54	Three micaceous plain ware sherds, one chert biface reduction flake
55	16 micaceous plain ware sherds, three buff ware sherds
56	15 micaceous plain ware sherds, one red ware sherd, three buff ware sherds
57	Nine micaceous plain ware sherds, one buff ware sherd
58	Nine micaceous plain ware sherds, one red ware sherd
59	Five micaceous plain ware sherds
60	One micaceous plain ware sherd
61	Five micaceous plain ware sherds, one red-on-buff sherd
62	External-friction lid, coffee can, meat tin, car thermostat, grease lid, wrench handle, crown cap, three sanitary cans, wood, rubber; one micaceous plain ware sherd
63	One micaceous plain ware sherd
64	Eight micaceous plain ware sherds
65	Two red ware sherds, eight micaceous plain ware sherds, basalt hammer stone
66	One basalt secondary flake, basalt shatter, 12 buff ware sherds
67	Two basalt secondary flakes, one red-on-buff sherd
68	One micaceous plain ware sherd
69	Two micaceous plain ware sherds, one buff ware sherd
70	One red-on-buff sherd, five micaceous plain ware sherds, three buff ware sherds

SUMMARY AND MANAGEMENT RECOMMENDATIONS

SWCA's archaeological survey of the APE conducted for PMGAA resulted in the identification and recording of eight new sites, seven previously recorded sites, and 70 IOs (Table 6). One of the sites—AZ U:10:127(ASM)—is listed in the NRHP. Nine sites— previously recorded sites AZ U:10:61(ASM), AZ U:10:64(ASM), AZ U:10:65(ASM), AZ U:10:66(ASM), AZ U:10:67(ASM), and AZ U:10:259(ASM); and newly recorded sites AZ U:10:314(ASM), AZ U:10:315(ASM), and AZ U:10:318(ASM)—and the 70 IOs are recommended or have been previously determined ineligible for listing in the NRHP. Five sites—newly recorded sites AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:319(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM)—are of indeterminate NRHP eligibility.

Table 6. Archaeological Sites within the NADP APE

Site No.	Landowner	Cultural Affiliation	Site Type	Previous Investigations	NRHP Eligibility
AZ U:10:61(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter with features	Eligibility testing and archival research	Delisted
AZ U:10:64(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter	Eligibility testing	Determined ineligible
AZ U:10:65(ASM)	PMGAA	Hohokam	Artifact scatter with features	Eligibility testing and data recovery	Delisted
AZ U:10:66(ASM)	PMGAA	Hohokam	Artifact scatter with features	Eligibility testing and data recovery	Delisted
AZ U:10:67(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter with features	Eligibility testing	Determined ineligible
AZ U:10:127(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter with features	Testing and data recovery	Listed
AZ U:10:259(ASM)	ADOT	Hohokam	Artifact scatter with features	Eligibility testing and data recovery	Recommended ineligible; previously determined eligible, but subsequently data recovered
AZ U:10:314(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter	–	Recommended ineligible
AZ U:10:315(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter	–	Recommended ineligible
AZ U:10:316(ASM)	PMGAA	Hohokam	Artifact scatter	–	Unknown; required testing
AZ U:10:317(ASM)	PMGAA	Hohokam, Euro-American	Artifact scatter	–	Unknown; required testing
AZ U:10:318(ASM)	PMGAA	Hohokam	Artifact scatter	–	Recommended ineligible
AZ U:10:319(ASM)	PMGAA	Hohokam	Artifact scatter	–	Unknown; required testing
AZ U:10:320(ASM)	PMGAA	Hohokam	Artifact scatter	–	Unknown; required testing
AZ U:10:321(ASM)	PMGAA	Hohokam	Artifact scatter	–	Unknown; required testing

Archaeological testing is recommended at the five sites of indeterminate NRHP eligibility for the purpose of determining the eligibility of these sites. For those sites determined to be eligible for the NRHP as a result of the testing, avoidance would be recommended, or if not feasible, a program of data recovery implemented to mitigate the adverse effects of development.

Multiple archaeological testing and data recovery projects have taken place at NRHP-listed AZ U:10:127(ASM). The entirety of the site within the NADP APE has been previously tested, identifying one area (Locus 2) containing buried archaeological features and requiring additional excavation mitigation should it not be able to be avoided. Additionally, one cremation burial was identified within the site during a testing project in 1993, and was left in place. This feature should similarly be avoided or properly excavated and repatriated if avoidance is not feasible.

No further archaeological work is recommended for sites AZ U:10:61(ASM), AZ U:10:64(ASM), AZ U:10:65(ASM), AZ U:10:66(ASM), AZ U:10:67(ASM), AZ U:10:259(ASM), AZ U:10:314(ASM), AZ U:10:315(ASM), and AZ U:10:318(ASM) or for the 70 IOs. Nevertheless, unanticipated discoveries of cultural resources must be reported and handled in agreement with the terms of the PA. State burial laws still apply, requiring that any discovery of human remains or sacred objects be reported. A burial agreement was executed in 1996 that applies to human remains discoveries on lands acquired from the disposal of WAFB, which constitutes a very high percentage of the NADP APE.

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Appendix D.2

Historic Buildings Inventory for the Phoenix-Mesa Gateway Airport Northeast Area Development Plan, Mesa, Maricopa County, Arizona

Prepared for

Phoenix-Mesa Gateway Airport Authority

Prepared by

SWCA Environmental Consultants

January 2014

HISTORIC BUILDINGS INVENTORY FOR THE PHOENIX-MESA GATEWAY AIRPORT NORTHEAST AREA DEVELOPMENT PLAN, MESA, MARICOPA COUNTY, ARIZONA

Prepared for

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Prepared by
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Arizona Antiquities Act Blanket Permit No. 2013-030bl

SWCA Project No. 25809

SWCA Cultural Resources Report No. 13-474

January 2014

PROJECT ABSTRACT

Report Title. Historic Buildings Inventory for the Phoenix-Mesa Gateway Airport Northeast Area Development Plan, Mesa, Maricopa County, Arizona

Report Date. January 2014

Agencies. Federal Aviation Authority (FAA) (lead federal agency), U.S. Air Force (USAF), Arizona Department of Transportation (ADOT), City of Mesa

Permit Number. Arizona Antiquities Act Blanket Permit No. 2013-030bl

Project Description. Phoenix-Mesa Gateway Airport Authority (PMGAA) proposes the Northeast Area Development Plan (NADP), a phased development program for the Phoenix-Mesa Gateway Airport that would incrementally expand airport passenger terminal capacity to match facility needs as commercial airline traffic and passengers increase. The proposed facilities would be located northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel, south of Ray Road and west of Ellsworth Road. The project would also include the acquisition via a lease agreement of a 30-acre parcel of land that is owned and administered by ADOT, as well as associated improvements to City of Mesa–administered Hawes, Ray, and Ellsworth Roads.

The NADP requires approval from the FAA; therefore, it constitutes a federal undertaking subject to Section 106 of the National Historic Preservation Act of 1966, as amended. Additionally, the project is subject to the terms and conditions of a Programmatic Agreement (PA) between the USAF, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation regarding the treatment of historic properties on land that was formerly Williams Air Force Base (WAFB), including the entirety of the location of Phoenix-Mesa Gateway Airport (formerly known as Williams Gateway Airport). Previous cultural resources studies conducted in advance of the USAF's disposal of WAFB resulted in the identification of multiple historic properties and the development and execution of the PA.

The NADP Area of Potential Effects (APE) includes the approximately 700-acre parcel of PMGAA airport property located northeast of Runway 12L-30R, the 30-acre ADOT parcel proposed for lease, and sections of Hawes, Ray, and Ellsworth Roads that would be improved as a result of the NADP. Ricondo and Associates, Inc.—the aviation consulting firm providing environmental planning services for PMGAA—contracted SWCA Environmental Consultants (SWCA) to conduct cultural resources surveys of the APE, specifically, an archaeological survey and a historic buildings survey. The results of the historic buildings survey are presented herein; the results of the archaeological survey are provided under separate cover.

Project Numbers. Arizona State Museum (ASM) Accession No. 2013-499

Land Ownership. PMGAA, ADOT, City of Mesa road right-of-way

Project Location. The project APE is located in Sections 20, 21, 28, 29, and 33, Township 1 South, Range 7 East, Maricopa County, Arizona, Gila and Salt River Baseline and Meridian, U.S. Geological Survey Higley Arizona, 7.5-minute quadrangle.

Dates of Field Work. September 10, 2013

Number of Cultural Resources. 19 (12 historic-era properties and 7 modern [less than 50 years old] properties)

National Register of Historic Places (NRHP)-Eligible Properties. None

NRHP-Ineligible Properties. 19 buildings and structures

Recorded Buildings and Structures within the Northeast Area Development Plan APE

WAFB Number	Facility Name	Construction Date
927	Skeet range with berm and target-holding structure and associated building	1961
928	Office building	1983
1100	Radar receiver site (associated radar towers have been removed)	1954
1101	Radar transmitter (direction finder) with two intact radar towers	1969
1110	Ordnance bunker (igloo)	1956
1111	Ordnance bunker (igloo)	1956
1112	Ordnance bunker (igloo)	1956
1113	Ordnance bunker (igloo)	1956
1120	Trailer maintenance; new munitions/maintenance facility	1983
1122	Flammable materials storage	1958
1124	Building; munitions maintenance and storage section	1958
1125	Building; unknown use	1956
1126	Building; unknown use	1957
1128	Maintenance shelter	ca. 1985
1130	Water Well #7, building and pumping/storage infrastructure	1958
1199	East lighting vault (utility building for modern airport runway lighting)	2001
N/A	Airport Surveillance Radar ASR-8	ca. 1996
N/A	Incinerator (used to destroy small munitions)	ca. 1985
N/A	Northeast area miscellaneous infrastructure: roads, fences, and utilities	ca. 1955

Recommendations. The buildings and structures noted above and recorded on Historic Property Inventory Forms are not individually eligible for NRHP listing, and are not eligible as contributing resources to a historic district. Their duties in service to the nation are concluded and duly noted in this report; they are not otherwise worthy of preservation.

The WAFB properties dating to the 1940s and associated with World War II that were previously determined eligible for the NRHP are located outside the NADP APE.

INTRODUCTION

Phoenix-Mesa Gateway Airport Authority (PMGAA) proposes the Northeast Area Development Plan (NADP), a phased development program for the Phoenix-Mesa Gateway Airport that would incrementally expand airport passenger terminal capacity to match facility needs as commercial airline traffic and passengers increase. The proposed facilities would be located northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel, south of Ray Road and west of Ellsworth Road (Figure 1). The project would also include the acquisition via a lease agreement of a 30-acre parcel of land that is owned and administered by the Arizona Department of Transportation (ADOT), as well as associated improvements to City of Mesa–administered Hawes, Ray, and Ellsworth Roads.

The NADP requires approval from the Federal Aviation Administration (FAA); therefore, it constitutes a federal undertaking subject to Section 106 of the National Historic Preservation Act of 1966, as amended. Additionally, the project is subject to the terms and conditions of a Programmatic Agreement (PA) between the U.S. Air Force (USAF), the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation regarding the treatment of historic properties on land that was formerly Williams Air Force Base (WAFB), including the entirety of the location of Phoenix-Mesa Gateway Airport (formerly known as Williams Gateway Airport). Previous cultural resources studies conducted in advance of the USAF's disposal of WAFB resulted in the identification of multiple historic properties and the development and execution of the PA.

The NADP Area of Potential Effects (APE) includes the approximately 700-acre parcel of PMGAA airport property located northeast of Runway 12L-30R, the 30-acre ADOT parcel proposed for lease, and sections of the Hawes, Ray, and Ellsworth Roads right-of-ways that would include utility improvements supporting the NADP (Figure 2). Ricondo and Associates, Inc.—the aviation consulting firm providing environmental planning services for PMGAA—contracted SWCA Environmental Consultants (SWCA) to conduct cultural resources surveys of the APE, specifically, an archaeological survey and a historic buildings survey. The results of the historic buildings survey are presented herein; the results of the archaeological survey are provided under separate cover.

The project APE is located in Sections 20, 21, 28, 29, and 33, Township 1 South, Range 7 East, Maricopa County, Arizona, Gila and Salt River Baseline and Meridian, U.S. Geological Survey (USGS) Higley Arizona, 7.5-minute quadrangle (Figure 3).

ENVIRONMENTAL SETTING

Phoenix-Mesa Gateway Airport is located in the southeastern part of the Phoenix Valley about 8 miles north of the Santan Mountains and 13 miles southwest of the Superstition Mountains. It is located along the northern edge of the Queen Creek delta—a broad alluvial fan fed by Queen Creek—where it abuts lower piedmont alluvium deposited by numerous, smaller unnamed drainages. The topography is nearly flat, sloping very gently to the west. Much of the Queen Creek delta was converted to farm land in historic times, and more recently to large residential developments. To this day, abundant farm land remains in cultivation just south of the airport.

Native vegetation in the project area is characteristic of the Lower Colorado River Subdivision of the Sonoran Desert (Brown 1994), although little native vegetation (primarily creosote bush-bursage and paloverde-cacti biotic communities) remains on the airport property. Annual average precipitation in this area is less than 200 mm (8 inches), most of which falls during summer monsoon thunderstorms. A second, less-severe period of precipitation occurs during the winter. Summer temperatures regularly exceed 100 degrees Fahrenheit while winters are generally mild with few frost days.

Figure 1. Project location.

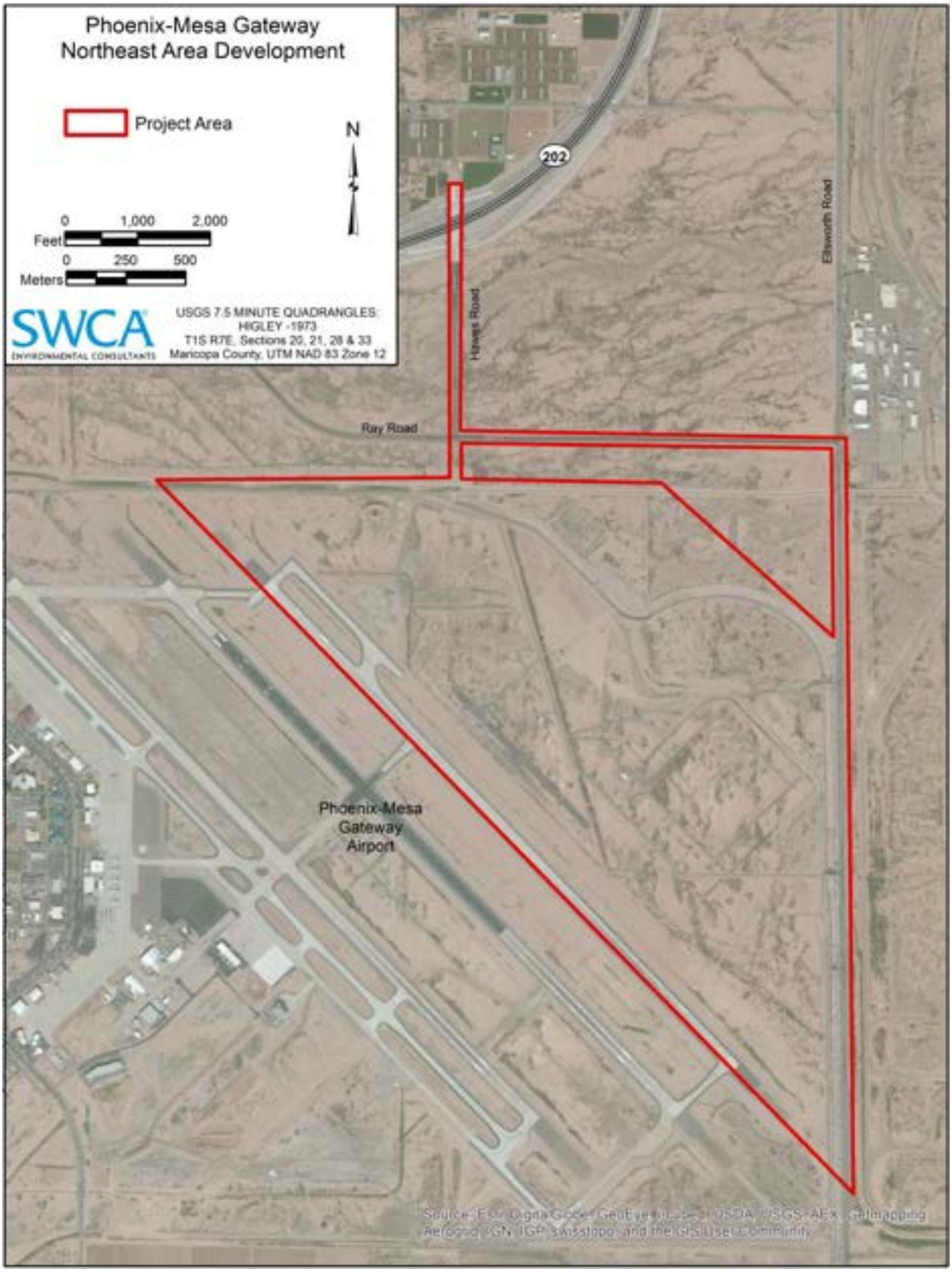

Figure 2. Project area.

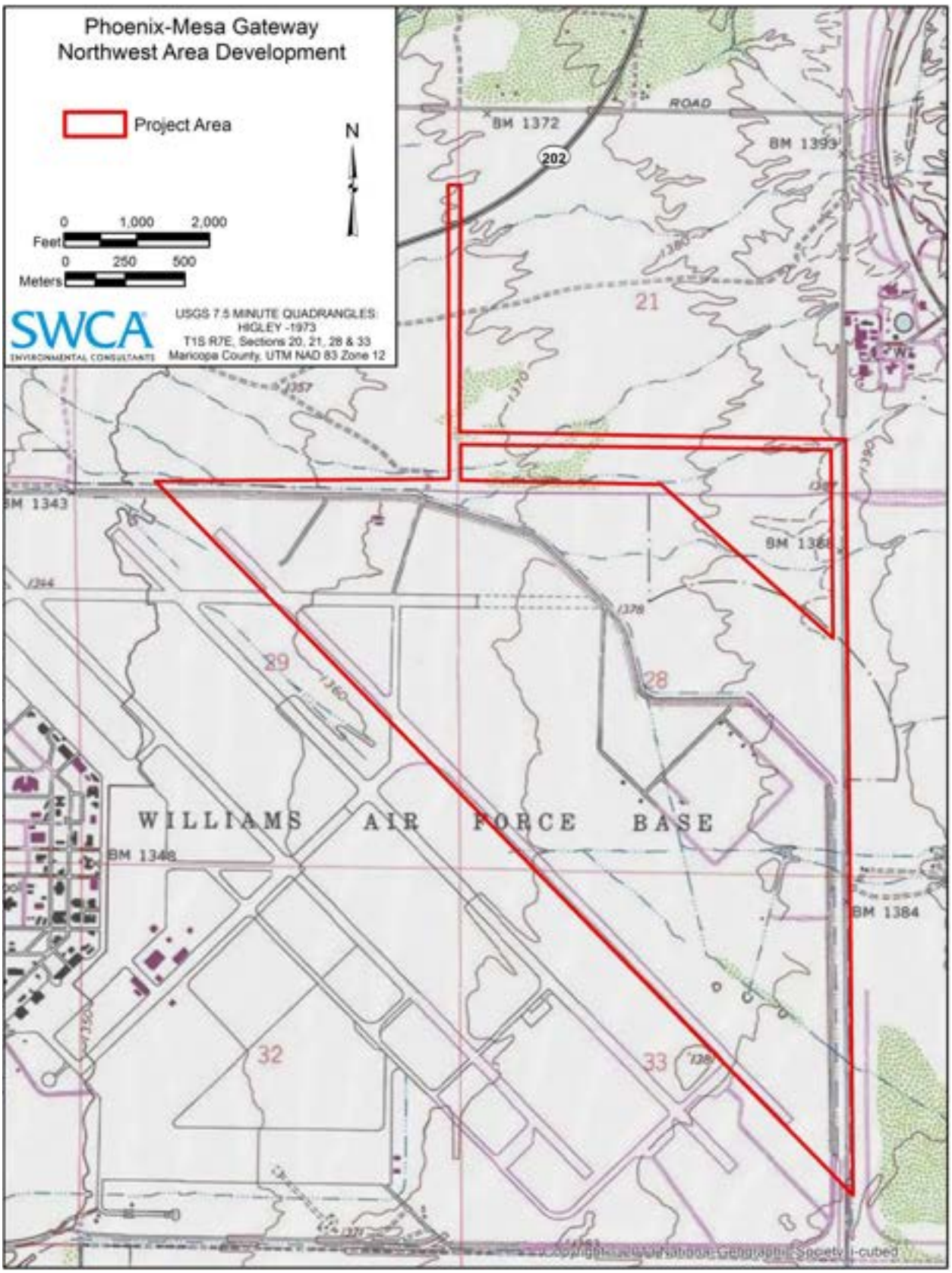

Figure 3. Project area on USGS Higley 7.5-minute quadrangle.

HISTORY OF WILLIAMS AIR FORCE BASE

Williams Field of World War II was one of hundreds of training and defense airfields constructed in the continental United States for the 1940s war effort (Thole 1996:147–155). The twin-engine fighter-aircraft pilot training field in Arizona's Salt River Valley desert near Higley, Chandler, and Mesa was completed in December 1941, just before the United States entered the war. Williams Field joined some 15 Army Air Fields newly built in Arizona to train the war's pilots, mechanics, gunnery technicians, flight controllers, and other aviation soldiers. The U.S. Army Air Corps named the field in February 1942 for an Arizona-native military pilot, Charles Linton Williams, killed in 1927 during training in Hawaii (Woodward et al. 1992:8–9,12).

In July 1945, the final year of World War II, Williams Field hosted the Army Air Force's first pilot-training program for the new Lockheed P-80 Shooting Star single-engine, single-seat jet fighter aircraft (Woodward et al. 1992:10). When the war ended in September 1945 and the vast majority of military training bases demobilized across the nation, Williams Field remained in service, in large part because of its next-generation jet-aircraft training role and its year-round favorable flying weather (USAF 2013).

Following creation of the USAF in 1947, the newly renamed Williams Air Force Base hosted the USAF's only advanced single-engine jet program, under command of the 3525th Pilot Training Wing. With advent of the Cold War in 1948 during the Soviet Union's Berlin blockade and U.S.-assisted airlift, WAFB became part of a revived national system of fighter-aircraft training programs. In 1949, WAFB trainees first flew the new T-33 two-seat jet trainer, based on the P-80 frame and engine. The Korean War, beginning in 1950, galvanized WAFB's continuing role in the larger global Cold War over the next three decades, supplying pilots for other European emergencies, the Cuban missile crisis, Viet Nam, and finally the accelerated arms race of the 1980s (USAF 2013).

With the fall of the Berlin Wall in 1989, and the successful Iraq War and collapse of the Soviet Union both in 1991, the U.S. Department of Defense celebrated victory in the Cold War and updated its service doctrines. Congress in 1991 initiated the Base Realignment and Closure (BRAC) Act, which scheduled WAFB for closure in 1993.

WILLIAMS AIR FORCE BASE (POTENTIAL) HISTORIC DISTRICT

Williams Field started with 2,160 acres, eventually growing as WAFB to about 4,127 acres, most of six sections. From World War II into the first years of the Cold War, WAFB relied on its full complement of some 400 of the Army's standard World War II "temporary" mobilization buildings and associated utilities erected between 1941 and 1943 (Keene et al. 1996:11). The post-1948 Air Force base continued to utilize its early 1940s hangars, flight control and maintenance facilities, housing, offices, personnel and family services, warehouses, and infrastructure concentrated on the west side of the main runways (Woodward et al. 1992:13–14).

In 1951, Congress funded for WAFB a modern and permanent 500-unit Wherry housing project, credited to armed services housing sponsor U.S. Senator Kenneth S. Wherry of Nebraska, who died in office that year (U.S. Congress 2013). Ultimately, two large Wherry housing areas, named North Desert Village and South Desert Village, filled available space in the west cantonment (Woodward et al. 1992:13, map) (Figure 4). Following the Korean armistice in 1953, WAFB continued its critical Air Training Command missions and hosted more facility upgrades (see Williams Air Force Base Resources in the Northeast Area Development Plan, below).

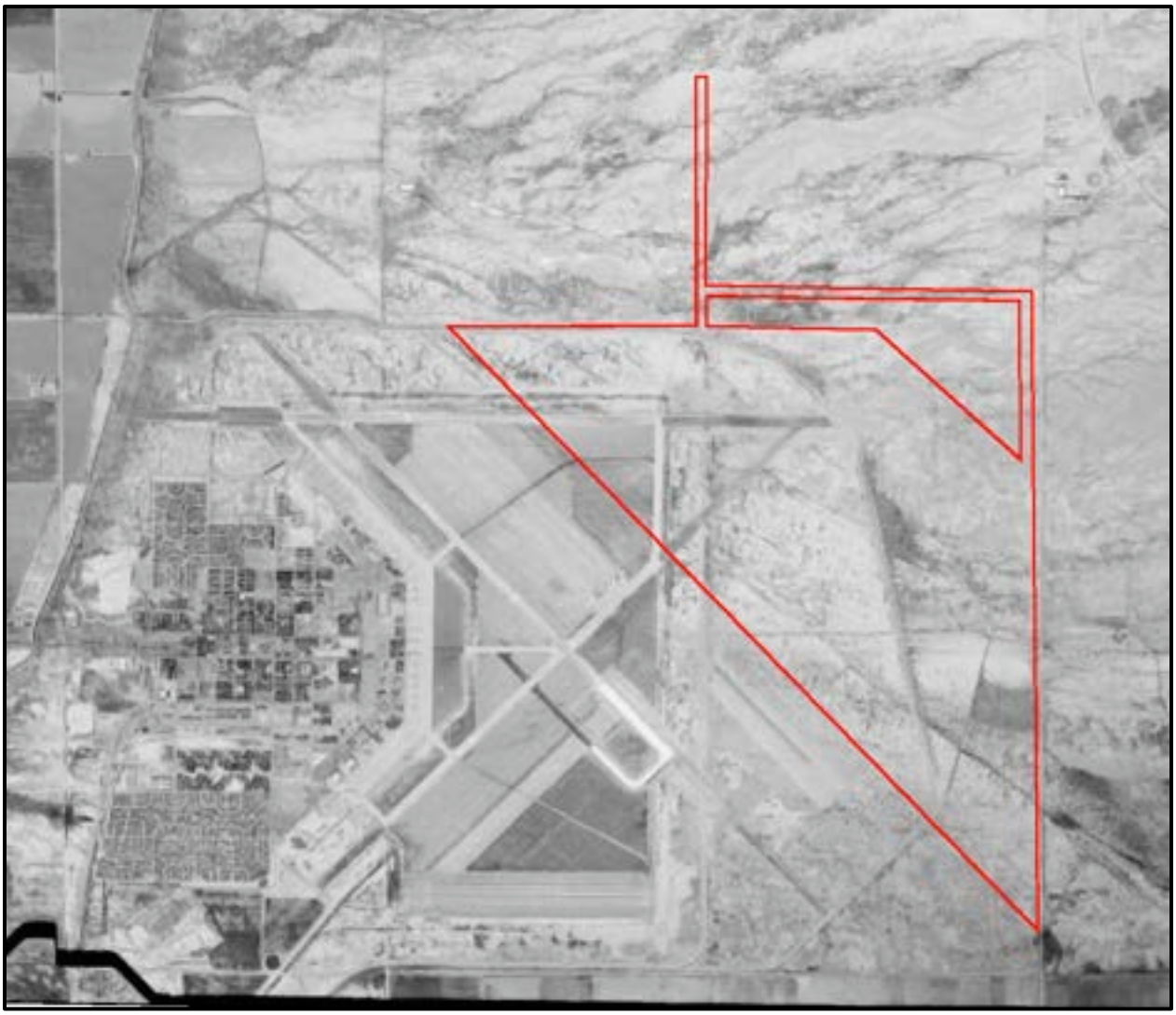

Figure 4. 1953 Army Map Service aerial photograph of WAFB with NADP APE outlined in red.

By the early 1980s, WAFB presented its zenith of facilities combining World War II and Cold War resources. By many accounts (e.g., Thole 1996; USAF 2013), WAFB was rare as a newly constructed World War II airfield that remained active—when most wartime facilities demobilized—between 1945 and the 1948 beginning of the Cold War. WAFB then continued to serve as a major pilot and gunnery training facility through 1989 and the end of the Cold War. Other air bases with associated missions, including Chanute in Illinois and Randolph in Texas, featured elaborate pre-war permanent facilities constructed in the 1930s (Thole 1996).

If WAFB had been evaluated for historic significance and National Register of Historic Places (NRHP) eligibility in the mid-1980s, perhaps the entire six-section base would have met the NRHP criteria as a historic district with hundreds of contributing properties upon a cohesive planned landscape of cantonment, runways and flight surfaces, and support facilities.

However, in 1982, the Assistant Secretary of Defense issued a memo to “all military departments” calling for removal of all “World War II permanent and temporary wood construction facilities” by 1990. WAFB responded as ordered, and through the decade “downgraded as required” most of its remaining inventory

of early 1940s buildings. WAFB enthusiastically retained eight in-use hangars and other facilities within its aircraft maintenance complex, all of steel construction. With these still-useful World War II hangars plus some $24 million in new construction authorized since 1989, WAFB in 1991 inventoried "922 facilities…valued at $524,000,000. 700 are family type housing, 49 are utilized for aircraft maintenance, 7 are utilized by flying squadron and operations, and the remaining are support facilities" (WAFB 1991:1).

When BRAC reviews in 1992 designated WAFB for closure in 1993, the USAF complied with the National Historic Preservation Act by evaluating the federal base and its resources for NRHP eligibility in preparation for transfer out of federal control. A "Historic Preservation Plan for Williams Air Force Base, Arizona" produced by Halliburton NUS in early 1992, and its resulting historic buildings survey (Woodward et al. 1992) evaluated WAFB only within its World War II context. The survey identified a "Williams Field Airplane Hangar Potential Historic District" encompassing seven early 1940s hangars and associated facilities (Woodward et al. 1992:map). The same evaluation team then produced a NRHP Historic Context, on the Multiple Property Documentation Form (MPDF) (Woodward et al. 1995), and with the MPDF in 1995 successfully nominated seven individual Williams Field properties to the National Register (NRHP 2013):

- "Flagpole" of 1941
- "Civil Engineering Maintenance Shop" of 1941
- "Housing Storage Supply Warehouse" of 1941
- "Demountable Hangar" of 1942
- "Water Pump Station and Water Tower" of 1942
- "Ammo Bunker (S-1007)" of 1942
- "Ammo Bunker (S-1008)" of 1942

For the remaining seven 1940s hangars in the "Potential Historic District," rather than nominate them to the NRHP, the USAF, the newly formed Williams Gateway Airport Authority, and the Arizona SHPO settled on documentation in anticipation of eventual demolition (Keene et al. 1996:16). The following six hangars were subsequently recorded to the Level I format of the Historic American Buildings Survey (HABS) through measured drawings, large-format photographs, and historical narrative (Keene et al. 1996):

- S-24, S-25, S-27, S-31, S-32, and T-38.

WILLIAMS AIR FORCE BASE RESOURCES IN THE NORTHEAST AREA DEVELOPMENT PLAN

Beginning in the 1950s, improvements to WAFB's pilot navigation systems expanded active infrastructure into its formerly undeveloped northeast area. The federal government had acquired ample room for the airfield's growth after 1941, including this large triangular area bounded by the main runways on the southwest, the base's perimeter fence along Ray Road on the north, and the perimeter fence along Ellsworth Road to the east (Woodward et al. 1992:map; WAFB 1958).

In the northeast area, the USAF installed new "Communications Facilities" (WAFB ca. 1990) in its 1100-series numbering system:

- Radar Receiver Site, Building 1100, in 1954 (see Historic Property Inventory Form [HPIF])
- Radar Transmitter Site, Building 1102 (not extant), ca. 1954
- TACAN (Tactical Air Navigation System) Site, Building 1103, ca. 1958 (not extant)
- Radar Transmitter (Direction Finder), Building 1101, in 1969 (see HPIF)

With changes in the USAF's training organization in 1956, WAFB retained its 3525th host unit through a name change to Combat Crew Training Wing (Fighter), still flying T-33 two-seat trainers. The "combat" addition brought new live-weapons training functions to WAFB, and resulted in more new facilities in the northeast parcel, concentrated within the fenced "Ordnance Area":

- Ordnance Bunkers, or igloos, Buildings 1110, 1111, 1112, and 1113, in 1956 (see single HPIF)
- Building 1125 (original function unknown), in 1956 (see HPIF)
- Building 1126 (original function unknown), in 1957 (see HPIF)
- Water Well #7, Building 1130 and pumping/storage infrastructure, in 1958 (see HPIF)
- Munitions Maintenance and Storage Section, Building 1124, in 1958 (see HPIF)
- Flammable Materials Storage, Building 1122, in 1958 (see HPIF)

WAFB recorded at least two other facilities in the northeast area, either constructing or adding to the "Skeet Range" personal weapons practice complex:

- Skeet Range with Berms and Target-Holding Structure, served by Building 927, in 1961 (see HPIF)
- Office Building 928, in 1983

Methods

SWCA Architectural Historian James W. Steely conducted fieldwork, including photography, on September 10, 2013. He completed a State of Arizona HPIF for each existing building and structure in the NADP APE (except Airport Surveillance Radar ASR-8, which was compiled by SWCA Archaeologist Paul Rawson). Mr. Steely was accompanied by Dennis Orr, Phoenix-Mesa Gateway Airport's Environmental and Archaeological Coordinator.

Summary

A total of 18 properties was recorded (Figure 5, Table 1), including a suite of features—roads, fences, and utilities—associated with the operation of WAFB. All of these properties postdate World War II, and most were built during the Cold War. Two recently constructed properties post-dating the closure of WAFB—Airport Surveillance Radar ASR-8 and the lighting vault housing controls for the modern runway lighting system—were also recorded.

Table 1. Recorded Buildings and Structures within the Northeast Area Development Plan APE

WAFB Number	Facility Name	Construction Date
927	Skeet range with berm and target-holding structure and associated building	1961
928	Office building	1983
1100	Radar receiver site (associated radar towers have been removed)	1954
1101	Radar transmitter (direction finder) with two intact radar towers	1969
1110	Ordnance bunker (igloo)	1956
1111	Ordnance bunker (igloo)	1956
1112	Ordnance bunker (igloo)	1956
1113	Ordnance bunker (igloo)	1956
1120	Trailer maintenance; new munitions/maintenance facility	1983
1122	Flammable materials storage	1958
1124	Building; munitions maintenance and storage section	1958
1125	Building; unknown use	1956
1126	Building; unknown use	1957
1128	Maintenance shelter	ca. 1985
1130	Water Well #7, building and pumping/storage infrastructure	1958
1199	East lighting vault (utility building for modern airport runway lighting)	2001
N/A	Airport Surveillance Radar ASR-8	ca. 1996
N/A	Incinerator (used to destroy small munitions)	ca. 1985
N/A	Northeast area miscellaneous infrastructure: roads, fences, and utilities	ca. 1955

National Register of Historic Places Eligibility

A complicated series of management decisions by the USAF for its active WAFB in the 1980s, plus the base-closure procedures and decisions of the early 1990s, resulted in relatively few individual properties determined NRHP eligible for their association with World War II. Subsequent agreements for evolution into today's public Phoenix-Mesa Gateway Airport denied what might have been an NRHP-eligible historic district associated more with the nation's long, costly, and successful Cold War of 1948–1989. In addition, if post-1945 resources had been evaluated individually, as were free-standing World War II facilities at Williams, an associated Historic Context might have identified individual Cold War resources of local, state, or national significance.

Today the former Williams Field and Air Force Base is rapidly transforming into a major regional airport, light-industry base, and educational center. Whatever remained of a WAFB Cold War historic district in 1993 began to disappear after 2000, with accelerated development of Willams Gateway Airport and its transition to today's Phoenix-Mesa Gateway Airport.

The northeast area's Cold War buildings and structures noted above and recorded on Historic Property Inventory Forms (Appendix A) thus are not individually eligible for listing in the NRHP, and are not eligible as contributing resources to a historic district. Their duties in service to the nation are concluded and duly noted in this report; they are not otherwise worthy of preservation.

SUMMARY AND RECOMMENDATIONS

A total of 18 properties was recorded, including a suite of features—roads, fences, and utilities—associated with the operation of WAFB. All of these properties postdate World War II, and most were built during the Cold War (1948–1989). Two recently constructed properties post-dating the closure of WAFB was also recorded. HPIFs are provided in Appendix A. All WAFB properties that date to the 1940s and that were associated with World War II and that have been previously determined eligible for the NRHP are located outside the NADP APE.

The northeast area's Cold War buildings and structures noted above are not individually eligible for listing in the NRHP, and are not eligible as contributing resources to a historic district. Their duties in service to the nation are concluded and duly noted in this report; they are not otherwise worthy of preservation.

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Appendix D.3

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Results of National Register of Historic Places Eligibility Testing of Four Sites at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County, Arizona

Prepared for

Phoenix-Mesa Gateway Airport Authority

Prepared by

SWCA Environmental Consultants

December 2015

RESULTS OF NATIONAL REGISTER OF HISTORIC PLACES ELIGIBILITY TESTING OF FOUR SITES AT PHOENIX-MESA GATEWAY AIRPORT, MESA, MARICOPA COUNTY, ARIZONA

Prepared for

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Arizona Antiquities Act Permit No. 2015-094ps

SWCA Project No. 33780

Cultural Resources Report No. 15-681

December 2015

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PROJECT ABSTRACT

Report Title. Results of National Register of Historic Places Eligibility Testing of Four Sites at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County, Arizona

Report Date. December 11, 2015

Agencies. The Federal Aviation Administration (FAA) is the lead federal agency. The Arizona State Museum (ASM) is the permitting agency. Other agencies are the Arizona Department of Transportation (ADOT) and the City of Mesa.

Permits. Arizona Antiquities Act Project Specific permit No. 2015-094ps, issued by ASM

Project Number. ASM Accession No. 2015-0431

Land Ownership. Municipal—Phoenix-Mesa Gateway Airport Authority (PMGAA)

Project Description. PMGAA proposes the Northeast Area Development Plan (NADP), which would relocate the existing airport passenger terminal complex to the northeastern corner of Phoenix-Mesa Gateway Airport (the Airport). The proposed facilities would be constructed northeast of Runway 12L-30R on a 700-acre parcel, most of which is undeveloped land, located within the Airport perimeter south of Ray Road and west of Ellsworth Road. The project would include the acquisition, via a lease agreement, of a 30-acre parcel of ADOT land. The project also would include utility improvements along Hawes, Ray, and Ellsworth Roads, which are municipal rights-of-way administered by the City of Mesa.

Within the NADP area of potential effects (APE) are four archaeological sites which, based on the recommendations of the archaeological survey, are of undetermined eligibility for listing in the National Register of Historic Places (NRHP). The FAA has requested that these four archaeological sites—AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM)—be subjected to subsurface archaeological testing in order to determine the NRHP eligibility of the sites, in support of National Environmental Policy Act analysis and review under Section 106 of the National Historic Preservation Act. All four sites are located on municipal lands administered by PMGAA and within the Airport perimeter.

SWCA conducted NRHP eligibility testing of the four sites November 2–5, 2015, adhering to the plan of work within *A National Register of Historic Places Eligibility Testing Plan for Sites AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM) at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County, Arizona* (Hesse 2015). Testing procedures included limited surface collection of artifacts and the excavation of backhoe test trenches. The results of eligibility testing are provided herein.

Results and Recommendations. NRHP eligibility testing was conducted within the NADP project APE at AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM) on November 2–5, 2015, in accordance with the approved work plan. A limited number of artifacts were collected from the surface of each site. No archaeological features or significant cultural deposits were identified at AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), or AZ U:10:321(ASM) as a result of the investigations. The four archaeological sites warrant no additional study or preservation, and SWCA recommends that they are ineligible for NRHP consideration.

In the event that previously unreported cultural resources are identified during ground-disturbing activities related to development of the Airport NADP facilities, all work would immediately cease within 30 meters (100 feet) until a qualified archaeologist has documented the discovery and evaluated its

eligibility for the NRHP, in consultation with FAA, ASM, the State Historic Preservation Office, and Tribes, as appropriate. Work would not resume in this area without approval of the lead agency.

If human remains are observed during construction, all work within 30 meters (100 feet) of the discovery would cease immediately. The ASM State Repatriation Coordinator (Todd Pitezel, 520-621-4795) and PMGAA would be contacted immediately to determine how to proceed. Human remains will at all times be treated with the utmost dignity and respect. All discoveries will be treated in accordance with Arizona burial laws (Arizona Revised Statutes 41-844 and 41-865), as appropriate, and work must not resume in this area without proper authorization.

INTRODUCTION

Phoenix-Mesa Gateway Airport Authority (PMGAA) proposes the Northeast Area Development Plan (NADP), which would relocate the existing airport passenger terminal complex to the northeastern corner of Phoenix-Mesa Gateway Airport (the Airport), in the City of Mesa, Maricopa County, Arizona. Ricondo and Associates, Inc., under contract to PMGAA, retained SWCA Environmental Consultants (SWCA) to conduct National Register of Historic Places (NRHP) eligibility testing at four archaeological sites—AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM)—in advance of development. Testing fieldwork took place on November 2–5, 2015, and was conducted in accordance with the approved work plan: *A National Register of Historic Places Eligibility Testing Plan for Sites AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM) at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County, Arizona* (Hesse 2015). No archaeological features or significant cultural deposits were identified as a result of the investigations. The four archaeological sites warrant no additional study or preservation, and SWCA recommends that they are ineligible for NRHP consideration.

PROJECT BACKGROUND

The proposed PMGAA NADP facilities would be constructed northeast of Runway 12L-30R on a 700-acre parcel, most of which is undeveloped land, located within the Airport perimeter south of Ray Road and west of Ellsworth Road. The project would include the acquisition, via a lease agreement, of a 30-acre parcel of Arizona Department of Transportation (ADOT) land. The project also would include utility improvements along Hawes, Ray, and Ellsworth Roads, which are municipal rights-of-way administered by the City of Mesa (Figures 1 and 2).

The NADP requires approval from the Federal Aviation Administration (FAA), which constitutes a federal undertaking subject to review under Section 106 of the National Historic Preservation Act of 1966, as amended. Additionally, the project is subject to the stipulations of a Programmatic Agreement among the U.S. Air Force (USAF), the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation regarding the treatment of historic properties on former Williams Air Force Base (WAFB) land, including Phoenix-Mesa Gateway Airport (formerly known as Williams Gateway Airport). Previous cultural resources studies conducted in advance of the USAF's abandonment of WAFB resulted in the identification of multiple historic properties and the development and execution of the Programmatic Agreement.

In 2013, Ricondo and Associates, Inc.—the aviation consulting firm providing environmental planning services for PMGAA—retained SWCA to conduct cultural resources surveys of the NADP area of potential effects (APE), which at the time included the approximately 700-acre parcel of PMGAA airport property located northeast of Runway 12L-30R, the 30-acre ADOT parcel proposed for lease, and sections of Hawes, Ray, and Ellsworth Roads rights-of-way that would include utility improvements supporting the NADP. Specifically, SWCA was tasked with conducting archaeological and historic building surveys, updating records regarding the condition of previously reported cultural resources, evaluating the eligibility of all identified cultural resources for inclusion in the NRHP, and assessing the effects of the undertaking on NRHP-eligible properties (Hesse et al. 2014).

Figure 1. Project location.

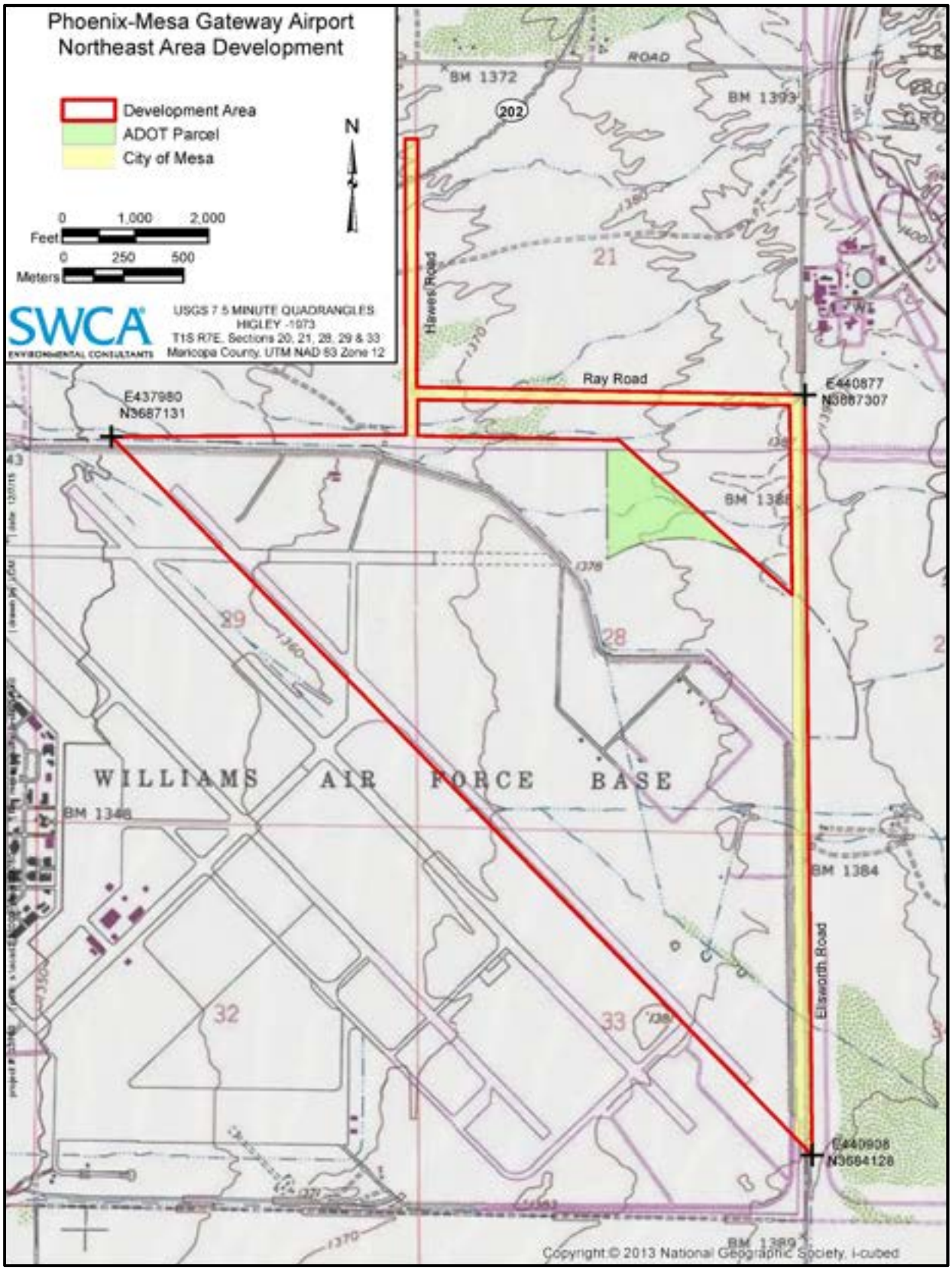

Figure 2. NADP project area.

The 2013 archaeological survey resulted in the identification and recording of eight newly identified archaeological sites, seven previously recorded archaeological sites, and 70 isolated occurrences of cultural materials. One of the archaeological sites—AZ U:10:69(ASM) (also referred to as AZ U:10:127[ASM])—is listed in the NRHP. Nine archaeological sites—previously recorded sites AZ U:10:61(ASM), AZ U:10:64(ASM), AZ U:10:65(ASM), AZ U:10:66(ASM), AZ U:10:67(ASM), and AZ U:10:259(ASM); and newly recorded sites AZ U:10:314(ASM), AZ U:10:315(ASM), and AZ U:10:318(ASM)—and the 70 isolated occurrences were determined ineligible for listing in the NRHP. Five archaeological sites—newly recorded sites AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:319(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM)—were of undetermined NRHP eligibility. These sites are depicted in Appendix A:Figure A-1.

Based on the results of the survey, PMGAA modified the NADP proposed action and action alternatives to avoid archaeological site AZ U:10:319(ASM), the largest of the five sites of indeterminate eligibility. The NADP cannot avoid impacts to AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM). The FAA has requested that these four archaeological sites be subjected to subsurface archaeological testing in order to determine the NRHP eligibility of the sites, in support of National Environmental Policy Act analysis and review under Section 106 of the National Historic Preservation Act. All four sites are located on municipal lands administered by PMGAA and within the Airport perimeter.

PROJECT LOCATION

The NADP APE is located in the city of Mesa, in the southeast Phoenix metropolitan area, in Sections 20, 21, 28, 29, and 33, Township 1 South, Range 7 East, Maricopa County, Arizona, Gila and Salt River Baseline and Meridian, on the U.S. Geological Survey (USGS) Higley, Arizona, 7.5-minute quadrangle (see Figure 2). The APE includes municipal land administered by PMGAA and rights-of-way administered by ADOT and the City of Mesa. The four archaeological sites subject to eligibility testing are within Sections 28 and 33 and are located within the Airport perimeter.

ENVIRONMENTAL SETTING

Phoenix-Mesa Gateway Airport is located in the southeastern part of the Phoenix Valley, about 13 kilometers (km) (8 miles) north of the Santan Mountains and 21 km (13 miles) southwest of the Superstition Mountains. It is located along the northern edge of the Queen Creek delta—a broad alluvial fan fed by Queen Creek—where it abuts lower piedmont alluvium deposited by numerous smaller, unnamed drainages. The topography is nearly flat, sloping very gently to the west. Much of the Queen Creek delta was converted to farmland in historic times, and more recently to large residential developments. To this day, abundant farmland remains in cultivation just south of the airport. The four archaeological sites proposed for NRHP-eligibility testing are located on distal alluvial fan deposits of the lower piedmont.

Native vegetation in the project area is characteristic of the Lower Colorado River Subdivision of the Sonoran Desert (Brown 1994), although little native vegetation (primarily creosote bush-bursage and paloverde-cacti biotic communities) remains on the airport property. Annual average precipitation in this area is less than 20 centimeters (cm) (8 inches), most of which falls during summer monsoon thunderstorms. A second, less-severe period of precipitation occurs during the winter. Summer temperatures regularly exceed 38 degrees Celsius (100 degrees Fahrenheit) while winters are generally mild with few frost days.

CULTURE HISTORY

Although the region has a prehistory stretching back more than 10,000 years, currently the archaeological sites on the Airport, including the four sites proposed for NRHP-eligibility testing, appear to be associated with the later ceramic period Hohokam occupation of the area. The following cultural history focuses only on the Hohokam ceramic period. A more extensive cultural history, extending from Paleoindian times through the post-World War II occupation of the Airport, is provided in Hesse et al. (2014).

Hohokam

The best-documented and most widespread archaeological remains in the Phoenix Basin are attributed to the Hohokam, prehistoric desert farmers who occupied much of central and southern Arizona (e.g., Bayman 2001; Crown and Judge 1991; Fish 1989; Gumerman 1991; Haury 1976). Although not necessarily recognizable as Hohokam, the earliest archaeological manifestation that probably gave rise to the Hohokam cultural tradition is assigned to the Red Mountain phase (A.D. 1–500) of the Pioneer period (A.D. 1–750) (Cable and Doyel 1987; Dean 1991; Hackbarth 1992, 2001; Morris 1969). Evidence from Red Mountain phase sites indicates that people subsisted on a mix of wild resources and agricultural products. Corn was the dominant crop, along with beans, squash, and cotton. The first evidence for canal irrigation along the Salt River is attributed to this time, A.D. 400 (Ackerly and Henderson 1989). Identified house forms include small circular and "bean-shaped" pit houses (Mabry 2000).

The period between A.D. 500 and 650 is defined as the Vahki phase. It appears that by this time, irrigation had become well established. Vahki phase canals have been identified at Snaketown (Haury 1976), as well as along the edges of the Salt River floodplain (Ackerly and Henderson 1989). Domestic architecture consists of square and rectangular pit houses of various sizes (Ciolek-Torello et al. 2000; Crary and Craig 2001).

The late Pioneer period, A.D. 650 to 750, saw the appearance of decorated pottery in southern Arizona. Hohokam decorated pottery is characterized by red-painted designs on a light-colored buff or brown background (Abbott 2001; Haury 1976). The earliest decorated pottery types include Estrella, Sweetwater, and Snaketown Red-on-buff (Wallace 2001). House types associated with the late Pioneer period vary greatly. Small, domed field houses made from bent poles and covered with brush served as temporary shelters at agricultural fields or at resource procurement and processing sites. Few artifacts are associated with the remains of these structures. Late Pioneer period habitation sites, on the other hand, contained moderate-size pit structures with square or rectangular floor plans and formal, plastered hearths. These were far more substantial than the field houses and were occupied for extended periods.

Late Pioneer period subsistence practices included dependence upon a mixture of wild resources and agricultural produce. The use of canals continued and irrigation expanded from the floodplains to include lands on terraces above rivers (Ackerly and Henderson 1989). Along with the continued use of floodplain fields, the canals allowed irrigation water to reach the terraces above the river.

The Gila Butte and Santa Cruz phases make up the Colonial period (A.D. 750–950). This was a time of expansion and elaboration of Hohokam culture. There were more sites and their distribution across the landscape increased considerably. Colonial period Hohokam artifacts have been found as far north as Prescott in north-central Arizona, south into northern Mexico, to the west of Gila Bend in southwestern Arizona, and east into New Mexico (Haury 1976). Abbott (1994, 2001) argues that the center for most of the decorated buff ware vessels produced during this time was in the area of the middle Gila River valley. Not only did the Hohokam expand their territory, their contact with their neighbors also increased. Intrusive ceramics from the north, east, and west have been found in Hohokam sites dating to this time. In fact, it is argued that Colonial period Hohokam social organization was tied to the exchange of ritual

and subsistence goods (e.g., Doyel 1985). Across Arizona, interaction spheres dominated the social landscape and facilitated exchange across the region. It is during this time that the Hohokam achieved their highest level in the production of arts and crafts. Ceramics were well made and elaborately decorated, as was shell jewelry.

The large, square communal structures found in earlier times ceased to be built during the Colonial period. Instead, ball courts, which were probably first built in the early A.D. 800s, became the dominant form of public architecture (Wallace 2001). Their appearance in southern Arizona is thought to mark the emergence of a regional system with religious, economic, and political links that crosscut geographical boundaries (Abbott 2001; Wilcox and Shenk 1977). Subsistence remained based on a mixture of wild resources and agricultural crops, although some wild species (e.g., little barley) were so intensively exploited that they appear to become as important as some of the domesticates (Bohrer 1987). The use of irrigation expanded significantly with the construction and maintenance of canals having a significant impact on Hohokam social and political organization (e.g., Abbott 2000). Canal systems, many of which remained in use for generations, were constructed throughout the Salt and Gila River valleys (e.g., Breternitz 1991; Howard 1990; Howard and Huckleberry 1991).

With the onset of the Sedentary period (Sacaton phase, A.D. 950–1150), there was a decline in the quality of Hohokam material culture, especially in the production of ceramics and shell ornaments. Ball courts were still the dominant form of public architecture during the Early Sedentary period; however, by its end, few were being built. As the construction of ball courts diminished, the construction of capped mounds or platform mounds became more common. Platform mounds were built near village centers around plazas that are surrounded by domestic features. House types exhibit significant variability and are aggregated within courtyard groups or village segments (Wilcox et al. 1981).

Subsistence continued to be based on agriculture, although there was some emphasis on the collection of certain wild plant species, in particular cholla. The production of cotton (its fiber for use in the weaving of textiles and its seeds as food) was also of major importance.

By the end of the Sedentary period, a major reorganization of Hohokam society had occurred. After a period of intensive growth and expansion, many village sites and areas were abandoned. Populations tended to begin to concentrate in larger villages along the Salt River. These changes in the social and political environment were reflected in concomitant changes in public architecture and ceramic production and shell ornament manufacturing. Additionally, there was an increase in population and increasing concentration of the population.

The Sedentary period is followed by the Classic period, which is divided into the Soho (A.D. 1150–1300) and the Civano phases (A.D. 1300–1450). Differences in ceramic decoration and architectural styles separate these two phases. Although they occur in lower frequencies, red-on-buff ceramics continue to be produced during the Soho phase. Red wares become increasingly common and the introduction of long-necked jars marks a clear contrast with the earlier ceramic styles. Structures with post-reinforced adobe walls and surface structures were common during the Soho phase. However, during the Civano phase, adobe compounds—often containing small plazas—and adobe structures were built and used to the near exclusion of semi-subterranean structures. Puddled and coursed adobe construction generally replaced the use of structures with pole-reinforced walls, and the number and proximity of rooms within compounds increased.

Public architecture also underwent a change in the early Classic period. There was a significant increase in the construction and use of platform mounds during the Classic period (Gregory et al. 1988). At the same time, the construction of ball courts declined to its lowest point. The apex of public architecture was achieved in the Civano phase with the building of “big houses.” The only remaining example of a big house is found today at Casa Grande Ruins on the outskirts of Coolidge. These structures likely served

multiple functions. It is argued that they were clear symbols of elite status in Hohokam society (Wilcox and Shenk 1977). Big houses often co-occurred with platform mounds, with the two being separated by a site's central plaza. The appearance of the big house is as mysterious as their disappearance. Their construction and use may have been the result of changes within Hohokam society, and their abandonment may have been tied to attacks from outsiders (e.g., Teague 1989; Wilcox and Shenk 1977).

Red wares and the disappearance of plain wares mark the Civano phase, although plain wares continue to dominate the total ceramic assemblage. Polychrome pottery (in particular, Gila and Tonto polychromes) and local imitations were present after A.D. 1320 (Reid and Whittlesey 1992).

Canal irrigation continued to be very important during the Civano phase. The Civano phase Hohokam depended greatly upon corn, beans, and squash as the mainstays of their diet. Corn was certainly the most common domesticate, although the abundance of agave at many sites indicates it too played a significant role in Civano phase subsistence activities. At some sites, during the late Classic period, the use of agave became increasingly important and the availability of agricultural produce declined (e.g., Miller 1994).

Hohokam social organization during the Civano phase was clearly different from what preceded it and from what was to follow. Population size and density at many of the large sites in the Salt River valley reached never-before-seen levels. Although the level of social and political organization actually achieved by the Hohokam is open to much debate, some increase in social complexity was undoubtedly necessary to manage the higher population densities that developed. This may have been expressed in the construction and use of platform mounds and big houses.

The post-Classic period (A.D. 1450–1540) in the Phoenix Basin, referred to by some as the Polvorón phase, is somewhat of a hazy gap between the late Classic period Hohokam and the arrival of the first Europeans (Bayman 2001). Nevertheless, the traits used to identify the Polvorón phase include jacal structures, polychrome ceramics, and the presence of an abundance of obsidian. However, many argue that these characteristics are not sufficient to distinguish the Polvorón phase from the late Civano phase. Additionally, chronological dates currently available for the Polvorón phase are imprecise, thus making it difficult to distinguish Civano and Polvorón phase sites from one another (see Dean 1991:87).

By the late Civano phase the success the Hohokam had enjoyed had vanished. High population densities, depletion of food resources, decline in agricultural productivity, disease and malnutrition, flooding, drought, and the collapse of many irrigation systems are cited for the collapse of the Hohokam (e.g., Bayman 2001; Van Gerven and Sheridan 1994). Nevertheless, Bayman (2001) points out that the Hohokam may have persisted until the early 1500s, and that the debate over the cause or causes for the decline and disappearance of the Hohokam is far from resolved. Some have even argued that Hohokam and Salado peoples may have directly encountered the Spanish (Reff 1992).

Following the collapse of the Hohokam regional system, Akimel O'odham (Pima) and Tohono O'odham (Papago) groups lived in the middle Gila River valley. For unknown reasons, the Salt River valley was either used sparingly or was abandoned following the Hohokam collapse. Akimel O'odham and Tohono O'odham groups lived in small rancherías, subsisting on agricultural products, wild plant foods, and game. The Pee Posh (Maricopa), who were migrants from the Gulf of California area, formed an alliance with the Pima in the early 1800s and have lived in the Salt-Gila Basin ever since. All these groups continue to occupy the area, living on several reservations.

RESEARCH DESIGN

In 1993, Williams Air Force Base was officially closed pursuant to the Base Realignment and Closure Act and the recommendations of the Defense Base Closure and Realignment Commission. Although

subsequently operated as Williams Gateway Airport after the closure of Williams Air Force Base, the property remained under USAF ownership until May 1998. The base closure was a federal undertaking, which required the USAF to consider the effects of their actions on historic properties. To address these obligations, the USAF sponsored a series of inventories to identify significant archaeological sites and historic buildings and structures. In total, these studies documented 23 historic properties (nine archaeological sites and 14 historic buildings or structures) throughout the former WAFB (Greenwald et al. 1994; Woodward et al. 1992).

In order to manage the effects on the historic properties, a Programmatic Agreement between the USAF, the SHPO, the Advisory Council on Historic Preservation, and concurring parties (which included the Gila River Indian Community, Salt River Pima-Maricopa Indian Community, Ak-Chin Indian Community, Tohono O'odham Nation, Hopi Tribe, Arizona State University, Maricopa Community College District, Salt River Project, Bureau of Land Management, and PMGAA [formerly Williams Gateway Airport Authority]) was negotiated and executed in May 1995. In accordance with the Programmatic Agreement, an umbrella Historic Properties Treatment Plan (HPTP) was developed for the protection, preservation, and investigation of the historic properties on the WAFB (SWCA and Ryden Architects 1995).

The HPTP for the former WAFB includes a research design that is meant to be a comprehensive framework for any archaeological investigation undertaken within the boundaries of the former WAFB, including the portion of the NADP within the Airport. The research design identifies a primary research theme for the Hohokam archaeological sites—the Midvale Community Network: Prehistoric Settlement and Land Use along the Queen Creek Delta. Three research domains are provided that would be productive in studying this theme: 1) settlement patterns, 2) exchange and interpretation, and 3) subsistence. The research design admits that other research domains could apply, and it provides "interregional exchange and craft specialization" as an example of a research topic of growing interest at the time.

In addition to the HPTP, an NRHP Multiple Property Documentation Form (MPDF) was prepared and ultimately led to the listing of the WAFB historic properties in the NRHP (Walsh-Anduze and Greenwald 1994). The multiple property listing name is "Hohokam and Euroamerican Land Use and Settlement along the Northern Queen Creek Delta, Arizona, ca. A.D. 700–1450 and ca. A.D. 1911." The associated historic context is "Land Use and Settlement along the Northern Queen Creek Delta, Arizona, by Hohokam (ca. A.D. 700–1450) and Euroamerican (ca. A.D. 1911) Population Groups." The geographical area of the multiple property nomination is WAFB. The MPDF provides a Hohokam cultural history and a discussion on the historic context, similar to that provided in the HPTP. The MPDF identifies and defines three associated property types: 1) habitation sites, 2) agricultural sites, and 3) resource processing sites. Habitation sites contain evidence of a house structure, and their association with other cultural manifestations, such as canals, ground stone, or pottery, help define their function, length of occupation, temporal association, and spatial relationships. Agricultural sites and their associated features, such as canals and irrigation ditches, define the area used for crop production; they may be associated with structures (field houses) that were used in association with the fields and for canal maintenance. Resource processing sites are defined by the presence of cooking features, such as roasting pits or hornos, and/or storage areas, which are often associated with botanical remains.

NATIONAL REGISTER OF HISTORIC PLACES ELIGIBILITY TESTING

Eligibility testing was conducted in accordance with the approved work plan: *A National Register of Historic Places Eligibility Testing Plan for Sites AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM) at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County,*

Arizona (Hesse 2015). The purpose of the testing program at sites AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM), as described in the plan, is to determine each site's eligibility for listing in the NRHP by gathering information for evaluation of site significance and integrity while keeping site disturbance to a minimum. The plan proposed limited surface collection of artifacts and sampling of the subsurface through a series of 2-foot-wide (0.6-meter [m]-wide) backhoe trenches. Site significance is evaluated by assessing if the sites meet the definition of any of the three property types described above and in the MPDF (i.e., habitation site, agricultural site, or resource processing site), and whether they have the potential to add important data related to the research domains defined in the HPTP for the former WAFB. At the minimum, buried archaeological features would need to be present in order to consider the sites eligible for listing in the NRHP.

Field Methods

Prior to fieldwork, SWCA obtained an archaeological collections repository agreement (No. 2015-431) from the Arizona State Museum (ASM) collections division, and an Arizona Antiquities Act project-specific permit (No. 2015-094ps) from the ASM permits office authorizing archaeological excavations on state, county, or municipal lands. In the event that human remains were located during excavations, disposition would be governed according to the existing 1996 burial agreement among ASM, the Gila River Indian Community, the Hopi Tribe, the Pueblo of Zuni, and WGAA (now PMGAA) for the former WAFB property. Arizona Bluestake was contacted prior to ground disturbance to arrange for marking of subsurface utilities.

Prior to ground disturbance, archaeologists examined the surface of each site and marked the location of all diagnostic or unique artifacts using pin flags. Each artifact was assigned a sequential point-provenience (PP) number. All marked locations were mapped using a Trimble GeoHX centimeter edition global positioning system (GPS) receiver with a precision of +/- 15 cm. Chronologically significant (decorated pottery) and unique PP were then collected. A 0.5-inch-diameter rebar with aluminum cap datum was set centrally within each site and precision mapped to serve as a future spatial reference; datum locations are depicted in the appendix and detailed in the site discussions below.

Next, backhoe trenches (BHTs) were positioned as designed in the work plan, to the extent possible. Some BHT locations were adjusted to avoid utilities and mature vegetation. Final BHT locations also were precision mapped. BHTs were numbered sequentially and excavated to depths of no more than 5 feet (1.5 m), in compliance with Occupational Safety and Health Administration (OSHA) regulations. The walls of the trenches were then manually faced and examined for subsurface archaeological deposits. No subsurface deposits were identified. One measured profile drawing and soil description was prepared for each site. All BHTs were backfilled upon completion of work.

Laboratory Methods

Following fieldwork, project materials and artifact collections were transported to SWCA's Phoenix Office and Laboratory for processing. All project records were reviewed for completeness and scanned. All collected artifacts were cleaned, cataloged, analyzed by in-house staff archaeologists Daniel Garcia and Lisa Champagne, and will be labeled and packaged for curation in accordance with ASM curation requirements upon acceptance of this report.

All collected ceramic sherds are subjected to detailed analysis that includes the recording of ware, temper type, vessel form and part, vessel function, and lot size, as appropriate. No flaked or ground stone artifacts were collected. One argillite disc was recovered and observations on weight, length, width, thickness, color, condition, and surface wear were documented. One marine shell artifact was recovered and

observations on genus and species (as possible), degree of fragmentation, artifact type, manufacturing evidence, and probable source were documented.

Curation

Upon approval of this report, SWCA will curate the materials generated from the investigations at the ASM under accession number 2015-431.

RESULTS OF ELIGIBILITY TESTING

The following sections describe sites AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM), detail any deviations from the site-specific work plans, present the results of test investigations, and offer recommendations of NRHP eligibility.

AZ U:10:316(ASM)

AZ U:10:316(ASM) was reported by Hesse et al. (2014) as a scatter of prehistoric Hohokam ceramic, flaked stone, and ground stone artifacts (Appendix A:Figure A-2).

Site Type: Artifact scatter
Function: Unknown
Cultural Affiliation: Hohokam
Temporal Affiliation: Prehistoric, A.D. 1000–1300
Dimensions: 47 × 25 m (1,064 m^2; 0.26 acre)
Elevation: 1,369 feet (417 m)
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA (municipal)
NRHP Recommendation: Not eligible

At the time of survey, an estimated 150 artifacts were present on the site surface, and amounted to a moderate surface artifact density of 0.16 artifacts per square meter. Observed artifacts included Gila Plain, Salt Red, and undifferentiated red-on-buff and buffware sherds, flaked fine-grained volcanic and chert debitage, a slate tabular tool, and a volcanic polishing stone. Despite the relatively small number of artifacts present at the site, the variety and diversity of material classes suggested that the assemblage may have resulted from multiple processing activities, perhaps habitation. Test excavations were recommended to determine if significant subsurface components were present.

With exception to the precise placement of some BHTs, fieldwork at AZ U:10:316(ASM) proceeded as presented in the site-specific work plan. Surface artifacts were identified and pin-flagged and the site boundaries were adjusted for changes in surface artifact distributions. Temporally diagnostic/unique artifacts were identified and mapped (n=43), and those deemed chronologically significant or unique (n=19) were collected; five backhoe trenches (Table 1, below) were placed as closely as possible to the plan locations (some trenches were adjusted to avoid vegetation or subsurface utilities). Excavated

trenches were mapped, manually prepared, and inspected for evidence of subsurface deposits. No subsurface deposits were identified, so a single representative soil description and profile was prepared to document subsurface stratigraphy (Table 2).

Table 1. Backhoe Trenches Excavated at AZ U:10:316(ASM)

BHT No.	Length (m)	Width (m)	Depth (m)	Date Completed	Notes
1	5.5	0.8	1.53	11/3/2015	Sterile
2	5.5	0.8	1.53	11/3/2015	Sterile
3	6.2	0.8	1.53	11/3/2015	Sterile
4	7.2	0.8	1.50	11/3/2015	Sterile. Trench moved slightly south from planned location.
5	5.5	0.8	1.50	11/3/2015	Sterile. Representative profile recorded.

Table 2. Representative Subsurface Soil Profile from BHT 5 at AZ U:10:316(ASM)

Unit	Depth (cmbgs)	Soil Description
I	0–30	Tan silt, slightly compacted, blocky
II	30–80	Tan silt, moderate to compact, calcium carbonate present, blocky
III	80–150	Tan silt, very compact, calcium carbonate present, slightly blocky

Collected Artifacts

In total, 19 surface artifacts, all ceramic sherds, were deemed chronologically significant and were collected from nine point-proveniences. These are summarized in Table 3, below.

Table 3. Collected Artifacts Recovered from AZ U:10:316(ASM)

Provenience	Bag Number	Artifact Class	Description	Quantity
PP1	1	Ceramic	Likely Sacaton Red-on-buff jar body sherd	1
PP2	2	Ceramic	Likely Casa Grande Buffware jar body sherd	1
PP4	4	Ceramic	Six Casa Grande Red-on-buff body sherds from a single jar vessel	6
PP7	7	Ceramic	Likely Sacaton Red-on-buff jar body sherd	1
PP12	12	Ceramic	Salt Red jar body sherd	1
PP13	13	Ceramic	Possible white-on-buff or Casa Grande Red-on-buff neck and body sherds from a large-circumference jar	6
PP17	17	Ceramic	Buffware Gila Shoulder bowl/jar sherd	1
PP19	19	Ceramic	Salt Red jar/plate body sherd	1
PP21	21	Ceramic	Santa Cruz Red-on-buff jar body sherd	1

Interpretations

Collectively, the red-on-buff sherds (Santa Cruz A.D. 850–1000, Sacaton A.D. 1000–1150, Casa Grande A.D. 1150–1450; Wood 1987) and the Salt Red (A.D. 1300–1450; Wood 1987) suggest that the assemblage dates to multiple occupations, minimally between A.D. 1000 and 1300. White-on-buff ceramics are not well understood, but similar white-on-red ceramics postdate A.D. 1200 (Wood 1987).

The diversity of surface artifact classes suggests that the site may represent a habitation or resource processing locus. No subsurface archaeological contexts were observed, and the relatively shallow (30 cm below ground surface [bgs]) formation of calcified soil suggests that archaeological contexts are no longer extant, having been removed by water erosion or historic-era mechanical means. This suggests that surface artifacts represent either deflation or redeposition—in either case, no archaeological contexts remain and limited data potential exists.

Recommendations

Following the MPDF, sites minimally should possess buried archaeological features that would provide data on prehistoric habitation, agriculture, or resource processing. No subsurface deposits are present and the assemblage does not provide significant data. AZ U:10:316(ASM), therefore, is recommended as not eligible for NRHP consideration.

AZ U:10:317(ASM)

AZ U:10:317(ASM) is a scatter of prehistoric ceramic, flaked, and ground stone artifacts with a small number of historic-era ceramic and glass artifacts (Appendix A:Figure A-3).

Site Type: Artifact scatter

Function: Unknown

Cultural Affiliation: Hohokam, Historic

Temporal Affiliation: Classic Period (A.D. 1300–1450), Late Historic (A.D. 1900–1965)

Dimensions: 114 × 44 m (5,362 m^2; 1.32 acres)

Elevation: 1,380 feet (421 m)

Vegetation: creosote, shrubs, grasses

Land Ownership: PMGAA (municipal)

NRHP Recommendation: Not eligible

Hesse et al. (2014) describe AZ U:10:317(ASM) as a sparse scatter of prehistoric and historic-era artifacts situated approximately 130 m north of previously investigated site AZ U:10:69(ASM)/AZ U:10:127(ASM) (see Appendix A:Figure A-1). The prehistoric component consisted of approximately 130 ceramic sherds, including Gila Plain, red-on-on-buff and buffware, Salt Red, and Gila Polychrome; about 10 pieces of flaked quartzite, jasper, and fine-grained volcanic debitage; and a granite ground stone metate fragment. The historic component included four COCA COLA bottle fragments and three whiteware dinner plate shards. The overall surface artifact density is moderate 0.05 artifacts per square meter. Despite the relatively small number of artifacts present at the site, the variety and diversity of material classes suggested that the assemblage may have resulted from multiple processing activities, perhaps habitation. The presence of Classic period ceramic sherds, suggests a possible association with neighboring site AZ U:10:69(ASM)/AZ U:10:127(ASM), which also has a Classic period assemblage. Test excavations were recommended to determine if significant subsurface components were present.

With exception to the precise placement of some backhoe trenches, fieldwork at AZ U:10:317(ASM) proceeded as presented in the site-specific work plan. Surface artifacts were identified and pin-flagged and the site boundaries were adjusted for changes in surface artifact distributions. Temporally diagnostic/unique artifacts were identified and mapped (n=111), and those deemed chronologically

significant or unique (n=65) were collected; six backhoe trenches (Table 4, below) were placed as closely as possible to the plan locations (some trenches were adjusted to avoid vegetation or subsurface utilities). Excavated trenches were mapped, manually prepared, and inspected for evidence of subsurface deposits. No subsurface deposits were identified, so a single representative soil description and profile was prepared to document subsurface stratigraphy (Table 5).

Table 4. Backhoe Trenches Excavated at AZ U:10:317(ASM)

BHT No.	Length (m)	Width (m)	Depth (m)	Date Completed	Notes
1	10.3	0.8	1.40	11/3/2015	Sterile. Representative profile recorded.
2	10.0	0.8	1.40	11/3/2015	Sterile
3	6.7	0.8	1.40	11/3/2015	Sterile
4	11.2	0.8	1.40	11/3/2015	Sterile
5	11.2	0.8	1.53	11/3/2015	Sterile
6	12.0	0.8	1.43	11/3/2015	Sterile

Table 5. Representative Subsurface Soil Profile from BHT 1 at AZ U:10:317(ASM)

Unit	Depth (cmbgs)	Soil Description
I	0–45	Tan silt, moderately compacted, blocky, with roots
II	45–105	Tan/reddish brown silt loam, compact, calcium carbonate present
III	105–145	Tan silt loam, very compact, calcium carbonate present, some roots

Artifacts

In total, 66 surface artifacts, all ceramic sherds, were deemed chronologically significant and were collected from 25 point-proveniences. These are summarized in Table 6, below.

Table 6. Collected Artifacts Recovered from AZ U:10:317(ASM)

Provenience	Bag Number	Artifact Class	Description	Quantity
PP2	2	Ceramic	Buffware body sherds	2
PP3	3	Ceramic	Sand-tempered brownware body and rim sherds. Abundant vugs. Possible protohistoric/historic O'odham	4
PP6	6	Ceramic	Buffware body sherd	1
PP8	8	Ceramic	Likely Casa Grande Red-on-buff jar body sherd	1
PP9	9	Ceramic	Likely Casa Grande Red-on-buff jar body sherds	2
PP11	11	Ceramic	Gila Polychrome bowl body sherd	1
PP13	13	Ceramic	Gila Polychrome bowl body sherd	1
PP15	15	Ceramic	Gila Polychrome bowl body sherd	1
PP16	16	Ceramic	Gila Polychrome bowl body sherd	1
PP19	19	Ceramic	Salt Red bowl body sherds	8
PP20	20	Ceramic	Gila Polychrome bowl body sherds	5
PP21	21	Ceramic	Gila Polychrome bowl body sherds	18

Table 6. Collected Artifacts Recovered from AZ U:10:317(ASM), Continued

Provenience	Bag Number	Artifact Class	Description	Quantity
PP23	23	Ceramic	Gila Polychrome bowl body sherds	2
PP25	25	Ceramic	Salt Red bowl body sherds	3
PP26	26	Ceramic	Salt Red bowl body sherd	1
PP29	29	Ceramic	Undifferentiated Buffware bowl body sherd	1
PP30	30	Ceramic	Gila Polychrome bowl body sherd	1
PP36	36	Ceramic	Salt Red bowl rim sherd	1
PP37	37	Ceramic	Undifferentiated Buffware bowl body sherds	2
PP38	38	Ceramic	Likely Casa Grande Red-on-buff jar body sherds	2
PP42	42	Ceramic	Undifferentiated Buffware rim sherd	1
PP48	48	Ceramic	Casa Grande Red-on-buff rim sherd	1
PP49	49	Ceramic	Undifferentiated red-on-buff body sherd	1
PP50	50	Ceramic	Undifferentiated red-on-buff body sherd	1
PP51	51	Ceramic	3 Undifferentiated Buffware bowl body sherd and 1 Gila Polychrome bowl body sherd	4

Interpretations

Collectively, the ceramic sherds (Casa Grande Red-on-buff A.D. 1150–1450; Gila Polychrome A.D. 1300–1600; Salt Red A.D. 1300–1450; Wood 1987) suggest that the assemblage dates minimally between A.D. 1300 and 1450, although the presence of possible protohistoric O'odham plain ware suggests the site may have an even later (post-A.D. 1600) occupation component.

The diversity of surface artifact classes suggests that the site may represent a habitation or resource processing locus. No subsurface archaeological contexts were observed, and the relatively shallow (45 cmbgs) formation of calcified soil suggests that archaeological contexts are no longer extant, having been removed by water erosion or historic mechanical means. This suggests that surface artifacts represent either deflation or redeposition—in either case, no archaeological contexts remain and limited data potential exists.

Recommendations

Following the MPDF, sites minimally should possess buried archaeological features that would provide data on prehistoric habitation, agriculture, or resource processing. No subsurface deposits are present and the assemblage does not provide significant data. Site AZ U:10:317(ASM), therefore, is recommended as not eligible for NRHP consideration.

AZ U:10:320(ASM)

AZ U:10:320(ASM) is a large, low-density scatter of prehistoric ceramic, flaked stone, ground stone, and marine shell artifacts (Appendix A:Figure A-4).

Site Type: Artifact scatter

Function: Unknown

Cultural Affiliation: Hohokam

Temporal Affiliation: Sedentary–Classic (A.D. 1000–1450)
Dimensions: 187 × 60 m (10,253 m^2; 2.53 acres)
Elevation: 1,384 feet (422 m)
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA (municipal)
NRHP Recommendation: Not eligible

AZ U:10:320(ASM) is located southeast of and adjacent to the floodwater channel that borders much of the northern and eastern boundaries of the Airport, and northeast of AZ U:10:319(ASM) (see Appendix A:Figure A-1). The artifact assemblage as reported by Hesse at al. (2014) consists of about 150 artifacts, including Gila Plain, Wingfield Plain, and red-on-buff ceramics; fine-grained basalt chopper tools; hammer stones; and debitage flakes; and a vesicular basalt metate fragment. The surface artifact density is low-to-moderate 0.02 artifacts per square meter. Despite the relatively small number of artifacts present at the site, the variety and diversity of material classes suggested that the assemblage may have resulted from multiple processing activities, perhaps habitation. Test excavations were recommended to determine if significant subsurface components were present.

With exception to the precise placement of some backhoe trenches, fieldwork at AZ U:10:320(ASM) proceeded as presented in the site-specific work plan. Surface artifacts were identified and pin-flagged and the site boundaries were adjusted for changes in surface artifact distributions. Temporally diagnostic/unique artifacts were identified and mapped (n=24), and those deemed chronologically significant or unique (n=10) were collected; eight backhoe trenches (Table 7, below) were placed as closely as possible to the plan locations (some trenches were adjusted to avoid vegetation or subsurface utilities). Excavated trenches were mapped, manually prepared, and inspected for evidence of subsurface deposits. No subsurface deposits were identified, so a single representative soil description and profile was prepared to document subsurface stratigraphy (Table 8).

Table 7. Backhoe Trenches Excavated at AZ U:10:320(ASM)

BHT No.	Length (m)	Width (m)	Depth (m)	Date Completed	Notes
1	20.0	0.8	1.40	11/4/2015	Sterile
2	20.0	0.8	1.40	11/4/2015	Sterile
3	20.0	0.8	1.50	11/5/2015	Sterile
4	20.0	0.8	1.50	11/5/2015	Sterile. Representative profile recorded.
5	20.0	0.8	1.50	11/5/2015	Sterile
6	20.0	0.8	1.50	11/5/2015	Sterile
7	20.0	0.8	1.50	11/5/2015	Sterile
8	20.0	0.8	1.50	11/5/2015	Sterile

Table 8. Representative Subsurface Soil Profile from BHT 4 at AZ U:10:320(ASM)

Unit	Depth (cmbgs)	Soil Description
I	0–24	Slightly compacted tan silt
II	24–50	Moderately compacted tan silt
III	50–110	Brown silt loam, moderately compact, calcium carbonate present, some clay modules, gravel, and sand interspersed
IV	110–150	Tan silt loam, moderately compact, calcium carbonate present, with pebbles interspersed

Artifacts

Ten surface artifacts, including ceramic sherds and marine shell, were deemed chronologically significant or exotic and were collected from seven point-proveniences. These are summarized in Table 9, below. The marine shell artifact is a 4-cm-long, 5-mm-wide, 4-mm-thick *Glycymeris* sp. bracelet fragment, estimated at 25 percent complete. Evidence of cutting, grinding, and polishing are present on all original exterior surfaces. There is no evidence for source; the raw material likely originated in the Sea of Cortez.

Table 9. Collected Artifacts Recovered from AZ U:10:320(ASM)

Provenience	Bag Number	Artifact Class	Description	Quantity
PP4	4	Ceramic	Salt Red jar body sherd	1
PP6	6	Shell	Worked *Glycymeris* sp. bracelet fragment	1
PP8	8	Ceramic	Sacaton Red-on-buff jar body sherd	1
PP9	9	Ceramic	Tonto Polychrome jar body sherds	3
PP10	10	Ceramic	Undifferentiated red-on-buff sherds	2
PP15	15	Ceramic	Buffware rim sherd	1
PP18	18	Ceramic	Salt Red jar body sherd	1

Interpretations

The single Sacaton Red-on-buff (A.D. 1000–1150; Wood 1987) ceramic suggests a Sedentary period Hohokam component, while the Tonto Polychrome and Salt Red sherds (A.D. 1300–1600 and 1300–1450, respectively; Wood 1987) suggest a Classic period occupation.

The diversity of surface artifact classes suggests that the site may represent a habitation or resource processing locus. No subsurface archaeological contexts were observed. Unlike the other three sites reported here, site AZ U:10:320(ASM) exhibits more soil formation and slightly deeper calcified soils, suggesting that surface deposits are not the result of water erosion or historic-era mechanical disturbance. The lack of subsurface contexts suggests that the site may have served as a short-term processing area.

Recommendations

Following the MPDF, sites minimally should possess buried archaeological features that would provide data on prehistoric habitation, agriculture, or resource processing. No subsurface deposits are present and the assemblage does not provide significant data. Site AZ U:10:320(ASM), therefore, is recommended as not eligible for NRHP consideration.

AZ U:10:321(ASM)

AZ U:10:321(ASM) is a scatter of prehistoric ceramic, flaked stone, and stone bead artifacts (Appendix A:Figure A-5).

Site Type: Artifact scatter
Function: Unknown
Cultural Affiliation: Hohokam
Temporal Affiliation: Prehistoric
Dimensions: 97 × 26 m (2,113 m^2; 0.52 acre)
Elevation: 1,387 feet (423 m)
Vegetation: creosote, shrubs, grasses
Land Ownership: PMGAA (municipal)
NRHP Recommendation: Not eligible

AZ U:10:321(ASM) is located west of the floodwater channel that borders the eastern boundary of the Airport, but northeast of the former location of the channel that was abandoned and replaced with the current channel in 2006. The artifact assemblage described by Hesse et al. (2014) includes about 50 Gila Plain, buffware, and Salt Red ceramic sherds; two fine-grained volcanic debitage flakes; and a stone disc bead fragment manufactured from a salmon-colored argillite. It exhibits a central drill hole and is broken in half. The overall artifact density is a moderate 0.04 artifacts per square meter. Most of the artifacts are located in the northern half of the site. Despite the relatively small number of artifacts present at the site, the variety of material suggested that the assemblage may have resulted from multiple processing activities, perhaps habitation. Test excavations were recommended to determine if significant subsurface components were present.

With exception to the precise placement of some backhoe trenches, fieldwork at AZ U:10:321(ASM) proceeded as presented in the site-specific work plan. Surface artifacts were identified and pin-flagged and the site boundaries were adjusted for changes in surface artifact distributions. Temporally diagnostic/unique artifacts were identified and mapped (n=47), and those deemed chronologically significant or unique (n=5) were collected; three backhoe trenches (Table 10, below) were placed as closely as possible to the plan locations (some trenches were adjusted to avoid vegetation or subsurface utilities). Excavated trenches were mapped, manually prepared, and inspected for evidence of subsurface deposits. No subsurface deposits were identified, so a single representative soil description and profile was prepared to document subsurface stratigraphy (Table 11).

Table 10. Backhoe Trenches Excavated at AZ U:10:321(ASM)

BHT No.	Length (m)	Width (m)	Depth (m)	Date Completed	Notes
1	11.2	0.8	1.30	11/4/2015	One plain ware sherd unearthed subsurface during excavation. Sterile. Representative profile recorded.
2	10.8	0.8	1.50	11/4/2015	Sterile
3	10.2	0.8	1.34	11/4/2015	Sterile

Table 11. Representative Subsurface Soil Profile from BHT 1 at AZ U:10:321(ASM)

Unit	Depth (cmbgs)	Soil Description
I	0–40	Moderately compacted tan silt with roots and small rocks
II	40–120	Tan compacted silt loam with small rounded rock, calcium carbonate present
III	120–135	Reddish tan, very compact silt loam, calcium carbonate present

Artifacts

Five surface artifacts, including ceramic sherds and an argillite bead fragment, were deemed chronologically significant or exotic and were collected from four point-proveniences (Table 12). The disc bead fragment is broken in half, is 15 mm long, 8 mm wide, 2 mm thick with a 6-mm-diameter central drill hole. The bead is manufactured from a reddish yellow (5YR7/6) argillite exhibiting evidence of grinding and cutting on all original exterior surfaces.

Table 12. Collected Artifacts Recovered from AZ U:10:321(ASM)

Provenience	Bag Number	Artifact Class	Description	Quantity
PP3	3	Ceramic	Undifferentiated red-on-buff jar body sherd	1
PP6	6	Ceramic	Undifferentiated red-on-buff jar body sherd	2
PP7	7	Ceramic	Buffware jar body sherd	1
PP9	9	Bead	Argillite disc bead fragment	1

Interpretations

Insufficient artifact data are available to ascertain the age of the site beyond generally prehistoric in age. The diversity of surface artifact classes suggests that the site may represent a habitation or resource processing locus. No subsurface archaeological contexts were observed, and the relatively shallow (40 cmbgs) formation of calcified soil suggests that archaeological contexts are no longer extant, having been removed by water erosion or historic-era mechanical means. This suggests that surface artifacts represent either deflation or redeposition—in either case, no archaeological contexts remain and limited data potential exists.

Recommendations

Following the MPDF, sites minimally should possess buried archaeological features that would provide data on prehistoric habitation, agriculture, or resource processing. No subsurface deposits are present and the assemblage does not provide significant data. Site AZ U:10:321(ASM), therefore, is recommended as not eligible for NRHP consideration.

SUMMARY AND RECOMMENDATIONS

Ricondo and Associates, Inc., under contract to PMGAA, retained SWCA to conduct NRHP eligibility testing at four archaeological sites—AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM)—in advance of Phoenix-Mesa Gateway Airport NADP facilities development. Testing fieldwork took place on November 2–5, 2015, in accordance with the approved work plan. Following the MPDF, sites minimally should possess buried archaeological features that would provide data on prehistoric habitation, agriculture, or resource processing. No archaeological features or

significant cultural deposits were identified at AZ U:10:316(ASM), AZ U:10:317(ASM), AZ U:10:320(ASM), and AZ U:10:321(ASM) as a result of the investigations. The four archaeological sites warrant no additional study or preservation, and SWCA recommends that they are ineligible for NRHP consideration.

In the event that previously unreported cultural resources are encountered during ground-disturbing activities related to development of the Phoenix-Mesa Gateway Airport NADP facilities, all work would immediately cease within 30 m (100 feet) until a qualified archaeologist has documented the discovery and evaluated its eligibility for the NRHP, in consultation with FAA, ASM, SHPO, and Tribes, as appropriate. Work would not resume in this area without approval of the lead agency.

If human remains are observed during construction, all work within 30 m (100 feet) of the discovery would cease immediately. The ASM State Repatriation Coordinator (Todd Pitezel, 520-621-4795) and PMGAA would be contacted immediately to determine how to proceed. Human remains will at all times be treated with the utmost dignity and respect. All discoveries will be treated in accordance with Arizona burial laws (Arizona Revised Statutes 41-844 and 41-865), as appropriate, and work must not resume in this area without proper authorization.

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Appendix D.4

SWCA®
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Archaeological Survey for the Phoenix-Mesa Gateway Airport ASR-8 Relocation, Rittenhouse Auxiliary Airfield, Pinal County, Arizona

Prepared for

Phoenix-Mesa Gateway Airport Authority

Prepared by

SWCA Environmental Consultants

December 2014

ARCHAEOLOGICAL SURVEY FOR THE PHOENIX-MESA GATEWAY AIRPORT ASR-8 RELOCATION, RITTENHOUSE AUXILIARY AIRFIELD, PINAL COUNTY, ARIZONA

Prepared for

Phoenix-Mesa Gateway Airport Authority
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SWCA Project No. 25809

SWCA Cultural Resources Report No. 14-588

December 2014

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PROJECT ABSTRACT

Report Title. Archaeological Survey for the Phoenix-Mesa Gateway Airport ASR-8 Relocation, Rittenhouse Auxiliary Airfield, Pinal County, Arizona

Report Date. December 2014

Agency Names. Federal Aviation Administration (FAA) (lead federal agency), Bureau of Land Management (BLM), U.S. Air Force (USAF)

Permit Number. BLM Cultural Resource Use Permit No. AZ-000515, Authorization No. PDO-15-001

Project Description. Phoenix-Mesa Gateway Airport Authority (PMGAA) proposes the Northeast Area Development Plan (NADP), a phased development program for the Phoenix-Mesa Gateway Airport that would incrementally expand airport passenger terminal capacity to match facility needs as commercial airline traffic and passengers increase. The NADP would require the relocation of an FAA airport surveillance radar (ASR) that is currently located within the NADP area of effect. The FAA conducted a site selection study to identify potential suitable sites for the relocated ASR. Based on operational, environmental, and construction considerations, the FAA selected a site located within the former Rittenhouse Auxiliary Airfield (RAAF) in northern Pinal County on land administered by the BLM and leased to the Arizona Army National Guard. The site is located approximately 7.8 nautical miles southeast of the air traffic control tower at Phoenix-Mesa Gateway Airport.

The proposed ASR system would include ASR-8 primary surveillance radar; air traffic control beacon interrogator model 5 secondary surveillance radar; beacon parrot; primary radar moving target indicator reflector; ASR-8 style antenna tower system; and a TDX2000d digitizer with associated communication interfaces between the radar site and the FAA existing automation systems. The height of the tower would be approximately 27 feet above ground level.

The NADP, including the relocation of the ASR, constitutes a federal undertaking of the FAA that is subject to Section 106 of the National Historic Preservation Act of 1966, as amended. Historic property inventories have been conducted of the area of potential effects (APE) for the NADP, as it relates to the proposed expansion of airport facilities (Hesse et al. 2014; Steely 2014). The APE for the proposed new ASR facility, which is the subject of this inventory report, is an approximately 6-acre site in which the ASR facility would be constructed, and an 830-foot-long, 100-foot-wide corridor in which an access road would be constructed. Once constructed, the ASR site would occupy an area that is only 200 × 200 feet (0.92 acre), and the access road would be only 20 feet wide. The APE for this study is significantly larger than the anticipated area of development to ensure adequate flexibility for final facility and access road siting during the design phase, for necessary utility infrastructure, for construction activities, and for any laydown areas.

Ricondo and Associates, Inc.—the aviation consulting firm providing environmental planning services for Phoenix-Mesa Gateway Airport Authority (PMGAA)—contracted SWCA Environmental Consultants (SWCA) to conduct a cultural resources survey of the APE. Specifically, SWCA was tasked with conducting an archaeological survey, evaluating all identified cultural resources for their eligibility to be listed in the National Register of Historic Places (NRHP), and assessing the effects of the project on NRHP-eligible properties.

Land Ownership. BLM

Project Location. The ASR APE is in Section 15, Township 2 South, Range 8 East, Gila and Salt River Baseline and Meridian, in Pinal County, Arizona, and can be found on the U.S. Geological Survey Desert Well and Sacaton NE, Arizona, 7.5-minute quadrangles.

Number of Acres Surveyed. 7.9 acres (all BLM)

NRHP-Listed Properties. None.

NRHP-Eligible Properties. One site—AZ U:10:190(ASM) [Rittenhouse Auxiliary Airfield]

NRHP-Ineligible Properties. No sites; one isolated occurrence (IO)

Recommendations. SWCA's archaeological survey of the ASR APE resulted in the identification of one archaeological feature of a previously recorded site and one IO. The archaeological feature is the remains of an abandoned runway of the former RAAF, the entirety of which has been previously assigned site number AZ U:10:190(ASM). The IO is a single pottery sherd of Hohokam plain ware.

In 2006–2008, Versar, Inc. (Versar), prepared a detailed National Register evaluation of the RAAF in support of the Arizona Army National Guard's use of the facility for possible readiness preparation activities (Versar 2008). Versar concluded that the RAAF was ineligible for listing in the NRHP because of diminished design integrity, compared with other, better preserved examples of this property type in southern Arizona, and because it has no unique or significant associations. Furthermore, the preserved features of the RAAF are generally in poor condition, and there are few associated artifacts. As a result, Versar argued that the property does not exhibit the potential to yield important information in history. The BLM, however, disagrees with Versar's recommendation of ineligibility, citing Thompson's (2004) historic context for military aviation training, and the BLM archaeologist's own experience with the Barry M. Goldwater Range in the 1990s (Cheryl Blanchard, personal communication, November 6, 2014). As such, the RAAF is considered NRHP-eligible under Criterion a, for its association with "training pilots for combat in World War II and supporting the mission of training pilots in the early stages of the Cold War period," as well as under Criterion d, for its information potential.

SWCA's survey of the ASR APE focused on a small portion of the 739-acre RAAF, intersecting only one of the 25 features identified and described by Versar. The northern part of the APE includes a small portion of Feature 4, one of the runways. SWCA's observations, admittedly limited in extent, were consistent with those described by Versar. Nothing new was observed in the ASR APE. Similarly, nothing was observed to contradict the BLM's recommendation that the property is eligible for listing in the NRHP. The single IO documented by SWCA is ineligible for listing in the NRHP.

PMGAA's NADP includes the removal of the existing ASR facility at Phoenix-Mesa Gateway Airport. The existing ASR dates to the mid-1990s and is ineligible for listing in the NRHP (Steely 2014). The existing ASR is, however, located within AZ U:10:65(ASM), a known archaeological site that was identified in 1994 during inventory conducted in advance of the USAF's disposal of Williams Air Force Base. The site was subjected to NRHP-eligibility testing, and, as a result, determined eligible and subsequently listed in the NRHP. In the following years, the site was the subject of multiple testing and data recovery projects that cumulatively exhausted the research potential of the site. In July 2009, the site was formally removed from the NRHP. The area that would be affected by the proposed removal of the existing ASR falls within the APE subjected to inventories conducted by SWCA for the NAPD as it related to the expansion of airport facilities (Hesse et al. 2014; Steely 2014).

The proposed relocation of the FAA ASR facility from Phoenix-Mesa Gateway Airport to the former RAAF would result in a finding of no adverse effect to historic properties. The existing radar facility is ineligible for the NRHP, and although it is located within an archaeological site, the site has been

thoroughly investigated and ultimately delisted from the NRHP. The new ASR would be within another known site—the remains of the RAAF (AZ U:10:190[ASM])—which has been evaluated for its potential NRHP eligibility and identified by the BLM as being eligible under Criterion a and Criterion d. SWCA recommends that a no adverse effect finding can be maintained by ensuring no contributing features are directly impacted by the proposed work, i.e., construction and placement of the new ASR shall not permanently impact any runway or other feature. SWCA further argues that the installation of an aerial surveillance radar at an auxiliary airfield is an appropriate use of the historic property and would not alter the integrity of the site.

Assuming adherence to the guidance points outlined above, no further archaeological work is recommended within the APE for the proposed location of the new ASR. In keeping with recommendations made by Hesse et al. (2014) for the NAPD, no further archaeological work is recommended within AZ U:10:65(ASM), which fully contains the existing ASR.

INTRODUCTION

Phoenix-Mesa Gateway Airport Authority (PMGAA) proposes the Northeast Area Development Plan (NADP), a phased development program for the Phoenix-Mesa Gateway Airport that would incrementally expand airport passenger terminal capacity to match facility needs as commercial airline traffic and passengers increase. The NADP would require the relocation of a Federal Aviation Administration (FAA) airport surveillance radar (ASR) that is currently located within the NADP area of effect. The FAA conducted a site selection study to identify potential suitable sites for the relocated ASR. Based on operational, environmental, and construction considerations, the FAA selected a site located within the former Rittenhouse Auxiliary Airfield (RAAF) in northern Pinal County on land administered by the Bureau of Land Management (BLM) and leased to the Arizona Army National Guard (AZARNG). The site is located approximately 7.8 nautical miles southeast of the air traffic control tower at Phoenix-Mesa Gateway Airport (Figure 1).

The proposed ASR system would include ASR-8 primary surveillance radar; air traffic control beacon interrogator model 5 secondary surveillance radar; beacon parrot; primary radar moving target indicator reflector; ASR-8 style antenna tower system; and a TDX2000d digitizer with associated communication interfaces between the radar site and the FAA existing automation systems. The height of the tower would be approximately 27 feet above ground level.

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PROJECT LOCATION

The ASR APE is located in Section 15, Township 2 South, Range 8 East, Gila and Salt River Baseline and Meridian, in Pinal County, Arizona, and can be found on the U.S. Geological Survey (USGS) Desert Well and Sacaton NE, Arizona, 7.5-minute quadrangles (Figure 2). The APE includes land owned by the BLM and leased to the AZARNG.

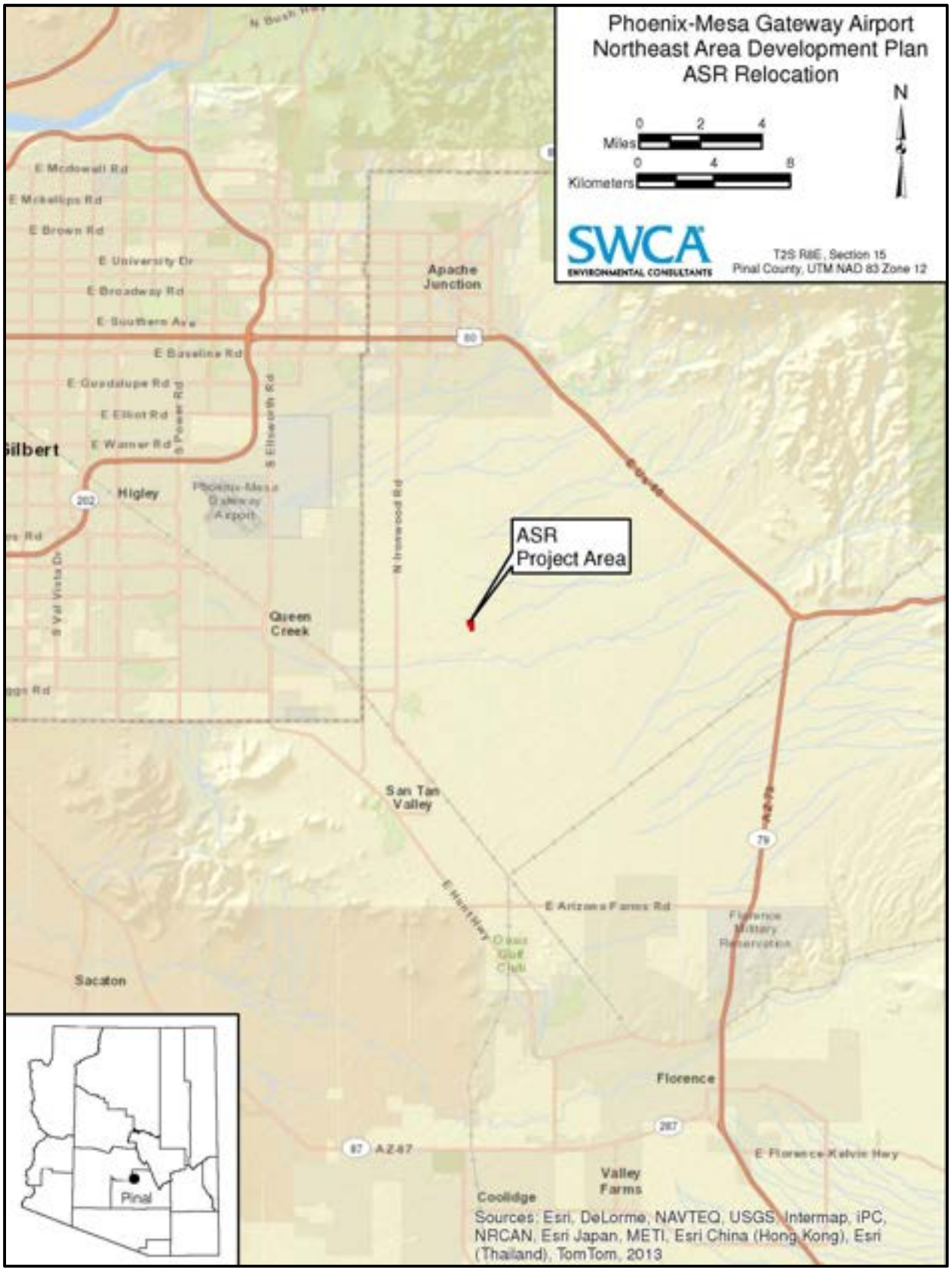

Figure 1. Project location.

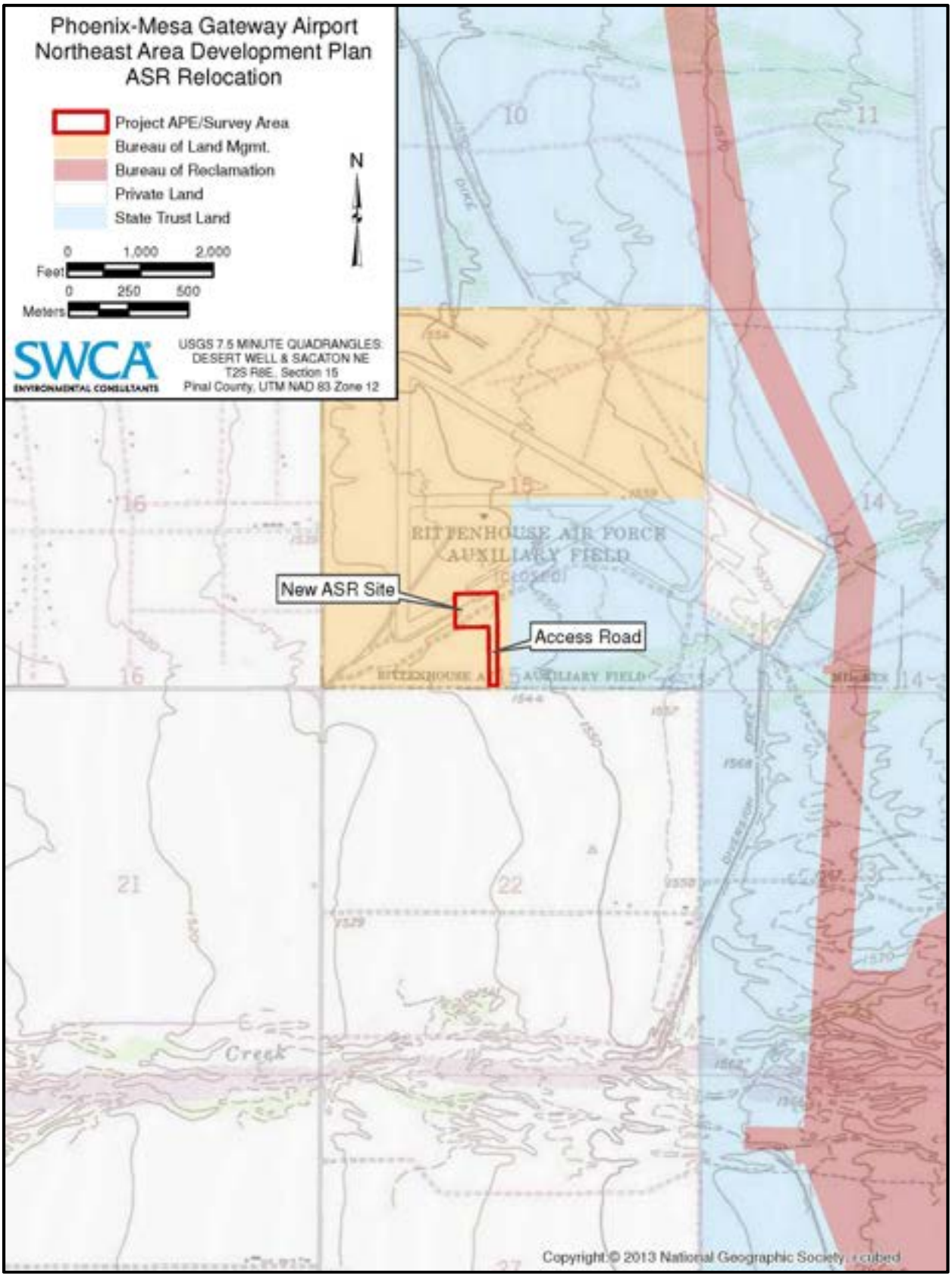

Figure 2. ASR-8 APE.

ENVIRONMENTAL SETTING

The ASR project area is located in the far southeastern part of the Phoenix Valley about 11 km (6.8 miles) northeast of the Santan Mountains and 16 km (10 miles) west of the Superstition Mountains. It is located on the Queen Creek delta—a broad, alluvial fan fed by Queen Creek and its tributaries. The topography is nearly flat, sloping very gently to the west. Much of the Queen Creek delta was converted to farmland in historic times, and more recently to large residential developments. The Central Arizona Project Canal is located almost 1 mile west of the ASR project site.

Native vegetation in the project area is characteristic of the Lower Colorado River Valley subdivision of the Sonoran Desertscrub biotic community (Brown 1994). Sparse native vegetation (primarily creosote bush [*Larrea tridentata*]) is on the RAAF property. Annual average precipitation in this area is less than 20 cm (8 inches), most of which falls during summer monsoon thunderstorms. A second, less-severe period of precipitation occurs during the winter. Summer temperatures regularly exceed 38 degrees Celsius (100 degrees Fahrenheit), while winters are generally mild with few frost days.

CULTURE HISTORY

Although the region has a prehistory stretching back more than 10,000 years, to date the archaeological sites on the RAAF appear to be associated with the later ceramic period Hohokam occupation of the area.

Paleoindian and Archaic Periods

The earliest documented human occupation of the Southwest occurred during the Paleoindian period, which is "well-documented from about 11,000 years ago to about 7,500 years ago" (Cordell 1997:99). Many Paleoindian sites have been identified in southern Arizona (Mabry 1998). However, evidence of Paleoindian occupation in central and south-central Arizona is relatively sparse and consists of isolated projectile points (Crownover 1994; Huckell 1982).

The Archaic succeeded the Paleoindian period and dates from around 5500 B.C. to about A.D. 200 (Cordell 1997). The terminating dates are highly variable and are generally determined by the appearance of agriculture. Late Archaic sites have been investigated immediately north of the Phoenix Basin in the McDowell Mountains and Paradise Valley (Hackbarth 1999; RECON 1987; Stubing and Mitchell 1999).

Hohokam

The best-documented and most widespread archaeological remains in the Phoenix Basin are attributed to the Hohokam, prehistoric desert farmers who occupied much of central and southern Arizona (e.g., Bayman 2001; Crown and Judge 1991; Fish 1989; Gumerman 1991; Haury 1976). Although not necessarily recognizable as Hohokam, the earliest archaeological manifestation that probably gave rise to the Hohokam cultural tradition is assigned to the Red Mountain phase (A.D. 1–500) of the Pioneer period (A.D. 1–750) (Cable and Doyel 1987; Dean 1991; Hackbarth 1992, 2001; Morris 1969). Evidence from Red Mountain phase sites indicates that people subsisted on a mix of wild resources and agricultural products. Corn was the dominant crop, along with beans, squash, and cotton. The first evidence for canal irrigation along the Salt River is attributed to this time, A.D. 400 (Ackerly and Henderson 1989). Identified house forms include small circular and "bean-shaped" pit houses (Mabry 2000).

The period between A.D. 500 and 650 is defined as the Vahki phase. It appears that by this time, irrigation had become well established. Vahki phase canals have been identified at Snaketown (Haury 1976), as well as along the edges of the Salt River floodplain (Ackerly and Henderson 1989). Domestic architecture

consists of square and rectangular pit houses of various sizes (Ciolek-Torrello et al. 2000; Crary and Craig 2001).

The late Pioneer period, A.D. 650 to 750, saw the appearance of decorated pottery in southern Arizona. Hohokam decorated pottery is characterized by red-painted designs on a light-colored buff or brown background (Abbott 2001; Haury 1976). The earliest decorated pottery types include Estrella, Sweetwater, and Snaketown Red-on-buff (Wallace 2001). House types associated with the late Pioneer period vary greatly. Small, domed field houses made from bent poles and covered with brush served as temporary shelters at agricultural fields or at resource procurement and processing sites. Few artifacts are associated with the remains of these structures. Late Pioneer period habitation sites, on the other hand, contained moderate-size pit structures with square or rectangular floor plans and formal, plastered hearths. These were far more substantial than the field houses and were occupied for extended periods.

Late Pioneer period subsistence practices included dependence upon a mixture of wild resources and agricultural produce. The use of canals continued and irrigation expanded from the floodplains to include lands on terraces above rivers (Ackerly and Henderson 1989). Along with the continued use of floodplain fields, the canals allowed irrigation water to reach the terraces above the river.

The Gila Butte and Santa Cruz phases make up the Colonial period (A.D. 750–950). This was a time of expansion and elaboration of Hohokam culture. There were more sites and their distribution across the landscape increased considerably. Colonial period Hohokam artifacts have been found as far north as Prescott in north-central Arizona, south into northern Mexico, to the west of Gila Bend in southwestern Arizona, and east into New Mexico (Haury 1976). Abbott (1994, 2001) argues that the center for most of the decorated buff ware vessels produced during this time was in the area of the middle Gila River valley. Not only did the Hohokam expand their territory, their contact with their neighbors also increased. Intrusive ceramics from the north, east, and west have been found in Hohokam sites dating to this time. In fact, it is argued that Colonial period Hohokam social organization was tied to the exchange of ritual and subsistence goods (e.g., Doyel 1985). Across Arizona, interaction spheres dominated the social landscape and facilitated exchange across the region. It is during this time that the Hohokam achieved their highest level in the production of arts and crafts. Ceramics were well made and elaborately decorated, as was shell jewelry.

The large, square communal structures found in earlier times ceased to be built during the Colonial period. Instead, ball courts, which were probably first built in the early A.D. 800s, became the dominant form of public architecture (Wallace 2001). Their appearance in southern Arizona is thought to mark the emergence of a regional system with religious, economic, and political links that crosscut geographical boundaries (Abbott 2001; Wilcox and Shenk 1977). Subsistence remained based on a mixture of wild resources and agricultural crops, although some wild species (e.g., little barley) were so intensively exploited that they appear to become as important as some of the domesticates (Bohrer 1987). The use of irrigation expanded significantly with the construction and maintenance of canals having a significant impact on Hohokam social and political organization (e.g., Abbott 2000). Canal systems, many of which remained in use for generations, were constructed throughout the Salt and Gila River valleys (e.g., Breternitz 1991; Howard 1990; Howard and Huckleberry 1991).

With the onset of the Sedentary period (Sacaton phase, A.D. 950–1150), there was a decline in the quality of Hohokam material culture, especially in the production of ceramics and shell ornaments. Ball courts were still the dominant form of public architecture during the Early Sedentary period; however, by its end, few were being built. As the construction of ball courts diminished, the construction of capped mounds or platform mounds became more common. Platform mounds were built near village centers around plazas that are surrounded by domestic features. House types exhibit significant variability and are aggregated within courtyard groups or village segments (Wilcox et al. 1981).

Subsistence continued to be based on agriculture, although there was some emphasis on the collection of certain wild plant species, in particular cholla. The production of cotton (its fiber for use in the weaving of textiles and its seeds as food) was also of major importance.

By the end of the Sedentary period, a major reorganization of Hohokam society had occurred. After a period of intensive growth and expansion, many village sites and areas were abandoned. Populations tended to begin to concentrate in larger villages along the Salt River. These changes in the social and political environment were reflected in concomitant changes in public architecture and ceramic production and shell ornament manufacturing. Additionally, there was an increase in population and increasing concentration of the population.

The Sedentary period is followed by the Classic period, which is divided into the Soho (A.D. 1150–1300) and the Civano phases (A.D. 1300–1450). Differences in ceramic decoration and architectural styles separate these two phases. Although they occur in lower frequencies, red-on-buff ceramics continue to be produced during the Soho phase. Red wares become increasingly common and the introduction of long-necked jars marks a clear contrast with the earlier ceramic styles. Structures with post-reinforced adobe walls and surface structures were common during the Soho phase. However, during the Civano phase, adobe compounds—often containing small plazas—and adobe structures were built and used to the near exclusion of semi-subterranean structures. Puddled and coursed adobe construction generally replaced the use of structures with pole-reinforced walls, and the number and proximity of rooms within compounds increased.

Public architecture also underwent a change in the Early Classic period. There was a significant increase in the construction and use of platform mounds during the Classic period (Gregory et al. 1988). At the same time, the construction of ball courts declined to its lowest point. The apex of public architecture was achieved in the Civano phase with the building of "big houses." The only remaining example of a big house is found today at Casa Grande Ruins on the outskirts of Coolidge. These structures likely served multiple functions. It is argued that they were clear symbols of elite status in Hohokam society (Wilcox and Shenk 1977). Big houses often co-occurred with platform mounds, with the two being separated by a site's central plaza. The appearance of the big house is as mysterious as their disappearance. Their construction and use may have been the result of changes within Hohokam society, and their abandonment may have been tied to attacks from outsiders (e.g., Teague 1989; Wilcox and Shenk 1977).

Red wares and the disappearance of plain wares mark the Civano phase, although plain wares continue to dominate the total ceramic assemblage. Polychrome pottery (in particular, Gila and Tonto polychromes) and local imitations were present after A.D. 1320 (Reid and Whittlesey 1992).

Canal irrigation continued to be very important during the Civano phase. The Civano phase Hohokam depended greatly upon corn, beans, and squash as the mainstays of their diet. Corn was certainly the most common domesticate, although the abundance of agave at many sites indicates it too played a significant role in Civano phase subsistence activities. At some sites, during the late Classic period, the use of agave became increasingly important and the availability of agricultural produce declined (e.g., Miller 1994).

Hohokam social organization during the Civano phase was clearly different from what preceded it and from what was to follow. Population size and density at many of the large sites in the Salt River valley reached never-before-seen levels. Although the level of social and political organization actually achieved by the Hohokam is open to much debate, some increase in social complexity was undoubtedly necessary to manage the higher population densities that developed. This may have been expressed in the construction and use of platform mounds and big houses.

The post-Classic period (A.D. 1450–1540) in the Phoenix Basin, referred to by some as the Polvorón phase, is a somewhat hazy gap between the Late Classic period Hohokam and the arrival of the first

Europeans (Bayman 2001). Nevertheless, the traits used to identify the Polvorón phase include jacal structures, polychrome ceramics, and the presence of an abundance of obsidian. However, many argue that these characteristics are not sufficient to distinguish the Polvorón phase from the late Civano phase. Additionally, chronological dates currently available for the Polvorón phase are imprecise, thus making it difficult to distinguish Civano and Polvorón phase sites from one another (see Dean 1991:87).

By the late Civano phase the success the Hohokam had enjoyed had vanished. High population densities, depletion of food resources, decline in agricultural productivity, disease and malnutrition, flooding, drought, and the collapse of many irrigation systems are cited for the collapse of the Hohokam (e.g., Bayman 2001; Van Gerven and Sheridan 1994). Nevertheless, Bayman (2001) points out that the Hohokam may have persisted until the early 1500s, and that the debate over the cause or causes for the decline and disappearance of the Hohokam is far from resolved. Some have even argued that Hohokam and Salado peoples may have directly encountered the Spanish (Reff 1992).

Following the collapse of the Hohokam regional system, Akimel O'odham (Pima) and Tohono O'odham (Papago) groups lived in the middle Gila River valley. For unknown reasons, the Salt River valley was either used sparingly or was abandoned following the Hohokam collapse. Akimel O'odham and Tohono O'odham groups lived in small rancherías, subsisting on agricultural products, wild plant foods, and game. The Pee Posh (Maricopa), who were migrants from the Gulf of California area, formed an alliance with the Pima in the early 1800s and have lived in the Salt-Gila Basin ever since. All these groups continue to occupy the area, living on several reservations.

Historic Period

Spanish, Mexican, and Euro-American factions began to arrive in appreciable numbers in the eighteenth century. Most of these early expeditions followed either the Santa Cruz or San Pedro Rivers up to the Gila River before turning westward. The ensuing period of historical exploitation was marked by mining, ranching, and homesteading interests. These historical pursuits included the construction of new canals, as well as the reuse of prehistoric ones.

Sylvester Pattie and James Ohio Pattie were the first Euro-Americans to pass through the Phoenix Basin in 1826. On February 2, 1848, the Treaty of Guadalupe Hidalgo was signed. Its provisions called for Mexico to cede 55 percent of its territory (present-day Arizona, California, New Mexico, and parts of Texas, Colorado, Nevada, and Utah) in exchange for $15 million in compensation. Thus, in 1848, the United States acquired most of what is now Arizona, and the rest was bought with the Gadsden Purchase in 1854. Through the mid-1800s, numerous Euro-American explorers and surveyors crossed Arizona, but again, the Phoenix Basin was bypassed (Cross et al. 1960; Trimble 1977; Wagoner 1989; Walker and Bufkin 1979).

The early development and growth of central Arizona during the late 1800s and early 1900s was a direct response to national economic stimuli. The discovery of gold in the Bradshaw Mountains in 1863 drew miners, the military, ranchers, and entrepreneurs to the region (Mawn 1977; Zarbin 1978). In 1889, Phoenix became the permanent capital, and in 1912, Arizona became a state (Luckingham 1989).

Phoenix

The genesis of modern Phoenix lies with Jack Swilling of Wickenburg. After organizing the Swilling Irrigation Canal Company, Jack Swilling moved to the valley in 1867 and began opening a canal to divert water from the Salt River (Zarbin 1997). Most canals in the Phoenix Basin were constructed and operated by companies. Approximately 15 major canals had appeared by 1888, with more than 400,000 acres

under cultivation. Components of these systems were acquired by the federal government beginning in 1902, and under a 1917 agreement, the system is now managed by the Salt River Project.

By 1868, a small colony had arisen about 4 miles east of where Phoenix is centered today. On May 4, 1868, Phoenix was officially recognized when it became an election precinct within Yavapai County. A post office was established on June 15 of the same year, with Jack Swilling as the postmaster. In the early 1870s, the town center officially shifted to the area around present-day Washington Street and Central Avenue. By 1880, Phoenix had a population of approximately 1,700 and Mesa about 1,000, and Hayden's Ferry, later to become known as Tempe, was emerging as a farming and trading center. The entire area developed into an extensive farmland of citrus orchards and cotton and lettuce fields. Territorial Governor John C. Frémont signed a bill incorporating the City of Phoenix on February 25, 1881.

The southern transcontinental railroad (Southern Pacific) ran considerably south of Phoenix. However, goods were transported to the Phoenix area via freight teams. It was not until July 1887 that the railroad arrived in Phoenix. In 1895, a second railroad linked Phoenix with the northern Arizona transcontinental railroad (Atlantic-Pacific). These railroads greatly reduced the costs of goods coming into the area. Construction of flood controls on Cave Creek prompted further development of the western valley in the early 1900s (Hackbarth 1995). During the 1870s and 1880s, demand for Arizona's gold and silver grew, as did the demand for the valley's agricultural produce (Morrow 1943).

In the 1880s, Phoenix began to take on the aura of a city, as sewer and water systems were begun and roadways expanded. In the late 1890s and early 1900s, national demand for Arizona's resources once again stimulated economic growth in the area (Morrow 1943). The construction of Roosevelt Dam in the early 1900s resulted in a boom in agriculture in the Phoenix Basin (Luckingham 1989), and the Enlarged Homestead Act of 1909 encouraged settlement of the arid lands around Phoenix.

The Higley area, which later became part of Gilbert, Mesa, Queen Creek, and the Phoenix-Mesa Gateway Airport, was primarily settled after about 1900. Several families moved to the area near Higley and Williams Field Road to farm or raise livestock under the National Homestead Act of 1862, the Desert Lands Act of 1877, the Enlarged Homestead Act of 1909, and later the Stock-Raising Homestead Act of 1916 (the Dry Farming Homestead Act) (BLM 2009; Stein 1990:4–6). Higley was named after Stephen Weaver Higley, a railroad man who helped build the Santa Fe Railway (Pickett 1996:264; Queen Creek 2009). Higley, who was an owner of the *Arizona Republican* newspaper, bought 8,300 acres of land where Higley is today with the idea of farming the land. The first post office at Higley was established in the Higley general store in 1910, on the original townsite of 40 acres.

World War II (WWII) spurred the construction of Williams Field in 1941. Williams Field—renamed Williams Air Force Base (WAFB) after the creation of the U.S. Air Force (USAF) in 1947—was one of hundreds of training and defense airfields constructed in the continental United States for the 1940s war effort (Thole 1996:147–155). The twin-engine fighter-aircraft pilot training field in Arizona's Salt River valley desert near Higley, Chandler, and Mesa was completed in December 1941, just before the United States entered the war. Williams Field joined some 15 Army Air Fields newly built in Arizona to train the war's pilots, mechanics, gunnery technicians, flight controllers, and other aviation soldiers. RAAF was one of five satellite airfield for Williams Field.

When the war ended in September 1945 and the vast majority of military training bases demobilized across the nation, Williams Field remained in service, in large part because of its next-generation jet-aircraft training role and its year-round favorable flying weather (USAF Civil Engineer Center 2013). With advent of the Cold War in 1948 during the Soviet Union's Berlin blockade and U.S.-assisted airlift, WAFB became part of a revived national system of fighter-aircraft training programs. In 1949, WAFB trainees first flew the new T-33 two-seat jet trainer, based on the P-80 frame and engine. The Korean

War, beginning in 1950, galvanized WAFB's continuing role in the larger global Cold War over the next three decades, supplying pilots for other European emergencies, the Cuban missile crisis, Vietnam, and finally the accelerated arms race of the 1980s (USAF Civil Engineer Center 2013). By 1971, the USAF ceased all flight training activities at RAAF, but continued to use the facilities for other training purposes.

With the fall of the Berlin Wall in 1989, and the first Iraq War and collapse of the Soviet Union both in 1991, the U.S. Department of Defense celebrated victory in the Cold War and updated its service doctrines. In 1990, Congress initiated the Base Realignment and Closure Act, which scheduled WAFB for closure in 1993.

PREVIOUS RESEARCH

AZSITE and National Register of Historic Places Research

Before fieldwork, SWCA consulted the AZSITE database, which includes records from the Arizona State Museum (ASM), Arizona State University, and the BLM, for previously conducted surveys and previously recorded sites in the project area and within a 1-mile radius of the project area. The National Park Service National Register Information Systems Database was also consulted for NRHP-listed properties or districts within a 1-mile (1.6-km) radius of project area. Additionally, reports prepared for the AZARNG related to RAAF, but not available through AZSITE or the ASM, were also reviewed (Davis et al. 2006; Versar 2008).

The records search indicates that 17 archaeological projects have been conducted within 1 mile (1.6 km) of the ASR-8 APE (Table 1, Appendix A:Figure A-1). Most of the land within a 1-mile (1.6-km) radius of the project area has been archaeologically surveyed, including the entirety of the ASR-8 APE.

The records search identified four archaeological sites within 1 mile (1.6 km) of the ASR-8 APE (Table 2; see Appendix A:Figure A-1). Apart from RAAF, the other sites are exclusively prehistoric Hohokam habitation and/or agricultural hamlet sites.

Table 1. Previous Archaeological Surveys within a 1-Mile (1.6-km) Radius of the Project Area

Agency Number	Survey Name	Institution
1973-13.ASM	Salt-Gila Survey	ASM
1979-124.ASM	Central Arizona Project (CAP), Salt-Gila Aqueduct, Reaches 1, 2, and 3	Museum of Northern Arizona
1985-232.ASM	CAP, Northland Task 8, Queen Creek Irrigation District	Northland Research, Inc. (Northland)
1986-185.ASM	Salt River Project, CAP and MAGMA	Archaeological Research Services, Inc. (ARS)
2000-723.ASM	AT&T NexGen/Core Project Link 3 Class 3 Survey	Western Cultural Resource Management Inc. (WCRM)
2001-704.ASM	Liesch: JO Combs Elementary School Survey	SWCA
2001-716.ASM	Survey of Three Op Amp Facilities, AT&T NexGen/Core Project, Link 3	WCRM
2003-910.ASM	Cultural Resources Survey of the 360Networks Fiber Optics Lines	TRC Mariah Associates, Inc.
2003-943.ASM	Survey at Ocotillo and Schnepf Roads	Northland
2004-679.ASM	AT&T NexGen/Core Project	WCRM
2004-1777.ASM	Apache Junction Survey	ARS
2007-692.ASM	Pinal West to Dinosaur Transmission Line Surveys	Desert Archaeology, Inc.

Table 1. Previous Archaeological Surveys within a 1-Mile (1.6-km) Radius of the Project Area (Continued)

Agency Number	Survey Name	Institution
2008-191.ASM	Town of Gilbert CAP Water Pipeline Project	Archaeological Consulting Services
2010-334.ASM	Solar Energy Site Tower Location Screening	SWCA
2010-356.ASM	Westwood Solar	SWCA
—	AZARNG Rittenhouse Auxiliary Airfield Survey	Louis Berger Group 2006
—	AZARNG Rittenhouse Auxiliary Airfield NRHP Evaluation	Versar 2008

Table 2. Previously Recorded Archaeological Sites within a 1-Mile (1.6-km) Radius of the Project Area

Site Number	Site Description	NRHP Eligibility*
AZ U:10:10(ASM)	Hohokam artifacts and fire-cracked rock features recorded in 1972	Eligible (recorder)
AZ U:10:21(ASM)	Hohokam ceramic, flaked stone and ground stone artifact scatter with thermal roasting features. Initially recorded in 1978. Surveyed only.	Not evaluated
AZ U:10:190(ASM)	WWII-era RAAF. Initially recorded in 2005 by Louis Berger Group. NRHP-eligibility evaluation by Versar in 2006–2008.	Eligible (Louis Berger) Not eligible (Versar) Eligible (BLM)
AZ U:14:73(ASM)	Smiley's Well—a Classic period Hohokam habitation consisting of a structural mound and artifact scatter. Initially recorded as two sites, first as AZ U:14:46(ASM) in 1972; then again in 1978 and eventually subsumed by the current site number; has subsequently been the subject of testing and data recovery as recently as 2008.	Determined eligible (State Historic Preservation Office)

Note: Shading indicates a site within the current project area.
** Data were obtained from AZSITE and may represent State Historic Preservation Office determinations or recorder recommendations*

Historical Map Research

In addition to the archaeological records search, historic-era maps were also conducted for the project area. The earliest maps consulted were the 1906 USGS Sacaton and Desert Well, Arizona, 15-minute quadrangles. These maps show little development of the area. An unimproved road is shown passing through what would later be platted as the southwestern part of Section 15, Township 2 South, Range 8 East and connecting Buchanan's Ranch [Desert Well], located about 7 miles northwest of the proposed ASR site, to Bowen's Ranch, located about 2 miles southeast of the proposed ASR site on the south side of Queen Creek. The General Land Office map of Township 2 South, Range 8 East from a 1911 survey depicts the same information, but with greater detail. The 1956 USGS Desert Well and Sacaton NE 7.5-minute maps show RAAF and numerous section line roads. The Buchanan Ranch from earlier maps is now the Anderson Ranch, and the Bowen Ranch is just an unnamed, unlabeled well.

Previous Research at Rittenhouse Auxiliary Airfield

The AZARNG RAAF near Queen Creek is a military complex constructed during WWII as a satellite airfield to WAFB. Designated site AZ U:10:190(ASM) in 2006 (Davis et al. 2006), RAAF comprised a set of four paved runways laid out as a bisected triangle and was used as a training field for twin and four engine bombers and single engine fighters during WWII (Freeman 2004). Despite closure by 1947, Rittenhouse was again active in 1956. The longest (4,000-foot) runway had been extended to 5,100 feet and was extended again in 1966 to 6,200 feet. USAF Tactical Pilotage charts list the Rittenhouse facility as closed in 1971, but with an operational VHF omni-directional radio range (VOR) beacon (Freeman 2004). In 1999, the Rittenhouse Army Heliport was listed as an active AZARNG facility, with one

1,500-foot-long operational runway. As of 2003, the RAAF was occasionally still used for training by AZARNG helicopter crews from Army Aviation Support Facility #1 in Phoenix (Davis et al. 2006:21).

In 2005, The Louis Berger Group, Inc. (Louis Berger Group), conducted a survey of the approximately 480 acres of the RAAF leased by the AZARNG from the BLM, in advance of a proposed project to accommodate AZARNG helicopter training exercises (Davis et al. 2006). As a result of this work, the RAAF—comprising at least 17 historic military features, including runways, cement footings and concrete supports, runway markers, a building foundation, tent stakes, electrical circuit boxes, drainage grates, and a diversion dike—was designated site AZ U:10:190(ASM), and recommended eligible for the NRHP under no specified criteria or historic context. No standing structures were present, although the portion of the site that extended outside the 480-acre surveyed area was not recorded. Treatment recommendations were for instrument mapping and archival research. Eight isolated occurrences (IOs)—all consisting of one or more historic metal cans, were also recorded at that time. No prehistoric cultural resources were observed.

Following the 2005 survey and recordation of AZ U:10:190(ASM) and subsequent NRHP-eligibility recommendation by the Louis Berger Group (Davis et al. 2006), the RAAF was more critically evaluated by Versar in 2007 and 2008 (Versar 2008). Versar evaluated the full 739-acre RAAF property via archival research and field documentation, recording 23 features and six isolated finds of prehistoric ceramic and flaked stone artifacts. The six newly identified features comprised additional water control and diversion features, taxiways, conduit boxes, a beacon base, and a mid-twentieth-century trash dump (Versar 2008).

As a result of this fieldwork and archival research, and through evaluation of the property under a recently completed historic context of WWII-era military aviation training sites (Thompson 2004), Versar recommended that RAAF was in fact not eligible for the NRHP because it did not meet any of the four NRHP Criteria of significance (Versar 2008:70–72). As one of several triangular airfields associated with WAFB—several of which are better-preserved examples of the property type—it lacked no unique association with WWII-era pilot training. Further, it lacked integrity of design—the original WWII triangular airfield design had been altered with runway extensions and, in places, resurfacing to accommodate recent AZARNG helicopter training.

As a result of correspondence associated with the current project, the BLM has indicated that RAAF is indeed NRHP-eligible, in disagreement with Versar's recommendation of ineligibility (Cheryl Blanchard, personal communication, November 6, 2014). The BLM, citing Thompson's (2004) historic context for military aviation training, and the BLM archaeologist's own experience with the Barry M. Goldwater Range in the 1990s, considers the RAAF NRHP-eligible under Criterion a, for its association with "training pilots for combat in World War II and supporting the mission of training pilots in the early stages of the Cold War period," as well as under Criterion d, for its information potential.

In 2008, Archaeological Consulting Services, Ltd., conducted cultural resources monitoring on BLM-administered land within the boundaries of AZ U:10:190(ASM), parallel to and just north of Ocotillo Road. The work, which would have crossed the proposed ASR access road, was performed in support of a Town of Gilbert–funded Central Arizona Project water pipeline installation (DeRosa and Droz 2008). No subsurface cultural features or materials were found during construction monitoring.

PROJECT METHODS

SWCA archaeologist David Barr surveyed the project area October 16, 2014, resulting in a total of one person–field day. General conditions for the survey were ideal, and ground visibility was close to 100 percent (Figure 3). The survey was conducted using standard archaeological techniques following ASM

guidelines for survey coverage and site recording methodologies. According to the standards for pedestrian survey established by ASM and commonly accepted by the BLM, a person conducting a pedestrian survey can achieve 100 percent coverage of a parcel by walking a series of systematic transects spaced no more than 20 m (66 feet) apart. The survey entailed systematically walking the 7.9-acre APE in parallel transects spaced no more than 20 m (66 feet) apart.

Evidence for cultural resources was sought in the form of artifacts (e.g., ceramics, lithics, historical metals, or glass) or features (concentrations of fire-affected rock, charcoal-stained soil, prehistoric or historic structures, or other cultural anomalies). The archaeologist systematically surveyed 7.9 acres.

The ASM has established standards for evaluating materials identified during archaeological surveys. Briefly, properties of archaeological interest must contain the remains of past human activity that are at least 50 years old. Beyond this, two classes of findings are recognized, the site and the IO. To qualify as a site, a property must contain, within an area no more than 50 feet in diameter, 30 or more artifacts of a single type, unless all pieces originate from a single source (e.g., one broken bottle or ceramic vessel); or 20 or more artifacts when multiple types are present, or any number of artifacts, when a single fixed feature is present; or multiple fixed features, with or without any associated artifacts. The site can be larger than 50 feet in diameter as long as any 50-foot-diameter portion of the site meets one of these conditions. Artifact finds that do not meet these criteria but that are over 50 years old may be designated IOs. Archaeological sites are accurately mapped and plotted using a handheld global positioning system (GPS) device, photographed, and recorded using the standard ASM form. The precise locations of the IOs are point located and recorded using a handheld GPS unit. Any identified artifacts were field-analyzed and then returned to their original locations.

Figure 3. Project area overview

National Register of Historic Places Criteria for Evaluation

Four criteria are applied in the evaluation of cultural properties for inclusion in the NRHP (36 Code of Federal Regulations 60.4). Normally, a significant property must be at least 50 years old and meet at least one of these four criteria to be considered eligible for listing in the NRHP. According to the NRHP criteria, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
B. that are associated with the lives of persons significant in our past; or
C. that embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguished entity whose components may lack individual distinction; or
D. that have yielded, or may be likely to yield, information important in prehistory or history.

PROJECT RESULTS

SWCA's archaeological survey of the ASR APE resulted in the identification of one archaeological feature of a previously recorded site and one IO. The archaeological feature is the remains of an abandoned runway of the former RAAF, the entirety of which has been previously assigned site number AZ U:10:190(ASM). The IO is a single pottery sherd of Hohokam plain ware (Figure 4). A description of the findings and a discussion of their significance follow.

AZ U:10:190(ASM)—Rittenhouse Auxiliary Airfield

AZ U:10:190(ASM) is the archaeological remains of the former RAAF, a WWII-era auxiliary field to Williams Army Airfield (later renamed WAFB). The Previous Research section of this report provides a brief history of the RAAF and a history of cultural resources investigations at the RAAF. Figure 5 shows the RAAF, and Table 3 lists previously recorded features.

SWCA Environmental Consultants' 2014 Survey

SWCA's survey in support of the proposed new ASR focused on only about 7.9 acres of the 739-acre facility. One previously recorded feature, Feature 4, was found to be within the ASR APE. Feature 4 is the southwest-northeast-oriented runway. It is asphalt, approximately 150 feet wide, and is raised about 4 inches above the surrounding ground surface. Small and large mesquite trees and creosote bush are growing out of the runway (Figure 6). No other features were found during the survey.

National Register of Historic Places Eligibility Evaluation

In 2006–2008, Versar prepared a detailed National Register evaluation of the RAAF in support of the AZARNG's use of the facility for possible readiness preparation activities (Versar 2008). Versar concluded that the RAAF was ineligible for listing in the NRHP because of diminished design integrity, compared with other, better-preserved examples of this property type in southern Arizona, and because it has no unique or significant associations. Furthermore, the preserved features of the RAAF are generally in poor condition, and there are few associated artifacts. As a result, Versar argued that the property does not exhibit the potential to yield important information in history. The BLM does not concur with this

Table 3. Features Documented at RAAF in 2007–2008 (Continued)

Feature No.	Description
17	Diversion dike and associated ditch
18	Concrete culvert
19	Mid-twentieth-century dump within old stock tank. Objects include 55-gallon drums, metal trash cans, paint cans, barbeque grill, wire fencing, telephone pole fragment, punch-top beverage cans, bottle and container glass, automobile maintenance items, ammunition boxes, wire, light bulbs, ceramic cup fragment, 1936 nickel, mattress springs, and window glass.
20	Runway markers
21	Conduit boxes
22	Beacon base probably associated with a VOR beacon, which was the radio navigation system used at the RAAF in the 1960s; includes surrounding erosion control berms and access road
23	Drainage system—drain boxes and outlet conduit/culvert
24	Taxiway
25	Taxiway

Source: Versar (2008:Table 4-1).

Figure 6. AZ U:10:190(ASM)

recommendation, and considers the site eligible for the NRHP under Criteria a and d (Cheryl Blanchard, personal communication, November 6, 2014).

SWCA's survey of the ASR APE focused on a small portion of the 739-acre RAAF, intersecting only one of the 25 features identified and described by Versar. The northern part of the APE includes a small portion of Feature 4, one of the runways. SWCA's observations of the physical site, admittedly limited in extent, were consistent with those described by Versar. Nothing new was observed. Similarly, nothing

was observed in the ASR APE to contradict the BLM's recommendation that the property is eligible for listing in the NRHP. The single IO documented by SWCA is ineligible for listing in the NRHP.

Isolated Occurrences

One isolated artifact was recorded during survey of the project area. IO 1 is a Hohokam mica-tempered plain ware pottery sherd. Versar (2008:Table 4-2) also noted few Hohokam artifacts during their survey of the property. Isolates noted by Versar included two occurrences of ceramic sherds (one single sherd and one cluster of nine sherds) and four pieces of flaked stone (a flake, two cores, and a uniface). These materials were dispersed across the southern part of the RAAF property. No Hohokam materials were noted during the Louis Berger Group survey.

SUMMARY AND MANAGEMENT RECOMMENDATIONS

SWCA's archaeological survey of the ASR APE resulted in the identification of one archaeological feature of a previously recorded site and one IO. The archaeological feature consists of the remains of an abandoned runway of the former RAAF, the entirety of which has been previously assigned site number AZ U:10:190(ASM). The IO is a single pottery sherd of Hohokam plain ware.

In 2006–2008, Versar prepared a detailed National Register evaluation of the RAAF in support of the AZARNG's use of the facility for possible readiness preparation activities (Versar 2008). Versar concluded that the RAAF was ineligible for listing in the NRHP because of diminished design integrity, compared with other, better-preserved examples of this property type in southern Arizona, and because it has no unique or significant associations. Furthermore, the preserved features of the RAAF are generally in poor condition, and there are few associated artifacts. As a result, Versar argued that the property does not exhibit the potential to yield important information in history. The BLM, however, disagrees with Versar's recommendation of ineligibility, citing Thompson's (2004) historic context for military aviation training, and the BLM archaeologist's own experience with the Barry M. Goldwater Range in the 1990s (Cheryl Blanchard, personal communication, November 6, 2014). As such, the RAAF is considered NRHP-eligible under Criterion a, for its association with "training pilots for combat in World War II and supporting the mission of training pilots in the early stages of the Cold War period," as well as under Criterion d, for its information potential.

SWCA's survey of the ASR APE focused on a small portion of the 739-acre RAAF, intersecting only one of the 25 features identified and described by Versar. The northern part of the APE includes a small portion of Feature 4, one of the runways. SWCA's observations, admittedly limited in extent, were consistent with those described by Versar. Nothing new was observed in the ASR APE. Similarly, nothing was observed to contradict the BLM's recommendation that the property is eligible for listing in the NRHP. The single IO documented by SWCA is ineligible for listing in the NRHP.

PMGAA's NADP includes the removal of the existing ASR facility at Phoenix-Mesa Gateway Airport. The existing ASR dates to the mid-1990s and is not eligible for listing in the NRHP (Steely 2014). The existing ASR is, however, located within AZ U:10:65(ASM), a known archaeological site that was identified in 1994 during inventory conducted in advance of the USAF's disposal of WAFB. The site was subjected to NRHP-eligibility testing, and, as a result, determined eligible and subsequently listed in the NRHP. In the following years, the site was the subject of multiple testing and data recovery projects that cumulatively exhausted the research potential of the site. In July 2009, the site was formally removed from the NRHP. The area that would be affected by the proposed removal of the existing ASR falls within the APE subjected to inventories conducted by SWCA for the NAPD as it related to the expansion of airport facilities (Hesse et al. 2014; Steely 2014).

The proposed relocation of the FAA ASR facility from Phoenix-Mesa Gateway Airport to the former RAAF would result in a finding of no adverse effect to historic properties. The existing radar facility is ineligible for the NRHP, and although it is located within an archaeological site, the site has been thoroughly investigated and ultimately delisted from the NRHP. The new ASR would be within another known site—the remains of the RAAF (AZ U:10:190[ASM])—which has been evaluated for its potential NRHP eligibility and identified by the BLM as being eligible under Criterion a and Criterion d. SWCA recommends that a no adverse effect finding can be maintained by ensuring no contributing features are directly impacted by the proposed work, i.e., construction and placement of the new ASR shall not permanently impact any runway or other feature. SWCA further argues that the installation of an aerial surveillance radar at an auxiliary airfield is an appropriate use of the historic property and would not alter the integrity of the site.

Assuming adherence to the guidance points outlined above, no further archaeological work is recommended within the APE for the proposed location of the new ASR. In keeping with recommendations made by Hesse et al. (2014) for the NAPD, no further archaeological work is recommended within AZ U:10:65(ASM), which fully contains the existing ASR.

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Appendix E

Land Use Assurance Letter

PHOENIX-MESA GATEWAY AIRPORT AUTHORITY
5835 SOUTH SOSSAMAN ROAD
MESA, ARIZONA 85212-6014

PHONE (480) 988 7600
FAX (480) 988 2315

May 10, 2016

Mr. Mike Williams
Manager, Phoenix Airports District Office
Federal Aviation Administration
3800 N. Central Avenue
Suite 1025
Phoenix, AZ 85012

SUBJECT: LAND USE ASSURANCE LETTER- NORTHEAST AREA DEVELOPMENT PLAN ENVIRONMENTAL ASSESSMENT

Dear Mike,

The Phoenix-Mesa Gateway Airport Authority (PMGAA), a Joint Powers Authority representing the Cities of Mesa, Phoenix, and Apache Junction, the Towns of Queen Creek and Gilbert, and the Gila River Indian Community, makes the following statement of land use assurance as required by Section 511(a)(5) of the Airport and Airway Improvement Act of 1982, as amended.

Phoenix-Mesa Gateway Airport (IWA) is physically located within the City of Mesa, Arizona, which has the authority to regulate and control land use and zoning within the City of Mesa municipal boundaries. IWA is bordered by the Town of Gilbert to the west, the Town of Queen Creek to the south. Areas of unincorporated Maricopa County remain to the north and east, but are within the City of Mesa's planning area for future land use authority. The City of Apache Junction lies further to the east.

PMGAA provides assurance that appropriate action has been and will be taken, to the extent reasonable, to restrict the use of land under PMGAA ownership and control to activities and purposes compatible with normal airport operations both existing and in the future. Moreover, within the municipal limits of the City of Mesa, the height and location of structures and natural objects within the vicinity of IWA are regulated by ordinances described within the Mesa City Code. Chapter 19 of the Mesa Zoning Ordinance includes Airfield Overlay District maps and regulations relating to permitted land uses within these districts. The Towns of Gilbert and Queen Creek have similar overlays based on boundaries established in the 1996 Williams Regional Planning Study and updated with the 2000 Part 150 Study. Unincorporated areas of Maricopa County bordering the airport to the east also have Airport District Zoning in place that provides land use protections.

PMGAA works with the municipalities having jurisdiction over land adjacent to, or in the immediate vicinity, of IWA and encourages the adoption of zoning laws, to the extent

reasonable, to restrict the land uses in these areas to activities and purposes compatible with airport operations. PMGAA is involved with neighboring communities and municipalities in promoting compatible land uses as evidenced by Part 150 noise mitigation efforts. PMGAA is committed to ensuring land use compatibility with the area surrounding IWA and proposed land use developments are routed for airport review in neighboring communities as it affects IWA.

Sincerely,

Jane L. Morris

Jane L. Morris, A.A.E.
Executive Director/CEO

Appendix F

Noise Analysis

Appendix F Noise Analysis

F.1 Methodology

This noise analysis addresses the future aircraft noise environment and potential noise impacts related to the No Action and Proposed Action alternatives in the area surrounding the Phoenix-Mesa Gateway Airport. On May 15, 2015, the FAA published a policy statement in the Federal Register regarding the required use of models for noise and air emissions for FAA actions. The notice states that effective May 29, 2015, the Aviation Environmental Design Tool (AEDT) Version 2b replaces AEDT Version 2a, Integrated Noise Model (INM), and Emissions and Dispersion Modeling System (EDMS) as the required tool for noise, fuel burn, and emissions modeling of FAA actions.[1] Noise exposure levels are calculated from airport-specific data input into the model. The year used to establish existing noise conditions was 2013, which was the last full year of available data at the time the EA was initiated. The No Action Alternative and the Proposed Action Alternative were compared for the operational years of 2022 (first full year of operation post-construction) and 2027 (fifth year of operation post-construction).

The FAA has determined that the cumulative aircraft noise exposure experienced by individuals must be established in terms of the yearly day-night average sound level (DNL) metric. The AEDT incorporates the number of annual average daily daytime, evening, and nighttime aircraft operations, flight paths, and flight profiles of aircraft, along with its extensive internal database of aircraft noise and performance information, to calculate the DNL around an airport. From a grid of points, the AEDT contouring program draws contours of equal DNL that can be superimposed onto land use maps. For this EA, four standard ranges of DNL noise contours are presented: DNL 60 – 64 decibels (dB), DNL 65 – 69 dB, DNL 70 - 75 dB, and DNL 75 dB and above.

The flight tracks modeled in the AEDT are based on the radar data of the flights operated at the Airport in 2013. The radar data was obtained from the Airport Noise Monitoring System at Phoenix Sky Harbor International Airport. Aircraft operations and fleet mix data used for this noise analysis are based on the FAA's Enhanced Traffic Management System Counts (ETMSC); FAA's Airport Traffic Control Tower (ATCT) count records from the Operations Network (OPSNET); and the Airport Operations records.

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[1] U.S. Department of Transportation, Federal Aviation Administration 14 CFR Chapter I, "Noise, Fuel Burn, and Emissions Modeling Using the Aviation Environmental Design Tool Version 2b," *Federal Register 80*, no. 94 (May 15, 2015).[2] Itinerant operations are takeoffs and landings to and from other airports.

F.2 Input Data

F.2.1 ACTIVITY LEVEL

The activity level was estimated using the FAA's Terminal Area Forecast (TAF), issued January 2016. **Table F-1** through **Table F-4** present annual and average annual day aircraft operations for existing (2013) and future (2022 and 2027) scenarios.

Table F-1: Annual Aircraft Itinerant Operations by User Category

	ANNUAL ITINERANT OPERATIONS		
USER CATEGORY	**2013[1/]**	**2022[2/]**	**2027[2/]**
Air Carrier	10,013	12,055	13,225
Air Taxi	12,018	30,044	31,574
General Aviation	65,094	52,291	53,676
Military	3,332	3,924	3,924
Total	90,457	98,314	102,399

NOTES:

1/ Historical annual operations for calendar year. Average annual day operations are computed by dividing the annual operations by 365 days.

2/ Annual operations from the FAA's TAF for the fiscal year. Average annual day operations are computed by dividing the annual operations by 365 days.

SOURCES: Operations for 2013 based on the ATCT counts obtained from the FAA's OPSNET; 2022 and 2027 operations are based on the Federal Aviation Administration, *Terminal Area Forecast*, January 2016.

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-2: Annual Aircraft Local Operations by User Category

	ANNUAL LOCAL OPERATIONS		
USER CATEGORY	**2013[1/]**	**2022[2/]**	**2027[2/]**
Civil	95,544	114,977	116,131
Military	2,661	3,839	3,839
Total	98,205	118,816	119,970

NOTES:

1/ Historical annual operations for calendar year.

2/ Annual operations from the FAA's TAF for the fiscal year. Average annual day operations are computed by dividing the annual operations by 365 days.

SOURCES: Operations for 2013 based on the ATCT counts obtained from the FAA's OPSNET; 2022 and 2027 operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016.

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-3: Average Annual Day Aircraft Itinerant Operations by User Category

	AVERAGE ANNUAL DAY ITINERANT OPERATIONS		
USER CATEGORY	**2013[1/]**	**2022[2/]**	**2027[2/]**
Air Carrier	27.4	33.0	36.2
Air Taxi	32.9	82.3	86.5
General Aviation	178.3	143.3	147.1
Military	9.1	10.8	10.8
Total[3/]	247.8	269.4	280.5

NOTES:

1/ Historical annual operations for calendar year. Average annual day operations are computed by dividing the annual operations by 365 days.

2/ Annual operations from the FAA's TAF for the fiscal year. Average annual day operations are computed by dividing the annual operations by 365 days.

3/ Total may reflect rounding.

SOURCES: Operations for 2013 based on the ATCT counts obtained from the FAA's OPSNET; 2022 and 2027 operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016.

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-4: Average Annual Day Local Aircraft Operations by User Category

	AVERAGE ANNUAL DAY LOCAL OPERATIONS		
USER CATEGORY	**2013[1/]**	**2022[2/]**	**2027[2/]**
Civil	261.8	315.0	318.2
Military	7.3	10.5	10.5
Total	269.1	325.5	328.7

NOTES:

1/ Historical annual operations for calendar year. Average annual day operations are computed by dividing the annual operations by 365 days.

2/ Annual operations from the FAA's TAF for the fiscal year. Average annual day operations are computed by dividing the annual operations by 365 days.

SOURCES: Operations for 2013 based on the ATCT counts obtained from the FAA's OPSNET; 2022 and 2027 operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016.

PREPARED BY: Ricondo & Associates, Inc., February 2016.

F.2.2 AIRCRAFT FLEET

The AEDT includes a database of noise-thrust-distance data for most aircraft operating in the United States. AEDT users must select the specific types of aircraft forecast to operate at the Airport. The AEDT then uses the appropriate noise-thrust-distance data for each aircraft type in calculating the overall noise exposure.

Tables F-5 through F-16 present the number of itinerant and local operations by arrivals and departures, daytime and nighttime activity, and aircraft type for the years 2013, 2022, and 2027.[2] The aircraft types were selected based on the following considerations:

- Future commercial air service at the Airport would resemble current service, in terms of markets served and the size of aircraft providing service; although, the number of operations would be greater.
- Older aircraft types (including the MD-80, B-737-300, B737-400, and B757) would be retired from the domestic fleet and would be replaced by modern Stage 3[3] aircraft of similar size and range.
- All Stage 2 business jet aircraft would be retired from the domestic fleet and replaced by modern Stage 3 business jets of generally comparable size and range.

F.2.3 AIRCRAFT DEPARTURE WEIGHT AND STAGE LENGTH

Aircraft departure weight is a factor in the dispersion of aircraft noise, because it affects the runway length for takeoff and the rate at which an aircraft is able to climb. The nonstop departure trip length is used as a surrogate for varying aircraft weight, as it determines how much fuel the aircraft must carry and, therefore, the weight of the aircraft at takeoff. The AEDT allows for different departure trip lengths, or stage lengths (unrelated to the 14 CFR Part 36 noise "stage" classifications). Stage length refers to the nonstop distance an aircraft travels after departure. Longer stage lengths are correlated with lower climb performance, because aircraft flying longer stage lengths have higher gross takeoff weights, due to the greater fuel loads.

Table F-17 and Table F-18 present the stage lengths by aircraft type, which are assumed for the itinerant operations. The stage length assumptions are generally based on the current ratio of stage lengths by aircraft type at the Airport, with some allowance for more aircraft at longer stage lengths in the future. The stage lengths were the same for 2022 and 2027.

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[2] Itinerant operations are takeoffs and landings to and from other airports.

[3] This refers to 14 CFR Part 36, *Noise Standards, Aircraft Type and Airworthiness Certification*. Before obtaining permits to operate in the United States, aircraft must be certified for compliance with the requirements of Part 36, which establishes maximum allowable noise levels. Certification levels currently range from Stage 1 (loudest) to Stage 4 (quietest). Stage 1 aircraft were required to cease operating in the United States in 1985. As of December 31, 2015, Stage 2 small jet aircraft are no longer allowed to operate in the United States. Refer to 14 CFR Part 36, *Noise Standards, Aircraft Type and Airworthiness Certification*, Sections 36.103, 36.501, and 36.805.

Table F-5 (1 of 2): Annual Aircraft Itinerant Operations by Aircraft Type—Arrivals Existing

		ANNUAL ITINERANT OPERATIONS—ARRIVALS (EXISTING)		
AIRCRAFT CATEGORY	AIRCRAFT TYPE	DAY	NIGHT	TOTAL[1/]
Air Carrier Jet	737300	7.42	1.83	9.25
	737400	3.71	0.92	4.63
	737700	1.48	0.37	1.85
	737800	8.16	2.01	10.18
	757300	4.08	1.01	5.09
	757RR	63.45	15.65	79.10
	767300	1.48	0.37	1.85
	A319-131	923.16	227.74	1,150.90
	A320-211	175.88	43.39	219.26
	CRJ9-ER	0.74	0.18	0.93
	DC1010	61.26	15.11	76.37
	DC93LW	7.19	1.77	8.97
	EMB190	20.41	5.03	25.44
	MD81	379.21	93.55	472.76
	MD83	2,425.52	598.36	3,023.88
Business Jet	BAE146	15.07	0.42	15.49
	CIT3	80.96	2.24	83.20
	CL600	121.24	3.35	124.59
	CL601	56.01	1.55	57.56
	CNA500	863.65	23.89	887.54
	CNA510	452.01	12.50	464.52
	CNA525C	1,001.45	27.70	1,029.15
	CNA55B	52.90	1.46	54.37
	CNA680	159.55	4.41	163.97
	CNA750	228.67	6.33	234.99
	ECLIPSE500	80.17	2.22	82.39
	EMB145	1,336.48	36.97	1,373.45
	F10062	125.98	3.49	129.47
	GIV	36.27	1.00	37.27
	GV	12.25	0.34	12.58
	IA1125	27.19	0.75	27.95
	LEAR25	104.54	2.89	107.44
	LEAR35	458.97	12.70	471.67
	MU3001	998.25	27.62	1,025.87

Table F-5 (2 of 2): Annual Aircraft Itinerant Operations by Aircraft Type—Arrivals Existing

		ANNUAL ITINERANT OPERATIONS—ARRIVALS (EXISTNG)		
AIRCRAFT CATEGORY	**AIRCRAFT TYPE**	**DAY**	**NIGHT**	**TOTAL[1/]**
Prop/Turbo Prop	1900D	6.83	0.78	7.61
	BEC58P	4,904.03	563.68	5,467.71
	CNA172	9,851.04	1,132.30	10,983.35
	CNA182	290.59	33.40	323.99
	CNA206	248.76	28.59	277.35
	CNA208	620.18	71.28	691.46
	CNA441	604.09	69.44	673.53
	DHC6	409.10	47.02	456.13
	DHC7	8.77	1.01	9.78
	DHC8	3.52	0.40	3.92
	DO328	23.39	2.69	26.08
	EMB120	0.68	0.08	0.76
	GASEPF	179.59	20.64	200.24
	GASEPV	11,039.87	1,268.95	12,308.82
	PA31	17.59	2.02	19.62
	SD330	10.56	1.21	11.77
Military Aircraft	C-130E	266.21	4.40	270.60
	F16A	396.90	6.55	403.46
	F18	101.03	1.67	102.70
	KC-135	205.27	3.39	208.66
Helicopter	R44	842.75	196.90	1,039.65
	S70	96.46	22.54	119.00
	S76	120.31	28.11	148.42
Total		40,542.30	4,686.20	45,228.50

NOTE:

1/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., February 2016. Total operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016: air carrier, air taxi, general aviation, and military aircraft based on current fleet operating at the Airport, after removing all Part 36 Stage 2 aircraft and older aircraft expected to be retired from the fleet and replaced with modern equivalent aircraft (in terms of size and seating capacity).

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-6 (1 of 2): Annual Aircraft Itinerant Operations by Aircraft Type—Departures Existing

		ANNUAL ITINERANT OPERATIONS—DEPARTURES (EXISTING)		
AIRCRAFT CATEGORY	AIRCRAFT TYPE	DAY	NIGHT	TOTAL[1/]
Air Carrier Jet	737300	7.85	1.40	9.25
	737400	3.93	0.70	4.63
	737700	1.57	0.28	1.85
	737800	8.64	1.54	10.18
	757300	4.32	0.77	5.09
	757RR	67.14	11.96	79.10
	767300	1.57	0.28	1.85
	A319-131	976.83	174.06	1,150.90
	A320-211	186.10	33.16	219.26
	CRJ9-ER	0.79	0.14	0.93
	DC1010	64.82	11.55	76.37
	DC93LW	7.61	1.36	8.97
	EMB190	21.59	3.85	25.44
	MD81	401.26	71.50	472.76
	MD83	2,566.54	457.34	3,023.88
Business Jet	BAE146	13.17	2.32	15.49
	CIT3	70.74	12.47	83.20
	CL600	105.93	18.67	124.59
	CL601	48.93	8.62	57.56
	CNA500	754.57	132.97	887.54
	CNA510	394.92	69.59	464.52
	CNA525C	874.97	154.18	1,029.15
	CNA55B	46.22	8.15	54.37
	CNA680	139.40	24.56	163.97
	CNA750	199.79	35.21	234.99
	ECLIPSE500	70.04	12.34	82.39
	EMB145	1,167.69	205.77	1,373.45
	F10062	110.07	19.40	129.47
	GIV	31.69	5.58	37.27
	GV	10.70	1.89	12.58
	IA1125	23.76	4.19	27.95
	LEAR25	91.34	16.10	107.44
	LEAR35	401.01	70.66	471.67
	MU3001	872.17	153.69	1,025.87

Table F-6 (2 of 2): Annual Aircraft Itinerant Operations by Aircraft Type—Departures Existing

		ANNUAL ITINERANT OPERATIONS—DEPARTURES (EXISTING)		
AIRCRAFT CATEGORY	**AIRCRAFT TYPE**	**DAY**	**NIGHT**	**TOTAL[1/]**
Prop/Turbo Prop	1900D	6.85	0.76	7.61
	BEC58P	4,924.35	543.37	5,467.71
	CNA172	9,891.85	1,091.49	10,983.35
	CNA182	291.79	32.20	323.99
	CNA206	249.79	27.56	277.35
	CNA208	622.74	68.72	691.46
	CNA441	606.59	66.93	673.53
	DHC6	410.80	45.33	456.13
	DHC7	8.81	0.97	9.78
	DHC8	3.53	0.39	3.92
	DO328	23.49	2.59	26.08
	EMB120	0.69	0.08	0.76
	GASEPF	180.34	19.90	200.24
	GASEPV	11,085.60	1,223.22	12,308.82
	PA31	17.67	1.95	19.62
	SD330	10.60	1.17	11.77
Military Aircraft	C-130E	268.12	2.48	270.60
	F16A	399.76	3.70	403.46
	F18	101.76	0.94	102.70
	KC-135	206.75	1.91	208.66
Helicopter	R44	1,012.37	27.28	1,039.65
	S70	115.88	3.12	119.00
	S76	144.52	3.89	148.42
Total		40,332.32	4,896.18	45,228.50

NOTE:

1/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., February 2016. Total operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016: air carrier, air taxi, general aviation, and military aircraft based on current fleet operating at the Airport, after removing all Part 36 Stage 2 aircraft and older aircraft expected to be retired from the fleet and replaced with modern equivalent aircraft (in terms of size and seating capacity).

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-7 (1 of 2): Annual Aircraft Itinerant Operations by Aircraft Type—Arrivals 2022

		ANNUAL ITINERANT OPERATIONS—ARRIVALS (2022)		
AIRCRAFT CATEGORY	**AIRCRAFT TYPE**	**DAY**	**NIGHT**	**TOTAL[1/]**
Air Carrier Jet	737300	8.93	2.20	11.14
	737400	4.47	1.10	5.57
	737700	1.79	0.44	2.23
	737800	9.83	2.42	12.25
	757300	4.91	1.21	6.13
	767300	1.79	0.44	2.23
	A319-131	1,943.88	479.54	2,423.42
	A320-211	863.95	213.13	1,077.08
	CRJ9-ER	0.89	0.22	1.11
	DC1010	72.17	17.81	89.98
	DC93LW	8.47	2.09	10.56
	EMB190	24.57	6.06	30.63
	MD81	456.54	112.63	569.17
	MD83	1,511.91	372.98	1,884.88
Business Jet	BAE146	17.75	0.49	18.24
	CIT3	65.34	1.81	67.14
	CL600	152.02	4.21	156.22
	CL601	55.13	1.53	56.66
	CNA500	806.93	22.32	829.26
	CNA510	370.83	10.26	381.09
	CNA525C	874.36	24.19	898.55
	CNA55B	51.29	1.42	52.71
	CNA680	278.00	7.69	285.69
	CNA750	393.54	10.89	404.42
	ECLIPSE500	64.40	1.78	66.18
	EMB145	1,900.06	52.56	1,952.62
	F10062	101.20	2.80	104.00
	GIV	29.13	0.81	29.94
	GV	10.13	0.28	10.41
	IA1125	22.74	0.63	23.36
	LEAR35	564.63	15.62	580.26
	MU3001	1,327.10	36.71	1,363.81

Table F-7 (2 of 2): Annual Aircraft Itinerant Operations by Aircraft Type—Arrivals 2022

		ANNUAL ITINERANT OPERATIONS—ARRIVALS (2022)		
AIRCRAFT CATEGORY	**AIRCRAFT TYPE**	**DAY**	**NIGHT**	**TOTAL[1/]**
Prop/Turbo Prop	1900D	17.07	1.96	19.03
	BEC58P	4,057.57	466.39	4,523.96
	CNA172	8,728.86	1,003.32	9,732.17
	CNA182	236.91	27.23	264.14
	CNA206	200.99	23.10	224.09
	CNA208	771.82	88.72	860.54
	CNA441	505.81	58.14	563.94
	DHC6	529.46	60.86	590.32
	DHC7	10.33	1.19	11.52
	DHC8	2.83	0.32	3.15
	DO328	27.55	3.17	30.72
	EMB120	1.71	0.20	1.90
	GASEPF	145.64	16.74	162.38
	GASEPV	14,556.94	1,673.21	16,230.15
	PA31	14.13	1.62	15.76
	SD330	8.48	0.97	9.45
Military	F16A	467.42	7.72	475.14
	F18	118.98	1.96	120.95
	KC-135	241.74	3.99	245.73
	C-130E	313.50	5.18	318.68
Helicopter	R44	676.99	158.18	835.17
	S70	113.60	26.54	140.14
	S76	300.76	70.27	371.03
Total		44,047.76	5,109.24	49,157.00

NOTE:

1/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., February 2016. Total operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016: air carrier, air taxi, general aviation, and military aircraft based on current fleet operating at the Airport, after removing all Part 36 Stage 2 aircraft and older aircraft expected to be retired from the fleet and replaced with modern equivalent aircraft (in terms of size and seating capacity).

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-8 (1 of 2): Annual Aircraft Itinerant Operations by Aircraft Type—Departures 2022

		ANNUAL ITINERANT OPERATIONS—DEPARTURES (2022)		
AIRCRAFT CATEGORY	**AIRCRAFT TYPE**	**DAY**	**NIGHT**	**TOTAL[1/]**
Air Carrier Jet	737300	9.45	1.68	11.14
	737400	4.73	0.84	5.57
	737700	1.89	0.34	2.23
	737800	10.40	1.85	12.25
	757300	5.20	0.93	6.13
	767300	1.89	0.34	2.23
	A319-131	2,056.90	366.52	2,423.42
	A320-211	914.18	162.90	1,077.08
	CRJ9-ER	0.95	0.17	1.11
	DC1010	76.37	13.61	89.98
	DC93LW	8.96	1.60	10.56
	EMB190	26.00	4.63	30.63
	MD81	483.09	86.08	569.17
	MD83	1,599.81	285.07	1,884.88
Business Jet	BAE146	15.51	2.73	18.24
	CIT3	57.08	10.06	67.14
	CL600	132.82	23.40	156.22
	CL601	48.17	8.49	56.66
	CNA500	705.02	124.24	829.26
	CNA510	323.99	57.09	381.09
	CNA525C	763.93	134.62	898.55
	CNA55B	44.82	7.90	52.71
	CNA680	242.89	42.80	285.69
	CNA750	343.83	60.59	404.42
	ECLIPSE500	56.27	9.92	66.18
	EMB145	1,660.09	292.53	1,952.62
	F10062	88.42	15.58	104.00
	GIV	25.45	4.49	29.94
	GV	8.85	1.56	10.41
	IA1125	19.86	3.50	23.36
	LEAR35	493.32	86.94	580.26
	MU3001	1,159.49	204.32	1,363.81

Table F-8 (2 of 2): Annual Aircraft Itinerant Operations by Aircraft Type—Departures 2022

		ANNUAL ITINERANT OPERATIONS—DEPARTURES (2022)		
AIRCRAFT CATEGORY	**AIRCRAFT TYPE**	**DAY**	**NIGHT**	**TOTAL[1/]**
Prop/Turbo Prop	1900D	17.14	1.89	19.03
	BEC58P	4,074.38	449.58	4,523.96
	CNA172	8,765.02	967.16	9,732.17
	CNA182	237.89	26.25	264.14
	CNA206	201.82	22.27	224.09
	CNA208	775.02	85.52	860.54
	CNA441	507.90	56.04	563.94
	DHC6	531.66	58.66	590.32
	DHC7	10.37	1.14	11.52
	DHC8	2.84	0.31	3.15
	DO328	27.66	3.05	30.72
	EMB120	1.71	0.19	1.90
	GASEPF	146.24	16.14	162.38
	GASEPV	14,617.24	1,612.91	16,230.15
	PA31	14.19	1.57	15.76
	SD330	8.52	0.94	9.45
Military Aircraft	F16A	470.79	4.35	475.14
	F18	119.84	1.11	120.95
	KC-135	243.48	2.25	245.73
	C-130E	315.76	2.92	318.68
Helicopter	R44	813.25	21.91	835.17
	S70	136.47	3.68	140.14
	S76	361.30	9.74	371.03
Total		43,790.11	5,366.89	49,157.00

NOTE:

1/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., February 2016. Total operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016: air carrier, air taxi, general aviation, and military aircraft based on current fleet operating at the Airport, after removing all Part 36 Stage 2 aircraft and older aircraft expected to be retired from the fleet and replaced with modern equivalent aircraft (in terms of size and seating capacity).

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-9 (1 of 2): Annual Aircraft Itinerant Operations by Aircraft Type—Arrivals 2027

		ANNUAL ITINERANT OPERATIONS—ARRIVALS (2027)		
AIRCRAFT CATEGORY	AIRCRAFT TYPE	DAY	NIGHT	TOTAL[1/]
Air Carrier Jet	737300	9.80	2.42	12.22
	737400	4.90	1.21	6.11
	737700	1.96	0.48	2.44
	737800	10.78	2.66	13.44
	757300	5.39	1.33	6.72
	767300	1.96	0.48	2.44
	A319-131	2,369.49	584.54	2,954.03
	A320-211	1,421.69	350.72	1,772.42
	CRJ9-ER	0.98	0.24	1.22
	DC1010	72.30	17.84	90.14
	DC93LW	8.47	2.09	10.56
	EMB190	26.95	6.65	33.60
	MD81	500.85	123.56	624.41
	MD83	947.80	233.81	1,181.61
Business Jet	BAE146	17.75	0.49	18.24
	CIT3	67.04	1.85	68.90
	CL600	157.94	4.37	162.31
	CL601	56.50	1.56	58.06
	CNA500	830.58	22.98	853.55
	CNA510	380.01	10.51	390.52
	CNA525C	899.04	24.87	923.92
	CNA55B	52.97	1.47	54.44
	CNA680	290.72	8.04	298.76
	CNA750	411.52	11.38	422.90
	ECLIPSE500	66.11	1.83	67.94
	EMB145	1,980.04	54.78	2,034.81
	F10062	103.88	2.87	106.76
	GIV	29.91	0.83	30.73
	GV	10.38	0.29	10.67
	IA1125	23.26	0.64	23.91
	LEAR35	576.11	15.94	592.05
	MU3001	1,380.42	38.19	1,418.60

Table F-9 (2 of 2): Annual Aircraft Itinerant Operations by Aircraft Type—Arrivals 2027

		ANNUAL ITINERANT OPERATIONS—ARRIVALS (2027)		
AIRCRAFT CATEGORY	**AIRCRAFT TYPE**	**DAY**	**NIGHT**	**TOTAL[1/]**
Prop/Turbo Prop	1900D	17.93	2.06	20.00
	BEC58P	4,168.61	479.15	4,647.76
	CNA172	8,989.41	1,033.27	10,022.68
	CNA182	243.31	27.97	271.27
	CNA206	206.35	23.72	230.07
	CNA208	801.53	92.13	893.66
	CNA441	519.29	59.69	578.98
	DHC6	549.28	63.14	612.42
	DHC7	10.33	1.19	11.52
	DHC8	2.90	0.33	3.24
	DO328	27.55	3.17	30.72
	EMB120	1.79	0.21	2.00
	GASEPF	149.38	17.17	166.55
	GASEPV	15,145.61	1,740.88	16,886.49
	PA31	14.51	1.67	16.18
	SD330	8.70	1.00	9.71
Military Aircraft	F16A	467.42	7.72	475.14
	F18	118.98	1.96	120.95
	KC-135	241.74	3.99	245.73
	C-130E	313.50	5.18	318.68
Helicopter	R44	694.92	162.37	857.29
	S70	113.60	26.54	140.14
	S76	316.08	73.85	389.93
Total		45,840.24	5,359.26	51,199.50

NOTE:

1/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., February 2016. Total operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016: air carrier, air taxi, general aviation, and military aircraft based on current fleet operating at the Airport, after removing all Part 36 Stage 2 aircraft and older aircraft expected to be retired from the fleet and replaced with modern equivalent aircraft (in terms of size and seating capacity).

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-10 (1 of 2): Annual Aircraft Itinerant Operations by Aircraft Type—Departures 2027

		ANNUAL ITINERANT OPERATIONS—DEPARTURES (2027)		
AIRCRAFT CATEGORY	AIRCRAFT TYPE	DAY	NIGHT	TOTAL[1/]
Air Carrier Jet	737300	10.37	1.85	12.22
	737400	5.19	0.92	6.11
	737700	2.07	0.37	2.44
	737800	11.41	2.03	13.44
	757300	5.70	1.02	6.72
	767300	2.07	0.37	2.44
	A319-131	2,507.25	446.77	2,954.03
	A320-211	1,504.35	268.06	1,772.42
	CRJ9-ER	1.04	0.18	1.22
	DC1010	76.51	13.63	90.14
	DC93LW	8.96	1.60	10.56
	EMB190	28.52	5.08	33.60
	MD81	529.97	94.44	624.41
	MD83	1,002.90	178.71	1,181.61
Business Jet	BAE146	15.51	2.73	18.24
	CIT3	58.57	10.32	68.90
	CL600	137.99	24.32	162.31
	CL601	49.36	8.70	58.06
	CNA500	725.68	127.88	853.55
	CNA510	332.01	58.51	390.52
	CNA525C	785.50	138.42	923.92
	CNA55B	46.28	8.16	54.44
	CNA680	254.00	44.76	298.76
	CNA750	359.54	63.36	422.90
	ECLIPSE500	57.76	10.18	67.94
	EMB145	1,729.96	304.85	2,034.81
	F10062	90.76	15.99	106.76
	GIV	26.13	4.60	30.73
	GV	9.07	1.60	10.67
	IA1125	20.33	3.58	23.91
	LEAR35	503.35	88.7	592.05
	MU3001	1,206.08	212.53	1,418.60

Table F-10 (2 of 2): Average Annual Aircraft Itinerant Operations by AEDT Aircraft Type—Departures 2027

		ANNUAL ITINERANT OPERATIONS—DEPARTURES (2027)		
AIRCRAFT CATEGORY	**AEDT AIRCRAFT TYPE**	**DAY**	**NIGHT**	**TOTAL[1/]**
Prop/Turbo Prop	1900D	18.01	1.99	20.00
	BEC58P	4,185.88	461.88	4647.76
	CNA172	9,026.65	996.03	10,022.68
	CNA182	244.31	26.96	271.27
	CNA206	207.21	22.86	230.07
	CNA208	804.85	88.81	893.66
	CNA441	521.44	57.54	578.98
	DHC6	551.56	60.86	612.42
	DHC7	10.37	1.14	11.52
	DHC8	2.91	0.32	3.24
	DO328	27.66	3.05	30.72
	EMB120	1.80	0.20	2.00
	GASEPF	150.00	16.55	166.55
	GASEPV	15,208.36	1,678.13	16,886.49
	PA31	14.57	1.61	16.18
	SD330	8.74	0.96	9.71
Military Aircraft	F16A	470.79	4.35	475.14
	F18	119.84	1.11	120.95
	KC-135	243.48	2.25	245.73
	C-130E	315.76	2.92	318.68
Helicopter	R44	834.79	22.49	857.29
	S70	136.47	3.68	140.14
	S76	379.69	10.23	389.93
Total		45,589.36	5,610.14	51,199.50

NOTE:

1/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., February 2016. Total operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016: air carrier, air taxi, general aviation, and military aircraft based on current fleet operating at the Airport, after removing all Part 36 Stage 2 aircraft and older aircraft expected to be retired from the fleet and replaced with modern equivalent aircraft (in terms of size and seating capacity).

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-11: Annual Aircraft Local Operations by Aircraft Type—Arrivals Existing

AIRCRAFT CATEGORY	AIRCRAFT TYPE	ANNUAL LOCAL OPERATIONS—ARRIVALS (EXISTING) DAY	NIGHT	TOTAL[1/]
Large/Business Jet	DC1010	48.04	11.85	59.89
	DC93LW	5.74	1.42	7.16
	BAE146	12.03	0.33	12.37
	CIT3	118.31	3.27	121.58
	CL600	130.15	3.60	133.75
	CL601	69.87	1.93	71.80
	CNA500	2,779.54	76.89	2,856.43
	CNA510	649.66	17.97	667.63
	CNA55B	70.04	1.94	71.98
	CNA750	154.09	4.26	158.36
	EMB145	1,245.86	34.47	1,280.33
	F10062	184.91	5.12	190.03
	GIV	53.23	1.47	54.71
	GV	17.44	0.48	17.93
	IA1125	38.32	1.06	39.38
	LEAR25	86.05	2.38	88.43
	LEAR35	586.16	16.22	602.38
	MU3001	1,005.11	27.81	1,032.91
Prop/Turboprop	BEC58P	7,095.76	815.60	7,911.37
	CNA172	13,753.82	1,580.90	15,334.72
	CNA182	423.51	48.68	472.19
	CNA206	364.12	41.85	405.97
	CNA208	669.02	76.90	745.92
	CNA441	863.87	99.29	963.16
	DHC6	415.63	47.77	463.40
	DHC7	7.01	0.81	7.81
	DO328	18.68	2.15	20.83
	GASEPF	261.16	30.02	291.18
	GASEPV	11,295.34	1,298.31	12,593.65
	SD330	15.49	1.78	17.28
Military Aircraft	C-130E	212.60	3.51	216.11
	F16A	316.98	5.23	322.21
	F18	80.68	1.33	82.02
Helicopter	KC-135	163.93	2.71	166.64
	R44	1,236.97	289.01	1,525.99
	S70	77.04	18.00	95.04
Total		44,526.16	4,576.34	49,102.50

NOTE:

1/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., February 2016. Total operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016: air carrier, air taxi, general aviation, and military aircraft based on current fleet operating at the Airport, after removing all Part 36 Stage 2 aircraft and older aircraft expected to be retired from the fleet and replaced with modern equivalent aircraft (in terms of size and seating capacity).

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-12: Annual Aircraft Local Operations by Aircraft Type—Departures Existing

AIRCRAFT CATEGORY	AIRCRAFT TYPE	ANNUAL LOCAL OPERATIONS—DEPARTURES (EXISTING) DAY	NIGHT	TOTAL[1/]
Air Carrier Jet	DC1010	50.83	9.06	59.89
	DC93LW	6.08	1.08	7.16
	BAE146	10.51	1.85	12.37
	CIT3	103.36	18.21	121.58
	CL600	113.71	20.04	133.75
	CL601	61.05	10.76	71.80
	CNA500	2,428.49	427.94	2,856.43
	CNA510	567.61	100.02	667.63
	CNA55B	61.20	10.78	71.98
	CNA750	134.63	23.72	158.36
	EMB145	1,088.51	191.81	1,280.33
	F10062	161.56	28.47	190.03
	GIV	46.51	8.20	54.71
	GV	15.24	2.69	17.93
	IA1125	33.48	5.90	39.38
	LEAR25	75.18	13.25	88.43
	LEAR35	512.13	90.25	602.38
	MU3001	878.17	154.75	1,032.91
Prop/Turbo Prop	BEC58P	7,125.16	786.21	7,911.37
	CNA172	13,810.80	1,523.92	15,334.72
	CNA182	425.27	46.93	472.19
	CNA206	365.63	40.34	405.97
	CNA208	671.79	74.13	745.92
	CNA441	867.44	95.72	963.16
	DHC6	417.35	46.05	463.40
	DHC7	7.03	0.78	7.81
	DO328	18.76	2.07	20.83
	GASEPF	262.24	28.94	291.18
	GASEPV	11,342.13	1,251.52	12,593.65
	SD330	15.56	1.72	17.28
Military Aircraft	C-130E	214.13	1.98	216.11
	F16A	319.26	2.95	322.21
	F18	81.27	0.75	82.02
	KC-135	165.11	1.53	166.64
Helicopter	R44	1,485.95	40.04	1,525.99
	S70	92.54	2.49	95.04
Total		44,035.66	5,066.84	49,102.50

NOTE:

1/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., February 2016. Total operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016: air carrier, air taxi, general aviation, and military aircraft based on current fleet operating at the Airport, after removing all Part 36 Stage 2 aircraft and older aircraft expected to be retired from the fleet and replaced with modern equivalent aircraft (in terms of size and seating capacity).

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-13: Annual Aircraft Local Operations by Aircraft Type—Arrivals 2022

		ANNUAL LOCAL OPERATIONS—ARRIVALS (2022)		
AIRCRAFT CATEGORY	AIRCRAFT TYPE	DAY	NIGHT	TOTAL[1/]
Air Carrier Jet	DC1010	69.30	17.10	86.40
	DC93LW	8.29	2.04	10.33
Business Jet	BAE146	17.36	0.48	17.84
	CIT3	142.52	3.94	146.46
	CL600	156.92	4.34	161.26
	CL601	86.05	2.38	88.43
	CNA500	3,357.01	92.87	3,449.87
	CNA510	785.73	21.74	807.47
	CNA55B	84.29	2.33	86.62
	CNA750	185.44	5.13	190.57
	EMB145	1,499.71	41.49	1,541.20
	F10062	222.52	6.16	228.68
	GIV	64.06	1.77	65.83
	GV	21.14	0.58	21.73
	IA1125	46.57	1.29	47.86
	LEAR35	841.07	23.27	864.33
	MU3001	1,212.72	33.55	1,246.27
Prop/Turboprop	BEC58P	8541.93	981.83	9523.76
	CNA172	16,551.25	1,902.44	18,453.70
	CNA182	509.65	58.58	568.23
	CNA206	438.18	50.37	488.54
	CNA208	807.61	92.83	900.44
	CNA441	1,042.36	119.81	1,162.18
	DHC6	506.31	58.20	564.51
	DHC7	10.11	1.16	11.27
	DO328	26.95	3.10	30.05
	GASEPF	314.97	36.20	351.18
	GASEPV	13,600.14	1,563.23	15,163.37
	SD330	18.65	2.14	20.79
Military Aircraft	F16A	457.30	7.55	464.85
	F18	116.40	1.92	118.33
	KC-135	236.50	3.91	240.41
	C-130E	306.71	5.06	311.78
Helicopter	R44	1,488.57	347.80	1,836.36
	S70	111.14	25.97	137.11
Total		53,885.44	5,522.565	59,408.00

NOTE:

1/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., February 2016. Total operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016: air carrier, air taxi, general aviation, and military aircraft based on current fleet operating at the Airport, after removing all Part 36 Stage 2 aircraft and older aircraft expected to be retired from the fleet and replaced with modern equivalent aircraft (in terms of size and seating capacity).

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-14: Annual Aircraft Local Operations by Aircraft Type—Departures 2022

AIRCRAFT CATEGORY	AIRCRAFT TYPE	ANNUAL LOCAL OPERATIONS—DEPARTURES (2022) DAY	NIGHT	TOTAL[1/]
Air Carrier Jet	DC1010	73.33	13.07	86.40
	DC93LW	8.77	1.56	10.33
Business Jet	BAE146	15.17	2.67	17.84
	CIT3	124.52	21.94	146.46
	CL600	137.10	24.16	161.26
	CL601	75.19	13.25	88.43
	CNA500	2,933.02	516.85	3,449.87
	CNA510	686.50	120.97	807.47
	CNA55B	73.64	12.98	86.62
	CNA750	162.02	28.55	190.57
	EMB145	1,310.31	230.90	1,541.20
	F10062	194.42	34.26	228.68
	GIV	55.97	9.86	65.83
	GV	18.47	3.26	21.73
	IA1125	40.69	7.17	47.86
	LEAR35	734.85	129.5	864.33
	MU3001	1,059.56	186.71	1,246.27
Prop/Turbo Prop	BEC58P	8,577.31	946.45	9,523.76
	CNA172	16,619.82	1,833.88	18,453.70
	CNA182	511.76	56.47	568.23
	CNA206	439.99	48.55	488.54
	CNA208	810.95	89.48	900.44
	CNA441	1,046.68	115.49	1,162.18
	DHC6	508.41	56.10	564.51
	DHC7	10.15	1.12	11.27
	DO328	27.06	2.99	30.05
	GASEPF	316.28	34.90	351.18
	GASEPV	13,656.48	1,506.89	15,163.37
	SD330	18.72	2.07	20.79
Military Aircraft	F16A	460.59	4.26	464.85
	F18	117.24	1.08	118.33
	KC-135	238.20	2.20	240.41
	C-130E	308.92	2.86	311.78
Helicopter	R44	1,788.18	48.18	1,836.36
	S70	133.51	3.60	137.11
Total		53,293.79	6,114.21	59,408.00

NOTE:

1/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., February 2016. Total operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016: air carrier, air taxi, general aviation, and military aircraft based on current fleet operating at the Airport, after removing all Part 36 Stage 2 aircraft and older aircraft expected to be retired from the fleet and replaced with modern equivalent aircraft (in terms of size and seating capacity).

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-15: Annual Aircraft Local Operations by Aircraft Type—Arrivals 2027

		ANNUAL LOCAL OPERATIONS—ARRIVALS (2027)		
AIRCRAFT CATEGORY	AIRCRAFT TYPE	DAY	NIGHT	TOTAL[1/]
Air Carrier Jet	DC1010	69.30	17.10	86.40
	DC93LW	8.29	2.04	10.33
Business Jet	BAE146	17.36	0.48	17.84
	CIT3	143.94	3.98	147.92
	CL600	158.48	4.38	162.86
	CL601	86.80	2.40	89.20
	CNA500	3,389.96	93.79	3,483.74
	CNA510	793.38	21.95	815.33
	CNA55B	85.13	2.36	87.49
	CNA750	187.30	5.18	192.48
	EMB145	1,514.74	41.90	1,556.64
	F10062	224.76	6.22	230.97
	GIV	64.70	1.79	66.49
	GV	21.35	0.59	21.94
	IA1125	47.01	1.30	48.31
	LEAR35	847.56	23.45	871.01
	MU3001	1,224.70	33.88	1,258.58
Prop/Turbo Prop	BEC58P	8627.48	991.66	9619.15
	CNA172	16,717.38	1,921.54	18,638.91
	CNA182	514.77	59.17	573.94
	CNA206	442.57	50.87	493.44
	CNA208	815.56	93.74	909.30
	CNA441	1,052.66	121.00	1,173.65
	DHC6	511.02	58.74	569.76
	DHC7	10.11	1.16	11.27
	DO328	26.95	3.10	30.05
	GASEPF	318.09	36.56	354.66
	GASEPV	13,736.19	1,578.87	15,315.07
	SD330	18.83	2.16	21.00
Military Aircraft	F16A	457.30	7.55	464.85
	F18	116.40	1.92	118.33
	KC-135	236.50	3.91	240.41
	C-130E	306.71	5.06	311.78
Helicopter	R44	1,503.51	351.29	1,854.79
	S70	111.14	25.97	137.11
Total		54,407.94	5,577.06	59,985.00

NOTE:

1/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., February 2016. Total operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016: air carrier, air taxi, general aviation, and military aircraft based on current fleet operating at the Airport, after removing all Part 36 Stage 2 aircraft and older aircraft expected to be retired from the fleet and replaced with modern equivalent aircraft (in terms of size and seating capacity).

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-16: Annual Aircraft Local Operations by Aircraft Type—Departures 2027

		ANNUAL LOCAL OPERATIONS—DEPARTURES (2027)		
AIRCRAFT CATEGORY	AIRCRAFT TYPE	DAY	NIGHT	TOTAL[1/]
Air Carrier Jet	DC1010	73.33	13.07	86.40
	DC93LW	8.77	1.56	10.33
Business Jet	BAE146	15.17	2.67	17.84
	CIT3	125.76	22.16	147.92
	CL600	138.46	24.40	162.86
	CL601	75.84	13.36	89.20
	CNA500	2,961.82	521.92	3,483.74
	CNA510	693.18	122.15	815.33
	CNA55B	74.38	13.11	87.49
	CNA750	163.64	28.84	192.48
	EMB145	1,323.43	233.21	1,556.64
	F10062	196.37	34.60	230.97
	GIV	56.53	9.96	66.49
	GV	18.65	3.29	21.94
	IA1125	41.07	7.24	48.31
	LEAR35	740.52	130.5	871.01
	MU3001	1,070.03	188.56	1,258.58
Prop/Turbo Prop	BEC58P	8,663.22	955.93	9,619.15
	CNA172	16,786.63	1,852.28	18,638.91
	CNA182	516.90	57.04	573.94
	CNA206	444.41	49.04	493.44
	CNA208	818.94	90.36	909.30
	CNA441	1,057.02	116.63	1,173.65
	DHC6	513.14	56.62	569.76
	DHC7	10.15	1.12	11.27
	DO328	27.06	2.99	30.05
	GASEPF	319.41	35.24	354.66
	GASEPV	13,793.10	1,521.97	15,315.07
	SD330	18.91	2.09	21.00
Military Aircraft	F16A	460.59	4.26	464.85
	F18	117.24	1.08	118.33
	KC-135	238.20	2.20	240.41
	C-130E	308.92	2.86	311.78
Helicopter	R44	1,806.12	48.67	1,854.79
	S70	133.51	3.60	137.11
Total		53,810.44	6,174.56	59,985.00

NOTE:

1/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., February 2016. Total operations are based on the Federal Aviation Administration, *Terminal Area Forecast – Phoenix-Mesa Gateway Airport*, January 2016: air carrier, air taxi, general aviation, and military aircraft based on current fleet operating at the Airport, after removing all Part 36 Stage 2 aircraft and older aircraft expected to be retired from the fleet and replaced with modern equivalent aircraft (in terms of size and seating capacity).

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-17: Air Carrier Departures by Stage Length (Existing)

	DEPARTURES BY AEDT STAGE LENGTH					
AIRCRAFT TYPE	1 (0–500 NM)	2 (501–1,000 NM)	3 (1,001–1,500 NM)	4 (1,501–2,500 NM)	5 (2,501–3,500 NM)	TOTAL[2/]
Boeing 737-300	100%	0	0	0	0	100%
Boeing 737-400	100%	0	0	0	0	100%
Boeing 737-700	100%	0	0	0	0	100%
Boeing 737-800	100%	0	0	0	0	100%
Boeing 757-300	100%	0	0	0	0	100%
Boeing 757RR	91.2%	0	0	0	8.8%	100%
Boeing 767-300	100%	0	0	0	0	100%
Airbus A319-131	9.6%	44.9%	45.4%	0	0	100%
Airbus A320-211	2.9%	47.9%	49.2%	0	0	100%
Bombardier CRJ9-ER	100%	0	0	0	0	100%
McDonnell Douglas DC-1010	100%	0	0	0	0	100%
McDonnell Douglas DC-93LW(huskit)	100%	0	0	0	0	100%
Embraer EMB190	100%	0	0	0	0	100%
McDonnell Douglas MD81	100%	0	0	0	0	100%
McDonnell Douglas MD83	15.7%	49.2%	35.1%	0	0	100%

NOTES:

AEDT – Aviation Environmental Design Tool

NM – Nautical Miles

1/ The stage length is the nonstop distance flown by an aircraft departing the Airport. The greater the stage length, the greater the fuel load and the heavier the aircraft. The heavier aircraft weights result in slower climb performance, which tends to result in greater noise levels on the ground. Only the air carrier category (with 60 seats or more) is shown. The departure stage lengths for air taxi, general aviation, and military aircraft are assumed to be 1.

2/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., January 2016. (Based on the existing fleet mix ratio of the large aircraft category.)

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-18: Air Carrier Departures by Stage Length (2022 and 2027)

	DEPARTURES BY AEDT STAGE LENGTH					
AIRCRAFT TYPE	1 (0–500 NM)	2 (501–1,000 NM)	3 (1,001–1,500 NM)	4 (1,501–2,500 NM)	5 (2,501–3,500 NM)	TOTAL[2/]
Boeing 737-300	100%	0	0	0	0	100%
Boeing 737-700	100%	0	0	0	0	100%
Boeing 737-800	100%	0	0	0	0	100%
Boeing 757-300	90.0%	0	0	0	10.0%	100%
Boeing 767-300	100%	0	0	0	0	100%
Airbus A319-131	12.8%	51.4%	35.9%	0	0	100%
Airbus A320-211	12.8%	51.4%	35.9%	0	0	100%
Bombardier CRJ9-ER	100%	0	0	0	0	100%
McDonnell Douglas DC-1010	100%	0	0	0	0	100%
McDonnell Douglas DC-93LW(huskit)	100%	0	0	0	0	100%
Embraer EMB190	100%	0	0	0	0	100%
McDonnell Douglas MD81	11.0%	54.0%	35.0%	0	0	100%
McDonnell Douglas MD83	12.8%	51.4%	35.9%	0	0	100%

NOTES:

AEDT – Aviation Environmental Design Tool

NM – Nautical Miles

1/ The stage length is the nonstop distance flown by an aircraft departing the Airport. The greater the stage length, the greater the fuel load and the heavier the aircraft. The heavier aircraft weights result in slower climb performance, which tends to result in greater noise levels on the ground. Only the air carrier category (with 60 seats or more) is shown. The departure stage lengths for air taxi, general aviation, and military aircraft are assumed to be 1.

2/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., January 2016. (Based on the existing fleet mix ratio of the large aircraft category.)

PREPARED BY: Ricondo & Associates, Inc., February 2016.

F.2.4 TIME OF DAY

The calculation of DNL includes a weighting of 10 decibels for operations occurring at night (from 10:00 p.m. to 7:00 a.m.). FAA radar data for calendar year 2013 were analyzed in order to provide a basis to forecast operations by time of day. The time of day percentages were rounded and, except for the air carrier category, equalized between arrivals and departures. The difference in the percentage of nighttime arrivals and departures was maintained for the air carrier category to reflect scheduling practices that may continue into the future.

Table F-19 through **Table F-21** present the percentage of daytime and nighttime operations for departures and arrivals by aircraft category for existing (2013), 2022, and 2027.

Table F-19: Percentage of Annual Operations by Aircraft Category, Operation Type, and Time of Day (Existing)

	ARRIVALS			DEPARTURES		
AIRCRAFT CATEGORY	**DAY[1/]**	**NIGHT[2/]**	**TOTAL**	**DAY[1/]**	**NIGHT[2/]**	**TOTAL**
Air Carrier Jet	80%	20%	100%	85%	15%	100%
Business Jet	97%	3%	100%	85%	15%	100%
Prop/Turbo Prop	90%	10%	100%	90%	10%	100%
Military Aircraft[3/]	98%	2%	100%	99%	1%	100%
Helicopter	81%	19%	100%	97%	3%	100%
Overall Percentages (weighted)	90%	10%	100%	90%	10%	100%

NOTES:

1/ Day = 7:00 a.m. to 10:00 p.m.

2/ Night = 10:00 p.m. to 7:00 a.m. In the calculation of DNL, an extra 10 decibels is assigned to nighttime operations.

3/ Military aircraft include KC135, F16, F18, and C130E. Civilian-type aircraft operated by military and government agencies are included in large jet, small jet prop/turboprop, and helicopter categories.

SOURCE: Ricondo & Associates, Inc., October 2015. (Based on the day/night percentages calculated for actual operations in 2013 and then rounded.)

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-20: Percentage of Annual Operations by Aircraft Category, Operation Type, and Time of Day (2022)

	ARRIVALS			DEPARTURES		
AIRCRAFT CATEGORY	DAY[1/]	NIGHT[2/]	TOTAL	DAY[1/]	NIGHT[2/]	TOTAL
Air Carrier Jet	80%	20%	100%	85%	15%	100%
Business Jet	97%	3%	100%	85%	15%	100%
Prop/Turbo Prop	90%	10%	100%	90%	10%	100%
Military Aircraft[3/]	98%	2%	100%	99%	1%	100%
Helicopter	81%	19%	100%	97%	3%	100%
Overall Percentages (weighted)	91%	9%	100%	91%	9%	100%

NOTES:

1/ Day = 7:00 a.m. to 10:00 p.m.

2/ Night = 10:00 p.m. to 7:00 a.m. In the calculation of DNL, an extra 10 decibels is assigned to nighttime operations.

3/ Military aircraft include KC135, F16, F18, and C130E. Civilian-type aircraft operated by military and government agencies are included in large jet, small jet prop/turboprop, and helicopter categories.

SOURCE: Ricondo & Associates, Inc., October 2015. (Based on the day/night percentages calculated for actual operations in 2013 and then rounded.)
PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-21: Percentage of Annual Operations by Aircraft Category, Operation Type, and Time of Day (2027)

	ARRIVALS			DEPARTURES		
AIRCRAFT CATEGORY	DAY[1/]	NIGHT[2/]	TOTAL	DAY[1/]	NIGHT[2/]	TOTAL
Air Carrier Jet	80%	20%	100%	85%	15%	100%
Business Jet	97%	3%	100%	85%	15%	100%
Prop/Turbo Prop	90%	10%	100%	90%	10%	100%
Military Aircraft[3/]	98%	2%	100%	99%	1%	100%
Helicopter	81%	19%	100%	97%	3%	100%
Overall Percentages (weighted)	91%	9%	100%	91%	9%	100%

NOTES:

1/ Day = 7:00 a.m. to 10:00 p.m.

2/ Night = 10:00 p.m. to 7:00 a.m. In the calculation of DNL, an extra 10 decibels is assigned to nighttime operations.

3/ Military aircraft include KC135, F16, F18, and C130E. Civilian-type aircraft operated by military and government agencies are included in large jet, small jet prop/turboprop, and helicopter categories.

SOURCE: Ricondo & Associates, Inc., January 2016. (Based on the day/night percentages calculated for actual operations in 2013 and then rounded.)
PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-22 through **Table F-24** present the annual number of operations by aircraft category, operation type, and time of day for 2022 and 2027. The numbers were calculated by applying the percentages in Table F-13 and Table F-14 to the number of operations by aircraft category presented in Tables F-5 through F-12.

Table F-22: Annual Operations by Aircraft Category, Operation Type, and Time of Day (Existing)

	ARRIVALS			DEPARTURES			
AIRCRAFT CATEGORY	**DAY[1/]**	**NIGHT[2/]**	**TOTAL**	**DAY[1/]**	**NIGHT[2/]**	**TOTAL**	**ANNUAL TOTAL**
ITINERANT OPERATIONS							
Air Carrier	4,083	1,007	5,091	4,321	770	5,091	10,181
Business Jet	6,212	172	6,384	5,427	956	6,384	12,767
Prop/Turbo Prop	28,219	3,244	31,462	28,335	3,127	31,462	62,924
Military Aircraft[3/]	969	16	985	976	9	985	1,971
Helicopter	1,060	248	1,307	1,273	34	1,307	2,614
Itinerant Total[4/]	**40,542**	**4,686**	**45,229**	**40,332**	**4,896**	**45,229**	**90,457**
LOCAL OPERATIONS							
Air Carrier	54	13	67	57	10	67	134
Business Jet	7201	199	7400	6291	1109	7400	14800
Prop/Turbo Prop	35183	4044	39227	35329	3898	39227	78455
Military Aircraft[3/]	774	13	787	780	7	787	1574
Helicopter	1314	307	1621	1578	43	1621	3242
Local Total	**44,526**	**4,576**	**49,103**	**44,036**	**5,067**	**49,103**	**9,8205**
All Operations—Total	**85,068**	**9,263**	**94,331**	**84,368**	**9,963**	**94,331**	**188,662**

NOTES:

1/ Day = 7:00 a.m. to 10:00 p.m.

2/ Night = 10:00 p.m. to 7:00 a.m. In the calculation of DNL, an extra 10 decibels is assigned to nighttime operations.

3/ Military aircraft include KC-135, F-16, F-18, and C-130E. Civilian-type aircraft operated by military and government agencies are included in large jet, small jet prop/turboprop, and helicopter categories.

4/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., January 2016. (Derived by applying the day-night percentages in Table F-19.)

PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-23: Annual Operations by Aircraft Category, Operation Type, and Time of Day (2022)

	ARRIVALS			DEPARTURES			
AIRCRAFT CATEGORY	**DAY[1/]**	**NIGHT[2/]**	**TOTAL**	**DAY[1/]**	**NIGHT[2/]**	**TOTAL**	**ANNUAL TOTAL**
ITINERANT OPERATIONS							
Air Carrier	4,914	1,212	6,126	5,200	926	6,126	12,253
Business Jet	7,085	196	7,281	6,190	1,091	7,281	14,562
Prop/Turbo Prop	29,816	3,427	33,243	29,940	3,303	33,243	66,487
Military Aircraft[3/]	1,142	19	1,161	1,150	11	1,161	2,322
Helicopter	1,091	255	1,346	1,311	35	1,346	2,692
Itinerant Total[4/]	**44,048**	**5,109**	**49,157**	**43,790**	**5,367**	**49,157**	**98,314**
LOCAL OPERATIONS							
Air Carrier	78	19	97	82	15	97	194
Business Jet	8,723	241	8,964	7,621	1,343	8,964	17,928
Prop/Turbo Prop	42,368	4,870	47,238	42,544	4,694	47,238	94,476
Military Aircraft[3/]	1,117	18	1,135	1,125	10	1,135	2,270
Helicopter	1,600	374	1,974	1,922	52	1,974	3,948
Local Total	**53,886**	**5,522**	**59,408**	**53,294**	**6,114**	**59,408**	**118,816**
All Operations—Total	**97,933**	**10,631**	**108,565**	**97,084**	**11,481**	**108,565**	**217,130**

NOTES:

1/ Day = 7:00 a.m. to 10:00 p.m.

2/ Night = 10:00 p.m. to 7:00 a.m. In the calculation of DNL, an extra 10 decibels is assigned to nighttime operations.

3/ Military aircraft include KC-135, F-16, F-18, and C-130E. Civilian-type aircraft operated by military and government agencies are included in large jet, small jet prop/turboprop, and helicopter categories.

4/ Total may reflect rounding.

SOURCE: Ricondo & Associates, Inc., January 2016. (Derived by applying the day-night percentages in Table F-20.)
PREPARED BY: Ricondo & Associates, Inc., February 2016.

Table F-24: Annual Operations by Aircraft Category, Operation Type, and Time of Day (2027)

	ARRIVALS			DEPARTURES			
AIRCRAFT CATEGORY	**DAY[1/]**	**NIGHT[2/]**	**TOTAL**	**DAY[1/]**	**NIGHT[2/]**	**TOTAL**	**Total**
ITINERANT OPERATIONS							
Air Carrier	5,383	1,328	6,711	5,696	1,015	6,711	13,422
Business Jet	7,334	203	7,537	6,408	1,129	7,537	15,074
Prop/Turbo Prop	30,857	3,547	34,404	30,984	3,419	34,403	68,807
Military Aircraft[3/]	1,142	19	1,161	1,150	11	1,161	2,322
Helicopter	1,125	263	1,388	1,351	36	1,387	2,775
Itinerant Total	**45,841**	**5,360**	**51,201**	**45,589**	**5,610**	**51,199**	**102,400**
LOCAL OPERATIONS							
Air Carrier	78	19	97	82	15	97	194
Business Jet	8,807	244	9,051	7,695	1,356	9,051	18,102
Prop/Turbo Prop	42,792	4,919	47,711	42,969	4,741	47,710	95,421
Military Aircraft[3/]	1,117	18	1,135	1,125	10	1,135	2,270
Helicopter	1,615	377	1,992	1,940	52	1,992	3,984
Local Total	54,409	5,577	59,986	53,811	6,174	59,985	119,971
All Operations—Total	**100,250**	**10,937**	**111,187**	**99,400**	**11,784**	**111,184**	**222,371**

NOTES:

1/ Day = 7:00 a.m. to 10:00 p.m.

2/ Night = 10:00 p.m. to 7:00 a.m. In the calculation of DNL, an extra 10 decibels is assigned to nighttime operations.

3/ Military aircraft include KC-135, F-16, F-18, and C-130E. Civilian-type aircraft operated by military and government agencies are included in large jet, small jet prop/turboprop, and helicopter categories.

SOURCE: Ricondo & Associates, Inc., January 2016. (Derived by applying the day-night percentages in Table F-21.)
PREPARED BY: Ricondo & Associates, Inc., February 2016.

F.2.5 RUNWAY USE

The variation in the use of the runways influences the pattern of noise exposure off the runway ends. Runway use at an airport is typically driven by prevailing wind and weather conditions, the lengths and widths of the runways, runway instrumentation, and the effects of other airports or air facilities in the area. Runway use may also be influenced by the location of the aircraft parking positions on the airfield.

Table F-25 summarizes the current pattern of runway use at the Airport, based on an analysis of radar data throughout 2013. Runway-use percentages are provided and broken down by type of operation (arrival, departure, and touch-and-go) and time of day. These percentages are expected to remain the same in the future, as long as the passenger terminal is located on the west side of the Airport.

Table F-25: Runway Use Percentages with Terminal on the West Side of Airport

		RUNWAY						
OPERATION TYPE	**TIME OF DAY**	**12C**	**12L**	**12R**	**30C**	**30L**	**30R**	**Total**
ARRIVALS								
	Daytime[1/]	1.4%	1.0%	11.1%	48.0%	29.7%	8.7%	100.0%
	Nighttime[2/]	1.3%	0.6%	18.9%	45.3%	28.7%	5.2%	100.0%
	Total All Arrivals	1.4%	1.0%	11.9%	47.8%	29.6%	8.4%	100.0%
DEPARTURES								
	Daytime[1/]	3.5%	1.3%	23.2%	31.0%	32.5%	8.5%	100.0%
	Nighttime[2/]	6.1%	1.0%	52.2%	29.0%	8.7%	3.0%	100.0%
	Total All Departures	3.8%	1.3%	26.4%	30.7%	29.9%	7.9%	100.0%
TOUCH-AND-GO OPERATIONS								
	Daytime [1/]	2.7%	1.0%	16.1%	46.3%	28.5%	5.4%	100.0%
	Nighttime [2/]	3.8%	0.9%	33.3%	44.8%	12.6%	4.6%	100.0%
	Total All Touch-and-Go	2.8%	1.0%	17.8%	46.2%	26.9%	5.3%	100.0%

NOTES: Columns may not add to totals due to rounding.

1/ Daytime = 7:00 a.m. to 10:00 p.m.

2/ Nighttime = 10:00 p.m. to 7:00 a.m.

SOURCE: Ricondo & Associates, Inc., July 2015. (Based on annual Phoenix-Mesa Gateway Airport operations for 2013 data derived from the radar data from the Airport Noise Monitoring System at Phoenix Sky Harbor International Airport.)

PREPARED BY: Ricondo & Associates, Inc., November 2015.

This Environmental Assessment is evaluating a potential project for the Northeast Area Development Plan, which proposes the development of a purpose-built passenger terminal on the east side of the Airport. **Table F-26** presents forecast runway-use percentages with the passenger terminal located on the east side of the Airport. These percentages were determined in consultation with Airport and Air Traffic Control personnel. To ensure efficient traffic flow and the safe separation of aircraft, Air Traffic Control officials determined that some touch-and-go activity by light aircraft would shift from the east runway (12L-30R) to the west runway (12R-30L). Conversely, most airline traffic would switch from the west to the east runway. Activity on the center runway (12C-30C) would not change greatly.

Table F-26: Runway-Use Percentages with Terminal Located on the East Side of Airport

		RUNWAY						
OPERATION TYPE	**TIME OF DAY**	**12C**	**12L**	**12R**	**30C**	**30L**	**30R**	**Total**
ARRIVALS								
	Daytime[1/]	1.4%	2.7%	9.4%	48.0%	22.2%	16.3%	100.0%
	Nighttime[2]	1.3%	6.5%	13.0%	45.3%	14.0%	19.8%	100.0%
	Total All Arrivals	1.4%	3.1%	9.8%	47.8%	21.4%	16.6%	100.0%
DEPARTURES								
	Daytime[1/]	3.5%	6.8%	17.7%	31.0%	26.9%	14.0%	100.0%
	Nighttime[2/]	6.1%	14.7%	38.5%	29.0%	6.7%	5.0%	100.0%
	Total All Departures	3.8%	7.7%	20.0%	30.7%	24.7%	13.0%	100.0%
TOUCH-AND-GO OPERATIONS								
	Daytime [1/]	2.7%	1.0%	16.1%	46.3%	28.5%	5.4%	100.0%
	Nighttime [2/]	3.8%	0.9%	33.3%	44.8%	12.6%	4.6%	100.0%
	Total All Touch-and-Go	2.8%	1.0%	17.8%	46.2%	26.9%	5.3%	100.0%

NOTES: Columns may not add to totals due to rounding.

1/ Daytime = 7:00 a.m. to 10:00 p.m.

2/ Nighttime = 10:00 p.m. to 7:00 a.m.

SOURCE: Ricondo & Associates, Inc., July 2015. (Based on annual Phoenix-Mesa Gateway Airport operations for 2013 data derived from the radar data from the Airport Noise Monitoring System data at Phoenix Sky Harbor International Airport, as well as discussions with Air Traffic Control personnel regarding anticipated changes associated with the relocation of the passenger terminal.)

PREPARED BY: Ricondo & Associates, Inc., November 2015.

F.2.6 GENERALIZED FLIGHT TRACKS

The location of flight routes to and from the Airport is a required input to the AEDT. **Exhibit F-1** depicts 754 generalized arrival flight tracks to each runway at the Airport. **Exhibit F-2** depicts 1,532 generalized departure flight tracks, and **Exhibit F-3** depicts 72 generalized touch-and-go flight tracks.

The generalized flight tracks were developed through the analysis of radar data secured for Airport activity during four weeks in 2013. The data were sorted to separate arrivals, departures, and touch-and-go activity. The data were analyzed to define centerlines (or spines) of numerous flight-track clusters. Dispersion patterns around the spines were then defined through a statistical analysis of the dispersion of flight tracks in each cluster.

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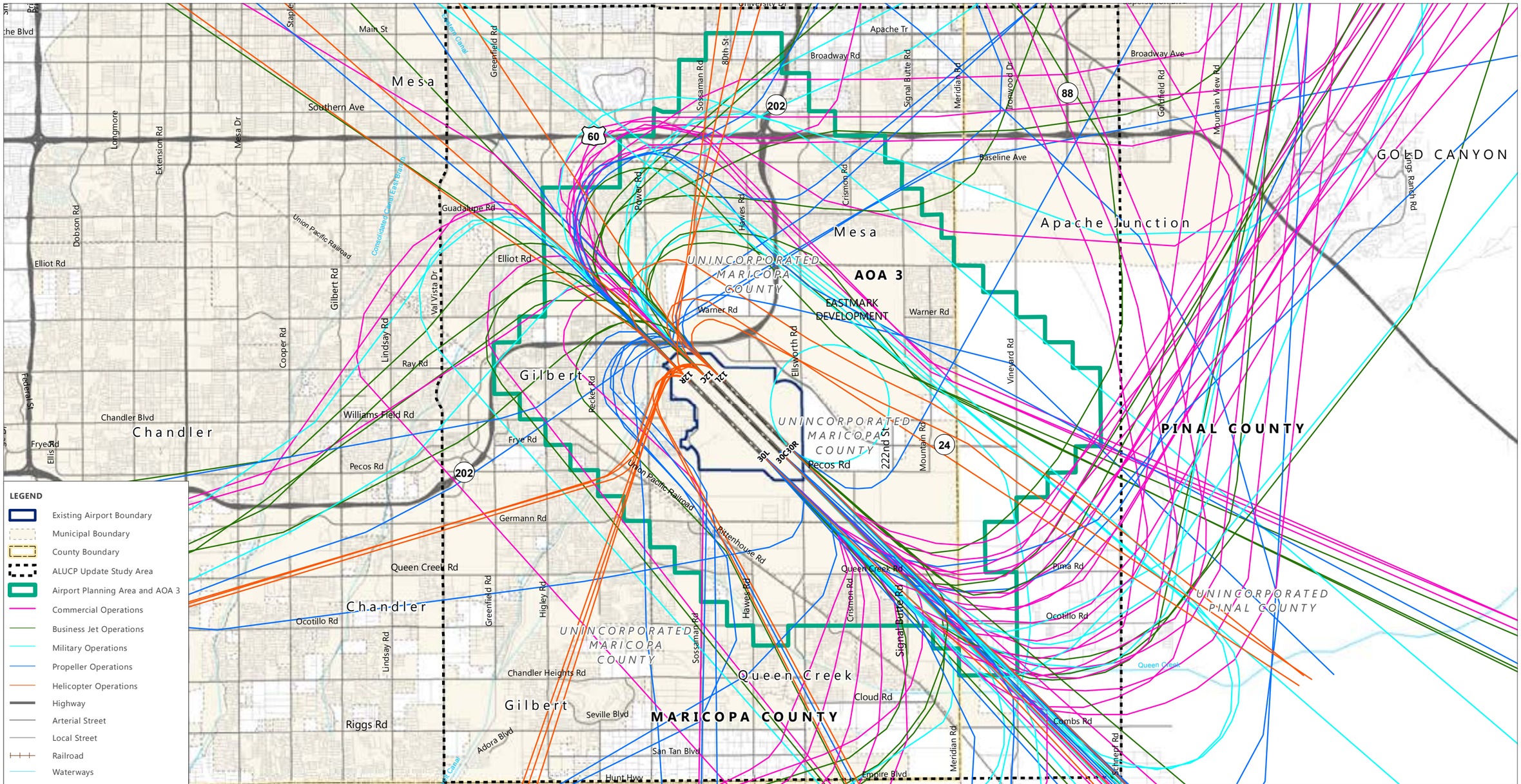

LEGEND

- Existing Airport Boundary
- Municipal Boundary
- County Boundary
- ALUCP Update Study Area
- Airport Planning Area and AOA 3
- Commercial Operations
- Business Jet Operations
- Military Operations
- Propeller Operations
- Helicopter Operations
- Highway
- Arterial Street
- Local Street
- Railroad
- Waterways

SOURCES: Phoenix-Mesa Gateway Airport Layout Plan, April 8, 2015 (airport property boundary); Ricondo & Associates, Inc., modeled flight tracks based on analysis of four weeks of radar data from 2013 provided through the Airport Noise Monitoring System at Sky Harbor International Airport, May 2014; Maricopa County Department of Transportation, 2012 (streets and highways); U.S. Census Bureau, 2014 (municipal boundaries, railroad).
PREPARED BY: Ricondo & Associates, Inc., November 2015.

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EXHIBIT F-1

Generalized Arrival Flight Tracks for Noise Modeling

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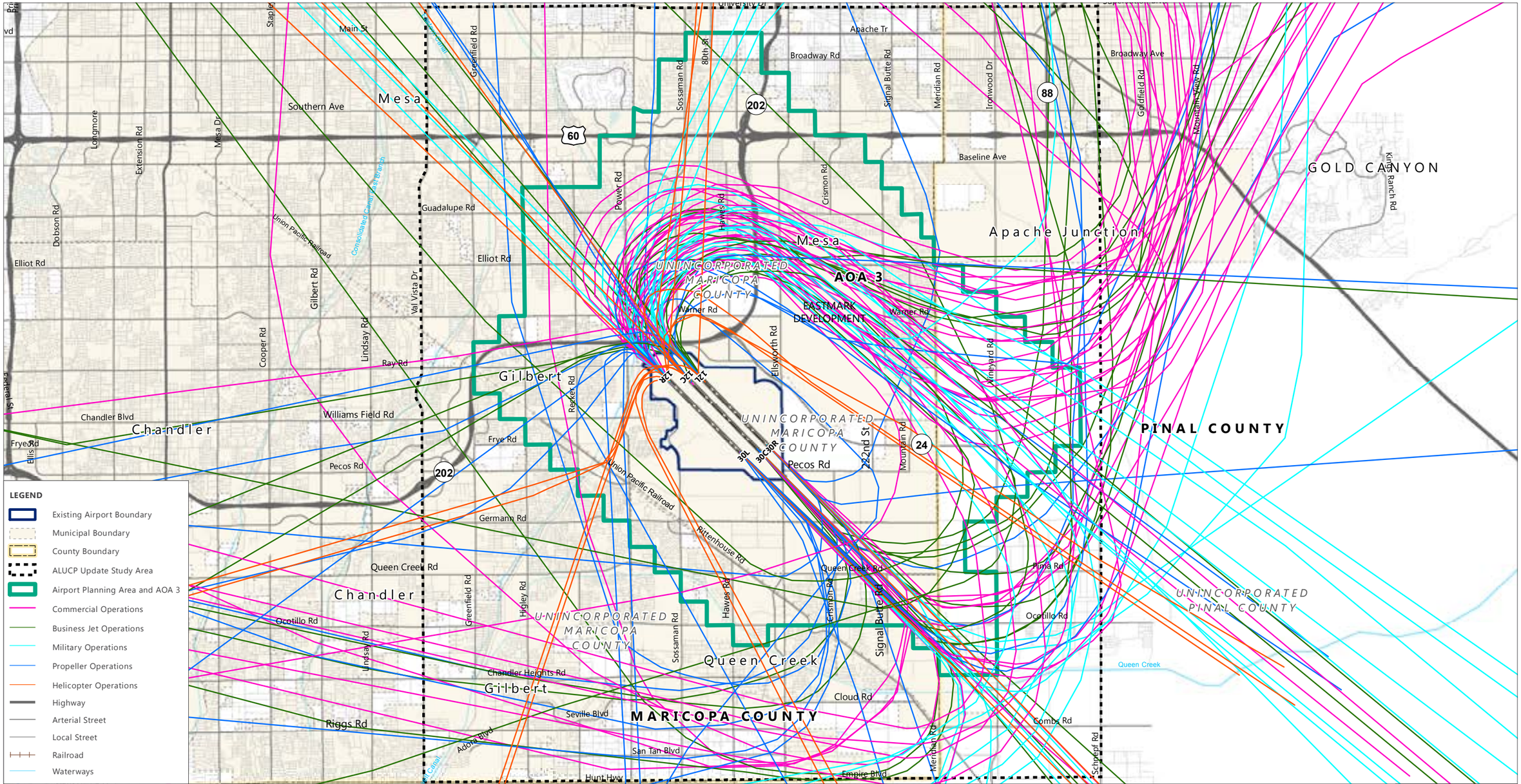

SOURCES: Phoenix-Mesa Gateway Airport Layout Plan, April 8, 2015 (airport property boundary); Ricondo & Associates, Inc., modeled flight tracks based on analysis of four weeks of radar data from 2013 provided through the Airport Noise Monitoring System at Sky Harbor International Airport, May 2014; Maricopa County Department of Transportation, 2012 (streets and highways); U.S. Census Bureau, 2014 (municipal boundaries, railroad).
PREPARED BY: Ricondo & Associates, Inc., November 2015.

EXHIBIT F-2

Generalized Departure Flight Tracks for Noise Modeling

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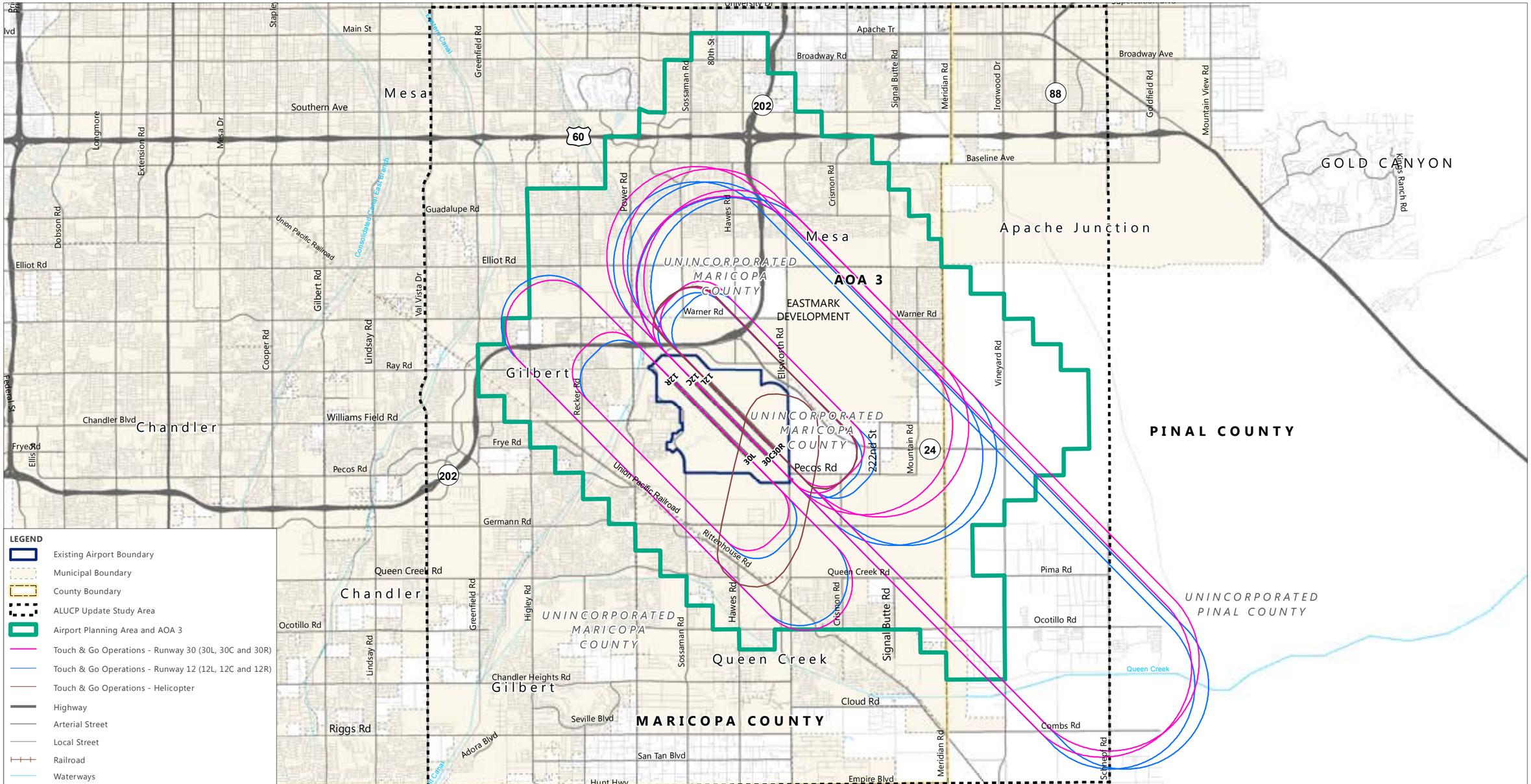

SOURCES: Phoenix-Mesa Gateway Airport Layout Plan, April 8, 2015 (airport property boundary); Ricondo & Associates, Inc., modeled flight tracks based on analysis of four weeks of radar data from 2013 provided through the Airport Noise Monitoring System at Sky Harbor International Airport, May 2014; Maricopa County Department of Transportation, 2012 (streets and highways); U.S. Census Bureau, 2014 (municipal boundaries, railroad).
PREPARED BY: Ricondo & Associates, Inc., November 2015.

EXHIBIT F-3

Generalized Touch-and-Go Flight Tracks for Noise Modeling

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Appendix G

Water Resources

G.1 Water Resources Technical Memorandum: Northeast Area Development Alternative

G.2 Preliminary Jurisdictional Determination: Northeast Area Development Alternative

G.3 Water Resources Technical Memorandum: RTN6 Site Alternative

Appendix G.1

Technical Memorandum

Water Resources ï Affected Environment
Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Prepared For:

Phoenix-Mesa Gateway Airport Authority
and
Ricondo & Associates, Inc.

Submitted by:

AMEC Environment and Infrastructure, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

January 2014

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1.0 PROJECT DESCRIPTION

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Åêóëí~äçåÉ=êçÅâëI=Éñíêã ëáÉ=êçÅâëI=íÜÉ=o ÉÇ=r åáI=íÜÉ=i çï Éêã=r åáI=íÜÉ=j áÇÇáÉ=r åáI=~åÇ=íÜÉ=r ééÉê
r åáK=qÜÉ=Åêóëí~äçåÉ=~åÇ=Éñíêã ëáÉ=êçÅâë=~êÉ=Åçã éëäëÉÇ=çÑ=ëãã áë=êçÅâë=ï áÜ=ëãã áë=êê
ÜóÇçÖÉçäçÖåÅ=Er ~íÉê=ÄÉ~êåÖF=éêçéÉãíáÉëK=qÜÉ=o ÉÇI=i çï Éêã=j áÇÇáÉI=~åÇ r ééÉê=r åáë=~êÉ
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pçäë=ï áÜåë=íÜÉ=éêçÅÉÅí=~êÉ~ ~êÉ ÖÉåÉê~äëó=ÇÉÑåÉÇ=~ë=ì åÅçåëçäÇ~íÉÇ=~äì îá=ä=ÇÉéçëáë=~åÇ
Åçåëäëí=éêãã ~êëó=çÑ` çåíåÉ=Åä=ó äç~ã I j çÜ~äëÅä=ó=äç~ã I=~åÇ=j çÜ~äëäç~ã I Å~äÅ~êÉçì ë=ëçäì ã
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qÜÉ=ã ~àçêáó=çÑëçäë=åë=íÜÉ=êçÅÉÅí=~êÉ~=~êÉ=Åçåëäçéêçéêçêã É=Ñ=êã ä~åÇ=ÑêêáÖ~íÉÇ Ek o` p=OMNPFX
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qÜÉ Åäëã ~íÉ=åë=åÉ~êÄó ` Ü~åÇÉê=e ÉáÖÜíëI ^êêçå~I=äë=~êÅ=E~éêçñãã ~íÉäó VKM åëÅÜÉë=çÑ
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RRKPcc êÉÅçêÇÉÇ=åë ` Ü~åÇÉê=e ÉáÖÜíëI=^êêçå~=Er ÉëíÉêå=oÉÖçå~ä= äëã ~íÉ= ÉåíÉê=OMNPFK

s ÉÇÉí~íáçå

qÜÉ=éêçãÉÅí=ëáÉ=äë=ÅÜ~ê~ÅíÉêãÉÇ=Äó=éä~åí=ëéÉÅåÉë=íóéåÅ~äçÑíÜÉ=i çï ÉêÉ=` çäçê~Çç=oãÉês~äÉó ëì ÄÇãäëáçå=çÑíÜÉ=pçåçê~å=ÇÉëÉêãë ëÅëì Ä=ÄáçíÅ=Åçã ã ì åáó=~ë=ÇÉëÅêãÉÇ=Äó=_êçï å=EMVVQPKj ì ÅÜ çÑíÜÉ=îÉÇÉí~íáçå=åë=íÜÉ=éêçãÉÅí=~êÉ~=ï ~ë íóéåÅ~äçÑíéêÉîáçì ëäó=Çäëíì êÄÉÇ=ÇÉëÉêãë=ä=åÇëÅ~éÉl ëì ÅÜ ~ë= íÜÉ= ÇÉåëÉ= ëí~åÇë= çÑ Äì êêçÄì ëÜ= *Ee óã ÉåçÅåÉ~= ë~äëçä=Fl=* ÇÉëÉêãë= Äêççã = E_ *~ÅÅÜ~êäë ë~êçíÜêçãÇÉëFl* o ì ëëéä~å=íÜäëíáÉ=E*p~äëçä=íê~ÖëFl=*~åÇ=çíÜÉê=ëì ÇÉê~äëéÉÅåÉë=åë=~êÉ~ë=ï ÜÉêÉ åÇÅ~íáçåë=çÑíã ÉÅÜ~åáÅ~äëì êÑíÅÉ=Çäëíì êÄ~åÅÉ=ï ÉêÉ=éêÉî ~ãÉåíK=l åÉ=ëÉÅíáçå=åë=íÜÉ=åçêÜÉ~ëí éçêáçå=çÑíÜÉ=éêçãÉÅí ëáÉ ~ééÉ~êÉÇ=íç=Ü~î É=ÄÉÉå ãÉëë=ãë é~ÅíÉÇ=Äó=Öêçì åÇ=Çäëíì êÄ~åÅÉ=~åÇ=íÜÉ î ÉÇÉí~íáçå=åë=íÜ~í=~êÉ~=ã çêÉ=Åäçëëäëó=êÉÑÉÅíÉÇ=íÜÉ=ì åÇäëíì êÄÉÇ=éçêáçåë=çÑíÜÉ=ëì êêçì åÇåÖ ä=åÇëÅ~éÉl ï áÜëí~åÇë=çÑÅêÉçëçíÉ=Äì ëÜ=E*~êêÉ~=íêêÇÉåí~í=*~Fl î ÉãÉí=ã Éëèì áÉ=E*mçëçéáë=íÉäíåë~Fl* ~åÇ=Åêã ÅåÑãçåë=íÜçêå=E *~ëíÉä=ÉãçêóåFK*

RKM t ^qbo=obpl r o` bp t fqefk qeb=mol gb` q=^ob^

pì êÑíÅÉ=t ~íÉê

qÜÉ éêçãÉÅí=~êÉ~=çÅÅì êë=ï áÜåë íÜÉ j áÇÇãÉ=d äë=oãÉêt ~íÉêëÜÉÇ EëÉÉ=^ éêÉåÇãñ=^ l=cäÜ êÉ=OFKk ç éÉêÉåëåá=äëì êÑíÅÉ=ï ~íÉê=ëçì êÅÉë=~êÉ äçÅ~íÉÇ åë=íÜÉ=î áÅëåáó=çÑíÜÉ=éêçãÉÅí=ëáÉKqÜÉ=Ñçääçï åÖ=íï ç ï ~íÉê=Åçåíêçäë=ÅÜ~åëÉäë=~êÉ=äçÅ~íÉÇ=ï áÜëë=íÜÉ=éêçãÉÅí ëáÉ ~åÇ=êÉÅÉãÉî É=êì åçÑíï ~íÉêë=Ñçäçã =íÜÉ éêçãÉÅí=ëáÉ=~åÇ=ëì êêçì åÇåÖ=~êÉ~ëWmçï ÉêëëÉ=çäçÇï ~ó=~åÇ=bäëï çêÜ=` Ü~åëÉäëÉÉ=^ éêÉåÇãñ ^ l=cäÜ êÉ=OFKqÜÉ=çäçÇ=` çåíêçäëaäëíëÅí=çÑj ~êëÅçé~=` çì åíó=ã ~åí~åë=íÜÉ=mçï ÉêëëÉ=çäçÇï ~ól ï ÜëÅÜ=Ñçêã ë=íÜÉ=åçêÜÉêë=éêçãÉÅí=ëáÉ=Äçì åÇ~êóK=qÜÉ=mçï ÉêëëÉ=çäçÇï ~ó=ëÉêã Éë=íç=ÅçåÉó ÇäëÅÜ~êÖÉë=Ñçäçã =íÜÉ=mçï ÉêëëÉ=çäçÇ=oÉí~êÇåÖ=píêã Åì êÉ=Ec o pFl=äçÅ~íÉÇ=~éêêçñãã ~íÉäë=RKO ã áëÉë=åçêÜÉ~ëí=çÑíÜÉ=éêçãÉÅí=ëáÉl=ë=ï Éäëë~ë=çî ÉêëëåÇëëÜÉÉí=Ñçäçï =ÅçäëÅí=ÉÇ=åë=íÜÉ=Ñçäçï ~ól=íç=áë ÅçåÑçì ÉåÅÉ=ï áÜ=íÜÉ=b ~ëí=j ~êëÅçé~=çäçÇï ~ól=äçÅ~íÉÇ=ë~éêêçñãã ~íÉäë=çåÉ=ã áëÉ=ï Éëí=çÑíÜÉ=éêçãÉÅí ëáÉ=EE ççÇlm~íÉäëOMNNFK

qÜÉ=bäëï çêÜ=` Ü~åëÉäëÑçêã ë=ã ì ÅÜ=çÑíÜÉ=É~ëíÉêëë=éêçãÉÅí=ëáÉ=Äçì åÇ~êó=~åÇ=äë=çï åÉÇ=Äó=` áó=çÑ j Éë~K=qÜäë=ÅÜ~åëÉäëã åë=é~ê~äëÉäëíç=bäëï çêÜ=o ç~Ç=åë=íÜÉ=ëçì íÜÉêëë=éêçêáçå=çÑíÜÉ=éêçãÉÅí=ëáÉl ÄÉÑçêÉ=íÜÉ=ÅÜ~åëÉäëíì êëë=åçêÜï Éëí=~åÇ=ã ~âÉë=~=ÑÉï =ÄÉåÇë=éêçêçê=íç=áë=ÅçåÑçì ÉåÅÉ=ï áÜ=íÜÉ mçï ÉêëëÉ=çäçÇï ~ól=ï áÜëë=íÜÉ=Äçì åÇ~êëÉë=çÑíÜÉ=éêçãÉÅí=ëáÉ=EëÉÉ=^ éêÉåÇãñ=^ l=cäÜ êÉ=OFKqÜÉ bäëï çêÜ=` Ü~åëÉäëÑçêã Éë=íç=ã áëÜ~íÉ=ÑçäççëëëÖ=~äçåÖ=bäëï çêÜ=o ç~ÇKt ~íÉê=Ñçäçï =ï áÜëë=íÜÉëÉ ÅÜ~åëÉäë=äë=ÖÉåÉê~äëíë=íç=íÜÉ=åçêÜ=~åÇ=ï Éëí=íçï ~êÇë=pçëë~ã ~å=o ç~ÇI ï ÜÉëÉ=á=äë=ÇäëÅÜ~êÖÉÇ=íç íÜÉ=b ~ëí=j ~êëÅçé~=çäçÇï ~óK=qÜäë Ñçäçï ~ó=ÅçåíëëÉë=ÖÉåÉê~äëíë=ëçì íÜï Éëí=ÅçäëÅíëëÖ=íÜÉ ï ~íÉêë=çÑm ì ÉÉåë=` êÉÉÉâ=~åÇ=ì ëëã ~íÉäë=ÇäëÅÜ~êÖëÖ=íç=íÜÉ=d äë=oãÉê=ì ëí=É~ëí=çÑd äë=_ì ííÉl ~ééêçñãã ~íÉäë NQKP ã áëÉë ëçì íÜï Éëí çÑíÜÉ=éêçãÉÅí ëáÉK

a ì êëÖ=íÜÉ=ëáÉ=ëëî ÉëíáÖ~íáçåI á=ï ~ë=åçíÉÇ=íÜ~í=ã ÉÅÜ~åëÅ~äçäëíì êÄ~åÅÉë=Ü~î É=ã çÇãÑÉÇ=íÜÉ ã ~äçêáó=çÑíÜÉ Öêçì åÇ=ëì êÑíÅÉ=çÑíÜÉ=éêçãÉÅí ~êÉ~KqÜÉ=Öêçì åÇ=ëì êÑíÅÉ=ëë=~êÉ~ë ÅäçëÉëí=íç=íÜÉ Éñëëíëë=ÖÉåÉê=ëì áï ~óë Ü~ë=ÄÉÉÉå=ã çÇãÑÉÇ íç ÇäÉêí ï ~íÉê=Ñçã =íÜÉ=ëì áï ~óë=åçêÜ=ëëíç=íÜÉ bäëï çêÜ ` Ü~åëÉä ~åÇ=mçï ÉêëëÉ=çäçÇï ~óKj ì ÅÜ=çÑíÜÉ=êÉã ~ëëëÖ=éêçãÉÅí=ëáÉ Ü~ë=ÄÉÉÉå=ã çÇãÑÉÇ=íç ~ÅÅçã ã çÇ~íÉ=~=ëì ã ÄÉê çÑ=ÇäÑÑÉêÉåí=~ÅíáäëëÉ éêÉî çì ëäó ÅçåÇì ÅíÉÇ=Äó=íÜÉ r åáÉÇ=pí~íÉë ^ëê cçêÅÉ çå=íÜÉ=éêçéÉêóI ï áÜ=åç ÉîçÇÉåí ÅççêÇëë~íçå=çÑëì êÑíÅÉ=ï ~íÉê=ÅçåîÉó~åÅÉKqÜäë Ü~ë ÖÉåÉê~äëíëÉëì äÉÇ=ëë ~=êÉä=íäîÉäëíëÑçêã ë=íÜÉ=Öêçì åÇKqÜÉêÉ=~êÉ=ëÉî É êÉ~ä~êÉ~ë ï ÜÉëÉ ä=êÖÉ=~ã çì åíëë=çÑ ÄêçâÉå=ÅçåÅéíÉ=Ü~î É=ÄÉÉå=Çì ã éÉÇI=ëçã É=çÑ=ï ÜëÅÜ=Ü~î É=ÄÉÉå ÅçîÉêÉÇ=ï áÜ=ëçãë ~åÇ Ü~î É ÇÉî ÉçéÉÇ=Öêçì åÇ=éëëëÇì ëë=ï ÜëÅÜ ëì êÑíÅÉ=ï ~íÉê=Çê~ëëë=íÜçì ÖÜ=íÜÉ=Åçäë~éëÉÇ=ëçãë=ÄÉíï ÉÉå

Äì êáÉÇ=ÅçåÅáÉíÉKp ÉÎ Éê~äçÑ=íÜÉëÉ äçÅ~íáçåë åÅà ÇÉ ÇäÅ~êÇÉÇ ÅçåÅáÉíÉ=~åÇ=~ëéÜ~ä=ÇÉÄêë íÜ~í Ü~ë Ñçêã ÉÇ êáÇÖÉë=i é=íç íÉå=ÑÉÉí ÜáÖÜÉê=íÜ~å=íÜÉ=ëì êêçì åÇåÖ=Öêçì åÇ=ëì êÑ=ÅÉK=qÜÉëÉ=êáÇÖÉë ÇáÉÅí=~åÇ=ÅçäÉÅí=ï ~íÉê=Ñçï =ï áÜåë=íÜÉ=éêçÉÅí=~êÉ~I ~äÜçì ÖÜ=íÜÉáÉ=äë=åç=åÇÅ~íáçå=íÜ~í=íÜÉëÉ ã ~íÉêá~äë=ï ÉáÉ éä~ÅÉÇ=ï áÜ=íÜÉ=åíÉåí=íç=ã çÇáÑ=ï ~íÉê=Ñçï KmÜçíçÖê~éÜë=êÉéêÉëÉåí~íâ É=çÑ=íÜÉ éêçÉÅí=ëáÉ=~êÉ=åÅà ÇÉÇ=åë=^ éêéÉåÇãñ=_K

páÉ=d Éçäçïó=~åÇ=e óÇêçÖÉçäçÖó

i çÅ~äÖÉçäçÖó=~í=íÜÉ=Ñçêã Éê=t áääë~ã ë=^ äë=c çêÅÉ=_~ëÉ=E^ c_FI=ï ÜáÜ=åÅà ÇÉë=íÜÉ=éêçÉÅí=ëáÉI ÖÉåÉê~äëó=ÅçåëäëíëçÑ=äÉêå~íåÖ ä~óÉêë=çÑ=ÑåÉ=Öê~åÉÇ=ëäíë=~åÇ=Åç~êëÉê=Öê~åÉÇ=ã ~íÉêá~äë=ëì ÅÜ ~ë=ë~åÇë=~åÇ=Öê~î Éäë=K=qÜÉ=ëíê~í=~=ÅçåíåÅì É=íç=~=ÇÉéíÜ=çÑ=~éêêçñãã ~íÉëó=OQLM=ÑÉÉí=EÑF=ÄÉäçï Öêçì åÇ=ëì êÑ=ÅÉ=EÄÖëFK=^ =Åä~ó=~ëì á~êÇ=äë=äçÅ~íÉÇ=~í=~éêêçñãã ~íÉëó=OQLM=ÑI=ÄÖëI=ëÉé~ê~íåÖ=íÜÉ r éêÉê=~åÇ=j áÇÇäÉ=ÖÉçäçÖåÅ=i åáëK=i çÅ~äÖÉçäçÖó=çÑ=åíÉêÉëí=åë=íÜÉ=éêçÉÅí=~êÉ~ ÅçåëäëíëçÑíÜÉ Ñçäçï åÖ=ÑÅÉ=ã ~åë=ÜóÇêçëíê~íáÖê~éÜáÅ=i åáëE=E^ j b` I=OMNP~FW

> s ~ÇçëÉ=wçåÉ M=íç=NSM=ÑI ÄÖëI\e ÉíÉêçÖÉåÉçì ëI=ÅçåëäëíåÖ=çÑ=åíÉêÄÉÇÇÉÇ=Åç~êëÉJ ~åÇ ÑåÉJÖê~åÉÇ=ä~óÉëëK=qÜÉ=ÇÄÄáÉ=wçåÉ äë ~=Åç~êëÉJÖê~åÉÇ=~åÇ=éÉêã É~ÄáÉ=ä~óÉêK
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> r éêÉê=t ~íÉê=_É~êåÖ=wçåÉ=E t _wF NSM=íç=NVR=ÑI=ÄÖëI\e ÉíÉêçÖÉåÉçì ëI=ÅçåëäëíåÖ=çÑ åíÉêÄÉÇÇÉÇ=Åç~êëÉJ ~åÇ=ÑåÉJÖê~åÉÇ=ä~óÉëëK=qÜÉ=t _w=äë=íÜÉ=i éêÉêã çëí=ë~íì ê~íÉÇ=i åáí=åë íÜÉ=éêçÉÅí=~êÉ~I=äë=i åÅçåÑåÉÇI=~åÇ=Åçåí~åë=~åÇ=Å~å=íê~åëã á=Öêçì åÇï ~íÉê=~í=äçï =óÉáÇëK
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> i çï =mÉêã É~Äáäó=wçåÉ=E mwF NVR=íç=ONM=ÑI=ÄÖëI\e çåëäëíë=çÑ=~ä~íÉê~äëó=Åçåíåì çì ë=ëäó Åä~ó=ä~óÉê=íÜ~í=ÜóÇê~ì äÅ~äëó=ëÉé~ê~íÉë=íÜÉ=t _w=Ñçã =íÜÉ=i çï Éê=p ~íì ê~íÉÇ=wçåÉ=E pwFK
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> i çï Éê=p ~íì ê~íÉÇ=wçåÉ=E pwF ONM=íç=OQLM=ÑI=ÄÖëI\e ÉíÉêçÖÉåÉçì ëI=ÅçåëäëíåÖ=çÑ åíÉêÄÉÇÇÉÇ=Åç~êëÉJ ~åÇ=ÑåÉJÖê~åÉÇ=ä~óÉëëK=qÜÉ=i pwI=ï ÜáÜ=äë=ëÉã áÅçåÑåÉÇ=Äó=íÜÉ çî Éêëóåë=i mwI=äë=íÜÉ=Åç~êëÉëí=~åÇ=ã çëí=éÉêã É~ÄáÉ=ë~íì ê~íÉÇ=i åáí=åë=íÜÉ=éêçÉÅí=~êÉ~K
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> ^ èì á~êÇ OQLM=íç=OSM=ÑI=ÄÖëI\e çï =éÉêã É~Äáäó=~åÇ=~ÅíëI=~ë=~=Ñçï =~åÇ=Åçåí~ã åë~åí ã áÖê~íçå=ÄçìåÇ~êóK

~ëÉÇçå=Öêçì åÇï ~íÉê=ÄÎ Éäã É~ëì êÉã Éåíë ÅçäÉÅíÉÇ=Ñçã íÜÉ=Ñçêã Éê=i êì áÇ=c ì Éäë=p íçê~ÖÉ=^ êÉ~ ~í=íÜÉ Ñçêã Éê=t áääë~ã ë ^c=E~éêêçñãã ~íÉëó NKO=ã áäÉë ëçì íÜï Éëí çÑ=íÜÉ=éêçÉÅí=ëáÉFI íÜÉ Öêçì åÇï ~íÉê=í~ÄáÉ=äë=äçÅ~íÉÇ=~í=~éêêçñãã ~íÉëó=NQLM=íç=NSM=ÑI=ÄÖëI=E^ j b` I=OMNOÄFK=d êçì åÇï ~íÉê=åë íÜÉ=éêçÉÅí=~êÉ~=åë=ÅçíÜ=íÜÉ=t _w=~åÇ=i pw ÖÉåÉê~äëó Ñçï ë=íç=íÜÉ=É~ëíJåçãíÜÉ~ëí=~=ÜóÇê~ì äÅ Öê~ÇáÉåí=çÑ=~êêçñãã ~íÉëó=MKMVMP=íç=MKMVMQ=ÑLÑI=E^ j b` I=OMNPÄFK=d êçì åÇï ~íÉê=ÄÎ Éäë=åë=íÜÉ=éêçÉÅí ~êÉ~=Ü~î É=êäëÉå=ã çÉ=íÜ~å=SM=ÑI=ëåÅÉ=íÜÉ=ä~íÉ=NVUMëI=Éì ~íåÖ=íç=~å=~î Éê~ÖÉ=ï ~íÉê=ÄÎ Éäêäë=çÑ OKV=ÑI=éÉê=óÉ~ê=ÄÎÜçì ÖÜ=OMNOFK=e çï ÉÎ ÉêI=åë ã çÉ=êÉÅÉåí=óÉ~êëI=íÜÉ=ê~íÉ=çÑ=êäëÉ=Ü~ë=êíÉ~Çäó ÇÉÅÉ~ëÉÇ=íç=ãÉëë=íÜ~å=NSM=ÑI=éÉê=óÉ~êK a ì É=íç=íÜÉ=ÇÉéíÜ=íç=Öêçì åÇï ~íÉê=åë íÜÉ=~êÉ~I=Öêçì åÇï ~íÉê êÉëçì êÅÉë=~êÉ=ì åäëÉäó=íç=Ü~î É=~åó=ãã é~Åí=çå=çê=ÄÉ=ãã é~ÅíÉÇ=Äó=~åó=éä~ååÉÇ=ÇÉÎ Éäçéã Éåí ~Åíâ áäÉëK qÜÉêÉ=~êÉ=ì åçë=ÉÅÉ=~êÉ=ì åÑÉêë=åë=íÜÉ=éêçÉÅí=ï áÅåáó=Eb åî âçåã Éåí~ä=mçíÉÅíáçå ^ ÖÉåÅó=>b m^ z=OMNP~FK

t ~íÉê=n ì ~äáó

t ~íÉê=èì ~äáó=åë=íÜÉ r åáÉÇ=p í~íÉë äë=êÉÇÖ ä~íÉÇ=ì åÇÉê=íÜÉ=` äÉ~å=t ~íÉê=^ Åí E t ^ FK=qÜÉ=ì áíã ~íÉ Öç~äçÑ=íÜÉ ` t ^ äë=íç=ã çåáçê=ï ~íÉê=èì ~äáóI=éêçíÉÅí=éêëëíåÖ É=ï ~íÉêÄçÇáÉëI=~åÇ=êÉÜ~Äáäí~íÉ=íÜçëÉ ï ~íÉêë íÜ~í=Ü~î É=~äÉ~Çó=ÄÉÉå=éçäì íÉÇK=qÜäë=äë=~ÅÅçã éäëÜÉÇ=íÜçì ÖÜ=íÜÉ=Éëí~Äëë Éåí=çÑ

åì ã ÉêçìëÍã çåáçêåÖì=éÉêã áíåÖì=~åÇ=ÑìåÇåÖéêçÖê~ã ëíÜ~í=ï çêê=åÖ=ÅçåìåÅíçå=ï áÜÉ~ÅÜ=çíÜÉê íç=éêçîáÇÉ=~=ã ÉÅÜ~åäëã =Ñçêéêçíé Áíåí=ÖÉï ~íÉêèì ~äóó=åÖ=íÜÉ r åáÉÇ pí~íÉëK

qÜÉ `t ^ êÉÖì ä~íÉë=éçäìíçå=éêã ~êäó=íÜêçì ÖÜ=íÜÉ=k ~íçå~ä=mçäìí~åí=aäëÅÜ~êÖÉ=bäãã åÖ~íçå póëíÉã Ek mabpF éÉêã áíåÖ=éêçÖê~ã Kfå=^ êêôçå~I=íÜÉ k mabp éêçÖê~ã =äë=ã éäÉã ÉåíÉÇ ~í íÜÉ ëí~íÉ=áÇì Éä=ì åÇÉê=íÜÉ=^ êêôçå~=mçäìí~åí=aäëÅÜ~êÖÉ=bäãã åÖ~íçå=póëíÉã =Ñçê=~äë=ä åÇë=ÉñÅÉéí cÉÇÉê=ä=~åÇ fåÇá~å ä~åÇëI ~åÇ äë ~Çã åäëíÉéÉÇ=Äó=íÜÉ=^ abn E^ abn =OMMOFK^ å=^ êêôçå~=k ~íçå~ä mçäìí~åí=aäëÅÜ~êÖÉ bäãã åÖ~íçå=póëíÉã =E^ wma bpF=éÉêã á=äë=êÉèì ãÉÇ=Ñçê=Ñ~ÅäãáÉë å=^ êêôçå~ íÜ~í ÇäëÅÜ~êÖÉ éçäìí~åíë=Ñçã =~ éçåí=ëçì êÅÉ=åíç=ï ~íÉêë=çÑ=íÜÉ=r åáÉÇ=pí~íÉëI=åÅà ÇåÖ=íÜÉ ÇäëÅÜ~êÖÉ=çÑ=ëíçêã ï ~íÉê=E^ abn =OMNP~FK aÉì Éäçéã Éåí çÑ=åÉï =Ñ~ÅäãáÉë=ï çì äÇ=êÉèì ãÉ=~å ^ wma bp=ÅçåëíÑ Åíçå=ÖÉåÉê~äéÉêã á=Ñçê=ÅçåëíÑ Åíçå=~ÅíçÅ áÅëI=ï éÉê~íçå=çÑåÉï =Ñ~ÅäãáÉë ï çì äÇ êÉèì ãÉ=íÜÉ=ÉñäëíåÖ=^ wma bp=ã ì äáëÉÅíçê=ÖÉåÉê~äéÉêã á=ÜÉäÇ=Äó=íÜÉ=^ êêççêí=íç=ÄÉ=ì éÇ~íÉÇ=íç åÅà ÇÉ=íÜÉ=åÅÉ~ëÉÇ=Ñççíéêãåí=Éêèì ~êÉ=Ñççí~ÖÉF=çÑ=íÜÉ=åÉï =Ñ~ÅäãáÉë=K

pÉÅíçå OMN=~åÇ OMQ=çÑ=íÜÉ=` äÉ~å=t ~íÉê=^ Åí=éêçíÉÅí=~êÉ~ë=î á~ä=íç=ëì êÑ~ÅÉ=ï ~íÉêI=å~ã Éäó ï Éíä~åÇëI=~åÇ=êÉÖì ä~íÉë=ÇêÉÇÖåÖì=ÑäããÖì=çê=çíÜÉêï êÉ=~äÉêãåÖï Éíä~åÇ=Ü~Äá~í=çê=ï ~íÉêë=çÑ=íÜÉ r åáÉÇ pí~íÉëKo ÉëéçåëäÅäãó=Ñçê=~Çã åäëíÉêåÖ=~åÇ=ÉåÑçêÅåÖ=pÉÅíçå OMN=~åÇ OMQ=äë=ëÜ~êÉÇ=Äó íÜÉ r åáÉÇ=pí~íÉë ^ êã ó=` çêêë=çÑ=bÅåÖåÉÉêë E çêêëFI bm^ Ebm^ OMNPÄFI=~åÇ=^ abn =E^ abn OMNPÄFK=qÜÉ=` çêêë=~Çã åäëíÉêë=å~íçåï áÇÉ=éÉêã áëI=ã ~âÉë=ÇÉÅäëçåë=çå=åÇâîáÇì ~äéÉêã áë=~åÇ à êäëÇåÅíçå~äÇÉíÉêã å~íçåëI=~åÇ=ÉåÑçêÅÉë=pÉÅíçå=OMQ=éêçî äçåë=Ebm^ =OMNPÄFK^ =pÉÅíçå=OMN t ~íÉê=nì ~äóó=` ÉêãÑÅ~íçå=ã ì ëí=~ÅÅçã é~åó=íÜÉ pÉÅíçå=OMQ=éÉêã á=~åÇ äë äëì ÉÇ=Äó=^ abn E^ abn =OMNPÄFK

k ç=ÉìäÇÉåÉ=çÑ=à êäëÇåÅíçå~äï ~íÉêë=çÑ=íÜÉ=r åáÉÇ=pí~íÉë ï ÉêÉ=ãÇÉåíÑÉÇ=~í=íÜÉ=éêçÇÉÅí=ëáÉ=Çì êåÖ ëáÉ=åî ÉëíáÖ~íçåëI=ï áÜ=íÜÉ=ÉñÅÉéíçå=çÑ=íÜÉ mçï ÉêäåÖ=cäççÇì ~ó=~åÇ=bäëï çêíÜ= Ü~åÅÉá=ï ÜáÜ åíÉêÅÉéí=ëÜÉÉí=Ñççï ë=åë=íÜÉ=ëÉÖçå=~åÇ=ÅçåîÉó=ëì êÑ~ÅÉ=ï ~íÉêë=íç=íÜÉ=b ~ëí=j ~êáÇé~=cäççÇì ~ó ~åÇ=ï áäã ~íÉäó íç íÜÉ=dëã=o â ÉêKqÜäë åÉñì ë íç=íÜÉ=dëã=o â Éêï ãäëãäÉäó ëì ~äÑó=íÜÉëÉ ÉéÜÉã Éê~ä ÅÜ~ååÉäë =~ë=à êäëÇåÅíçå~äï ~íÉêë çÑ=íÜÉ=r åáÉÇ=pí~íÉëI=ï ÜáÜ ï çì äÇ ëÉëì ãÉ pÉÅíçå=OMN ~åÇ=OMQ éÉêã áëÉF=~åÇ=ÅççêÇåã~íçå=ï áÜ=íÜÉ=` çêêë ~åÇ=^ abn Ñçê=ÇäëÅÜ~êÖÉë çÑ=ÇäÉÇÇÉÇ=çê=Ñäãã ~íÉêá~ë åíç=íÜÉëÉ=ÅÜ~ååÉäë=~ë=~=ëÉëì á=çÑ=Ñì ëÉ=ÅçåëíÑ Åíçå ~ÅíçÅ áÅëK aÉéÉåÇåÖ ì éçå=à êäëÇåÅíçå~ä äãã áë=~åÇ=íÜÉ=ÉñíÉåí=çÑ=ÅÜ~ååÉäë=~äÖäã Éåíì=~ë=ï Éäë~ë=íÜÉ ~ëëçÅá~íÉÇ ëì ~åíáó çÑ=ÇäëÅÜ~êÖÉÇ ~åÇçê=ÇäÉÇÇÉÇ=ã ~íÉêá~ëI=ã çÇäÅÅ~íçåë=~åÇ=ã éêçîÉã Éåíë=íç íÜÉ ÅÜ~ååÉäë=ï çì äÇ=êÉèì ãÉ=~ k ~íçåï áÇÉ=çê=fåÇáîáÇì ~äp ÉÅíçå=OMQ=éÉêã á=Ñçã =íÜÉ=` çêêë ~åÇ=~ëëçÅá~íÉÇ=p ÉÅíçå=OMN=éÉêã á Ñçã =^ abnK

t áÜåë=^ êêôçå~I=Öêçì åÇì ~íÉê=ëì ~äóó=êÉÖì ä~íçåë=~êÉ=ã éäÉã ÉåíÉÇ ì åÇÉê íÜÉ=^ ëì ãÑÉê=mêçíÉÅíçå mêçÖê~ã ~Çã åäëíÉêÉÇ=Äó=íÜÉ=^ abn KqÜÉ=åíÉåí=çÑ=íÜÉ=^ ëì ãÑÉê=mêçíÉÅíçå=mêçÖê~ã =äë=íç=êÉÖì ä~íÉ ÇäëÅÜ~êÖÉë=çÑ=ï ~ëíÉï ~íÉê=íÜ~í=Åçì äÇ=éçíÉåíá~äóó=ã é~ÅÍ=Öêçì åÇì ~íÉê=ëì ~äóóK^ åó=Ñ~ÅäãáÉë=íÜ~í ÇäëÅÜ~êÖÉ=~=éçäìí~åí=ÉáÜÉê=ÇäÉÅíáîó=íç=~å=~ëì ãÑÉêI=íç=íÜÉ=ä åÇë=ëì êÑ~ÅÉI=çê=íÜÉ=~êÉ~=ÄÉíï ÉÉå=~å ~ëì ãÑÉê=~åÇ=íÜÉ=ä åÇë=ëì êÑ~ÅÉI=åë=ëì ÅÜ=~=ã ~åÉêí=íÜ~í=íÜÉ=éçäìí~åí=ã ~ó=ÄÉ=êÉ~ëçå~Äóó=ÉñéÉÅíÉÇ=íç êÉ~ÅÜ= ~å= ~ëì ãÑÉê= ~êÉ= êÉèì ãÉÇ= íç= çÄí~åë= ~å= ^ ëì ãÑÉê= mêçíÉÅíçå= mÉêã á= E^ abn = OMNPÅFK ` çåëíë Åíçå=~åÇ=çéÉê~íçå=çÑ=ÅíçÅ=Ñ~ÅäãáÉë=~í=íÜÉ=^ êêççêí ~êÉ=åçí=ÉñéÉÅíÉÇ=íç êÉëì ä=åë=ÇäÉÅí=çê åÇäÉÅí=ÇäëÅÜ~êÖÉë=íç=~å=~ëì ãÑÉêX=íÜÉëÉ=Ñçêí=~å ~ééäÅ~íçå=Ñçê=~å=^ ëì ãÑÉê=mêçíÉÅíçå=mÉêã á ï çì äÇ=åçí=ÄÉ=~åíåÅë~íÉÇK

cäççÇéä=åë

cäççÇéä=åë=~êÉ=ÄÉáë=çÑäçï I=êÎ ÉäÖêçì åÇ=éêÉëÉåí=çå=çåÉ=çê=ÄçíÜëÇÉë=çÑ~=ëíêÉ~ã =ÅÜ~ååÉä=åÇ ~êÉ=ëì ÄäÉÅí=íç=ÉáÜÉê=éÉêçÇÅ=çê=åÑäÉëì Éåí=åì åÇ~íçå=Äó=Ñäçç=ï ~íÉêK=fåì åÇ~íçå=Ç~åÖÉêë ~ëëçÅá=íÉÇ=ï áÜ=Ñäçç Éä=åë=Ü~î É=éêçã éíÉÇ=cÉÇÉê~ä=ëí~íÉI=~åÇ=äçÅ~ä=äÉÖêë=íçå=íÜ~í=ãã áë ÇÉî Éäçéã Éåí=å=íÜÉëÉ=~êÉ~ë=ä=êÖÉäó=íç=êÉÅäÉ~íçå=~åÇ=éêÉëÉêã ~íçå=~Åíâ áÉëK=bñÉÅì íâ É=I êÇÉê NNVUUI *cäççÇéä=åë=j ~å~ÖÉã Éåí*I=êÉèì ãêÉë=~Åíçåë=íç=ã åãã âÉ=Ñäçç Ç=êãëâë=~åÇ=ãã é~ÅíëK=r åÇÉê íÜë=çêÇÉêI=ÇÉî Éäçéã Éåí=~áÉêå~íâ Éë=ã ì ëí=ÄÉ=Åçåëäçêêçé=~åÇ=Äì âçåÖ=êÉèì ãêÉã Éåíë=ã ì ëí=ÄÉ=åë ~ÅÅçêÇ~åÅÉ=ï áÜ=ëéÉÅäÑÅ=cÉÇÉê~ä=ëí~íÉI=~åÇ=äçÅ~ä=Ñäçç Éä=åë=êÉÖì ä=íçåëK

^ ÅÅçêÇåÖ=íç=cÉÇÉê~ä=b ã ÉêÖÉåÅó=j ~å~ÖÉã Éåí=^ ÖÉåÅó=Ecbj ^ F=cäççÇéä=åë=j ~éë=çÑj ~êåÅçé~ ` çì åíó=~åÇ=r åëåÅçêçê~íÉÇ=^ êÉ~ëI íï ç=Ñäçç Ç=òçåÉë=Ü~î É=ÄÉÉå=ÇÉãëåÉ~íÉÇ=Ñçê=íÜÉ=éêçÇÉÅí=ëáÉ Ecbj ^ =OMMUI=OMMRFKmçêãíçåë=çÑ=íÜÉ=éêçÇÉÅí=ëáÉ=~äçåÖ=e ~ï Éë=o ç~ÇI=o ~ó=o ç~ÇI ~åÇ=íÜÉ=É~ëí ëáÇÉ=çÑb äëï çêãÜ=o ç~Ç=~êÉ=Åä=ëëáÑÉÇ=~ë=wçåÉ=u ÉëÜ~ÇÉÇFKwçåÉ=u =åÇÅ~íÉë=~êÉ~ë=çÑä çÇÉê~íÉ Ñäçç Ç=Ü~ò~êÇI=ì ëì ~äó=ÄÉíï ÉÉå=íÜÉ=ãã áë=çÑ=íÜÉ=NMMJóÉ~ê=~åÇ=RMMJóÉ~ê=Ñäçç Ç=ÉÎ Éåíë Ecbj ^ OMNPFKqÜÉ êÉã ~åãåÖ=éçêãíçåë çÑ=íÜÉ éêçÇÉÅí ëáÉ ~êÉ ÇÉëáÖå~íÉÇ=~ë wçåÉ=a I=ï ÜáÅÜ åÇçÅ~íÉë éçëëáÅáÉ=Äì í=ì åÇÉíÉêã åÉÇ=Ñäçç Ç=Ü~ò~êÇëI=~ë=åç=~å~äëëãë=çÑ=Ñäçç Ç=Ü~ò~êÇë=Ü~ë=ÄÉÉå=ÅçåÇì ÅíÉÇ Ecbj ^ =OMNPXëÉÉ=^ éêÉåÇãñ=^ I=cäÖì êÉ RFK

t Éíä=åÇë

t Éíä=åÇë=~êÉ=ÇÉÑåÉÇ=Äó=íÜÉ ` çêéë ~åÇ=bm^ =~ë=íÜçëÉ=~êÉ~ë=íÜ~í=~êÉ=åì åÇ~íÉÇ=çêë~íì ê~íÉÇ=Äó ëì êÑ=ÅÉ=çê=Öêçì åÇï ~íÉê=~í=~=Ñäçèì ÉåÅó=~åÇ=Çì ê~íçå=ëì ÑÜÅÅÉåí=íç=ëì éêçêãI=~åÇ=íÜ~í=ì åÇÉê=åçêã ~ä ÅêêÅì ã ëí~åÅÉë=Çç ëì éêçêãI=~=êêÉî ~ëÉåÅÉ=çÑ=î ÉÇÉí~íçå=íóéêÅ~äó=~Ç~éíÉÇ=Ñçê=äÑÉ=åë=ë~íì ê~íÉÇ=ëçãä ÅçåÇáçåëëK^ ë=ÇÉÑåÉÇ=åë=NVUQI=ì Éíä=åÇë=ÖÉåÉê~äó=åÅÅì ÇÉ=ëï ~ã êëI=ã ~êëÜÉëI=Äç ÖëI=~åÇ=ëãã äë=ê ~êÉ~ë =EPP=` co =POUKP=xÄzFK=t Éíä=åÇë=êêçî åÇÉ=~=î ~êêÍóó=çÑ=ÑìåÅíçåë=åÅì ÇåÖ=Öêçì åÇï ~íÉê êÉÅÜ~êÖÉ=~åÇ=ÇêëÅÜ~êÖÉX=Ñäçç Ç=Ñäçï =~äÉê~íçåX=ëÉÇãë Éåí=ëí~Äáäó~íçåX=ëÉÇãë Éåí=~åÇ=íçñÅ~åí êÉíÉåíçåX=ìêêÉåí=êÉã çî ~ä=~åÇ=íê~åëÑçêã ~íçåX=~ëì ~íÅ=~åÇ=íÉêêÉëíêê~äÇî Éêëäó=~åÇ=~Äì åÇ~åÅÉX ~åÇ=ì åêì ÉåÉëëK=gì êêëÇÅíçå~äï Éíä=åÇë=~êÉ=íÜçëÉ=ëì ÄäÉÅí íç=êÉÖì ä=íçêó=~ì íÜçêóó=ì åÇÉê=pÉÅíçå OMQ=çÑ=íÜÉ=` áÉ~å t ~íÉê ^ ÅíX=bñÉÅì íâ É I êÇÉê NNVVM *mêçíÉÅíçå=çÑ=t Éíä=åÇë*I=~åÇ=êÉèì ãêÉë ~å~äóëÉë=çÑ=éçíÉåíá=äãã é~Åíë=íç=ï Éíä=åÇë=êÉä=íÉÇ=íç=éêçéçëÉÇ=cÉÇÉê~ä=Åíçåë K

qÜÉ r åáÉÇ=pí~íÉë cäëÜ=~åÇ=t äçÅäÑÉ=pÉêî áÅÉ Er pct pF k ~íçå~ä=t Éíä=åÇë fåî Éåíçêó Ek t fF áÇÉåíáÑÉÇ íï ç ÑäÉëÜ ~íÉê=éçåÇë ï áÜåë=íÜÉ=éêçÇÉÅí=ëáÉ ~åÇ=ëÉî Éê=ä ã çêÉ ëã ~äëéçåÇë=ï áÜåë=~ çåÉJã äÉ=ê~Çì ë=çÑ=íÜÉ=éêçÇÉÅí=ëáÉ Er pct p OMNPFKqÜÉ=k t f=ã ~éêëÖ åÇçÅ~íÉÇ çåÉ=éçåÇ ~í=íÜÉ åçêíÜÉ~ëí=Åçêë Éê=çÑ=íÜÉ=ãáÉêëÉÅíçå=çÑb äëï çêãÜ ~åÇ o ~ó êç~Çë ~åÇ=~ëÉÅçåÇ=éçåÇ=í=íÜÉ=åçêíÜ ÉåÇ=çÑe ~ï Éë=o ç~Ç=ÉëÉÉ=^ éêÉåÇãñ=^ I=cäÖì êÉ=OFKr pd p=íçéçÖê~éÜëÅ=ã ~éë=~åÇ=~Éêá=äãã ~ÖÉêó êÉî áÉï ÉÇ ÇáÇ=åçí=ëåÇáÅ~íÉ=~åó=ï Éíä=åÇë=çê=ëì êÑ=ÅÉ=ï ~íÉê=ã éçì åÇã ÉåíëK

qÜÉ=éêçÇÉÅí=ëáÉ=ï ~ë=ëì êî ÉóÉÇ=Ñçê=íÜÉ=éçíÉåíá=ä=éêÉëÉåÅÉ=çÑ=ï Éíä=åÇë=Çì êêåÖ=íÜÉ=ëáî ÉëíáÖ~íçåK=k çï Éíä=åÇë=ï ÉêÉ=çÄëÉêî ÉÇ=ï áÜåë=íÜÉ=éêçÇÉÅí=~êÉ~K^ =ëíçêã ï ~íÉê=êÉíÉåíçå=Ä~ëëå ï ~ë=çÄëÉêî ÉÇ=~í íÜÉ=åçêíÜÉ~ëí=ÅçêÅÉê=çÑ=íÜÉ=åíÉêëÉÅíçå=çÑ=b äëï çêãÜ ~åÇ=o ~ó=êç~Çë=íÜ~í ~éêÉ~êë=íç ÅçäëÉÅí=~åÇ=ÅçåîÉó=ã åçÑÑÜçã =êç~Çï ~óë=~åÇ=~Çà~ÅÉåí=~êÉ~ë ëëÉÉ=^ éêÉåÇãñ=_ Ñçê ëáÉ=éÜçíçÖê~éÜëFK^ ÅÅÉëë=íç=íÜÉ=åçêíÜ=ÉåÇ=çÑ=e ~ï Éë=o ç~Ç=ï ~ë=êÉëíêáÅíÉÇ=Çì É=íç=ÜáÖÜï ~ó Åçåëíêã ÅíçåK=qÜÉ=éçåÇ=ÇÉåíáÑÉÇ=Äó k t f ã ~éë=~éêÉ~êë=íç=ÄÉ=~ëëçÅá=íÉÇ=ï áÜ=íÜÉ=Ç~ãáó=Ñ=êã åçêíÜ=çÑpí~íÉ o çì íÉ=OMOK

SKMI `l k` i r pfl k

k ç=éÉêÉåáá~äëÌ êÑ=ÅÉ=ï ~íÉêë=çê=ï ÉíÌ~åÇë=ï ÉêÉ çÄëÉêÌ ÉÇ=~í=íÜÉ=éêçäÉÅí=ëáÉ ~åÇ=åç=ëçäÉ=ëçÌ êÅÉ ~èÌ ãÑÉêë=~êÉ=äçÅ~íÉÇ=ï áÜåë=íÜÉ=éêçäÉÅí=î áÅëáóKqï ç ÉéÜÉã Éê~äÅÜ~ååÉäl=mçï ÉêëáÉ=c äççÇï ~ó ~åÇ=b äëï çêÜÉ=` Ü~ååÉäÌ ~êÉ=äçÅ~íÉÇ çå íÜÉ=éêçäÉÅí=ëáÉ ~åÇ ì áãã ~íÉäó=ÇäëÅÜ~êÇÉ ãåíç=íÜÉ=d ãã~o áÌ ÉêKfí ãë=~åíÅáé~íÉÇ=íÜ~í=íÜÉëÉ=ÅÜ~ååÉäë=ï çì äÇ=ÄÉ=Åçåëäçé=ÉÇ à êëÇáÅíçå~äÄó=íÜÉ ` çêéë=ÇÌ É íç íÜÉãê åÉñì ë=íç=íÜÉ=d ãã~=o áÌ ÉêK=mçíÉåíá~ä=ãã é~Åíë=íç=íÜÉëÉ=ÅÜ~ååÉäë ï ãëë=éÉèì ãÉ=~ÖÉåÅó ÅççêÇãå~íçå=~åÇ=~éêêçéêá~íÉ=éÉêã áë=íç=ÄÉ=çÄí~ãåÉÇ éêçêçê=íç Åçåëíêì Åíçå ~Åíâ ãáÉëKmçêçåë=çÑ íÜÉ=éêçäÉÅí=ëáÉ=~êÉ=äçÅ~íÉÇ=ÄÉíï ÉÉå=íÜÉ=NMMJ ~åÇ=RMMJbÉ~êÑçÇçòçåÉëXÜçï ÉÌ ÉêÌ=íÜÉ=ã ~àçêáó=çÑ íÜÉ=ëáÉ=ãë=ÅÜ~ëëãÑÉÇ=~ë=wçåÉ=a l=ãåÇáÅ~íãåÖ=åç=å~ãëëãë=çÑÑçÇçÜ~ò~êÇë=Ü~ë=ÄÉÉå éÉêÑçêã ÉÇK

THWI obcbobk` bp

^j b` =båî âçåã Éåí=Ç=fåÑã~ëíéã Åíì êÉI=fåÅK=E^j b` FI=OMNP~Kcáå~ãmÉJa ÉëáÇà=fåî ÉëíáÇ~íáçå=t çêã mä~åI=páÉ=pqMNOI=c çêã Éêt áãã~ã ë=^ áê=c çêÅÉ=_ ~ëÉI=j Éë~=^ êáçå~Kg~åì ~êó=OMNPK

^j b` I=OMNPÄKa ê~ÑI=^ ååì ~ä=OMNO=d êçì åÇï ~íÉêj çåáçêáÇÖ=o Éé çêI=c çêã Éê=i êì áÇ=c ì Éäp íçê~ÖÉ ^ êÉ~I=páÉ=pqMNOI=c çêã Éêt áãã~ã ë=^ áê=c çêÅÉ=_ ~ëÉI=j Éë~=^ êáçå~Kg~åì ~êó=OMNPK

^ êáçå~=a Éé~êíã Éåí=çÑb åî âçåã Éåí~ä=n ì ~äáó=E^ a b n FK=OMNP~K=t ~íÉê=n ì ~äáó=a â ëáçåW
mÉêã áëW^ êáçå~=mçäì í~åí=a ëÅÜ~êÖÉ=b äãã åã~íáçå=p óëíÉã d ÉåÉê~äfåÑçêã ~íáçåK
^ î ~äà~ÄäÉ=~í Üíí é\Wï ï ï K~òÇÉèKÖçî LÉåî âçåÜï ~íÉêÜéÉêã áëL~òéÇÉëKÜíã äK=t ÉÄëáÉ
~ÅÅÉëëÉÇ=çå= ÅíçÄÉê UI=OMNPK

^ êáçå~=a Éé~êíã Éåí=çÑb åî âçåã Éåí~ä=n ì ~äáó=E^ a b n FK=OMNPÄK=t ~íÉê=n ì ~äáó=a â ëáçåW
mÉêã áëWmÉêã áW^ ëÉ~å=t ~íÉê=^ Åí=E t ^ F=OMN= ÉêíãÑÅ~íáçå\ K=^ î ~äà~ÄäÉ=~í
Üíí é\Wï ï ï K~òÇÉèKÖçî LÉåî âçåÜï ~íÉêÜéÉêã áëLÅï ~OMNKÜíã äK=t ÉÄëáÉ=~ÅÅÉëëÉÇ=çå
l ÅíçÄÉê NM=OMNPK

^ êáçå~=a Éé~êíã Éåí=çÑb åî âçåã Éåí~ä=n ì ~äáó=E^ a b n FK OMNPÅKt ~íÉê=n ì ~äáó=a â ëáçåW mÉêã áëW
^ èì ãÑÉê=mçíÉÅíáçå=mÉêã áë=E^ mmF d ÉåÉê~äfåÑçêã ~íáçåK=^ î ~äà~ÄäÉ=~í
Üíí é\Wï ï ï K~òÇÉèKÖçî LÉåî âçåÜï ~íÉêÜéÉêã áëL~éé KÜíã äÇÇÉåÉê~äK=t ÉÄëáÉ=~ÅÅÉëëÉÇ=çå
l ÅíçÄÉê=UI=OMNPK

^ êáçå~=a Éé~êíã Éåí=çÑb åî âçåã Éåí~ä=n ì ~äáó=E^ a b n FK=OMNOCKt ~íÉê=n ì ~äáó=a â ëáçåWmÉêã áëW
^ êáçå~=mçäì í~åí=a ëÅÜ~êÖÉ=b äãã åã~íáçå=p óëíÉã K=^ î ~äà~ÄäÉ=~í
Üíí é\Wï ï ï K~òÇÉèKÖçî LÉåî âçåÜï ~íÉêÜéÉêã áëLÇçï åäç~ÇLÉé~äêÜÇÑK=t ÉÄëáÉ=~ÅÅÉëëÉÇ=çå
l ÅíçÄÉê=OI=OMNPK

^ êáçå~=a Éé~êíã Éåí=çÑt ~íÉê=o Éëçì êÅÉëK=OMNPK=d êçì åÇï ~íÉê=p áÉ=fåî Éåíçêó d êçì åÇï ~íÉê
a ~í~K=^ î ~äà~ÄäÉ=~í Üíí é ëé\WÖêï ÉÄK~òï ~íÉêÜÇçî Lï ~íÉêÜÉëçì êÅÉÇ~í~Ld t pfK~ëéñK=t ÉÄëáÉ
~ÅÅÉëëÉÇ=çå= ÅíçÄÉê=NI=OMNPK

_êçï åI=a ~î áÇI=ÉÇK=NVVCK _ áçíáÅ=` çã ã ì ãááÉëW p çì íÜï ÉëíÉêå=r åáÉÇ=p í~íÉë=~åÇ=k çêÜï ÉëíÉêå j ÉñáÅçK=r åáî Éêëáó=çÑr í~Ü=mÉëëI=p ~ä= ~âÉ= áóK=PQO=éé K

b åî âçåã Éåí~ä mêçíÉÅíáçå=^ ÖÉåÅó=Eb m^ FK=OMNP~K pçäÉ=p çì êÅÉ=^ èì ãÑÉê m~ÅãÑÅ=p çì íÜï ÉëíI
o ÉÖáçå= VK= = ^ î ~äà~ÄäÉ= ~í Üíí é\Wï ï ï KÉé~KÖçî LÉÖáçåVÜï ~íÉêÜëë~KÜíã äK
t ÉÄëáÉ=~ÅÅÉëëÉÇ=çå= ÅíçÄÉê=UI=OMNPK

b åî âçåã Éåí~ä mêçíÉÅíáçå=^ ÖÉåÅó=Eb m^ FK=OMNPÄK=t Ü~í=äë= äÉ~å= ~íÉê=^ Åí=E t ^ F=p ÉÅíáçå=OMQ\
^ î ~äà~ÄäÉ=~í Üíí é\Wï ~íÉêKÉé~KÖçî LíóéÉIçÅÉÄLÜ~Äá~íLÅï ~OMQKÅÑã K=t ÉÄëáÉ=~ÅÅÉëëÉÇ=çå
l ÅíçÄÉê=QI OMNPK

c ÉÇÉê~ä=b ã ÉêÖÉåÅó=j ~å~ÖÉã Éåí=^ ÖÉåÅó=Ec b j ^ FK=OMNPK=a ÉÑÅáçåë=çÑ=c b j ^ =c äççÇ=wçåÉ
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Üíí éëW ã ëÅKÑÉã ~KÖçî Lï ÉÄ~éélï ÅëLëíçêÉëLëÉêã áÉíLáÅÑçî \ëíçêÉfÇZNMMMNCÅ~í~äçÖfÇZNMMMNCä
~åÖfÇZJNCÅçåíÉåíZÑççÇwçåÉëCíáäÉZc b j ^ B OROMc äççÇB OROMwçåÉB OROMa ÉëáÖÅ~íáçåëK
t ÉÄëáÉ ^ ÅÅÉëëÉÇ=çå= ÅíçÄÉê=UI=OMNPK

cÉÇÉê~ä=bã ÉêÖÉåÅó j ~å~ÖÉã Éåí=^ÖÉåÅó=Ec bj ^FK<=OMMUK<=j ~é=m~åÉä=fa\W=MQMNP` OSVRe l j ~êáÅçé~=` çì åíó=r åáÅçêéçê~íÉÇ=~åÇ=fåÅçêéçê~íÉÇ=^ãÉ~ëK<=j çëí=ãÉÅÉåí=i ÉííÉê=çÑ=j ~é ` çêãÉÅíçå= ^éêãã= NI= OMMUK< = ^î~ãä~ÄäÉ= ~í ÜíéëWã ëÅKÑÉã ~KÖçîlï ÉÄ~éélï ÅëLëíçêÉëLëÉãî ãÉíLcÉã ~t ÉäÅçã Ésã£ï \ëíçêÉfÇZNMMMNCÅ~ í~äçÖfÇZNMMMNCä~åÖfÇZJNCì ëÉêqóéÉZd K<t ÉÄëáÉ=^ÅÅÉëëÉÇ=çå=t ÅíçÄÉê=OI=OMNPK

cÉÇÉê~ä=bã ÉêÖÉåÅó=j ~å~ÖÉã Éåí=^ÖÉåÅó=Ec bj ^FK<=OMMRK<=j ~é=m~åÉä=fa\W=MQMNP` OSURe l j ~êáÅçé~=` çì åíó=r åáÅçêéçê~íÉÇ=~åÇ=fåÅçêéçê~íÉÇ=^ãÉ~ëK<=i ÉííÉê=çÑ=j ~é=` çêãÉÅíçå l ÅíçÄÉê= NI= OMMRK< = ^î~ãä~ÄäÉ= ~í ÜíéëWã ëÅKÑÉã ~KÖçîlï ÉÄ~éélï ÅëLëíçêÉëLëÉãî ãÉíLcÉã ~t ÉäÅçã Ésã£ï \ëíçêÉfÇZNMMMNCÅ~ í~äçÖfÇZNMMMNCä~åÖfÇZJNCì ëÉêqóéÉZd K<t ÉÄëáÉ=^ÅÅÉëëÉÇ=çå=t ÅíçÄÉê=OI=OMNPK

cäççÇ=` çåíêçä=aäëíêáÅí=çÑ=j ~êáÅçé~=` çì åíóK=OMNPI=eäëíçêáÅ~ä=^ÉêÅ~ä=mÜçíçÖê~éÜë=Ç~íÉÇ=NVPTI NVQVI= NVTVI= NVVPI= ~åÇ= NVVS= íÜêçì ÖÜ= OMNMK< ^î~ãä~ÄäÉ= ~í ÜíéWï ï ïKÑÅÇKã ~êáÅçé~KÖçîldfplã ~éëK~ëéñK<t ÉÄëáÉ=^ÅÅÉëëÉÇ=t ÅíçÄÉê=OMNPK

k~íì ê~ä=oÉëçì êÅÉë=` çåëÉãî ~íçå=pÉãîáÉ Ek o` pFW pÉÉ=r åáÉÇ=pí~íÉë aÉé~ãã Éåí=çÑ ^ÖêáÅì áì ãÉI=k~íì ê~ä=oÉëçì êÅÉë=` çåëÉãî ~íçå=pÉãîáÉK

r åáÉÇ=pí~íÉë=aÉé~ãã Éåí=çÑ=^ÖêáÅì áì ãÉI k~íì ê~ä=oÉëçì êÅÉë=` çåëÉãî ~íçå=pÉãîáÉ=Ek o` pFK OMNPK t ÉÄ=pçãäpì ãî Éó ^Ö ãä~J` ~êÉÑÅÉÉ=^ãÉ~I=^êêòçå~I m~ãíë=çÑ=j ~êáÅçé~=~åÇ=mäã~ä ` çì åíáÉëK ^î~ãä~ÄäÉ=~í ÜíéWï ÉÄëçãäì ãî ÉóKãêÅëKëÇ~KÖçîL~éélt ÉÄpçãpì ãî ÉóK~ëéñK t ÉÄëáÉ=~ÅÅÉëëÉÇ pÉéíÉã ÄÉê=ORI=OMNPK

r åáÉÇ=pí~íÉë=dÉçäçÖÅ~äpì ãî Éó=Er pd pFK OMNNK *eáÖÉó/=^êêòçå~* TKRJ ãì íÉ=nì ~Çê~åÖÉ=j ~éK

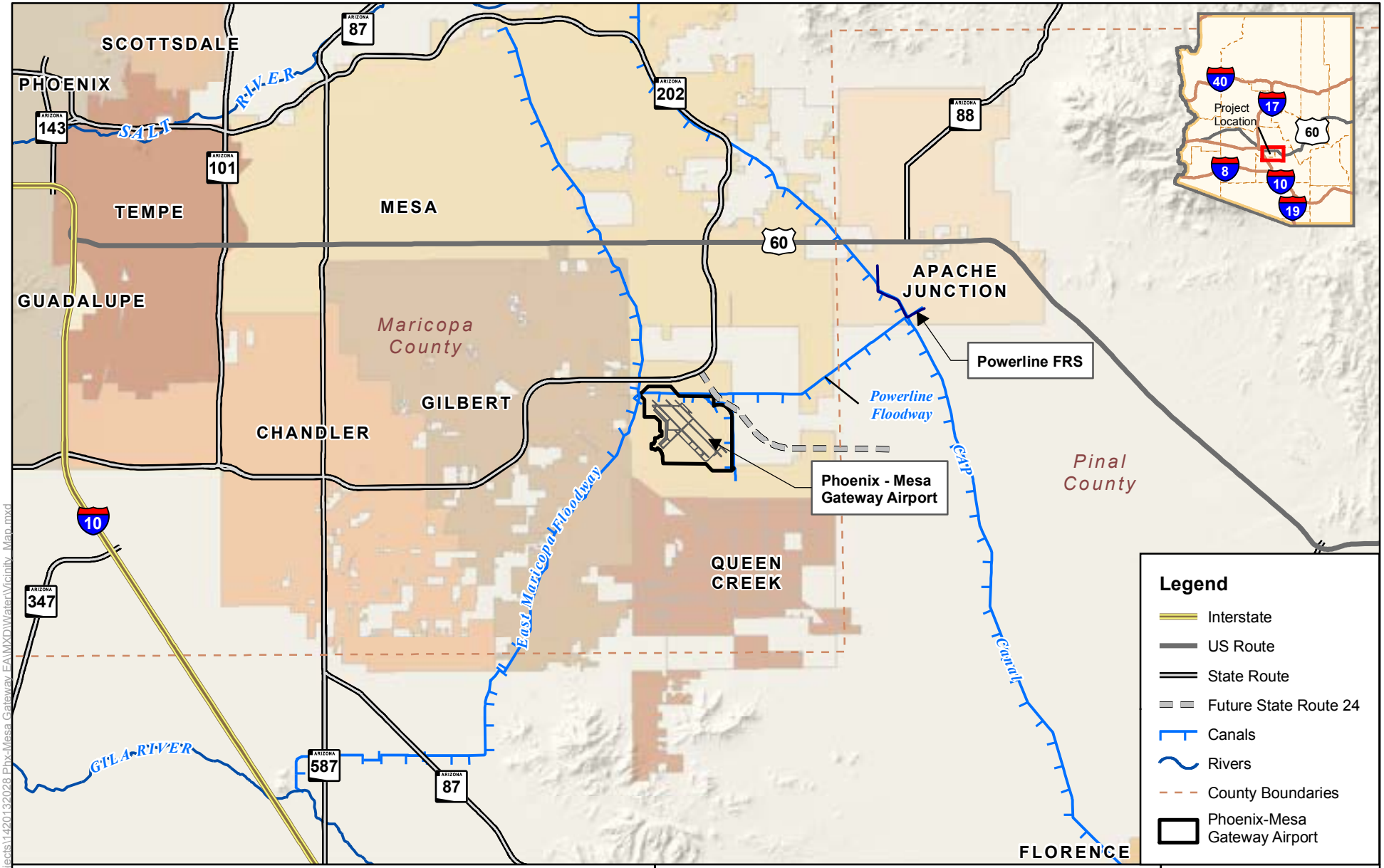
r åáÉÇ=pí~íÉë=cäëÜ=~åÇ=t ãçÅäÑÉ=pÉãîáÉK OMNPK<=k~íçå~ä=t Éíä~åÇë=fåî ÉåíçêóK<=^î~ãä~ÄäÉ=~í ÜíéWï ï ïKÑI ëKÖçîlï Éíä~åÇëLa~í~Lj ~éé ÉãÜíã äK<t ÉÄëáÉ=~ÅÅÉëëÉÇ=t ÅíçÄÉê=NI=OMNPK

t ÉëíÉêå=oÉÖçå~ä=` äãã~íÉ=` ÉåíÉãK<=OMNPK<=mÉêçÇ=çÑ=oÉÅçêÇ=j çåíÜäó=` äãã~íÉ=pì ã ã ~êóI ` Ü~åÇáÉê=eÉáÜÜíëI=^êêòçå~ EMONRNQFK<=mÉêçÇ=çÑ=oÉÅçêÇWNVUN íç OMNMK ^î~ãä~ÄäÉ=~í ÜíéWï ï ïK êÅÅKÇêáKÉÇì LÅÖáLÄäLÅäj ^fk Keã ~òNRNQK t ÉÄëáÉ=~ÅÅÉëëÉÇ pÉéíÉã ÄÉê=OSI OMNPK

t ççÇI=m~íÉãC=^ëëçÅá~íÉëI=fåÅK=j ~ëíÉê=aê~åã~ÖÉ=oÉéçãî=ÑçêêJ Éë~=mêçîåÖ=dêçì åÇëI=mãÉé~êÉÇ ÑçêÅAVaj _=j Éë~=mêçîåÖ=dêçì åÇëI=i i ` K pì Äã áíÉÇ=íçWî áó=çÑ=j Éë~K ^î~ãä~ÄäÉ=~í ÜíéWï ï ïKã Éë~~òKÖçîLÄÉííÉêã Éë~LéÇÑÇã ÄLéÖj ~ëíÉêa ê~åã~ÖÉ=oÉéçãîK<ÇÑK< = t ÉÄëáÉ ~ÅÅÉëëÉÇ=t ÅíçÄÉê=OI=OMNPK

^ mmbk a fu=^

cfd r obp



0 2 4 8 Miles

Job No.	1420132028
PM:	KR
Date:	10/8/2013
Scale:	1" = 4 miles

N

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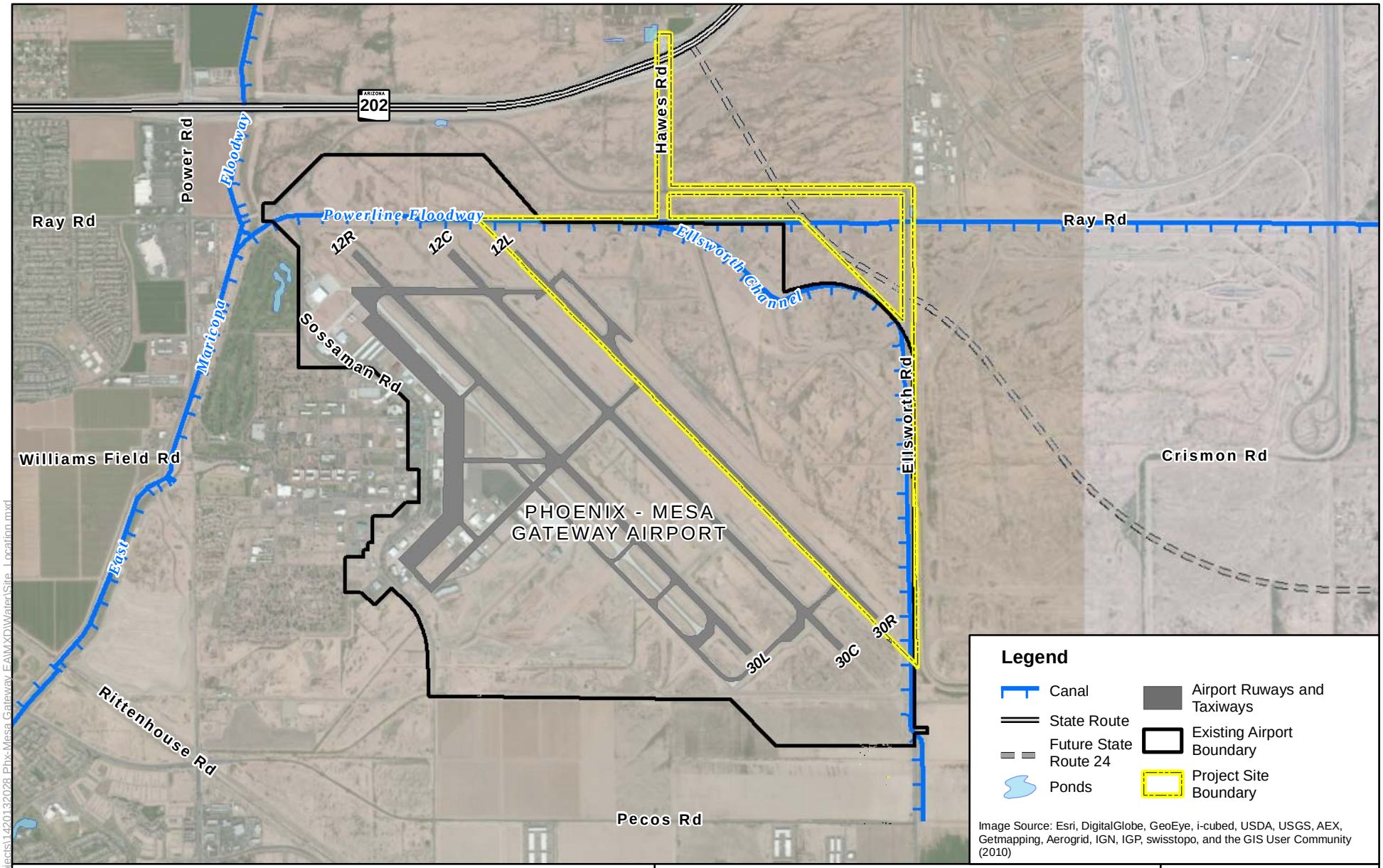
Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Vicinity Map

FIGURE 1

amec

Path: X:\Projects\2013 Projects\1420132028 Phx-Mesa Gateway EA\MXD\Water\Vicinity_Map.mxd



0 1,500 3,000 6,000 Feet

Job No.	1420132028
PM:	KR
Date:	1/9/2014
Scale:	1" = 3000'

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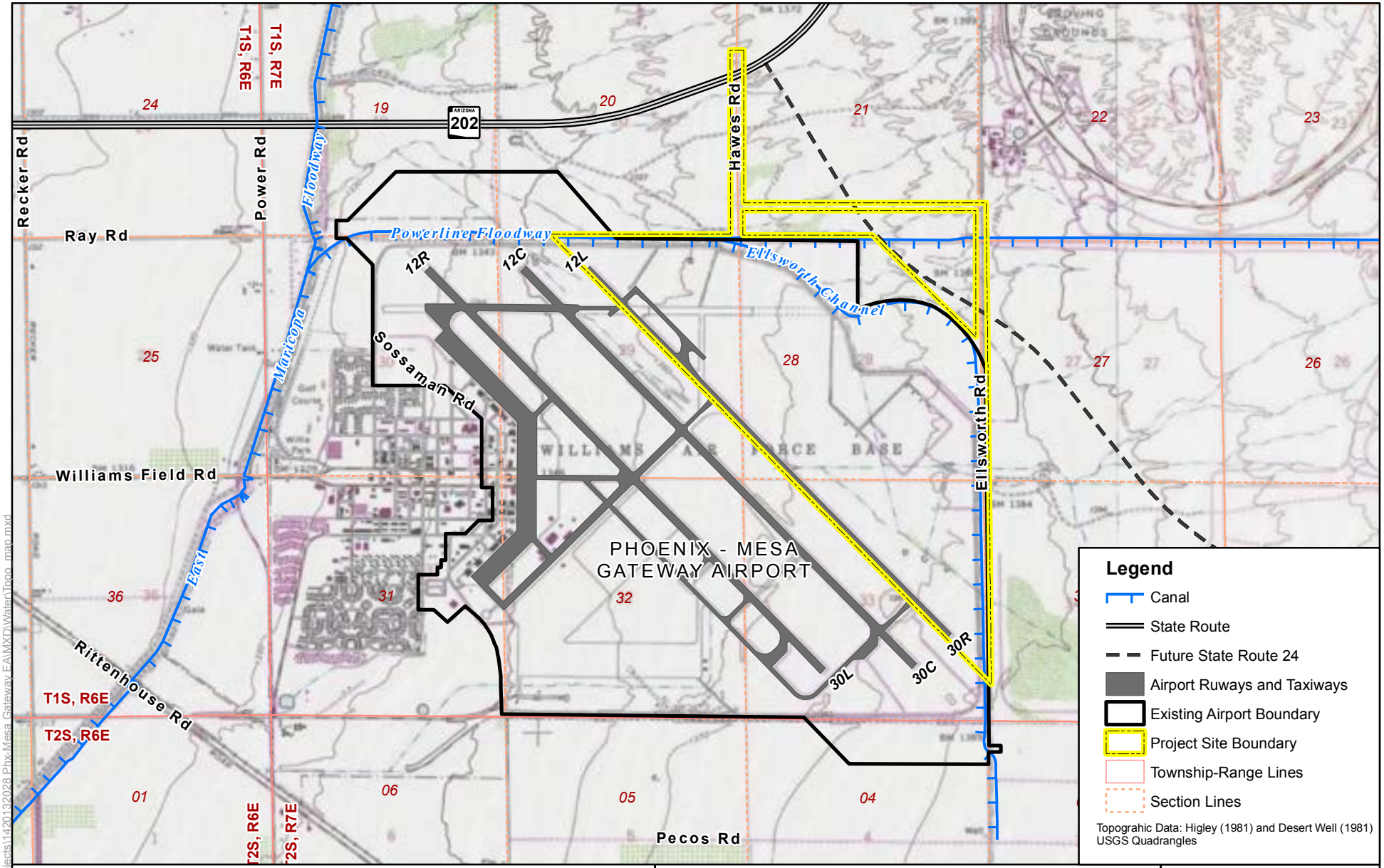
Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Project Site Location

FIGURE
2

amec

Path: X:\Projects\2013 Projects\1420132028 Phx-Mesa Gateway_EA\MXD\Water\Site_Location.mxd



0 1,500 3,000 6,000 Feet

Job No.	1420132028
PM:	KR
Date:	1/16/2014
Scale:	1" = 3000'

N

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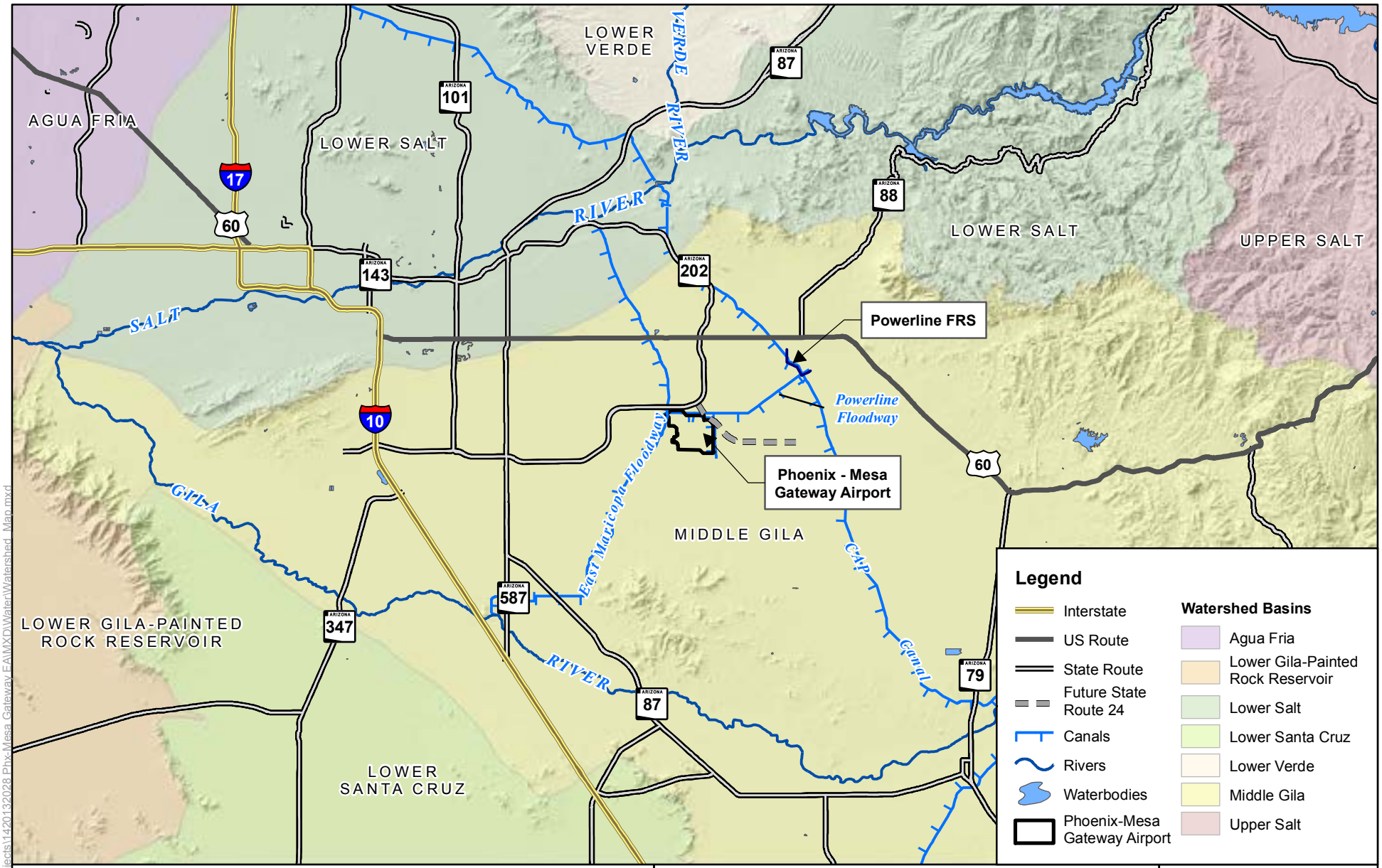
Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Topographic Map

FIGURE
3

amec

Path: X:\Projects\2013 Projects\1420132028 Phx Mesa Gateway EA\MXD\Water\Topo_map.mxd



0 4 8 16 Miles

Job No.	1420132028
PM:	Kr
Date:	1/16/2014
Scale:	1" = 8 miles

N

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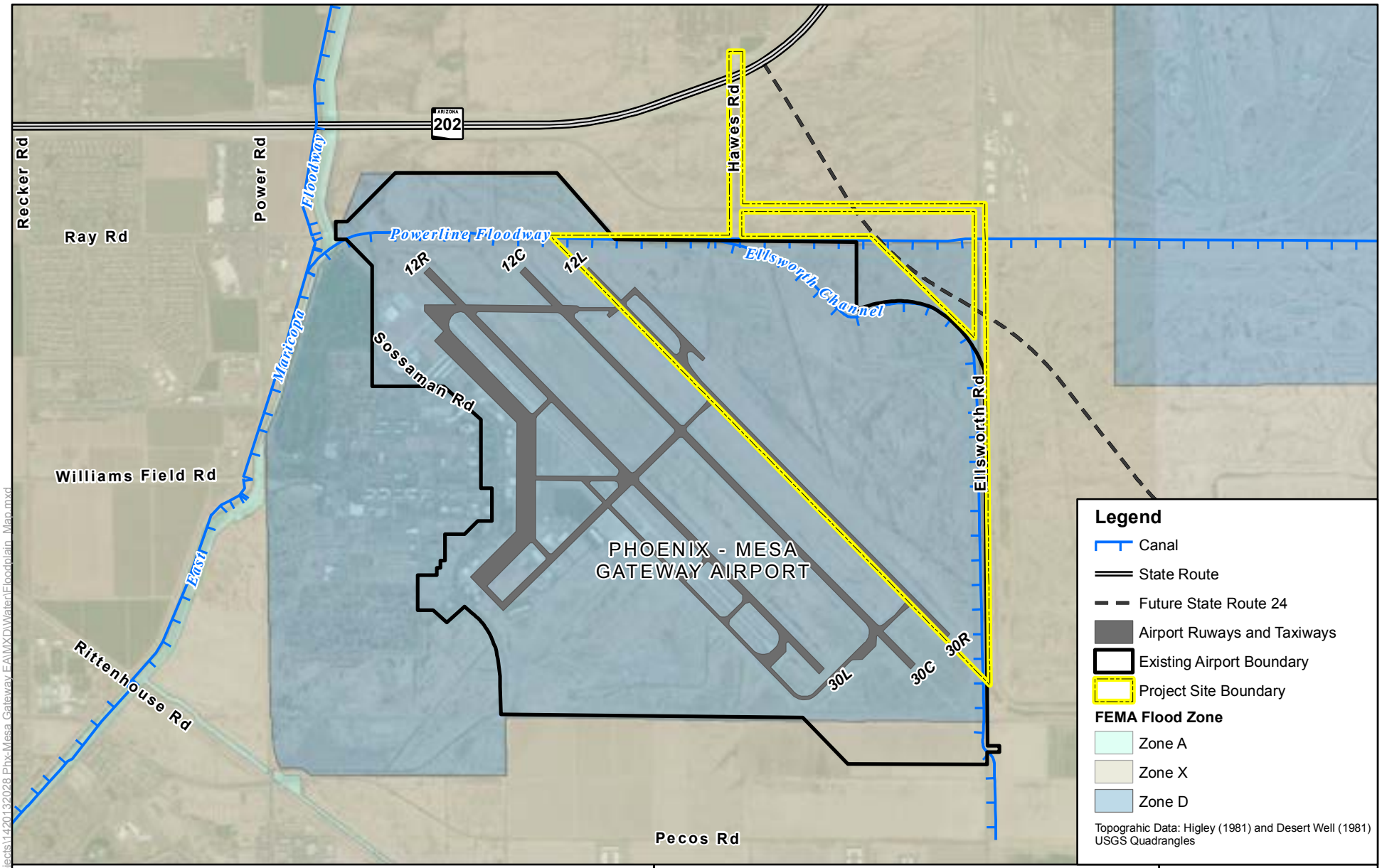
Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Watershed Map

FIGURE **4**

amec

Path: X:\Projects\2013 Projects\1420132028 Phx-Mesa Gateway EA\MXD\Water\Watershed_Map.mxd



0 1,500 3,000 6,000 Feet

Job No.	1420132028
PM:	KR
Date:	1/16/2014
Scale:	1" = 3000'

N

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Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Floodplain Map

FIGURE
5

amec

Path: X:\Projects\2013 Projects\1420132028 Phx-Mesa Gateway EA\MXD\Water\Floodplain_Map.mxd

^mmbkafu=_

pfqb=mel ql do^mef`=il d

mÜçíç NKs áÉÌ çÑb äæëï çêÜ= Ü~ååÉäæ~äçåÖçåÉ=çÑëÉÌ Éê~äÄÉåÇë=ï áÜåå=ÍÜÉ éêçáÉÅÍ=ëáÉI éÜçíç=í~âÉå=Ñ~ÅåáÖ=åçêÜåçêÜÉ~ëíK

mÜçíç OKs áÉÌ çÑb äæëï çêÜ= Ü~ååÉäæï ÜÉêÉ=á=ê åë=é~ê~äÉäíç=b äæëï çêÜ=o ç~ÇI éêáçê=íç ï ÜÉêÉ=á=Åì êÉë=åçêÜï Éëí=åíç=ÍÜÉ=éêçáÉÅÍ=ëáÉXéÜçíç=í~âÉå=Ñ~ÅåáÖ åçêÜK

mÜçíç PKs áÉÌ =çÑåçêÜÌ ÉëÍ=ÉåÇ=çÑ=~êéçêÃ=êÃ åÌ ~ó=~êÉ~=ëÜçÌ êåÖ=Çê~åå~ÖÉ ÑÉ~íÌ êÉ=íç=ÇêÉÅÍ=ëÌ êÑÅÉ=êÃ åçÑÑíç=mçÌ ÉêäåÉ=c äççÇÌ ~óXéÜçíç=í~âÉå=ÑÅêåÖ ëçÌ íÜÉ~ëíK

mÜçíç QKs áÉÌ =çÑéêçáÉÅÍ=ëáÉ=ëÜçÌ êåÖ=êÉéÉëÉëÉåí~íâ É=Ñà=í=Öêçì åÇ=ëÌ êÑÅÉ=Ì áÜ ëÅ~íÍÉêÉÇ=Ì ÉÖÉí~íçåXéÜçíç=í~âÉå ÑÅêåÖ ëçÌ íÜK

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Appendix G.2

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, U.S. ARMY CORPS OF ENGINEERS
3636 N CENTRAL AVENUE, SUITE 900
PHOENIX, ARIZONA 85012-1939

April 7, 2015

Mary Reker
Phoenix-Mesa Gateway Airport Authority
5835 S. Sossaman Road
Mesa, Arizona 85212

SUBJECT: Preliminary Jurisdictional Determination regarding geographic jurisdiction

Dear Ms. Reker:

I am responding to your request (File No. SPL-2014-00774-PC) dated March 31, 2015 for a preliminary Department of the Army jurisdictional determination (JD) for the Phoenix-Mesa Gateway Airport Northeast Area Development Plan project site (33.311558, -111.645862) located within the City of Mesa, Maricopa, Arizona.

Based on available information, I have preliminarily determined waters of the U.S. may be present on the Phoenix-Mesa Gateway Airport Northeast Area Development Plan project site in the approximate locations noted on the enclosed drawing. The basis for this finding can be found on the enclosed Preliminary Jurisdictional Determination (JD) form. Please be aware preliminary JDs are non-binding indications of the presence of waters of the U.S., including wetlands, on a parcel, are advisory in nature and may not be appealed. If you accept this determination, please sign and date this form and return to the issuing office within two weeks of receipt. However, you are hereby informed of your option to request an approved jurisdictional determination, which may be appealed. Note that for purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a preliminary JD will treat all waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional waters of the U.S.

Preliminary and approved jurisdictional determinations are fully explained in Regulatory Guidance Letter 08-02, dated June 26, 2008 which can be found at http://www.usace.army.mil/Portals/2/docs/civilworks/RGLS/rgl08-02.pdf . Further, proffered individual permits (and all terms and conditions contained therein), individual permit denials, and any jurisdictional issues may also be appealed pursuant to 33 CFR Part 331.

This determination was conducted to identify the extent of the Corps' Clean Water Act jurisdiction on the Phoenix-Mesa Gateway Airport Northeast Area Development Plan project site identified in your request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

Thank you for participating in the regulatory program. If you have any questions, please contact Penny Childers at 602-230-6891 or via e-mail at Penny.Childers@usace.army.mil. Please also complete the customer survey form at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey , which would help me to evaluate and improve the regulatory experience for others.

Sincerely,

Sallie Diebolt
Chief, Arizona Branch
Regulatory Division

Enclosures
1. Preliminary Jurisdictional Determination Form
2. Preliminary Jurisdictional Delineation Map

cc
Theresa Price, AMEC Environment & Infrastructure, Inc.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office: Los Angeles District | File/ORM #: SPL-2014-00774-PC | PJD Date: Apr 7, 2015

State: AZ | City/County: Mesa/Maricopa County

Nearest Waterbody: East Maricopa Floodway

Location: TRS, LatLong or UTM: Section 20,21,28,29, and 33 Township 1S, Range 7E

Name/ Address of Person Requesting PJD: Mary Reker, Phoenix-Mesa Gateway Airport, 5835 S. Sossaman Road, Mesa, AZ 85212

Identify (Estimate) Amount of Waters in the Review Area:

Non-Wetland Waters: 21300 linear ft | 53 width | 25.79 acres | Stream Flow: Ephemeral

Wetlands: 0 acre(s) | Cowardin Class: Riverine

Name of Any Water Bodies on the Site Identified as Section 10 Waters: Tidal: n/a | Non-Tidal: n/a

☑ Office (Desk) Determination
☑ Field Determination: Date of Field Trip: Jan 20, 2015

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: AMEC, 2015
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps
- ☐ Corps navigable waters' study:
- ☑ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☑ USGS 8 and 12 digit HUC maps.
- ☑ U.S. Geological Survey map(s). Cite quad name: Highley, Arizona 7.5'
- ☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Aguila-Carefree Area, AZ, Parts of Maricopa & Pi
- ☑ National wetlands inventory map(s). Cite name: USFWS NWI Wetlands Mapper website
- ☐ State/Local wetland inventory map(s):
- ☑ FEMA/FIRM maps: 04013C2760L and 04013C2770L
- ☐ 100-year Floodplain Elevation is:
- ☑ Photographs: ☑ Aerial (Name & Date): NAIP, 2013
  - ☑ Other (Name & Date): AMEC, 2015
- ☐ Previous determination(s). File no. and date of response letter:
- ☐ Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager (REQUIRED)

Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office	Los Angeles District	File/ORM #	SPL-2014-00774-PC	PJD Date:	Apr 7, 2015
State	AZ	City/County	Mesa/Maricopa County	Person Requestinq PJD	Mary Reker

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
20*	33.31760067	-111.6464263	Riverine	20.02 acres	Non-Section 10 non-wetlan
23**	33.3211875	-111.6547386	Riverine	5.77 acres	Non-Section 10 non-wetlan

Notes:

Two (2) waterways within the project area are proposed as jurisdictional: Ellsworth Channel and Powerline Floodway.

The Powerline Floodway is identified as jurisdictional waters of the US (riverine system) in the US Fish and Wildlife Service National Wetlands Inventory database, and possesses a definable ordinary high water mark (OHWM) and nexus to the Gila River. Ellsworth Channel has a definable OHWM and nexus to the Powerline Floodway.

Data points were collected throughout the project area to document site characteristics of areas appearing as potential water features. The majority of those areas did not exhibit characteristics of Waters of the US, including evidence of an OHWM or defined bed/bank. The "JD Field Notes" in Attachment B of this report contains additional information for all data points collected during this investigation.

* Multiple GPS points were collected along Ellsworth Channel (data points 20, 21, 22, 31, 32, 33, and 34). The area provided in this table is the total area of Ellsworth Channel within the project limits. Please see "Aquatic Resources" and "JD Field Notes" in Attachment B of this report for additional information/site characteristics at each GPS point along Ellsworth Channel.

** Multiple GPS points were collected along Powerline Floodway (data points 23, 24, 25, 26, 27, 28, 29, and 30). The area provided in this table is the total area of Powerline Floodway within the project limits. Please see "Aquatic Resources" and "JD Field Notes" in Attachment B of this report for additional information/site characteristics at each GPS point along Powerline Floodway

* * * * PRELIMINARY (RGL 08-02) * * * *

SECTION 404 JURISDICTIONAL DELINEATION

U.S. Army Corps of Engineers, Los Angeles District

Application No. SPL -2014 - 00774 - PC

Boundary of area surveyed for jurisdictional waters of the United States

Approximate Ordinary High Water Mark

Potential Waters of the United States

n/a Potential Wetlands (If legend is blank no wetlands occur with survey area.)

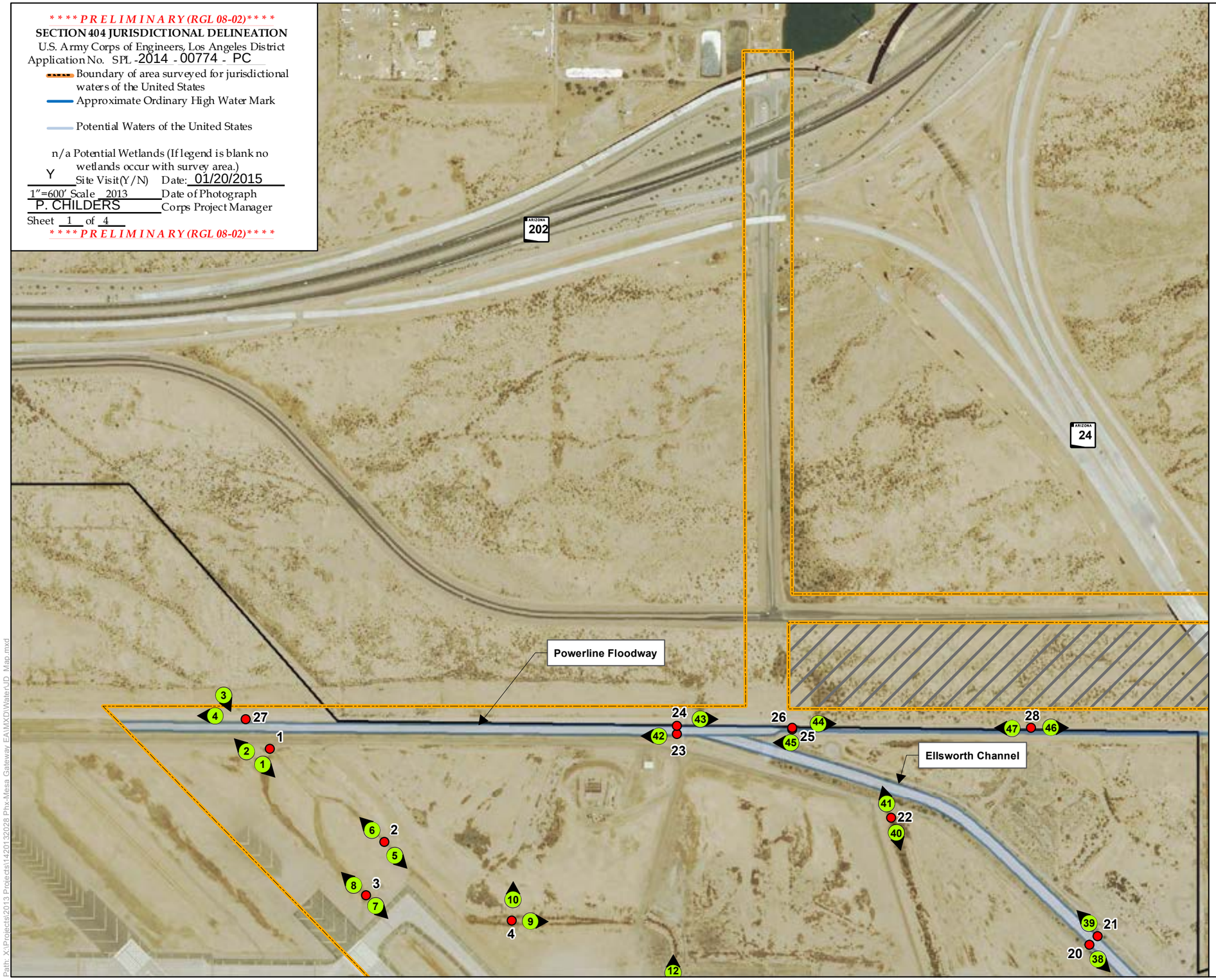
Y Site Visit(Y/N) Date: 01/20/2015

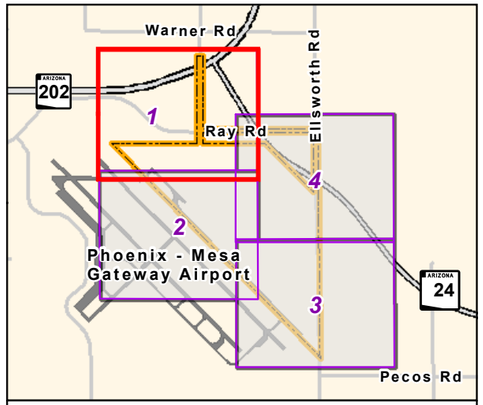
1"=600' Scale 2013 Date of Photograph

P. CHILDERS Corps Project Manager

Sheet 1 of 4

* * * * PRELIMINARY (RGL 08-02) * * * *





Area of Detail

Legend

Photo Point: Arrow indicates direction of photo

Field Data Points

Existing Airport Boundary

Non-Surveyed Area

Aerial Imagery: NAIP, 2013

Coordinate System: NAD 1983 State Plane Arizona Central (US Feet)

0 300 600 1,200 Feet

N

Preliminary Jurisdictional Determination
Phoenix-Mesa Gateway Airport
Maricopa County, Arizona

Map 1 of 4

Job No.	14-2013-2028
PM:	KR
Date:	3/23/2015
Scale:	1" = 600'

amec

The map shown here has been created with all due and reasonable care and is strictly for use with AMEC Project Number 14-2013-2028. This map has not been certified by a licensed land surveyor, and any third party use of this map comes without warranties of any kind. AMEC assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

Path: X:\Projects\2013 Projects\14201 32028 Phx-Mesa Gateway EA\MXD\Waters\JD_Map.mxd

* * * * PRELIMINARY (RGL 08-02) * * * *

SECTION 404 JURISDICTIONAL DELINEATION

U.S. Army Corps of Engineers, Los Angeles District

Application No. SPL -2014 -00774 - PC

Boundary of area surveyed for jurisdictional waters of the United States

Approximate Ordinary High Water Mark

Potential Waters of the United States

n/a Potential Wetlands (If legend is blank no wetlands occur with survey area.)

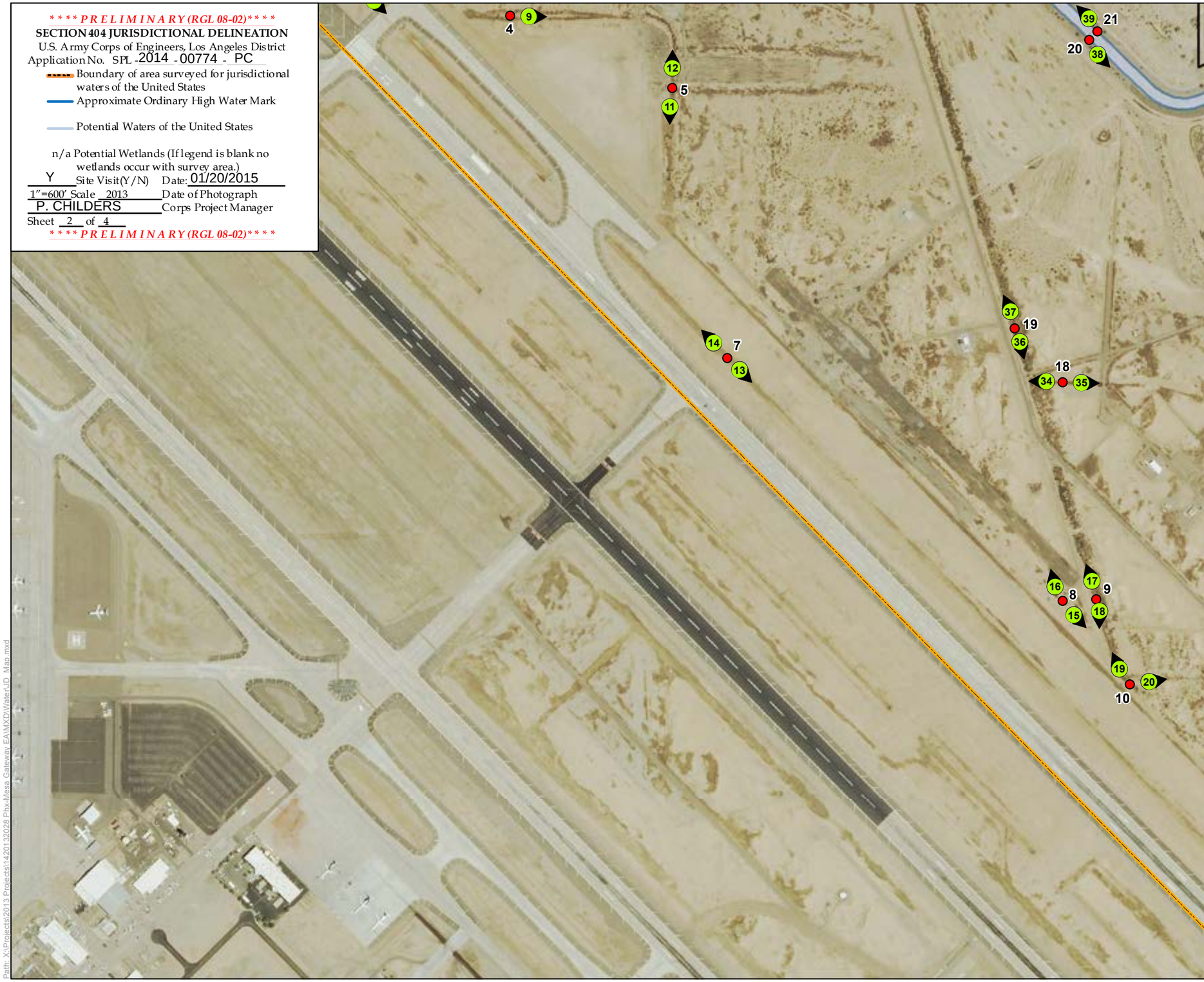
Y Site Visit(Y/N) Date: 01/20/2015

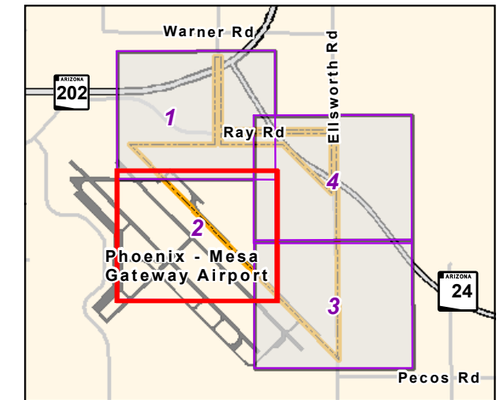
1"=600' Scale 2013 Date of Photograph

P. CHILDERS Corps Project Manager

Sheet 2 of 4

* * * * PRELIMINARY (RGL 08-02) * * * *





Area of Detail

Legend

- Photo Point: Arrow indicates direction of photo
- Field Data Points
- Existing Airport Boundary
- Non-Surveyed Area

Aerial Imagery: NAIP, 2013

Coordinate System: NAD 1983 State Plane Arizona Central (US Feet)

0 300 600 1,200 Feet

N

Preliminary Jurisdictional Determination
Phoenix-Mesa Gateway Airport
Maricopa County, Arizona

Map 2 of 4

Job No.	14-2013-2028
PM:	KR
Date:	3/23/2015
Scale:	1" = 600'

amec

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* * * * PRELIMINARY (RGL 08-02) * * * *

SECTION 404 JURISDICTIONAL DELINEATION

U.S. Army Corps of Engineers, Los Angeles District

Application No. SPL -2014 - 00774 - PC

Boundary of area surveyed for jurisdictional waters of the United States

Approximate Ordinary High Water Mark

Potential Waters of the United States

n/a Potential Wetlands (If legend is blank no wetlands occur with survey area.)

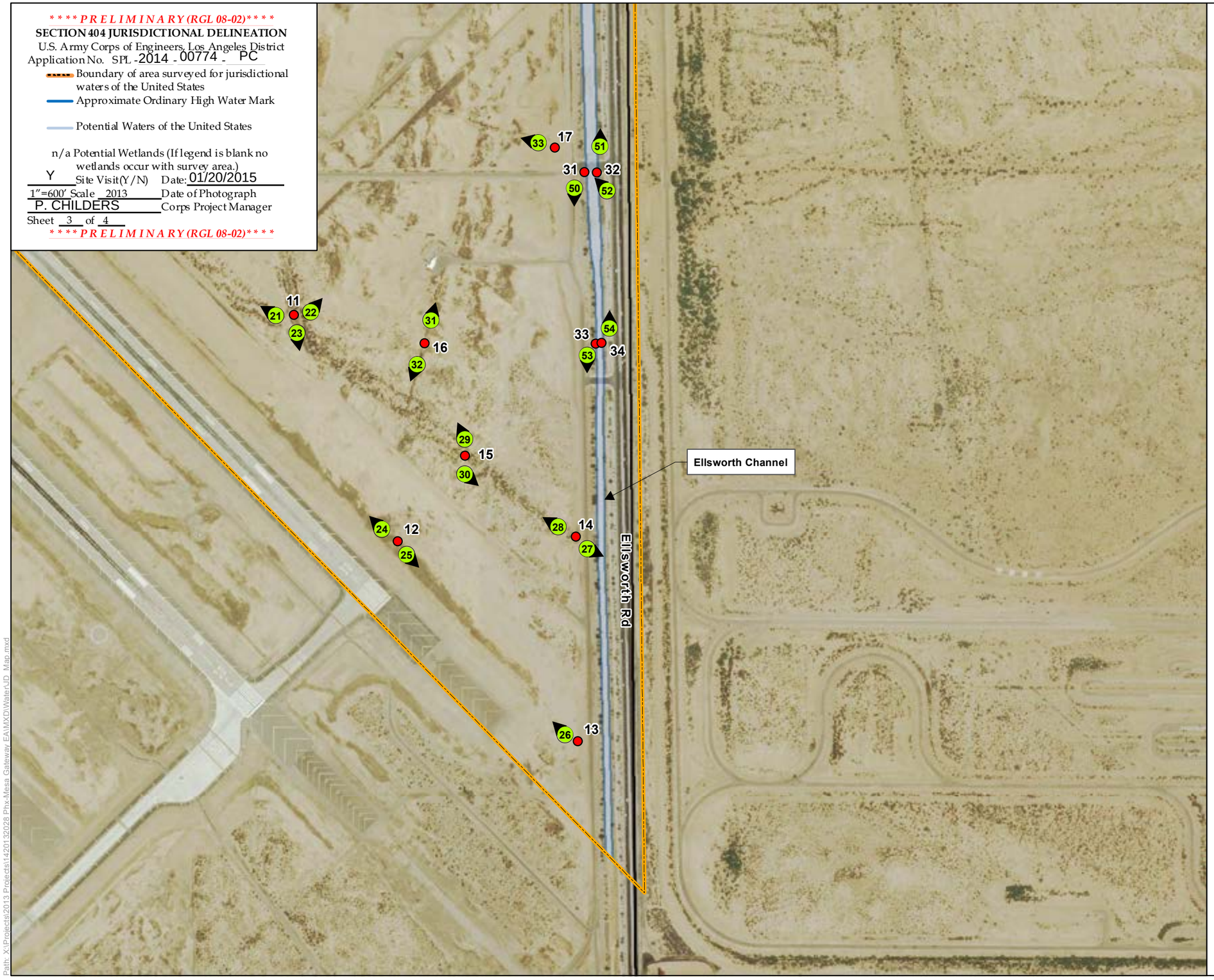
Y Site Visit(Y/N) Date: 01/20/2015

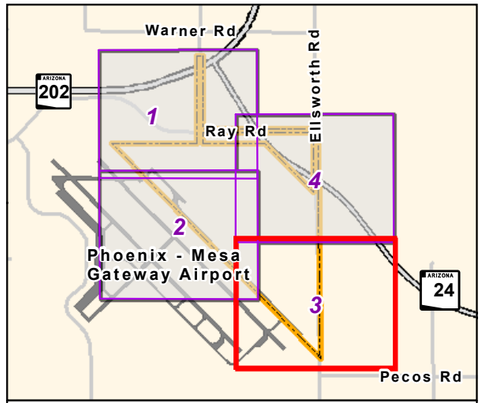
1"=600' Scale 2013 Date of Photograph

P. CHILDERS Corps Project Manager

Sheet 3 of 4

* * * * PRELIMINARY (RGL 08-02) * * * *





Area of Detail

Legend

Photo Point: Arrow indicates direction of photo

Field Data Points

Existing Airport Boundary

Non-Surveyed Area

Aerial Imagery: NAIP, 2013

Coordinate System: NAD 1983 State Plane Arizona Central (US Feet)

0 300 600 1,200 Feet

N

Preliminary Jurisdictional Determination
Phoenix-Mesa Gateway Airport
Maricopa County, Arizona

Map 3 of 4

Job No.	14-2013-2028
PM:	KR
Date:	3/23/2015
Scale:	1" = 600'

amec

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* * * * PRELIMINARY (RGL 08-02) * * * *

SECTION 404 JURISDICTIONAL DELINEATION

U.S. Army Corps of Engineers, Los Angeles District

Application No. SPL - 2014 - 00774 - PC

Boundary of area surveyed for jurisdictional waters of the United States

Approximate Ordinary High Water Mark

Potential Waters of the United States

n/a Potential Wetlands (If legend is blank no wetlands occur with survey area.)

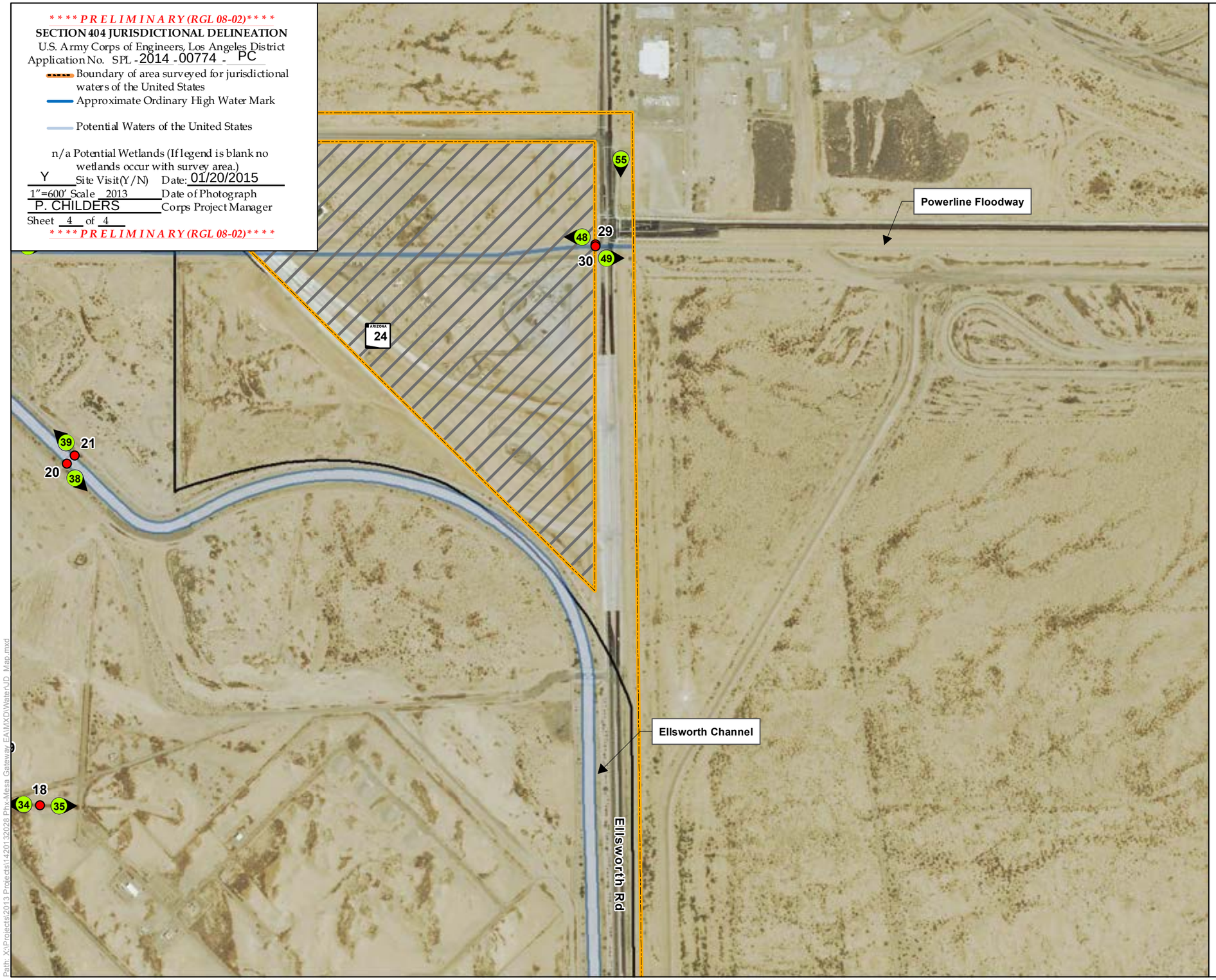
Y Site Visit(Y/N) Date: 01/20/2015

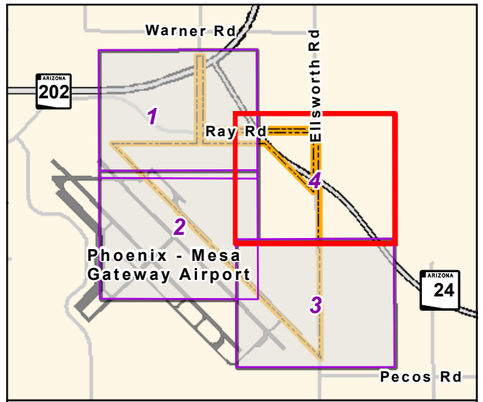
1"=600' Scale 2013 Date of Photograph

P. CHILDERS Corps Project Manager

Sheet 4 of 4

* * * * PRELIMINARY (RGL 08-02) * * * *





Area of Detail

Legend

- Photo Point: Arrow indicates direction of photo
- Field Data Points
- Existing Airport Boundary
- Non-Surveyed Area

Aerial Imagery: NAIP, 2013

Coordinate System: NAD 1983 State Plane Arizona Central (US Feet)

0 300 600 1,200 Feet

N

Preliminary Jurisdictional Determination
Phoenix-Mesa Gateway Airport
Maricopa County, Arizona

Map 4 of 4

Job No.	14-2013-2028
PM:	KR
Date:	3/23/2015
Scale:	1" = 600'

amec

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Preliminary Jurisdictional Determination Request
Phoenix-Mesa Gateway Airport Northeast Area Development Plan
Maricopa County, Arizona
USACE File No.: not issued

Prepared for:

Phoenix-Mesa Gateway Airport Authority

and

Ricondo & Associates, Inc.

Submitted by:

Amec Foster Wheeler Environment & Infrastructure, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

March 2015

Amec Foster Wheeler Internal Project No. 14-2013-2028

March 30, 2015
Amec Foster Wheeler Project No.: 14-2013-2028

Arizona Section Regulatory Branch
US Army Corps of Engineers, Los Angeles District
3636 North Central Avenue, Suite 900
Phoenix, AZ 85012

Attn: Sally Diebolt, Chief
Penny Childers, Project Manager

Re: Preliminary Jurisdictional Determination Request, Resubmittal
Phoenix-Mesa Gateway Airport Northeast Area Development Plan
Maricopa County, Arizona
USACE File No.: not issued

The Phoenix-Mesa Gateway Airport Authority (PMGAA) is proposing to relocate the passenger terminal and associated facilities on approximately 700 acres of the northeast portion of the Phoenix-Mesa Gateway Airport (Airport). An Environmental Assessment is being prepared for this development project in accordance with the National Environmental Policy Act (NEPA) and Federal Aviation Administration (FAA) guidelines.

The project site consists of approximately 700 acres located on the northeast side of the Airport in Mesa, Arizona (Attachment A, Figure 1). The main portion of the project site is bordered to the north by the Powerline Floodway (just south of Ray Road), Ellsworth Road to the east, and Runway 12L/30R to the southwest (Attachment A, Figure 2). The southwest corner of Ray Road and Ellsworth Road intersection and the State Route 24 project currently under construction are not included as part of the project site.

The project site is located in Sections 20, 21, 28, 29, and 33, Township 1S, Range 7E, Gila and Salt River Baseline and Meridian, Maricopa County, Arizona (Attachment A, Figure 3). The project site is included on the *Higley, Arizona* United States Geological Survey (USGS) 7.5-minute topographic map (USGS 2011) at latitude 108.423 °W, longitude 35.396 °N (Figure 1). The PMGAA owns the majority of the property within the project site, with the exception of an approximate 30-acre parcel currently owned by the Arizona Department of Transportation (ADOT) and the Ray Road, Ellsworth Road, and Hawes Road right-of-ways.

Included in this preliminary jurisdictional determination request are the completed preliminary jurisdictional determination form, project location and site maps, topographic map, watershed map (Attachment A, Figure 4), floodplain map (Attachment A, Figure 5), aerial photographs, and ground photographs of the project site and adjacent areas.

Summary of Site Investigation

Amec Foster Wheeler conducted field reviews of the project site on August 26, 2013 and on July 1, 2014. Prior to the July 2014 field review, aerial imagery and topographic and National

Wetlands Inventory (NWI) maps were reviewed for areas appearing as potential Waters of the US, including ephemeral drainages and existing channels. During the July field review, Amec Foster Wheeler visited those areas identified during background review. Data points, photographs, and locations were plotted utilizing a global positioning system (GPS) device. Potential Waters of the US were delineated based on the presence of an identifiable ordinary high water mark (OHWM), as indicated by physical characteristics such as a clear, natural water line visible on the bank, changes in the character of soil/substrate, destruction of terrestrial vegetation, and the presence of litter and debris. The characteristics of the surrounding area were also used to help define and describe observations of drainage patterns during the field survey. Geomorphic and vegetative indicators as described in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008) were also observed for during the field survey.

During the site investigation, it was noted that mechanical disturbances have modified the majority of the ground surface of the project area. The ground surface in areas closest to the existing runways has been modified to divert water from the runways north into the Ellsworth Channel (Attachment D, Project Area Photographs). Much of the remaining project site has been modified to accommodate a number of different activities previously conducted by the United States Air Force on the property, with no evident coordination of surface water conveyance. This has generally resulted in a relatively flat surface with slightly lower areas serving to collect surface water runoff that is absorbed into the ground.

The Powerline Floodway and Ellsworth Channel are located within the project site and receive runoff waters within and around the perimeter of the project site (Attachment A, Figure 2). The Flood Control District of Maricopa County maintains the Powerline Floodway, which forms the northern project site boundary. The Ellsworth Channel forms much of the eastern project site boundary and is owned by City of Mesa. The Ellsworth Channel serves to mitigate flooding along Ellsworth Road. Water flow within these channels is generally to the north and west towards Sossaman Road, where it discharges to the East Maricopa Floodway. This floodway continues generally southwest, collecting the waters of Queen Creek and ultimately discharging to the Gila River just east of Gila Butte, approximately 14.3 miles southwest of the project site.

Potential Jurisdictional Waters of the US

The preliminary jurisdictional delineation based on Amec Foster Wheeler's field review is summarized in the Preliminary Jurisdictional Determination Form (Attachment B) and is depicted on aerial imagery (Attachment C) that outlines the area identified as potential Waters of the US (area highlighted in blue). It is our recommendation that the portion of the Powerline Floodway (5.77 acres) and Ellsworth Channel (20.02 acres) from toe-of-slope to toe-of-slope within the project site be considered jurisdictional (Attachment B). The Powerline Floodway is identified as jurisdictional waters of the US (riverine system) in the US Fish and Wildlife Service National Wetlands Inventory database, and possesses a definable OHWM and nexus to the Gila River. Ellsworth Channel has a definable OHWM and a nexus to the Powerline Floodway. **The total area of potential Waters of the US within the project site is approximately 25.79 acres (Attachment B).**

Cultural and Natural Resources Review

Numerous cultural resources investigations have been performed for the project area and adjacent areas. An archaeological investigation of the project area was performed within the last year, which identified eight previously unrecorded archaeological sites and seven previously recorded sites. A historic building inventory of the project area, also performed within the last year, identified eighteen historic properties associated with the operation of Williams Air Force Base, most of which were constructed during the Cold War era (1948-1989). Several additional historic and archaeological investigations have been performed within the project vicinity since 1992, primarily in response to the closure of Williams Air Force Base, as well as for projects associated with the development of the Airport and construction of State Route 24. Early Section 106 Consultation for this project will begin as soon as the project scope has been finalized. The two recently completed surveys (archaeological and historic building inventory) will be submitted in compliance with the Section 106 process.

The Biological Resources Technical Memorandum (Attachment E) did not identify plant or wildlife occurrences for federal and state protected species within the project site. Impacts to federal and state protected wildlife are not currently anticipated as a result of the proposed area development activities.

Soils information for the project area was obtained from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) (Attachment F). No hydric soils have been identified by the NRCS within the project area. The majority of the soils within the project area are rated as prime farmland if irrigated (approximately 78 percent), with the remaining 22 percent classified as not prime farmland.

Attached to this letter are:

- Attachment A – Supporting Figures
- Attachment B – Preliminary Jurisdictional Delineation Form, Aquatic Resources Table, and JD Field Notes Table
- Attachment C – Aerial Imagery and Proposed Jurisdictional Limits
- Attachment D – Project Area Photographs
- Attachment E – Biological Resources Technical Memorandum
- Attachment F – Soil Resource Report

This letter serves as a request for review and issue of the preliminary jurisdictional delineation. If you have any questions or require additional information, please feel free to call us at (602) 733-6000.

Respectfully submitted,
Amec Foster Wheeler Environment & Infrastructure, Inc.

Theresa Price

Theresa Price
Botanist/Environmental Planner

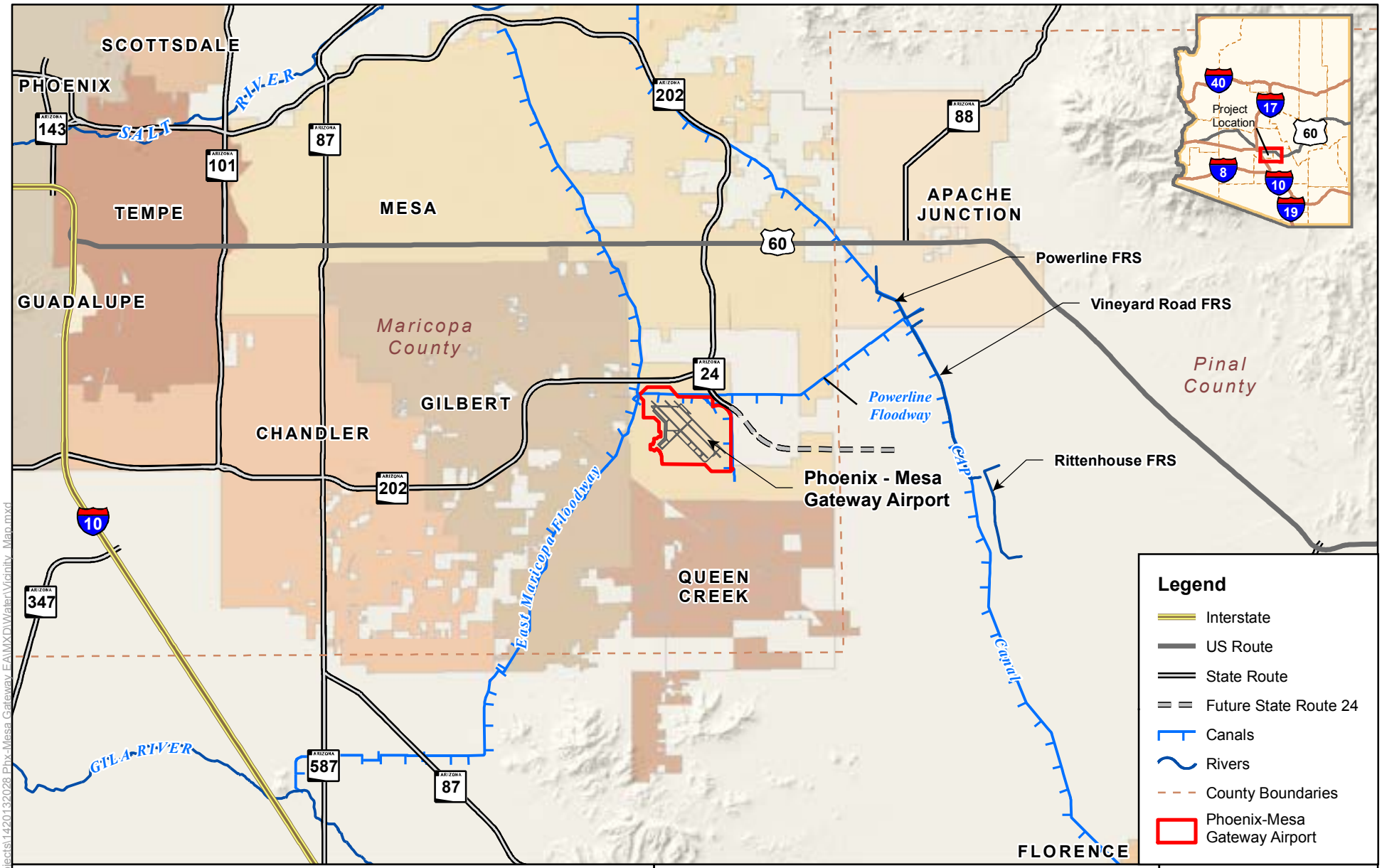
Steve Swarr
Senior Environmental Planner

c: Addressee (1)

G:\Environmental-Development\2013 Projects\14-2013-2028 Phx-Mesa Gateway EA\Reports\Prelim JD\01_PGMAA_Cover_Letter.doc

ATTACHMENT A

SUPPORTING FIGURES



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Job No.	1420132028
PM:	KR
Date:	11/24/2014
Scale:	1" = 4 miles

N

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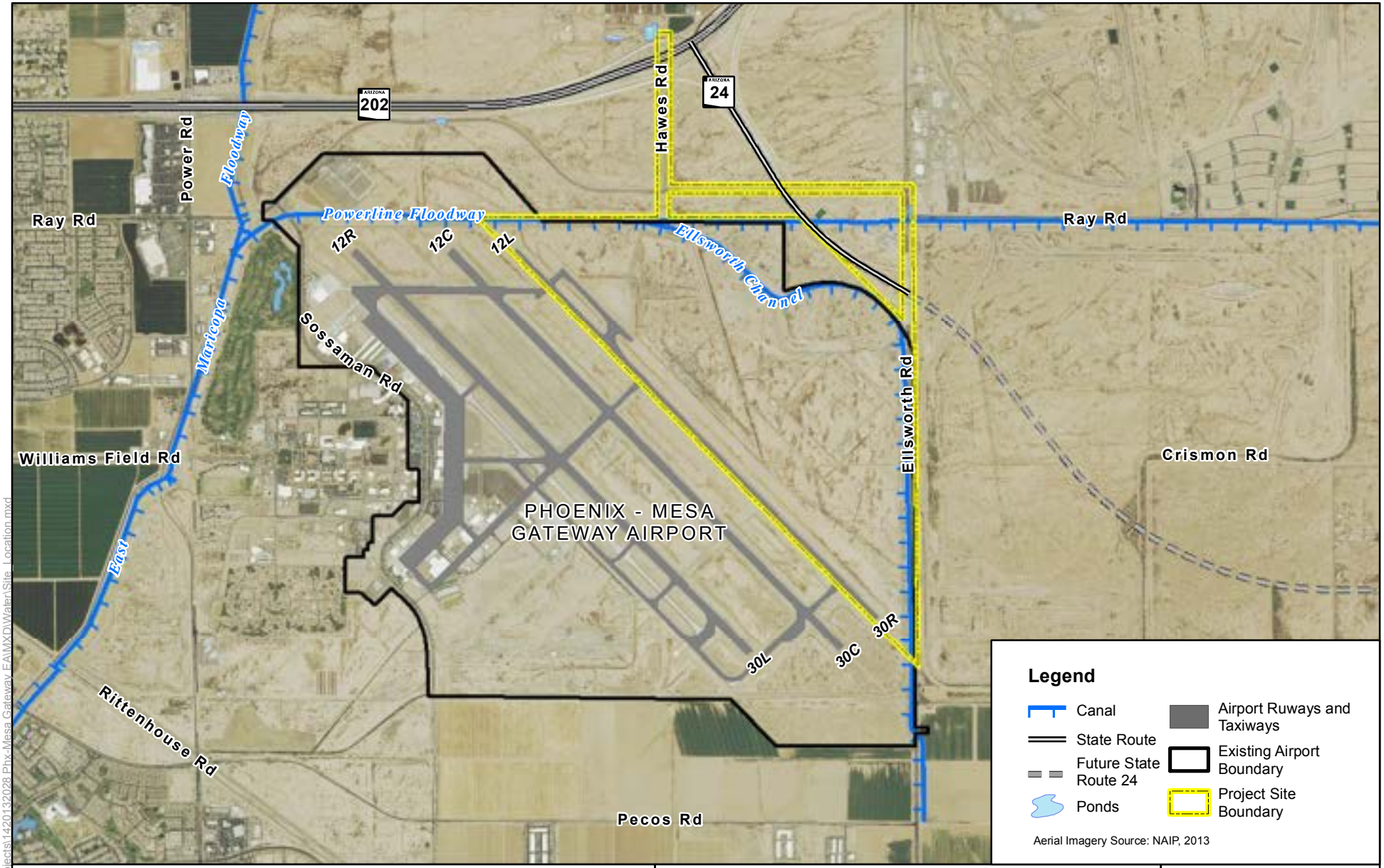
Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Vicinity Map

FIGURE 1

amec

Path: X:\Projects\2013 Projects\1420132028 Phx-Mesa Gateway EA\MXD\WaterVicinity_Map.mxd



0 1,500 3,000 6,000 Feet

Job No.	1420132028
PM:	KR
Date:	11/24/2014
Scale:	1" = 3000'

N

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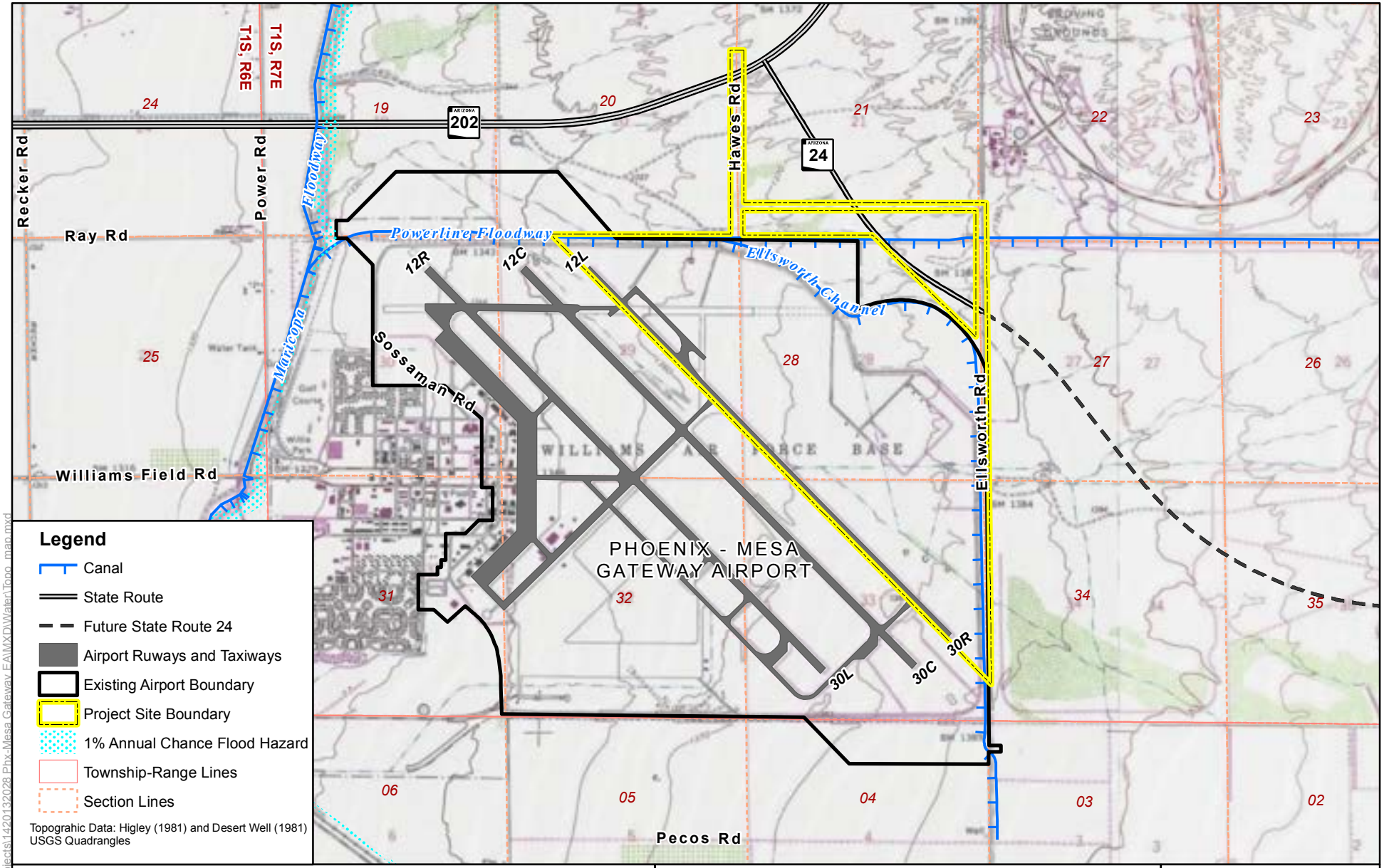
Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Project Site Location

FIGURE
2

amec

Path: X:\Projects\2013 Projects\1420132028 Phx-Mesa Gateway EA\MXD\Water\Site_Location.mxd



Job No.	1420132028
PM:	KR
Date:	11/24/2014
Scale:	1" = 3000'

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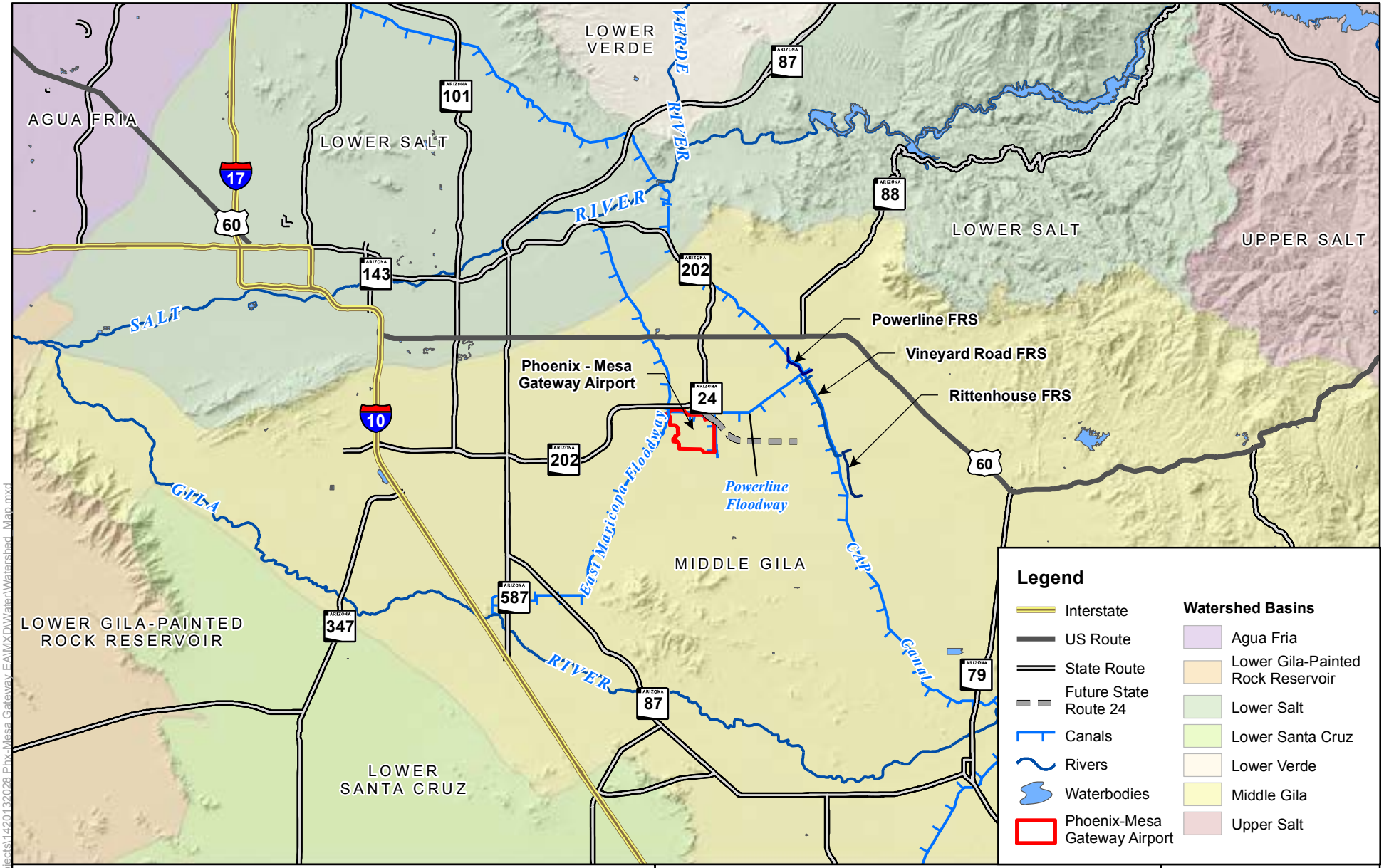
Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Topographic Map

FIGURE
3

amec

Path: X:\Projects\2013 Projects\1420132028 Phx-Mesa Gateway EA\MXD\Water\Topo_map.mxd



0 4 8 16 Miles

Job No.	1420132028
PM:	Kr
Date:	11/24/2014
Scale:	1" = 8 miles

N

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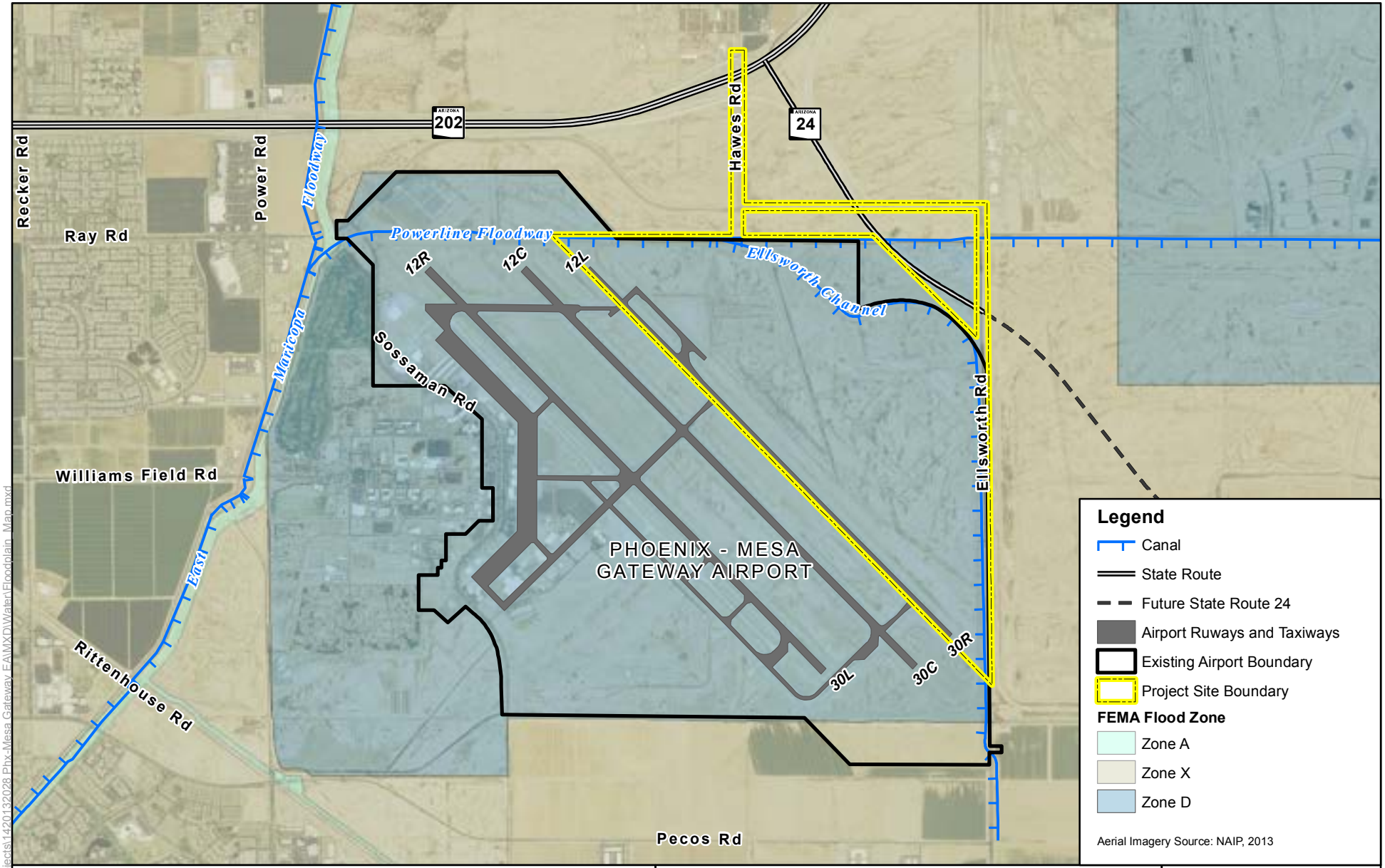
Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Watershed Map

FIGURE 4

amec

Path: X:\Projects\2013 Projects\1420132028 Phx-Mesa Gateway EA\MXD\Water\Watershed_Map.mxd



0 1,500 3,000 6,000 Feet

Job No.	1420132028
PM:	KR
Date:	11/24/2014
Scale:	1" = 3000'

N

The map shown here has been created with all due and reasonable care and is strictly for use with AMEC Project Number 1420132028. This map has not been certified by a licensed land surveyor, and any third party use of this map comes without warranties of any kind. AMEC assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Floodplain Map

FIGURE
5

amec

Path: X:\Projects\2013 Projects\1420132028 Phx-Mesa Gateway EA\MXD\Water\Floodplain_Map.mxd

ATTACHMENT B

PRELIMINARY JURISDICTIONAL DELINEATION FORM
AQUATIC RESOURCES TABLE
AND
JD FIELD NOTES TABLE

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there "*may be*" waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office: Los Angeles District | File/ORM #: Not yet assigned | PJD Date: 2015-03-30

State: AZ | City/County: Mesa/Maricopa County

Nearest Waterbody: East Maricopa Floodway

Location: TRS, LatLong or UTM:

Name/ Address of Person Requesting PJD: Mary Reker
Phoenix-Mesa Gateway Airport
5835 S. Sossaman Road
Mesa, AZ 85212

Identify (Estimate) Amount of Waters in the Review Area:

Non-Wetland Waters: 21300 linear ft | 53 width | 25.79 acres | Stream Flow: Ephemeral

Wetlands: 0 acre(s) | Cowardin Class: Riverine

Name of Any Water Bodies on the Site Identified as Section 10 Waters: Tidal: | Non-Tidal:

☐ Office (Desk) Determination
☐ Field Determination: | Date of Field Trip:

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: AMEC, 2015
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps
- ☐ Corps navigable waters' study:
- ☑ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☑ USGS 8 and 12 digit HUC maps.
- ☑ U.S. Geological Survey map(s). Cite quad name: Higley, Arizona 7.5'
- ☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Aguila-Carefree Area, AZ, Parts of Maricopa & Pi
- ☑ National wetlands inventory map(s). Cite name: USFWS NWI Wetlands Mapper website
- ☐ State/Local wetland inventory map(s):
- ☑ FEMA/FIRM maps: 04013C2760L and 04013C2770L
- ☐ 100-year Floodplain Elevation is:
- ☑ Photographs: ☑ Aerial (Name & Date): NAIP, 2013
  - ☑ Other (Name & Date): AMEC, 2015
- ☐ Previous determination(s). File no. and date of response letter:
- ☐ Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager (REQUIRED)

Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office	Los Angeles District	File/ORM #	Not yet assigned	PJD Date:	2015-03-30
State	AZ	City/County	Mesa/Maricopa County	Person Requestinq PJD	Mary Reker

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
20*			Riverine	20.02	Non-Section 10 non-wetlanc
23**			Riverine	5.77	Non-Section 10 non-wetlanc
			n/a		Non-Section 10 non-wetlanc
			n/a		Non-Section 10 non-wetlanc
			n/a		
			n/a		

Notes:

Two (2) waterways within the project area are proposed as jurisdictional: Ellsworth Channel and Powerline Floodway.

The Powerline Floodway is identified as jurisdictional waters of the US (riverine system) in the US Fish and Wildlife Service National Wetlands Inventory database, and possesses a definable ordinary high water mark (OHWM) and nexus to the Gila River. Ellsworth Channel has a definable OHWM and nexus to the Powerline Floodway.

Data points were collected throughout the project area to document site characteristics of areas appearing as potential water features. The majority of those areas did not exhibit characteristics of Waters of the US, including evidence of an OHWM or defined bed/bank. The "JD Field Notes" in Attachment B of this report contains additional information for all data points collected during this investigation.

* Multiple GPS points were collected along Ellsworth Channel (data points 20, 21, 22, 31, 32, 33, and 34). The area provided in this table is the total area of Ellsworth Channel within the project limits. Please see "Aquatic Resources" and "JD Field Notes" in Attachment B of this report for additional information/site characteristics at each GPS point along Ellsworth Channel.

** Multiple GPS points were collected along Powerline Floodway (data points 23, 24, 25, 26, 27, 28, 29, and 30). The area provided in this table is the total area of Powerline Floodway within the project limits. Please see "Aquatic Resources" and "JD Field Notes" in Attachment B of this report for additional information/site characteristics at each GPS point along Powerline Floodway

Aquatic Resources Table

Waters_Name	Cowadin_Code	HGM_Code	Measurement_Type	Amount	Units	Waters_Types	Latitude	Longitude	Local_Waterway	Data point
Ellsworth Channel	R4SB		Area	20.02	ACRE	RPW	33.31760067	-111.6464263		20
Powerline Floodway	R4SB		Area	5.77	ACRE	RPW	33.3211875	-111.6547386		23

Project Name: Phoenix-Mesa Gateway Airport
USACE Project Number: not yet assigned
AMEC Project Number: 14-2013-2028
Sheet: of 2

State: Arizona
City: Mesa
County: Maricopa

East Maricopa Floodway
Colorado
9.0 inches rain

Type of wash ditch (A), bedrock (B), arroyo (C), live stream (D), intermittent wash (IT) ephemeral wash (EF), perennial (PF), standing water (SW), other (O)
Type of sedim Sand (S), sandy/gravel (S/G), gravely/sand (G/S), gravel (G), cobble (C) sandy/clay (S/C), silt (ST), natural line (N), stain (T), mineral salts (MS), river rock (RR), bedrock (B), other (O)
Other varies (V), unknown (UNK)

				Proposed Jurisdictional								Yes/No or Unknown (UNK)									
GPS Data Point #	Photo #	Map Sheet #	Wash Name or Description	Yes	No	OHWM width (ft)	OHWM depth (in)	OHWM Present? yes / no	Type of Wash	Surface Flow: Discrete (D) and/or Confined (C), or Sheet Flow (SF)	Vegetation Difference between Wash & Upland	Change in soil particle size between Wash & Upland	Defined bed and bank	Water Stains	Shelving or cut banks	Exposed Roots	Sediments deposits and type	Vegetation Destruction	Presence of litter debris	Vegetated bottom	Additional Notes
1	1, 2	1	North Drainage Site E ditch & outfall to Powerline Floodway	X		6-8	3	yes	A	D/C	no	yes	yes	no	no	no	Si S	no	no	no	North Drainage Site E ditch and outfall.
2	5, 6	1	North Drainage Site E ditch		X	4-6	2-3	no	A	SF	no	no	no	no	no	no	Si S	no	no	no	Measurements are from toe to toe of slope of ditch.
3	7, 8	1	North Drainage Site E ditch		X	12	2	no	A	SF	no	no	no	no	no	no	Si S	yes	no	no	Measurements are from toe to toe of slope of
4	9, 10	1	North Drainage Site E ditch, eastern branch		X	20	2-4	no	A	SF	no	no	no	no	no	no	Si S	no	no	no	Cleared channel; measurements from toe to toe of slope of ditch.
5	11, 12	2	North Drainage Site E ditch, eastern branch		X	15	2-4	no	A	SF	yes	no	no	no	no	no	Si S	no	no	no	Cleared channel; measurements from toe to toe of slope of ditch.
7	13, 14	2	North Drainage Site E ditch		X	24	2	no	A	SF	yes	no	no	no	no	no	Si S	no	no	no	Grassy channel; measurements from toe to toe of slope of ditch.
8	15, 16	2	Upland		X	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
9	17, 18	2	Ellsworth Channel Outfall 4 ditch		X	6	3	no	A	SF	yes	no	no	no	no	no	Si S	no	no	no	No defined bed/bank; measurements from toe to toe of slope of ditch.
10	19, 20	2	Upland		X	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	May have historically been a ditch but is now cutoff by road and no channel visible.
11	21, 22, 23	3	Upland - shrub line		X	n/a	n/a	n/a	O/A	SF	yes	no	no	no	no	no	no	no	no	no	Evident in aerial imagery, no drainage feature observed.
12	24, 25	3	North Drainage Site E ditch		X	0	0	no	O	SF	no	no	no	no	no	no	Si S	no	no	no	Grassy swale/essentially upland, no defined
13	26	3	North Drainage Site E ditch - End; Upland		X	0	0	no	n/a	SF	no	no	no	no	no	no	Si S	no	no	no	Upland; Beginning of North Drainage Site E ditch.
14	27, 28	3	Unnamed swale		X	0	0	no	n/a	SF	yes	no	no	no	no	no	Si S	no	no	no	No defined channel/bed. Denser vegetation than upland.
15	29, 30	3	Unnamed swale		X	0	0	no	EF	SF	yes	no	no	no	no	no	Si S	no	no	no	No defined channel/bed. Denser vegetation than upland.
16	31, 32	3	Unnamed swale		X	0	0	no	EF	SF	no	no	no	no	no	no	Si S	no	no	no	No defined channel/bed. Denser vegetation than upland.
17	33	3	Upland		X	0	0	no	n/a	SF	no	no	no	no	no	no	Si S	no	no	no	No evidence of drainage flow.
18	34, 35	2	Unnamed swale		X	0	0	no	n/a	SF	no	no	no	no	no	no	SI S	no	no	no	No defined bed/bank or OHWM line.
19	36, 37	2	Fenceline/Ellsworth Channel Outfall 4 swale		X	6	1	no	A	SF	yes	no	no	no	no	no	Si S	no	no	no	Evidence of occasional ponding, no defined bed/bank.
20	38	2	Ellsworth Channel S. bank	X		70	2-4	yes	O/EF	C	yes	no	yes	no	no	no	Si S	no	no	no	Ellsworth Channel, earthen bottom.
21	39	2	Ellsworth Channel N. bank	X		70	2-4	yes	O/EF	C	yes	no	yes	no	no	no	Si S	no	no	no	Ellsworth Channel, earthen bottom.
22	40, 41	1	Ellsworth Channel Outfall 4		X	20	1-2	no	O/EF	SF	yes	no	no	no	no	no	Si S	no	no	no	No defined bed/bank or OHWM; conveys along
23	42	1	Powerline Floodway S. bank	X		55	2-3	yes	O/EF	C	no	no	yes	no	no	no	Si S	no	no	no	Powerline Floodway, earthen bottom.

Project Name: Phoenix-Mesa Gateway Airport
USACE Project Number: not yet assigned
AMEC Project Number: 14-2013-2028
Sheet: of 2

Type of wash ditch (A), bedrock (B), arroyo (C), live stream (D), intermittent wash (IT) ephemeral wash (EF), perennial (PF), standing water (SW), other (O)
Type of sedim Sand (S), sandy/gravel (S/G), gravely/sand (G/S), gravel (G), cobble (C) sandy/clay (S/C), silt (ST), natural line (N), stain (T), mineral salts (MS), river rock (RR), bedrock (B), other (O)
Other varies (V), unknown (UNK)

State: Arizona
City: Mesa
County: Maricopa

East Maricopa Floodway
Colorado
9.0 inches rain

GPS Data Point #	Photo #	Map Sheet #	Wash Name or Description	Proposed Jurisdictional: Yes	Proposed Jurisdictional: No	OHWM width (ft)	OHWM depth (in)	OHWM Present? yes / no	Type of Wash	Surface Flow: Discrete (D) and/or Confined (C), or Sheet Flow (SF)	Vegetation Difference between Wash & Upland	Yes/No or Unknown (UNK): Change in soil particle size between Wash & Upland	Defined bed and bank	Water Stains	Shelving or cut banks	Exposed Roots	Sediments deposits and type	Vegetation Destruction	Presence of litter debris	Vegetated bottom	Additional Notes
24	43	1	Powerline Floodway N. bank	X		55	2-3	yes	O/EF	C	no	no	yes	no	no	no	Si S	no	no	no	Earthen bottom; drop structure here.
25	45	1	Powerline Floodway S. bank	X		10	2	yes	O	C	no	no	yes	no	no	no	O	no	no	no	Concrete bottom.
26	44	1	Powerline Floodway N. bank	X		9	2	yes	O	C	no	no	yes	no	no	no	O	no	no	no	Concrete bottom.
27	3, 4	1	North Drainage Site E Outfall to Powerline Floodway	X		55	2	yes	O/EF	C	no	no	yes	no	no	no	Si S	no	no	no	Outfall Site E to Powerline Floodway.
28	46, 47	1	Powerline Floodway N. bank	X		9	2-3	yes	O/EF	C	no	no	yes	no	no	no	O	no	no	no	Concrete bottom.
29	48	4	Powerline Floodway N. bank	X		9	2-3	yes	O/EF	C	no	no	yes	no	no	no	O	no	yes	no	Concrete bottom.
30	49	4	Powerline Floodway S. bank	X		9	2-3	yes	O/EF	C	no	no	yes	no	no	no	O	no	yes	no	Concrete bottom.
31	50	3	Ellsworth Channel W. bank	X		75	1-2	yes	O/EF	C	no	no	yes	no	no	no	Si S	no	yes	no	Earthen bottom, landscaped/riprap banks.
32	51, 52	3	Ellsworth Channel E. bank	X		75	1-2	yes	O/EF	C	no	no	yes	no	no	no	Si S	no	yes	no	Earthen bottom, landscaped/riprap banks.
33	53	3	Ellsworth Channel W. bank	X		45	1-2	yes	O/EF	C	no	no	yes	no	no	no	Si S	yes	yes	no	Earthen bottom, landscaped/riprap banks.
34	54	3	Ellsworth Channel E. bank	X		45	1-2	yes	O/EF	C	no	no	yes	no	no	no	Si S	yes	yes	no	Earthen bottom; soil cracks and flattened

Project Name: Phoenix-Mesa Gateway Airport
USACE Project Number: not yet assigned
AMEC Project Number: 14-2013-2028
Sheet: 2 of 2

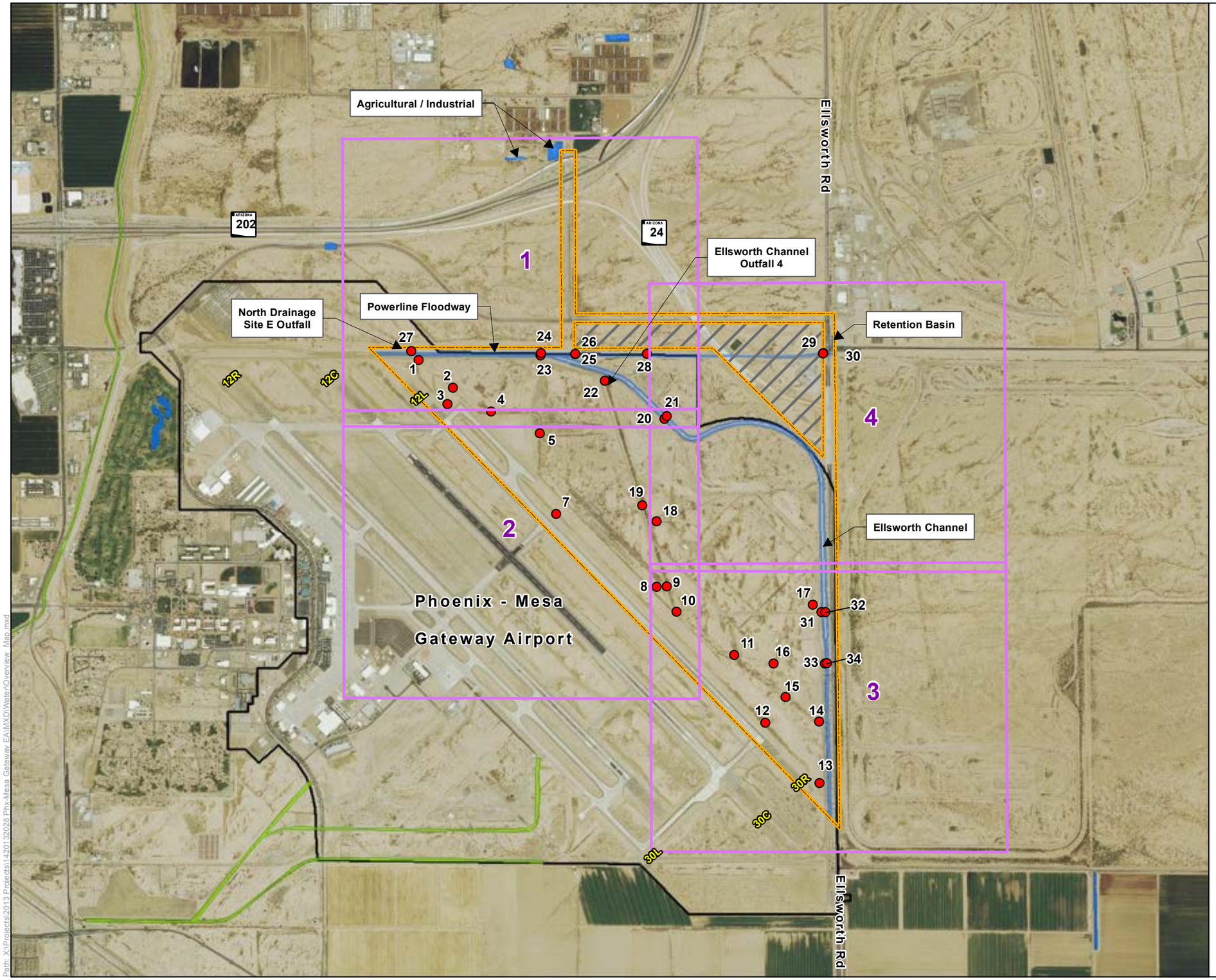
State: Arizona
City: Mesa
County: Maricopa

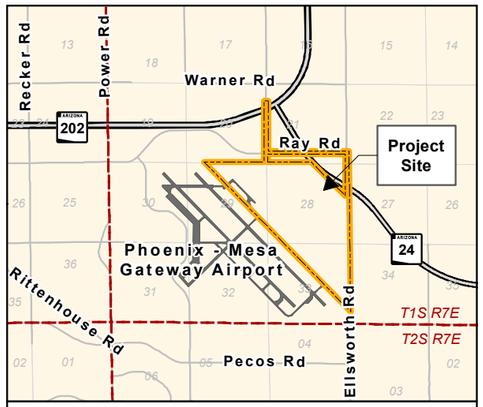
Nearest Water Body: East Maricopa Floodway
Nearest TNW: Colorado
Avg Rainfall/Snowfall: 9.0 inches rain

GPS Data Point #	Latitude	Longitude
1	33.32095422	-111.6629461
2	33.31937473	-111.6606447
3	33.31846855	-111.6610135
4	33.31803336	-111.65808
5	33.31681005	-111.654826
7	33.31224395	-111.6537277
8	33.30812116	-111.6469897
9	33.3081483	-111.6463144
10	33.30670674	-111.6456502
11	33.30426487	-111.6417774
12	33.30042382	-111.6396931
13	33.29702406	-111.6360662
14	33.30049049	-111.6360971
15	33.30187148	-111.6383292
16	33.30377877	-111.6391424
17	33.30709045	-111.636494
18	33.31182011	-111.6469791
19	33.31272918	-111.647943
20	33.31760067	-111.6464263
21	33.31774452	-111.6462672
22	33.31975772	-111.6504187
23	33.3211875	-111.6547386
24	33.3213278	-111.6547346
25	33.32126128	-111.6524144
26	33.32128405	-111.6524111
27	33.32145745	-111.6634346
28	33.321278	-111.6475928
29	33.32129522	-111.6357457
30	33.3212604	-111.6357476
31	33.30667383	-111.6359001
32	33.30666882	-111.6356532
33	33.30376648	-111.6356843
34	33.30377561	-111.6355663

ATTACHMENT C

AERIAL IMAGERY AND PROPOSED JURISDICTIONAL LIMITS





Area of Detail

Legend

- Field Data Points
- NWI Freshwater Pond
- NWI Riverine
- Potential Waters of the US
- Existing Airport Boundary
- Non-Surveyed Area
- Project Site Boundary
- Map Index

Aerial Imagery Source: NAIP, 2013
Coordinate System: NAD 83 State Plane Arizona Central (US Feet)

0 1,000 2,000 4,000 Feet

N

Preliminary Jurisdictional Determination
Phoenix-Mesa Gateway Airport
Maricopa County, Arizona

Overview Map

Job No.	14-2013-2028
PM:	KR
Date:	3/23/2015
Scale:	1" = 2000'

amec

The map shown here has been created with all due and reasonable care and is strictly for use with AMEC Project Number 14-2013-2028. This map has not been certified by a licensed land surveyor, and any third party use of this map comes without warranties of any kind. AMEC assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

Path: X:\Projects\2013 Projects\142013\2028 Phx-Mesa Gateway EA\MXD\Water\Overview_Map.mxd

* * * * PRELIMINARY (RGL 08-02) * * * *

SECTION 404 JURISDICTIONAL DELINEATION

U.S. Army Corps of Engineers, Los Angeles District

Application No. SPL - _____ - _____ - _____

Boundary of area surveyed for jurisdictional waters of the United States

Approximate Ordinary High Water Mark

Potential Waters of the United States

n/a Potential Wetlands (If legend is blank no wetlands occur with survey area.)

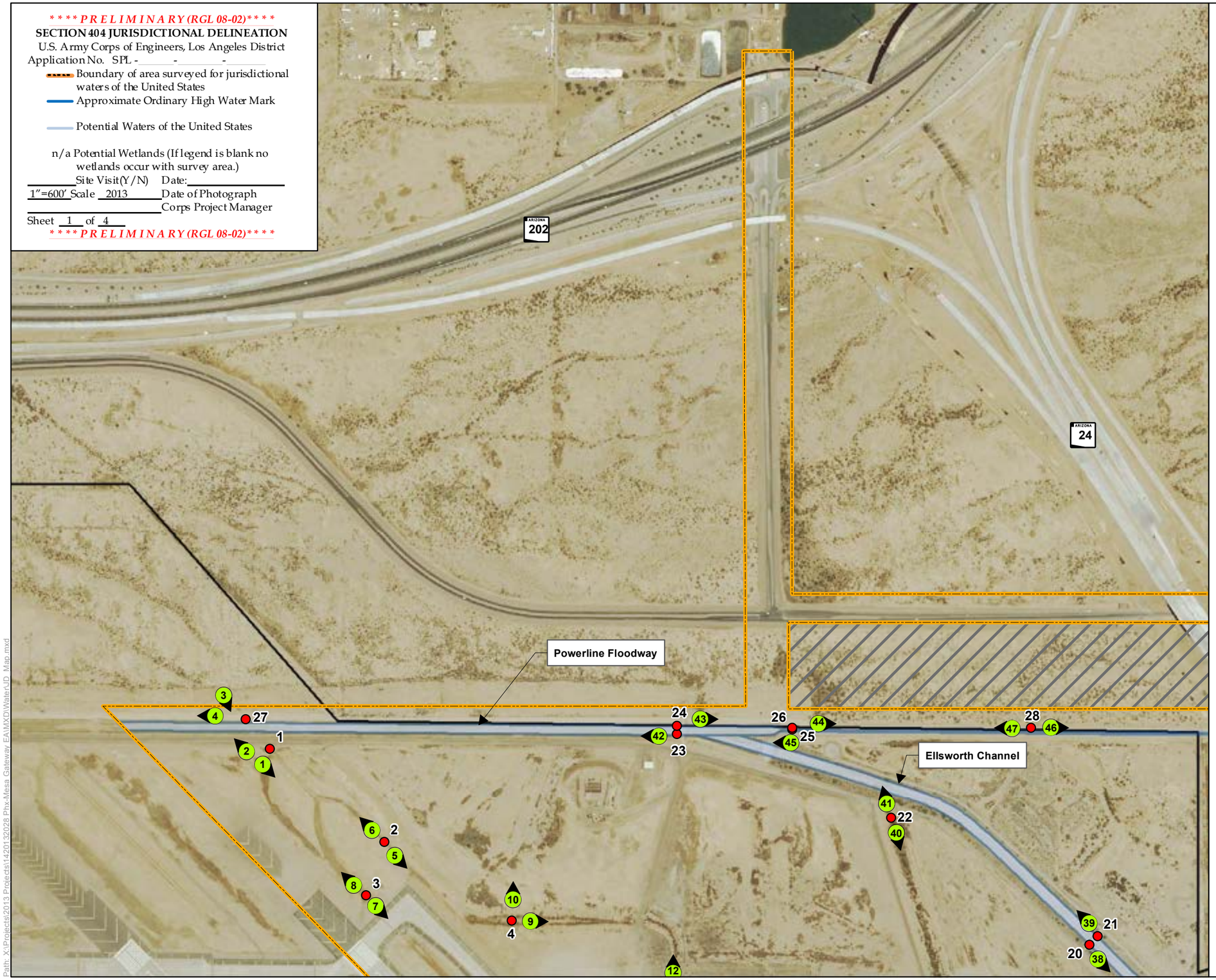
_____ Site Visit(Y/N) Date: _____

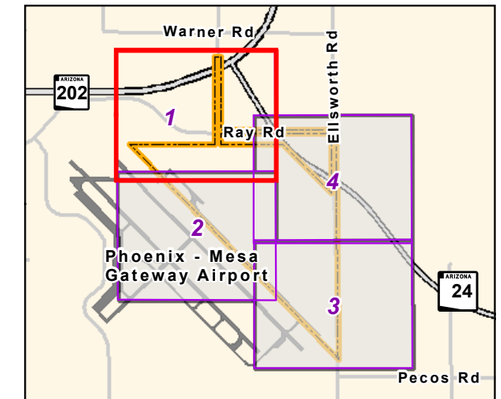
1"=600' Scale 2013 Date of Photograph

_____ Corps Project Manager

Sheet 1 of 4

* * * * PRELIMINARY (RGL 08-02) * * * *





Area of Detail

Legend

Photo Point: Arrow indicates direction of photo

Field Data Points

Existing Airport Boundary

Non-Surveyed Area

Aerial Imagery: NAIP, 2013

Coordinate System: NAD 1983 State Plane Arizona Central (US Feet)

0 300 600 1,200 Feet

N

Preliminary Jurisdictional Determination
Phoenix-Mesa Gateway Airport
Maricopa County, Arizona

Map 1 of 4

Job No.	14-2013-2028
PM:	KR
Date:	3/23/2015
Scale:	1" = 600'

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* * * * PRELIMINARY (RGL 08-02) * * * *

SECTION 404 JURISDICTIONAL DELINEATION

U.S. Army Corps of Engineers, Los Angeles District

Application No. SPL - _____ - _____ - _____

Boundary of area surveyed for jurisdictional waters of the United States

Approximate Ordinary High Water Mark

Potential Waters of the United States

n/a Potential Wetlands (If legend is blank no wetlands occur with survey area.)

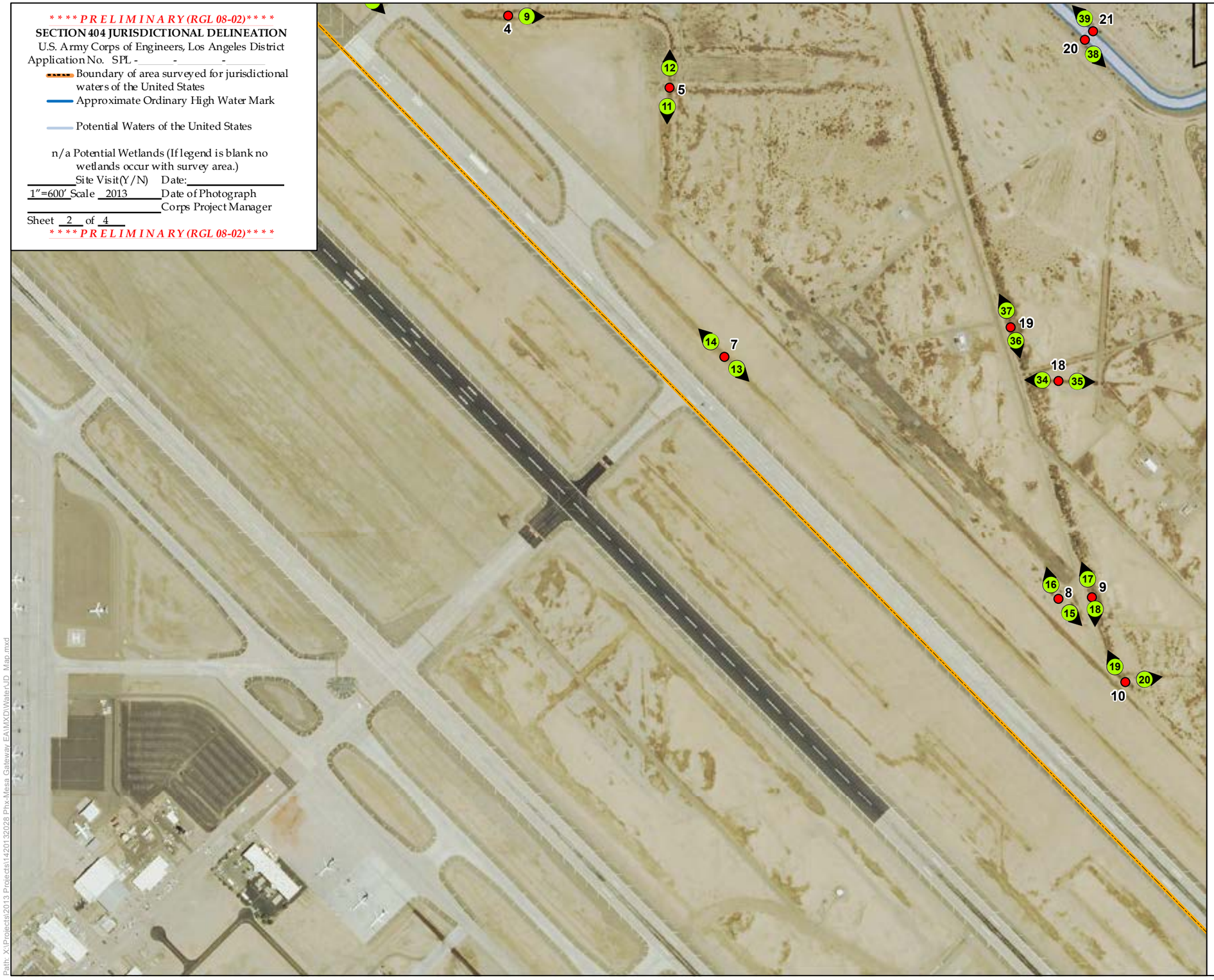
_____ Site Visit(Y/N) Date: _____

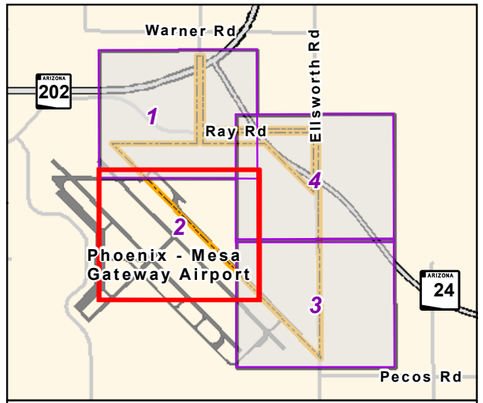
1"=600' Scale 2013 Date of Photograph

_____ Corps Project Manager

Sheet 2 of 4

* * * * PRELIMINARY (RGL 08-02) * * * *





Area of Detail

Legend

- Photo Point: Arrow indicates direction of photo
- Field Data Points
- Existing Airport Boundary
- Non-Surveyed Area

Aerial Imagery: NAIP, 2013

Coordinate System: NAD 1983 State Plane Arizona Central (US Feet)

0 300 600 1,200 Feet

N

Preliminary Jurisdictional Determination
Phoenix-Mesa Gateway Airport
Maricopa County, Arizona

Map 2 of 4

Job No.	14-2013-2028
PM:	KR
Date:	3/23/2015
Scale:	1" = 600'

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* * * * PRELIMINARY (RGL 08-02) * * * *

SECTION 404 JURISDICTIONAL DELINEATION

U.S. Army Corps of Engineers, Los Angeles District

Application No. SPL - _____ - _____ - _____

Boundary of area surveyed for jurisdictional waters of the United States

Approximate Ordinary High Water Mark

Potential Waters of the United States

n/a Potential Wetlands (If legend is blank no wetlands occur with survey area.)

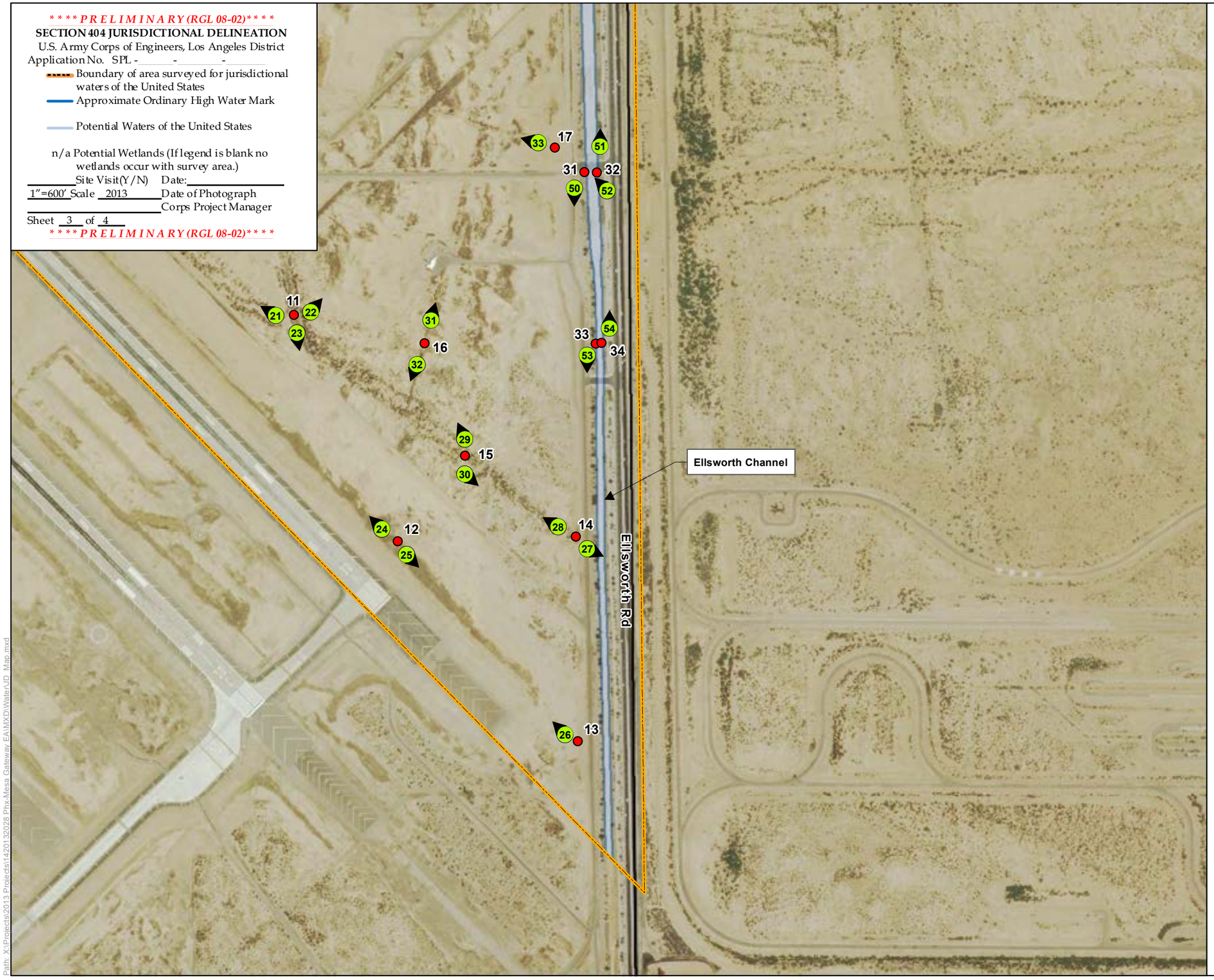
_____ Site Visit(Y/N) Date: _____

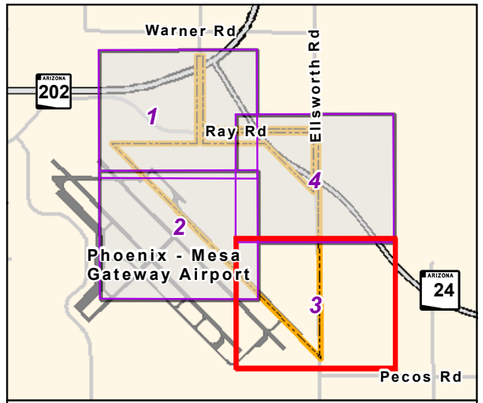
1"=600' Scale 2013 Date of Photograph

_____ Corps Project Manager

Sheet 3 of 4

* * * * PRELIMINARY (RGL 08-02) * * * *





Area of Detail

Legend

Photo Point: Arrow indicates direction of photo

Field Data Points

Existing Airport Boundary

Non-Surveyed Area

Aerial Imagery: NAIP, 2013

Coordinate System: NAD 1983 State Plane Arizona Central (US Feet)

0 300 600 1,200 Feet

N

Preliminary Jurisdictional Determination
Phoenix-Mesa Gateway Airport
Maricopa County, Arizona

Map 3 of 4

Job No.	14-2013-2028
PM:	KR
Date:	3/23/2015
Scale:	1" = 600'

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SECTION 404 JURISDICTIONAL DELINEATION

U.S. Army Corps of Engineers, Los Angeles District

Application No. SPL - _____ - _____ - _____

Boundary of area surveyed for jurisdictional waters of the United States

Approximate Ordinary High Water Mark

Potential Waters of the United States

n/a Potential Wetlands (If legend is blank no wetlands occur with survey area.)

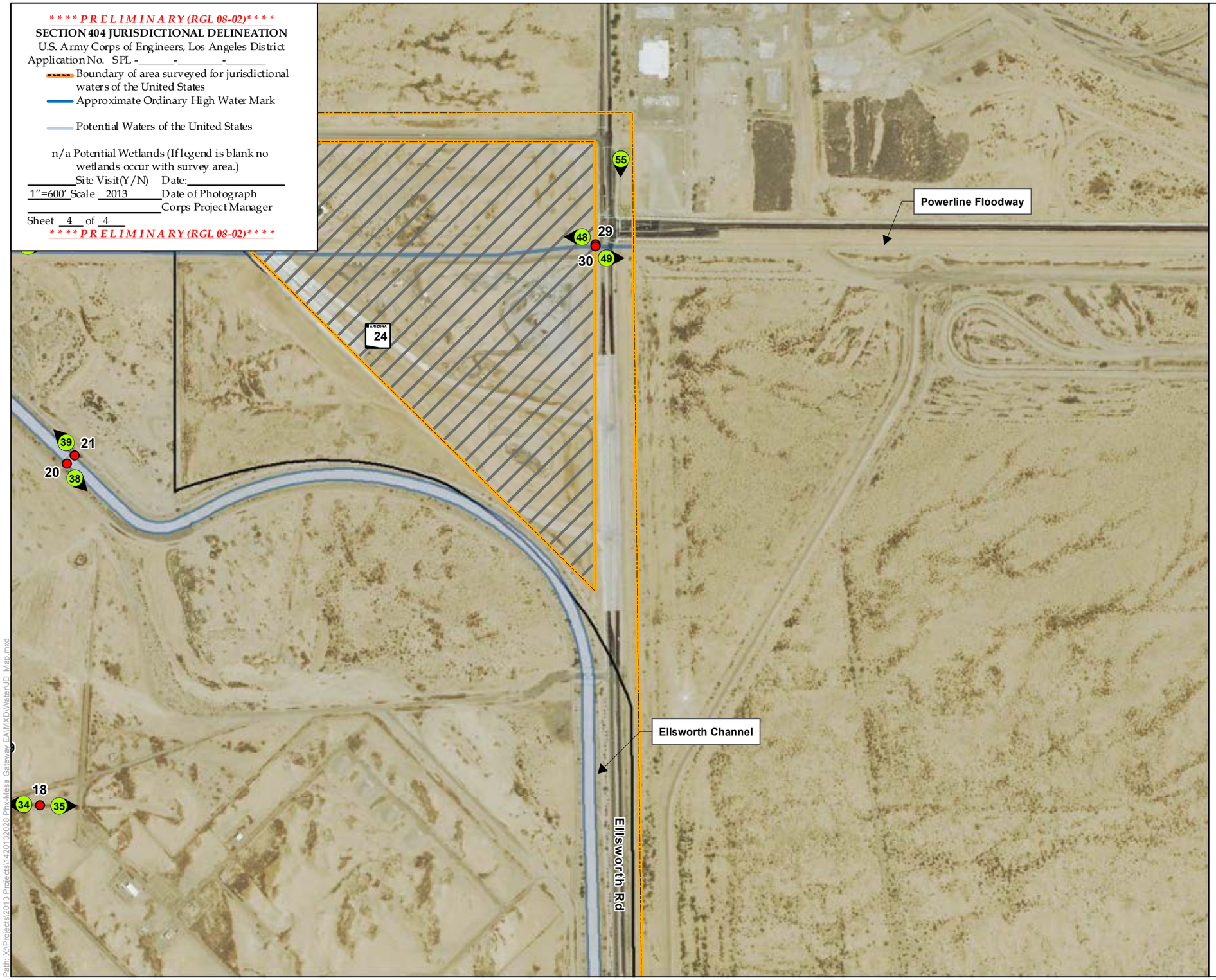
_____ Site Visit(Y/N) Date: _____

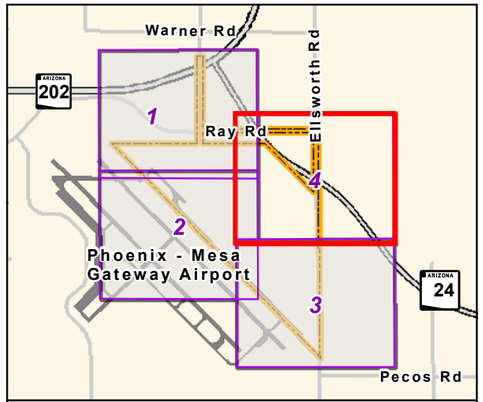
1"=600' Scale 2013 Date of Photograph

_____ Corps Project Manager

Sheet 4 of 4

* * * * PRELIMINARY (RGL 08-02) * * * *





Area of Detail

Legend

- Photo Point: Arrow indicates direction of photo
- Field Data Points
- Existing Airport Boundary
- Non-Surveyed Area

Aerial Imagery: NAIP, 2013

Coordinate System: NAD 1983 State Plane Arizona Central (US Feet)

0 300 600 1,200 Feet

N

Preliminary Jurisdictional Determination
Phoenix-Mesa Gateway Airport
Maricopa County, Arizona

Map 4 of 4

Job No.	14-2013-2028
PM:	KR
Date:	3/23/2015
Scale:	1" = 600'

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ATTACHMENT D

PROJECT AREA PHOTOGRAPHS

Photo 1. Data point 1 - View of northwest end of Runway 12L/R30 area showing North Drainage Site E ditch, which directs surface runoff to Powerline Floodway via Site E Outfall; photo taken facing southeast (upgradient).

Photo 2. Data point 1 - View of Site E Outfall from North Drainage Site E ditch into Powerline Floodway. Photo taken facing northwest (downgradient).

Photo 3. Data point 27 - View of Site E Outfall from North Drainage Site E ditch into Powerline Floodway; Site E Outfall conveys drainage from North Drainage Site E ditch shown in Photo 3. Photo taken facing southeast (upgradient).

Photo 4. Data point 27 - View of Powerline Floodway downstream of North Drainage Site E ditch. Photo taken facing west (downgradient).

Photo 5. Data point 2 - View of northeast channel of North Drainage Site E ditch, showing representative flat to moderately graded constructed ditch east of Runway 12L/30R; photo taken facing southeast (upgradient).

Photo 6. Data point 2 - View of northeast channel of North Drainage Site E ditch, showing representative flat to moderately graded constructed ditch east of Runway 12L/30R; photo taken facing northwest (downgradient).

Photo 7. Data point 3 - View of southwest channel of North Drainage Site E ditch, east of Runway 12L/30R; photo taken facing southeast (upgradient).

Photo 8. Data point 3 - View of southwest channel of North Drainage Site E ditch, east of Runway 12L/30R; photo taken facing northwest (downgradient).

Photo 9. Data point 4 - View of former runway or road, note that water appears to settle in this location; photo taken facing east.

Photo 10. Data point 4 - View across from former runway or road, note disturbed upland and lack of discrete surface flow pattern; photo taken facing north.

Photo 11. Data point 5 – View of upland vegetation within a depression/former channel; photo taken facing south.

Photo 12. Data point 5 – View of upland vegetation within a depression/former channel; photo taken facing north.

Photo 13. Data point 7 – View of North Drainage Site E ditch; photo taken facing southeast (upgradient).

Photo 14. Data point 7 – View of North Drainage Site E ditch, showing representative flat to moderately graded constructed ditch east of Runway 12L/30R; photo taken facing northwest (downgradient).

Photo 15. Data point 8 – View of upland area east of Runway 12L/30R; photo taken facing southeast.

Photo 16. Data point 8 – View of upland area east of Runway 12L/30R; photo taken facing north-northwest.

Photo 17. Data point 9 – View along band of vegetation adjacent to former base road/pathway; photo taken facing north-northwest.

Photo 18. Data point 9 – View towards Runway 12L/30R from vegetated area adjacent to former base road/pathway, looking across existing roadway east of the runway; photo taken facing south.

Photo 19. Data point 10 – View along band of vegetation east and upland from the North Drainage Site E ditch; photo taken facing north-northwest

Photo 20. Data point 10 – View along band of vegetation east and upland from the North Drainage Site E ditch; photo taken facing east.

Photo 21. Data point 11 – View of vegetated upland area east of North Drainage Site E ditch; photo taken facing northwest.

Photo 22. Data point 11 – View of vegetated upland area east of North Drainage Site E ditch; photo taken facing northeast.

Photo 23. Data point 11 – View of vegetated upland; photo taken facing south-southeast, towards Runway 12L/30R.

Photo 24. Data point 12 – View of vegetated area within North Drainage Site E ditch, showing little to no characteristics of drainage or OHWM, and relatively flat surface topography; photo taken facing northwest.

Photo 25. Data point 12 – View of vegetated area within North Drainage Site E ditch, showing relatively flat surface topography; Ellsworth Road is in the background; photo taken facing southwest.

Photo 26. Data point 13 – View of the starting point (uppermost gradient end) of North Drainage Site E ditch as observed from a point just east of the eastern fenceline (west of Ellsworth Road); photo taken facing northwest.

Photo 27. Data point 14 – View of upland area with Ellsworth Road visible in the background), as observed from a point just east of the eastern fenceline; photo taken facing southeast.

Photo 28. Data point 14 – View of upland vegetated area near the eastern fenceline; photo taken facing northwest.

Photo 29. Data point 15 – View of upland vegetation band at data point 15, looking towards data point 16. Vegetation line evident in aerial imagery but no distinct drainage or OHWM observed. Photo taken facing north-northwest.

Photo 30. Data point 15 – View of upland area, no discrete evidence of drainage or OHWM observed; photo taken facing southeast.

Photo 31. Data point 16 – View of upland vegetation band; photo taken facing north-northeast.

Photo 32. Data point 16 – View of upland vegetation band; photo taken facing south-southwest.

Photo 33. Data point 17 – View of upland area as observed from near an access road near the eastern fenceline; photo taken facing west-northwest.

Photo 34. Data point 18 – View of vegetated area/swale adjacent to old base road; photo taken facing west (downgradient).

Photo 35. Data point 18 – View of vegetated area/swale adjacent to old base road; photo taken facing east (upgradient).

Photo 36. Data point 19 – View of fence line/Ellsworth Channel Outfall 4 drainage swale upgradient of the Ellsworth Channel Outfall 4 (shown in Photo 41); photo taken facing south-southeast (upgradient).

Photo 37. Data point 19 – View of fence line/Ellsworth Channel Outfall 4 drainage swale upgradient of the Ellsworth Channel Outfall 4 (shown in Photo 41); photo taken facing north-northeast (downgradient).

Photo 38. Data point 20 – View of Ellsworth Channel upstream of the junction with Powerline Floodway; photo taken facing southeast (upgradient).

Photo 39. Data point 21 – View of Ellsworth Channel upstream of the junction with Powerline Floodway; photo taken facing northwest (downgradient).

Photo 40. Data point 22 – View of fence line/Ellsworth Channel Outfall 4 drainage swale upgradient of the Ellsworth Channel Outfall 4; photo taken facing south-southeast (upgradient).

Photo 41. Data point 22 – View towards Ellsworth Channel Outfall 4 that conveys drainage from along airport fence line to Ellsworth Channel; photo taken facing north-northwest (downgradient).

Photo 42. Data point 23 – View of Powerline Floodway downgradient of the junction with Ellsworth Channel. Photo taken facing west (downgradient).

Photo 43. Data point 24 – View of Powerline Floodway, immediately downgradient of its junction with Ellsworth Channel (visible in background). Powerline Floodway is visible on the left side, background; Ellsworth Channel is to the right of the floodway. Photo taken facing east (upgradient).

Photo 44. Data point 25 – View of Powerline Floodway immediately upgradient of the transition from concrete channel to earthen bottom, upgradient of the junction with Ellsworth Channel. Photo taken facing east (upgradient).

Photo 45. Data point 26 – View of Powerline Floodway as it transitions from concrete channel to earthen bottom, upgradient of the junction with Ellsworth Channel. Photo taken facing west (downgradient).

Photo 46. Data point 28 – View of Powerline Floodway upgradient of the junction with Ellsworth Channel, with the new State Route 24 visible in the background. Photo taken facing east (upgradient).

Photo 47. Data point 28 – View of Powerline Floodway upgradient of the junction with Ellsworth Channel. Photo taken facing west (downgradient).

Photo 48. Data point 29 – View of Powerline Floodway as observed from Ellsworth Road (State Route 24 visible in the background). Photo taken facing west (downgradient).

Photo 49. Data point 30 – View of Powerline Floodway as observed from across Ellsworth Road; photo taken facing east (upgradient).

Photo 50. Data point 31 – View of vegetated Ellsworth Channel, parallel to Ellsworth Road; photo taken facing south (upgradient).

Photo 51. Data point 32 – View of Ellsworth Channel where it runs parallel to Ellsworth Road, prior to where it curves northwest into the project site; photo taken facing north (downgradient).

Photo 52. Data point 32 – View of access road culverts within Ellsworth Channel where it runs parallel to Ellsworth Road; photo taken facing northwest.

Photo 53. Data point 33 – View of vegetated Ellsworth Channel, parallel to Ellsworth Road; photo taken facing south (upgradient).

Photo 54. Data point 34 – View of vegetated Ellsworth Channel, parallel to Ellsworth Road; photo taken facing north (downgradient).

Photo 55. View of retention basin north of the intersection of Ellsworth Road and Ray Road, at location indicated as a wetland on NWI maps (see Attachment C, Overview Map). Photo taken facing south along Ellsworth Road.

ATTACHMENT E

BIOLOGICAL RESOURCES EVALUATION

The Biological Resources Evaluation (Attachment E) is included in its entirety as Appendix C, Biological Resources, of this Environmental Assessment

ATTACHMENT F

SOIL RESOURCE REPORT

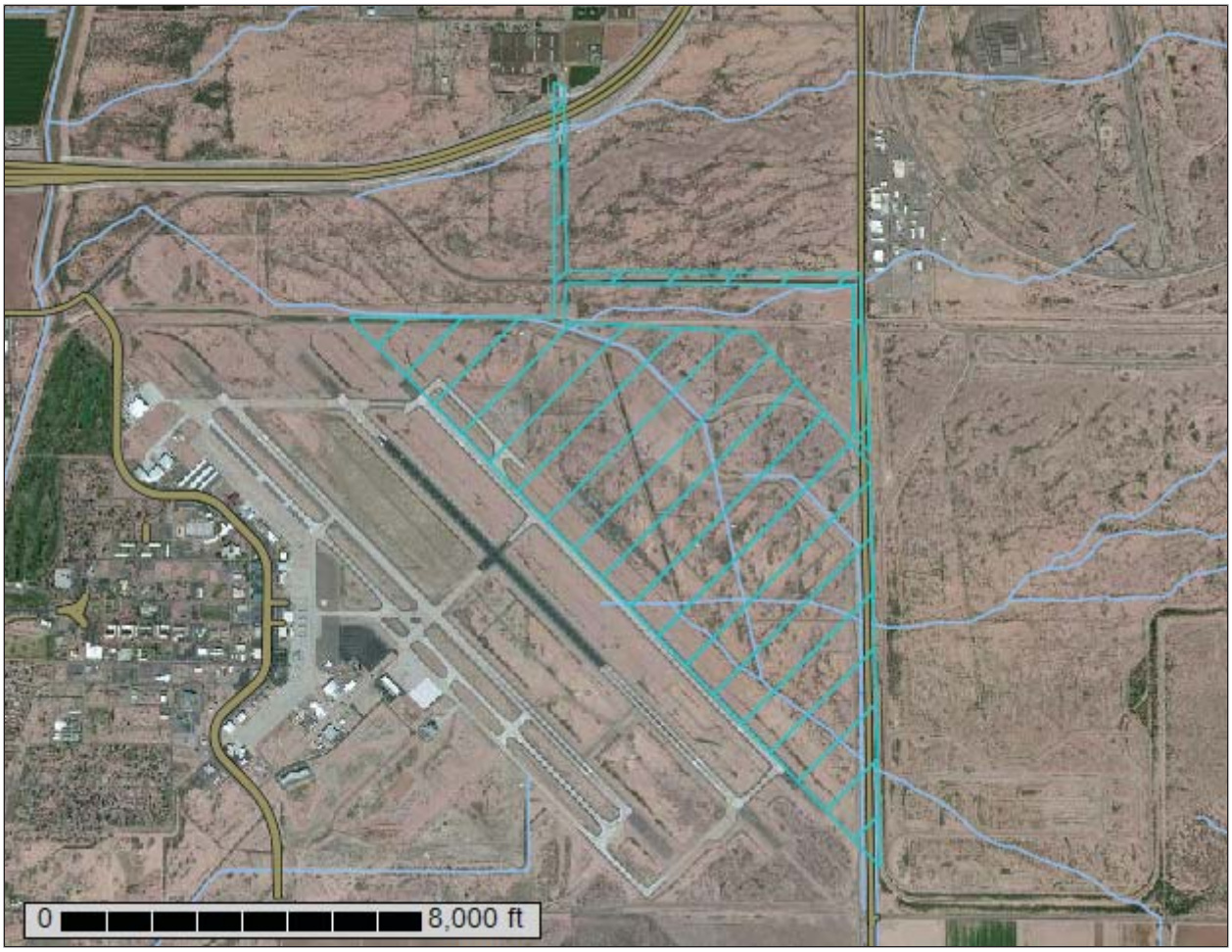
United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties

PMGAA



September 25, 2013

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

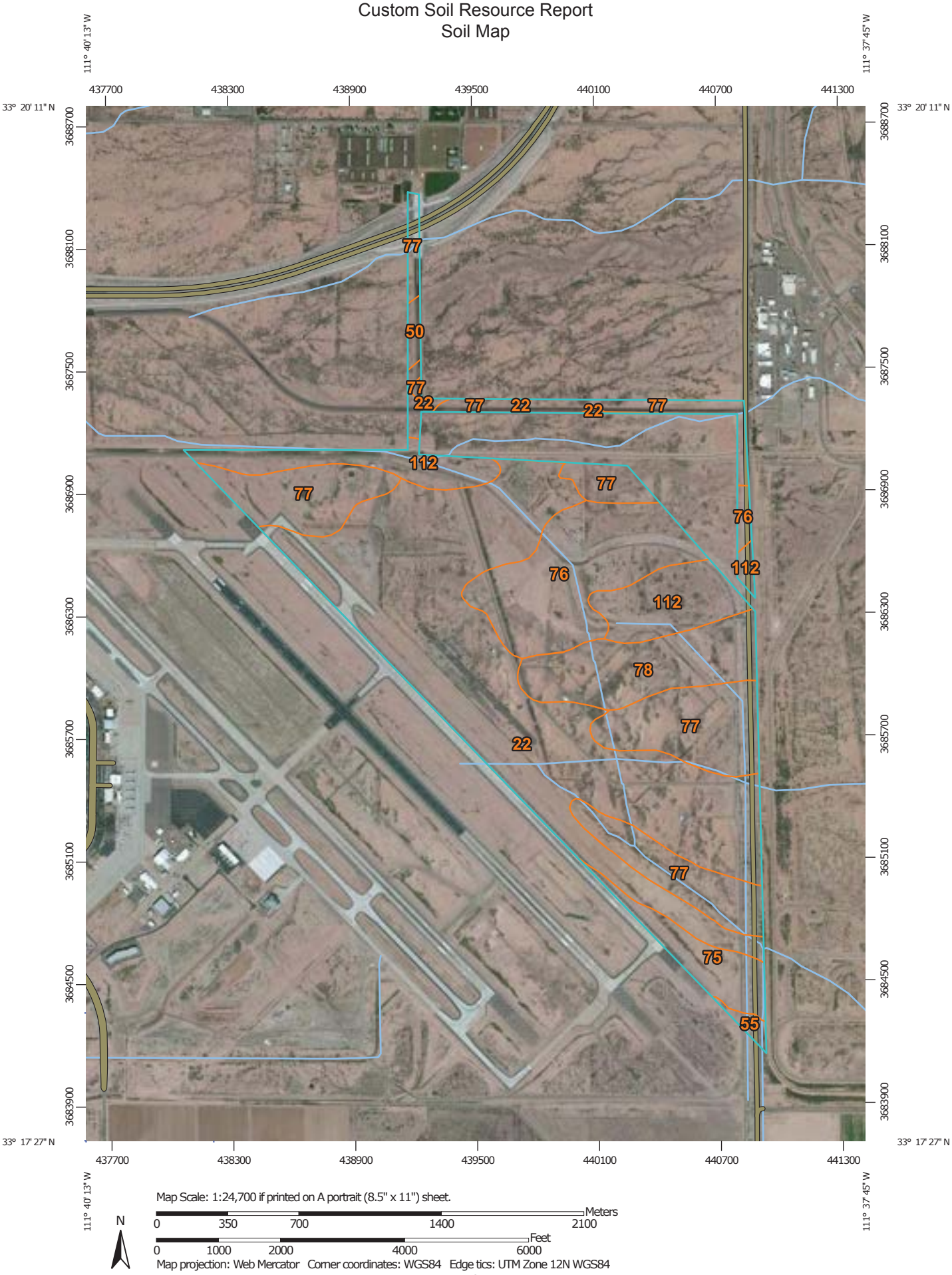
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:24,700 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 350 700 1400 2100

Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties
Survey Area Data: Version 7, Aug 27, 2008

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 1, 2010—Nov 27, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties (AZ645)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
22	Contine clay loam	436.4	43.5%
50	Estrella loams	5.0	0.5%
55	Gilman loams	4.8	0.5%
75	Mohall loam	36.6	3.6%
76	Mohall loam, calcareous solum	124.0	12.4%
77	Mohall clay loam	218.5	21.8%
78	Mohall clay loam, calcareous solum	82.4	8.2%
112	Tremant gravelly sandy loams	95.4	9.5%
Totals for Area of Interest		**1,002.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially

where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties

22—Contine clay loam

Map Unit Setting

Elevation: 1,200 to 2,200 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 250 to 300 days

Map Unit Composition

Contine and similar soils: 100 percent

Description of Contine

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 8.4 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 3e
Land capability (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: Clay Loam Upland 7-10" p.z. (R040XB205AZ)

Typical profile

0 to 2 inches: Clay loam
2 to 30 inches: Clay loam
30 to 60 inches: Sandy loam

50—Estrella loams

Map Unit Setting

Elevation: 1,100 to 2,200 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 250 to 300 days

Map Unit Composition

Estrella and similar soils: 45 percent
Estrella and similar soils: 35 percent

Description of Estrella

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 10.1 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 1
Land capability (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: Limy Fan 7-10" p.z. (R040XB207AZ)

Typical profile

0 to 21 inches: Loam
21 to 55 inches: Clay loam
55 to 60 inches: Gravelly sandy loam

Description of Estrella

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Summit

Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 10.1 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 1
Land capability (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: Loamy Upland 7-10" p.z. (R040XB213AZ)

Typical profile

0 to 21 inches: Loam
21 to 55 inches: Clay loam
55 to 60 inches: Gravelly sandy loam

55—Gilman loams

Map Unit Setting

Elevation: 1,100 to 2,200 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 250 to 300 days

Map Unit Composition

Gilman and similar soils: 40 percent
Gilman and similar soils: 40 percent

Description of Gilman

Setting

Landform: Flood plains, alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.7 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 2e
Land capability (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Limy Fan 7-10" p.z. (R040XB207AZ)

Typical profile

0 to 5 inches: Loam
5 to 43 inches: Very fine sandy loam
43 to 60 inches: Fine sandy loam

Description of Gilman

Setting

Landform: Flood plains, alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.7 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 2e
Land capability (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Loamy Upland 7-10" p.z. (R040XB213AZ)

Typical profile

0 to 5 inches: Loam

5 to 43 inches: Very fine sandy loam
43 to 60 inches: Fine sandy loam

75—Mohall loam

Map Unit Setting

Elevation: 1,200 to 2,200 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 250 to 300 days

Map Unit Composition

Mohall and similar soils: 100 percent

Description of Mohall

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water capacity: High (about 10.8 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 1
Land capability (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: Loamy Upland 7-10" p.z. (R040XB213AZ)

Typical profile

0 to 7 inches: Loam
7 to 60 inches: Clay loam

76—Mohall loam, calcareous solum

Map Unit Setting

Elevation: 1,200 to 2,200 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 250 to 300 days

Map Unit Composition

Mohall and similar soils: 100 percent

Description of Mohall

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water capacity: High (about 10.7 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 1
Land capability (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: Limy Fan 7-10" p.z. (R040XB207AZ)

Typical profile

0 to 7 inches: Loam
7 to 60 inches: Clay loam

77—Mohall clay loam

Map Unit Setting

Elevation: 1,200 to 2,200 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 250 to 300 days

Map Unit Composition

Mohall and similar soils: 100 percent

Description of Mohall

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water capacity: Moderate (about 8.3 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 1
Land capability (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: Clay Loam Upland 7-10" p.z. (R040XB205AZ)

Typical profile

0 to 2 inches: Clay loam
2 to 42 inches: Clay loam
42 to 60 inches: Extremely cobbly loamy sand

78—Mohall clay loam, calcareous solum

Map Unit Setting

Elevation: 1,200 to 2,200 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 250 to 300 days

Map Unit Composition

Mohall and similar soils: 100 percent

Description of Mohall

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water capacity: High (about 10.8 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 1
Land capability (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: Limy Fan 7-10" p.z. (R040XB207AZ)

Typical profile

0 to 6 inches: Clay loam
6 to 60 inches: Clay loam

112—Tremant gravelly sandy loams

Map Unit Setting

Elevation: 1,200 to 2,200 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 250 to 300 days

Map Unit Composition

Tremant and similar soils: 65 percent
Tremant and similar soils: 15 percent

Description of Tremant

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Available water capacity: Moderate (about 7.3 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 2e
Land capability (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: Sandy Loam Upland 7-10" p.z. (R040XB218AZ)
Other vegetative classification: Sandy Loam Upland 7-10" p.z. (040XB218AZ_2)

Typical profile

0 to 9 inches: Gravelly sandy loam
9 to 41 inches: Gravelly sandy clay loam
41 to 60 inches: Gravelly sand

Description of Tremant

Setting

Landform: Fan terraces

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Available water capacity: Moderate (about 7.3 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 2e
Land capability (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: Limy Fan 7-10" p.z. (R040XB207AZ)

Typical profile

0 to 9 inches: Gravelly sandy loam
9 to 41 inches: Gravelly sandy clay loam
41 to 60 inches: Gravelly sand

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

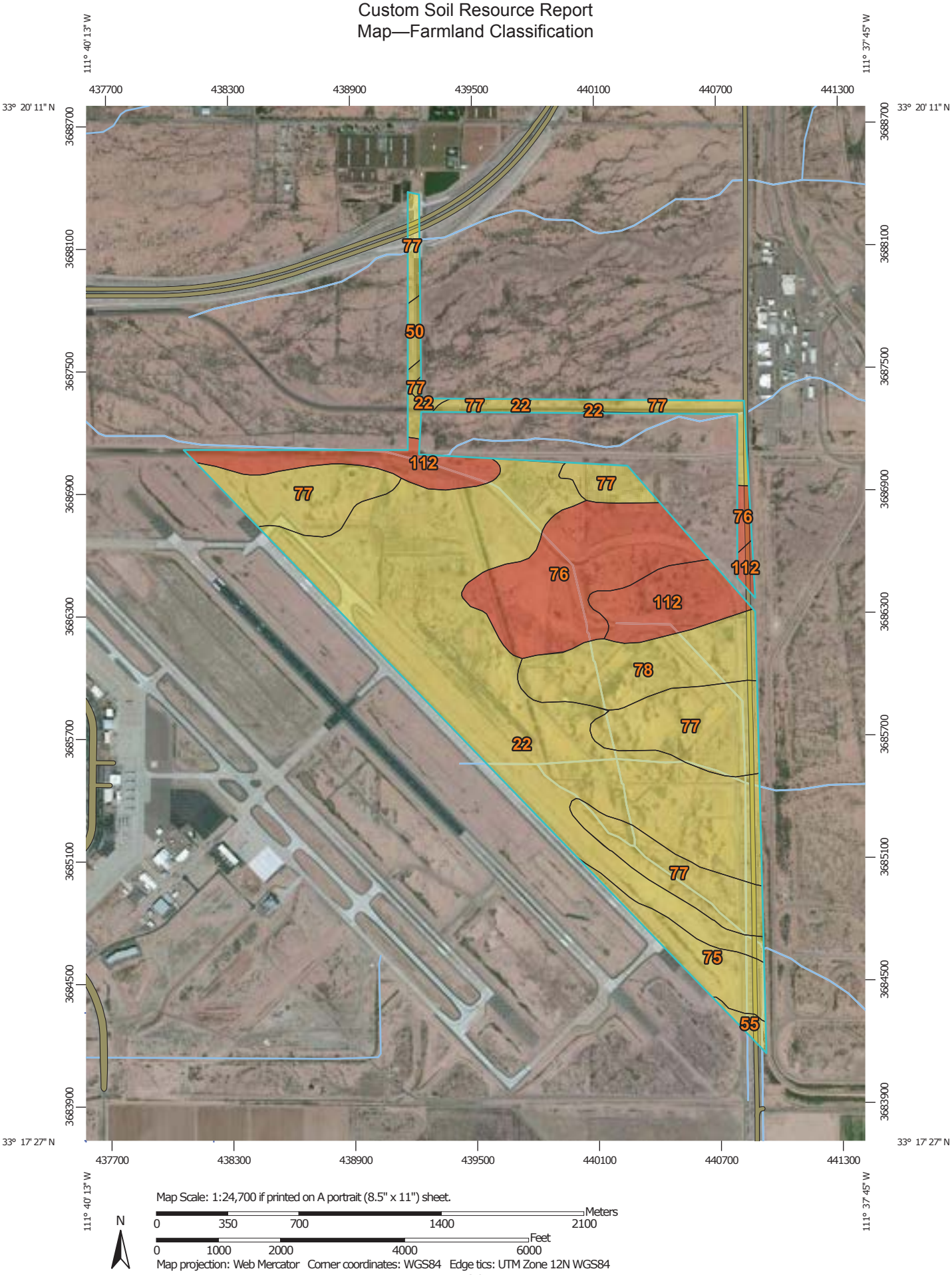
Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Farmland Classification

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Map—Farmland Classification



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Water Features

MAP INFORMATION

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties
Survey Area Data: Version 7, Aug 27, 2008

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 1, 2010—Nov 27, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Farmland Classification

Farmland Classification— Summary by Map Unit — Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties (AZ645)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
22	Contine clay loam	Prime farmland if irrigated	436.4	43.5%
50	Estrella loams	Prime farmland if irrigated	5.0	0.5%
55	Gilman loams	Prime farmland if irrigated	4.8	0.5%
75	Mohall loam	Prime farmland if irrigated	36.6	3.6%
76	Mohall loam, calcareous solum	Not prime farmland	124.0	12.4%
77	Mohall clay loam	Prime farmland if irrigated	218.5	21.8%
78	Mohall clay loam, calcareous solum	Prime farmland if irrigated	82.4	8.2%
112	Tremant gravelly sandy loams	Not prime farmland	95.4	9.5%
Totals for Area of Interest			**1,002.9**	**100.0%**

Rating Options—Farmland Classification

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Hydric Rating by Map Unit

This rating indicates the proportion of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is designated as "hydric," "predominantly hydric," "partially hydric," "predominantly nonhydric," or "nonhydric" depending on the rating of its respective components and the percentage of each component within the map unit.

"Hydric" means that all components listed for a given map unit are rated as being hydric. "Predominantly hydric" means components that comprise 66 to 99 percent of the map unit are rated as hydric. "Partially hydric" means components that comprise 33 to 66 percent of the map unit are rated as hydric. "Predominantly nonhydric" means components that comprise up to 33 percent of the map unit are rated as hydric. "Nonhydric" means that none of the components are rated as hydric. The assumption here is that all components of the map unit are rated as hydric or nonhydric in the underlying database. A "Not rated or not available" map unit rating is displayed when none of the components within a map unit have been rated.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

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Custom Soil Resource Report
Map—Hydric Rating by Map Unit

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Hydric (100%)

Predominantly hydric (66 to 99%)

Partially hydric (33 to 65%)

Predominantly nonhydric (1 to 32%)

Nonhydric (0%)

Not rated or not available

Soil Rating Lines

Hydric (100%)

Predominantly hydric (66 to 99%)

Partially hydric (33 to 65%)

Predominantly nonhydric (1 to 32%)

Nonhydric (0%)

Not rated or not available

Soil Rating Points

Hydric (100%)

Predominantly hydric (66 to 99%)

Partially hydric (33 to 65%)

Predominantly nonhydric (1 to 32%)

Nonhydric (0%)

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties
Survey Area Data: Version 7, Aug 27, 2008

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 1, 2010—Nov 27, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydric Rating by Map Unit

Hydric Rating by Map Unit— Summary by Map Unit — Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties (AZ645)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
22	Contine clay loam	0	436.4	43.5%
50	Estrella loams	0	5.0	0.5%
55	Gilman loams	0	4.8	0.5%
75	Mohall loam	0	36.6	3.6%
76	Mohall loam, calcareous solum	0	124.0	12.4%
77	Mohall clay loam	0	218.5	21.8%
78	Mohall clay loam, calcareous solum	0	82.4	8.2%
112	Tremant gravelly sandy loams	0	95.4	9.5%
Totals for Area of Interest			**1,002.9**	**100.0%**

Rating Options—Hydric Rating by Map Unit

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

References

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Appendix G.3

qÉÅÜåáÅ~äÑ Éã çê~åÇì ã

t ~íÉê oÉëçì êÅÉë ^ÑÑÉÅíÉÇ=båî áêçåã Éåí ^áêéçêí=pì êî Éãäã~åÅÉ=o~Ç~ê=E^ poF=páÉ kçêíÜÉ~ëí=^êÉ~=a Éî Éäçéã Éåí=mä~å mÜçÉåáÑJ Éë~=d~íÉï ~ó=^áêéçêí

mêÉé~êÉÇ=ççêW

mÜçÉåáÑJ Éë~=d~íÉï ~ó=^áêéçêí=^ì íÜçêáó
~åÇ
oáÅçåÇç=C=^ëëçÅá~íÉëI=fåÅK

pì Äã áíÉÇ=ÄóW

^j b` båî áêçåã Éåí=~åÇ=fåÑê~ëíêì ÅíìêÉI=fåÅK
QSMMHb~ëí=t ~ëÜáåÖíçå=píêÉÉíI=pì áÉ=SMM
mÜçÉåáÑI=^êáòçå~ URMPQ

kçî Éã ÄÉê OMNQ

q^_ib=k=c=lkqbkqp

m~ÖÉ

NKM molgb`q=abp`ofmqflk KKKK

NKM mol gb` q=a bp` ofmqfl k

qÜÉ=mÜçÉåãÑJ Éë~=d~íÉï ~ó=^ãéçêã=^ì íÜçêáó=Emj d^^F=äë éêçéçëåÖ=íç=êÉäçÅ~íÉ=íÜÉ=é~ëëÉåÖÉê íÉêã åã~ä~åÇ=~ëëçÅá~íÉÇ=Ñ~ÅäãáÉë ~í íÜÉ=mÜçÉåãÑJ Éë~=d~íÉï ~ó=^ãéçêã=E^ãéçêãFK^ë=é~êã=çÑ=íÜÉ éêçéçëÉÇ=~ÅíçåI íÜÉ=ÉñäíåÖ=^ãéçêã=pì êÉãä~åÅÉ=o~Ç~ê=E^poF=íÜ~í=äë ÅìêÉåíäó äçÅ~íÉÇ=çå ~ãéçêã=éêçéÉêóó=ï äãäåÉÉÇ=íç=ÄÉ=êÉäçÅ~íÉÇ=íç=~å=çÑÑëáÉ=äçÅ~íáçåKqÜÉ=éêçéçëÉÇ=^poêÉäçÅ~íáçå ëáÉ=äë=äçÅ~íÉÇ=ï áÜåå=íÜÉ=oáíÉåÜçì ëÉ qê~åãåÖ^êÉ~=åã åçêÜÉêå=måã~ä` çì åíóI=^êôçå~I=ëçì íÜÉ~ëï çÑ=íÜÉ=^ãéçêãK^å=båî ãçåã Éåí~ä=^ëëÉëëã Éåí Eb^F äë=ÄÉåÖ=éêÉé~êÉÇ=Ñçê=íÜäë=ÇÉî Éäçéã Éåí éêçäÉÅí=åã=~ÅÅçêÇ~åÅÉ=ï áÜ=íÜÉ=k~íçå~äb åî ãçåã Éåí~ämçäÅó=^Åí=Ek bm^F=~åÇ=c^^=Ó áÇÉäåÉëK

^j b` =båî ãçåã Éåí=C=fåÑê~ëíêã Åíì êÉI=fåÅK=E^j b` F=ï ~ë=í~ëäÉÇ=íç=ÇçÅì ã Éåí=íÜÉ ï ~íÉêêÉëçì êÅÉë çÑ=íÜÉ éêçéçëÉÇ=^po=éêçäÉÅí ëáÉI=åÅì ÇåÖ ëì êÑ=ÅÉ=ï ~íÉêëI=Å~å~äëI=ï Éíä~åÇëI=~åÇ=Ñçç Çéä~åëK qÜäë=êÉéçêã=éêÉëëÉåíë=~=ëì ã ã ~êó=çÑ=ÑåÇåÖë=Ñçã =Ä~ÅâÖêçì åÇ=êÉëÉ~êÅÜ=~åÇ=ÑÉäÇ=ëáÉ êÉÅçåå~äëë~åÉ Ñçê=íÜÉ=éêçéçëÉÇ=^po=äçÅ~íáçåK

OKM mol gb` q i l ` ^qfl k

qÜÉ ^po éêçäÉÅí=ëáÉ=Åçåëäëíë=çÑ=éééçñãã ~íÉäó S~ÅêÉë äçÅ~íÉÇ ~ééçñãã ~íÉäó TKUå~ì íáÅ~äã åÉë ëçì íÜÉ~ëï=çÑíÜÉ ^ãéçêã=qê~ÑÑÅ=` çåíêçä=qçï Éê ëÉÉ ^ééÉåÇãñ=^I cáÖì êÉ=NF~í=mÜçÉåãÑJ Éë~ d~íÉï ~ó=^ãéçêãK=qÜÉ=éêçäÉÅí=ëáÉ äë=ï áÜåå íÜÉ=oáíÉåÜçì ëÉ=qê~åãåÖ=^êÉ~I=å=~éééçñãã ~íÉäó=QUMJ ~ÅêÉ=^êôçå~=^êã ó=k~íçå~ä=dì ~êÇ=E^w^okdF=Ñ~ÅäãáÓ=äçÅ~íÉÇ=åã=ì ÉÉå=` êÉÉâI måã~ä` çì åíóI ^êôçå~ Eb^=båÖåÉÉêåÖì=pÅáÉåÅÉI=~åÇ=qÉÅÜçäçÖóI=fåÅK=OMMUFKqÜÉ=oáíÉåÜçì ëÉ=qê~åãåÖ=^êÉ~ êêÉî áçì ëäó=çéÉê~íÉÇ=~ë~å=~ì ñäãê~ó=~ãÑÉäÇ=~åÇ=ÜÉäãéçêã=~ëëçÅá~íÉÇ=ï áÜ=t äãäã~ä ë=^ãê=cçêÅÉ=_~ëÉ ~åÇ äë ÅìêÉåíäó ÄçêÇÉêÉÇ íç=íÜÉ ëçì íÜ=Äó=b~êí=I Åçíäçç=o ç~ÇI=k çêÜ=pÅÜåÉéÑo ç~Ç=íç=íÜÉ=ï ÉëíI ` Éåíê~ä=^êôçå~=mêçÅÉÅí E ^mF` ~å~äíç=íÜÉ=É~ëíI=~åÇ=çéÉå=ÇÉëÉêã=íç=íÜÉ=åçêÜ EëÉÉ ^ééÉåÇãñ=^I cáÖì êÉ=OFK

qÜÉ=éêçäÉÅí=ëáÉ=äë äçÅ~íÉÇ åã=pÉÅíçå NRI=qçï åëÜáé OpI=o~åÖÉ Ub I=dãä~=~åÇ=p~ãí=o â Éê=_~ëÉäãÉ ~åÇ=j ÉêÇá~åI måã~ä` çì åíóI=^êôçå~=EëÉÉ ^ééÉåÇãñ=^I cáÖì êÉ PFKqÜÉ=éêçäÉÅí=~êÉ~=äë=åÅì ÇÉÇ çå íÜÉ *aÉëÉêã=t Éäl=^êôçå~* ~åÇ *p~Å~íçå=k bI=^êôçå~* r åáÉÇ=pí~íÉë d ÉçäÇóÅ~ä=pì êã Éó=Er pd pF THRJã åì íÉ=íçéçÖê~éÜÅ=ã ~éë Er pd p=OMNN~I=ÄFKqÜÉ ä~åÇ=çå=ï ÜáÅÜ=íÜÉ=éêçéçëÉÇ=^po=ëáÉ=äë äçÅ~íÉÇ=äë=ÅìêÉåíäó=çï åÉÇ=Äó=íÜÉ=_ì êÉ~ì=çÑ=i ~åÇ=j ~å~ÖÉã Éåí=E_i j F=~åÇ=äë=äÉ~ëÉÇ=íç=íÜÉ ^w^okdK

qÜçì ÖÜçì í=íÜäë t ~íÉê oÉëçì êÅÉë pì ã ã ~êó íÜÉ=íÉêã = éêçäÉÅí=ëáÉ =äë=ì ëÉÇ=íç=êÉéêÉëëÉåí=íÜÉ ~ééçñãã ~íÉ S~ÅêÉë ï áÜåå=íÜÉ=ëì êã Éó=Äçì åÇ~êáÉëI=åÅì ÇåÖ=íÜÉ=éêçéçëÉÇ=~ÅÅÉëë=êç~Ç EëÉÉ ^ééÉåÇãñ=^I cáÖì êÉ=OFI ï ÜáÅÉ=íÜÉ=íÉêã = éêçäÉÅí=~êÉ~ =åÅì ÇÉë=íÜÉ=ÉåíäÉ=ëì êã Éó=~êÉ~=~åÇ ëì êçì åÇåÖ=ä~åÇë=çì íëäÇÉ=Äì í=~Çà~ÅÉåí=íç=íÜÉ=éêçäÉÅí=ëáÉK=qÜÉ=íÉêã = éêçäÉÅí=î åÅåáó =äë=ì ëÉÇ=íç ÇÉåçíÉ=~=ã çêÉ=ÉÑé~åëâ É=ä~åÇëÅ~éÉ=ÅçåíÉÑíK

PKM cfbi a=pfqb=fk s bpqfd ^qfl k

^j b` ëÅäÉåíäëíëI=åÅì ÇåÖ=~ Äçäçäëëíë éÉêÑçêã ÉÇ=~=ÑÉäÇ=åî ÉëíáÖ~íçå=çÑ=íÜÉ=éêçäÉÅí=~êÉ~=çå I ÅíçÄÉê=NRI OMNQ EëÉÉ=^ééÉåÇãñ=_I=páÉ=mÜçíçÖê~éÜÅ=i çÖFKqÜÉ=éì êéçëÉ=çÑ=íÜÉ=ëì êã Éó=ï ~ë=íç áÇÉåíÑó=ï ~íÉê=êÉëçì êÅÉë=ÉÉKÖK=ëì êÑ=ÅÉ=ï ~íÉêëI=Å~å~äëI=ï Éíä~åÇëF=íÜ~í=çÅÅì êã=íÜÉ=éêçäÉÅí=~êÉ~K qÜÉ=ëáÉ=ï ~ë=ëì êã ÉóÉÇ=çå=Ñççí×çÄëÉêã ~íçåë=Ñçã =íÜÉ=ÑÉäÇ=ëáÉ=åî ÉëíáÖ~íçåë ~êÉ=ÇäÅì ëëÉÇ=åã íÜÉ=Ñçäçï åÖëÉÅíçåë=çÑ=íÜäë=ã Éã çê~åÇì ã K

QKM mevpf` ^i=pfqb=abp` ofmqfl k

qçéçÖê~éÜó=~åÇ=pçãäoÉëçìêÅÉë

qÜÉ=éêçãÉÅí=~ãÉ~ äãÉë=ï áÜåå=íÜÉ=eáÖÅÉó=_~ëåI=~å=~äìîáã JÑäãÉÇ=ëíãÅíê~ä=ÇÉéêÉëëáçå=åí=íÜÉ=p~á oáÉê=s~äãÉó=_~ëåí=EíÜÉ=Ä~ëåFí=åí=íÜÉ É~ëíÉåí=éçãíçå=çÑ=íÜÉ=_~ëåí=~åÇ=o~åÖÉ=mÜóëáçÖê~éÜåÅ mêçîáåÅÉ=çÑ=ëçìíÜ=ÅÉåíê~ä=^êãçå~K qÜÉ=íçéçÖê~éÜó=ãë=ÅÜ~ê~ÅíÉêãÉÇ=Äó=åçãÜ=íç=åçãÜï ÉëííÉåÇåÖ=ï áÇÉI=Ñãí=íI=~äìîáã JÑäãÉÇ=Ä~ëåë=ëìêêçìåÇÉÇ=Äó=ëíÉÉéI=ãï ÖÖÉÇI=äçï JÉäãÉÑ=ã çìåí~åê~åÖÉëK=qÜÉ=eáÖÅÉó=_~ëåí=ãë=Äçìåí=Äó=íÜÉ=r ëÉêó=~åÇ=d çáÇÑÉáÇ=j çìåí~åë=íç=íÜÉ=åçãÜ=íÜÉ pìéÉëëíáíçå=j çìåí~åë=íç=íÜÉ=É~ëíI=íÜÉ=p~åí~å=j çìåí~åë=íç=íÜÉ=ëçìíÜI=~åÇ=íÜÉ=pçìíÜ j çìåí~åë=íç=íÜÉ=ï ÉëíKbäÉî~íçå=çÑ=íÜÉ=éêçãÉÅí=~ãÉ~=ê~åÖÉë=Ñçã =~éêêçñãã ~íÉäó=NIRPMíç=NIRTM ÑÉÉí=~Äçî É=ã É~å=ëÉ~=ãÉî ÉäE~ã ëãK

pçãäë=ï áÜåå=íÜÉ=éêçãÉÅí=~ãÉ~ ~ãÉ ÖÉåÉê~äóó=ÇÉÑåÉÇ=~ë=ì åÅçåëçäÇ~íÉÇ=~äìîáã=ä~ÇÉéçëáë=~åÇ ÅçåëäëÍ=éêãã ~êãóó=çÑ a~íÉä=åÇ=äç~ã =~åÇ=a ÉåìëÉ=ë~åÇó=äç~ã Er åãÉÇ=pí~íÉë a Éé~ãã ÉåÍ=çÑ ^ÖãÅìäìëÉI k~íìê~ä=oÉëçìêÅÉë=` çåëÉãã ~íçå=pÉããÅÉ xk o` pz OMNQFK a~íÉä=åÇ=äç~ã =ëçãäë ~ãÉ ÇÉêîÉÇ=Ñçã =ã ãÉÇ Ñ=å ~äìîáã =~åÇ=çÅÅì êçå=Ñ=å=íÉêê~ÅÉë=çå=ëäçéÉë çÑM=íç O éÉêÅÉåíK=qÜÉëÉ ëçäë=~ãÉ=Åçåëäçéãã=ï Éäë=Çê~åÉÇK a Éåìëë=~åÇ=çÅÅì êçå=Ñ=å=íÉêê~ÅÉë=çå=ëäçéÉë çÑM=íç O éÉêÅÉåíK=qÜÉëÉ ëçäë=~ãÉ=Åçåëäçéãã=ï Éäë=Çê~åÉÇK a Éåìëë=~åÇ=çÅÅì êçå=Ñ=å=íÉêê~ÅÉë

RKM t ^qbo=obpl r o` bp t fqefk qeb=mol gb` q=^ob^

pì êÑ~ÅÉ=t ~íÉê

qÜÉ=éêçãÉÅí=~êÉ~=çÅÅì êë=ï áÜåë íÜÉ j áÇÇáÉ=dåä~=oâÉêt ~íÉêëÜÉÇ ëÉÉ=^ éêÉåÇãñ=^ I=cáÜ êÉ=QFKk ç éÉêÉåäá~äëì êÑ~ÅÉ=ï ~íÉê=ëçì êÅÉë=~êÉ äçÅ~íÉÇ åë=íÜÉ=î áÅäáó=çÑ=íÜÉ=éêçãÉÅí=ëáÉKqÜÉ ` ^ m ` ~å~ä éêçãÉÅí Ñçêã ë=íÜÉ=É~ëí=Äçì åÇ~êó=çÑ=íÜÉ=éêçãÉÅí=~êÉ~ ~åÇ oáíÉåÜçì ëÉ cäçç Ç=oÉí~êÇåÖ=píã ÅÍì êÉ Ecop Fäë äçÅ~íÉÇ ~éêêçñãã ~íÉäó=MKR=ã äáÉ É~ëí=çÑ=íÜÉ=éêçãÉÅí=~êÉ~ ëÉÉ=^ éêÉåÇãñ=^ I=cáÜ êÉ=QFKqÜÉ ` ^ m ` ~å~ä éêçîáÇÉë=äëëáÖ~íáçå=~åÇ=ã ì åáÅáé~ä=~åÇ åÇì ëíêéá~äï ~íÉê=íç=ì ëÉëë=åë=j ~êáÅçé~I=måë~ä ~åÇ=mãã ~=Åçì åíáÉë=íÜçì ÇÜ=~=ëóëíÉã =çÑ=èì ÉÇì ÅíëI=éì ã éåÖ=Ñ=ÅäáÉëI=~åÇ=éáÉäáÉë íÜ~í=Åçåî Éó ` çäçê~Çç=oâÉê=ï ~íÉê=Ñçã =ì ~âÉ=e ~î ~ëì =Er åáÉÇ=pí~íÉë=a Éé~êãã Éåí=çÑ=íÜÉ=fåíÉêáçé=_ì êÉ~ì =çÑ oÉÅä=ã ~íáçå=OMNNFKqÜÉ cäçç Ç=` çåíêçä=a äëíêÅí=çÑj ~êáÅçé~=` çì åíó=ã ~åí~åë=íÜÉ oáíÉåÜçì ëÉ copl=ï ÜáÅÜ ã åë É~ëí=çÑ=~åÇ é~ê~äáÉä=íç=íÜÉ ` ^ m ` ~å~äK=qÜÉ oáíÉåÜçì ëÉ cop éêçîáÇÉë=Ñçç Ç Åçåíêçä=Ñçê=íÜÉ ` ^ m ` ~å~ä=~ë=ï Éää~ë Ççï åëíêÉ~ã =éçãíáçåë=çÑj ~êáÅçé~=` çì åíóK

aì êåÖ=íÜÉ=ëáÉ=åî Éëíáî ~íáçåI á=ï ~ë=åçíÉÇ=íÜ~í éêÉî áçì ë=ÇÉî Éäçéã Éåí=çÑ=íÜÉ=ëáÉ=Ü~ë ã çÇãÉÇ ~ ä~êÖÉ=éçãíáçå çÑ=íÜÉ Öêçì åÇ=ëì êÑ~ÅÉ=çÑ=íÜÉ=éêçãÉÅí ~êÉ~KqÜÉ=çäÇ=~ãÑÉäÇ=ëì êÑ~ÅÉë=Åçåëäëí=çÑ ÇÉÖê~ÇÉÇ=~ëéÜ~ä=ï áÜ=î ÉÖÉí~íáçå=Öêçï åÖ=ÄÉíï ÉÉå ~ëéÜ~ä=ä~óÉêëK=qÜÉ=êÉã ~åÇÉê=çÑ=íÜÉ ëáÉ Åçåëäëíë= çÑ=Ñà~íI=çéÉå ä~åÇ=ï áÜ=åç=Çê~åë~ÖÉ=ÑÉ~íì êÉë ~åÇ=ëÅ~ííÉêÉÇ=ÇÉëÉêã=î ÉÖÉí~íáçåK mÜçíÇê~éÜë=êÉéêÉëÉåí~íî É=çÑ=íÜÉ=éêçãÉÅí=ëáÉ=~êÉ=åÅì ÇÉÇ åë=^ éêÉåÇãñ=_K

dêçì åÇï ~íÉê

_~ëÉÇ=çå=åÑçêã ~íáçå=éêçî áÇÉÇ=Äó=íÜÉ=mÜçÉåãñ=^ ÅíîÉ=j ~å~ÖÉã Éåí=^ êÉ~ Ñçê=Öêçì åÇï ~íÉê=ÇÉéíÜ íç=ï ~íÉê åë íÜÉ=éêçãÉÅí=î áÅäáóI ~ë=ã É~ëì êÉÇ=åë=OMMPl î ~êáÉÇ=Ñçã =éêêçñãã ~íÉäó=PCO=íç=PVV=ÑÉÉí ÄÉäçï =Öêçì åÇ=ëì êÑ~ÅÉ=E^ êáôçå~=a Éé~êãã Éåí=çÑt ~íÉê=oÉëçì êÅÉë x^at oz OMNQFKdêçì åÇï ~íÉê áÉî Éäë=åë=íÜÉ=éêçãÉÅí î áÅäáó Ü~î É=êáôÉå=ã çÉÉ=íÜ~å=SM=ÑÉÉí=ëäÅÉ=íÜÉ É~êáó=NVVMë E^at o OMNQFK aì É=íç=íÜÉ=ÇÉéíÜ=íç=Öêçì åÇï ~íÉê=åë=íÜÉ=~êÉ~I=Öêçì åÇï ~íÉê=êÉëçì êÅÉë=~êÉ=ì åäáÉáó=íç=Ü~î É=~áó ãã é~Åí=çå=çê=ÄÉ=ãã é~ÅíÉÇ=Äó=~åó=éä~ååÉÇ=ÇÉî Éäçéã Éåí=~Åíî áäÉëK qÜÉêÉ=~êÉ=åç=ëçãÉ=ëçì êÅÉ ~èì ÑÉëë=åë=íÜÉ=éêçãÉÅí=î áÅäáó=Eb åî êçåã Éåí~ãmçíÉÅíçå=^ ÖÉåÅó=xbm^zOMNQ~FK

t ~íÉê=ì ~äáó

t ~íÉê=èì ~äáó=åë=íÜÉ r åáÉÇ=pí~íÉë äë=êÉÖì ä=íÉÇ=ì åÇÉê=íÜÉ= äÉ~å=t ~íÉê=^ Åí E t ^ FK=qÜÉ=ì áãã ~íÉ Öç~äçÑ=íÜÉ ` t ^ äë=íç=ã çåáçê=ï ~íÉê=èì ~äáóI=éêçíÉÅí=éêëëíåÉ=ï ~íÉêÄçÇÉëI=~åÇ=êÉÜ~Äáãã~íÉ=íÜçëÉ ï ~íÉêë íÜ~í=Ü~î É=~ãÉ~Çó=ÄÉÉÅå=éçäì íÉÇK=qÜäë=äë=~ÅÅçã éäëÜÉÇ=íÜêçì ÇÜ=íÜÉ=Éëí~Äëëëãã É Åí=çÑ åì ã Éêçì ë=ã çåáçêêåÖì=éÉêã áíåÖì=~åÇ=Ñì åÇåÖ=éêçÖê~ã ë=íÜ~í=ï çêê=åë=Åçåì åÅíçå=ï áÜ=É~ÅÜ=çíÜÉê íç=éêçî áÇÉ=~=ã ÉÅÜ~åëëã =Ñçê=éêçíÉÅíåÖ=ï ~íÉê=èì ~äáó=åë=íÜÉ r åáÉÇ pí~íÉëK

qÜÉ ` t ^ êÉÖì ä=íÉë=éçäì íáçå=éêêã ~êáó=íÜêçì ÇÜ=íÜÉ=k ~íáçå~ä=mçäì í~åí=a äëÅÜ~êÖÉ=b äãã åë~íáçå póëíÉã Ek ma bpF éÉêã áíåÖ=éêçÖê~ã K=fåë=^ êáôçå~I=íÜÉ k ma bp éêçÖê~ã =äë=ã éäÉã ÉåíÉÇ ~í íÜÉ ëí~íÉ=äÉî Éä=ì åÇÉê=íÜÉ=^ êáôçå~=mçäì í~åí=a äëÅÜ~êÖÉ=b äãã åë~íáçå=póëíÉã =Ñçê=~ä=ä~åÇë ÉñÅÉéí cÉÇÉê~ä=~åÇ fåÇá~å ä~åÇëI ~åÇ äë ~Çã åëíÉêÉÇ=Äó=íÜÉ ^ êáôçå~=a Éé~êãã Éåí=çÑ=båî êçåã ã ~åÇ=ä ì ~äáó=E^ a bn XOMMOFK^ å=^ êáôçå~=k ~íáçå~=mçäì í~åí=a äëÅÜ~êÖÉ b äãã åë~íáçå=póëíÉã =E^ wma bpF éÉêã á=äë=êÉèì áëÉÇ=Ñçê=Ñ=Åäáëëíëë åë=^ êáôçå~ íÜ~í=ÇäëÅÜ~êÖÉ=éçäì í~åíë=Ñçã =~ éçãåí=ëçì êÅÉ=åëíç ï ~íÉêë=çÑ=íÜÉ=r åáÉÇ=pí~íÉëI=åëÅì ÇåÖ=íÜÉ=ÇäëÅÜ~êÖÉ=çÑëíçêã ï ~íÉê=E^ a bn OMNQ~FKmj d^^ Ü~ë ~å=Éñäáíåë=^ wma bp=ã ì ëáëÉÅíçê=ÖÉåÉê~ä=éÉêã á Ñçê=íÜÉ=^ êáôçéãI=ï ÜáÅÜ=êÉèì áëÉë=íÜ~í=~ píçêã ï ~íÉê=mçäì íáçå=mÉî Éåíáçå=mä~å=Ep t mmmF ÄÉ=éêÉé~êÉÇ=Ñçê=íÜÉ=Ñ=Åäáëëíëë=åëÅì ÇÉÇ=åë=íÜÉ éÉêã áKpåÅÉ=íÜÉ éêçéçëÉÇ=çÑÑëáÉ ^ po=Ñ=äëë ì åÇÉê=íÜÉ=éì ãÉï =çÑ=íÜÉ=c^^=~åÇ mj d^^ ï çì äÇ

Ü~îÉ=åç=êÉëéçåëéÅÅãíó=çê=çîÉêëéÅÜÜí=çÑ¶ÜÉ=^ pol=íÜÉ=Éñãëíåë=Ö=pt mmm Ñçê=íÜÉ=^ ãéçãí ï çìäÇ=åÉÉÇ íç=ÄÉ=ì éÇ~íÉÇ çåÅÉ=íÜÉ=éêçéçëÉÇ ^ po =ãë=åë=çéÉê~íáçåI=åë=çêÇÉêíç=êÉã çîÉ ~åó êÉÑÑéÉåÅÉ=íç íÜÉ ÅìêëÉåí ^ poK` çåëíëã ÅíáçåÇ=çÑ¶ÜÉ=éêçéçëÉÇ=^ po =ëáÉ ï çìäÇ=êÉëìãëÉ=~å=^ wma bp=Åçåëíëã ÅíáçåÇ ÖÉåÉê~äéÉëã áãÑ¶ÜÉ=~êÉ~çÑÇëíìêÄ~åÅÉ=ãë=ÖëÉ~íÉêíÜ~å=çåÉ=ENF=~ÅëÉK

pÉÅíáçåÇ OMN=~åÇ OMQ=çÑ¶ÜÉ=` ãÉ~å t ~íÉê=^ Åí=éêçíÉÅí=~êÉ~ë=îá~ä=íç=ëì êÑ¶ÅÉ=ï ~íÉêI=å~ã Éäõ ï Éíä~åÇëI=~åÇ=êÉÖì ä~íÉë=ÇêÉÇÖåÖì=Ñãëëãì=çê=çíÜÉêï ãëÉ=~äÉêëåÖ=ï Éíä~åÇ=Ü~Äá~í=çê=ï ~íÉêë=çÑ¶ÜÉ r åáÉÇ pí~íÉëKoÉëéçåëéÅÅãíó=Ñçê=~Çã åëíÉêëåÖ=~åÇ=ÉåÑçêÅåÖ=pÉÅíáçåÇ OMN=~åÇ OMQ=ãë=ëÜ~êÉÇ=Äó íÜÉ r åáÉÇ=pí~íÉë ^ êã ó=` çêéë=çÑ¶båÖåÉÉêë E çêéëÑI bm^ EbM^ OMNQÄFI=~åÇ=^ abn =E^ abn OMNQÄFK=qÜÉ=` çêéë=~Çã åëíÉêë=å~íáçåï ãÇÉ=éÉêã áëI=ã ~âÉë=ÇÉÅëáçåë=çå=åÇâáÇ ~äéÉêã áë=~åÇ ìêëÇáÅíáçå~äÇÉíÉêã åë~íáçåëI=~åÇ=ÉåÑçêÅÉë=pÉÅíáçåÇ=OMQ=éêçîëáçåë=EbM^ OMNQÄFK^ =pÉÅíáçåÇ OMN t ~íÉê=mì ~äõó=` ÉêãÑÅ~íáçå=ã ì ëí=~ÅÅçã é~åó=íÜÉ=pÉÅíáçåÇ=OMQ=éÉêã á=~åÇ ãë ãëëì ÉÇ=Äó=^ abn E^ abn OMNQÄFK

k ç=ÉÎ ãÇÉåÅÉ=çÑ¶ìêëëÇáÅíáçå~äï ~íÉêë=çÑ¶ÜÉ=r åáÉÇ=pí~íÉë ï ÉêÉ=ãÇÉåíÑÉÇ=~í=íÜÉ=éêçãÉÅÍëáÉ=Çì êëåÖ ëáÉ=ëåî ÉëíáÖ~íáçåëK

t áÜëå=^ êëòçå~I=Öêçì åÇï ~íÉê=èì ~äõó=êÉÖì ä~íáçåë=~êÉ=ãë éáÉã ÉåíÉÇ ì åÇÉêíÜÉ=^ èì ãÑÉê=mêçíÉÅíáçå mêçÖê~ã ~Çã åëíÉêÉÇ=Äó=íÜÉ=^ abn KqÜÉ=åíÉåí=çÑ¶ÜÉ=^ èì ãÑÉê=mêçíÉÅíáçå=mêçÖê~ã =ãë=íç=êÉÖì ä~íÉ ÇëÅÜ~êÖÉë=çÑ¶ï ~ëíÉï ~íÉê=íÜ~í=Åçì äÇ=éçíÉåíá~äõó=ãë é~Åí=Öêçì åÇï ~íÉê=èì ~äõóK^ åó=Ñ¶ÅëãÉë=íÜ~í ÇëÅÜ~êÖÉ=~=éçäõ í~åí=ÉáÜÉê=ÇëÉÅíáõó=íç=~å=~èì ãÑÉêI=íç=íÜÉ=ä~åÇëì êÑ¶ÅÉI=çê=íÜÉ=~êÉ~=ÄÉíï ÉÉå=~å ~èì ãÑÉê=~åÇ=íÜÉ=ä~åÇëì êÑ¶ÅÉI=åë=ëì ÅÜ=~ã ~åëÉê=íÜ~í=íÜÉ=éçäõ í~åí=ã ~ó=ÄÉ=êÉ~ëçå~Äõó=ÉñéÉÅíÉÇ=íç êÉ~ÅÜ= ~å= ~èì ãÑÉê= ~êÉ= êÉèì ãëÉÇ= íç= çÄí~åë= ~å= ^ èì ãÑÉê= mêçíÉÅíáçå mÉêã á= E^ abn OMNQÄFK ` çåëíëã ÅíáçåÇ=~åÇ=çéÉê~íáçåÇ=çÑ¶ÅÉï =Ñ¶ÅëãÉë Ñçê íÜÉ=^ ãéçãíI=åÅìçëëãÉ=íÜÉ=^ po =ëáÉI ~êÉ=åçí ÉñéÉÅíÉÇ=íç êÉëì ãí=åë=ÇëÉÅí=çê=åÇëÉÅí=ÇëÅÜ~êÖÉë=íç=~å=~èì ãÑÉê¥íÜÉëÉÑçêÉI=~å ~éêäÅ~íáçåë=Ñçê=~å ^ èì ãÑÉê=mêçíÉÅíáçåë=mÉêã á=ï çì äÇ=åçí=ÄÉ=~åíÅëé~íÉÇK

<u>cäççÇéä~åë</u>

cäççÇéä~åë=~êÉ=ÄÉíáë=çÑäçï I=ãÉî ÉäÖêçì åÇ=éêÉëÉåí=çå=çåÉ=çê=ÄçíÜëäÇÉë=çÑ¶~=ëíáÉ~ã =ÅÜ~åëÉä~åÇ ~êÉ=ëì ÄëÉÅí=íç=ÉáÜÉê=éÉêçÇçÅ=çê=åÑÑÉëì Éåí=åì åÇ~íáçå=Äó=Ñççç=ï ~íÉêK=fåì åÇ~íáçå=Ç~åÖÉêë ~ëëçÅ~íÉÇ=ï áÜ=Ñççç Céä~åë=Ü~îÉ=éêçã éíÉÇ=cÉÇÉê~ä=ëí~íÉI=~åÇ=äçÅ~ä=äÉÖëëä~íáçå=íÜ~í=ãë ÇÉî Éäçéã Éåí=åë=íÜÉëÉ=~êÉ~ë=ä~êÖÉäõ=íç=êÉÅëÉ~íáçå=~åÇ=éêÉëÉÑ ~íáçå=~Åíâ áëÉëK=bñÉÅì íâÉ=I êÇÉê NNVUUI *cäççÇéä~åë=j ~å~ÖÉã Éåí*I=êÉèì ãëÉë=~Åíáçåë=íç=ã åëã âÉ=Ñççç=êëëâë=~åÇ=ãë é~ÅíëK=r åÇÉê íÜëë=çêÇÉêI=ÇÉî Éäçéã Éåí=~äÉêëë~íâ Éë=ã ì ëí=ÄÉ=Åçåëëäçéêã É=~åÇ=Äì âçåÖ=êÉèì ãëÉã Éåíë=ã ì ëí=ÄÉ=åë ~ÅÅçêÇ~åÅÉ=ï áÜ=ëéÉÅëÑÅ=cÉÇÉê~ä=ëí~íÉI=~åÇ=äçÅ~äÑççÇéä~åë=êÉÖì ä~íáçåëK

^ ÅÅçêÇçåÖ=íç=cÉÇÉê~ä=bã ÉêÖÉåÅó=j ~å~ÖÉã Éåí=^ ÖÉåÅó=Ecbj ^ F=cäççÇéä~åë=j ~éë=çÑ mëë~ä ` çì åíóI=^ êëòçå~ ~åÇ fåÅçêéçê~íÉÇ ^ êÉ~ëI íÜÉ=éêçãÉÅíáçåë=Ü~ë ÄÉÉå=ÇÉãëÉ~íÉÇ ~ë=wçåÉ=a Ecbj ^ OMMT~I=ÄFKcäççÇ wçåÉ=a =ëëÇëÅ~íÉë=éçëëäÄäÉ=Äì í=ì åÇÉíÉêã ëëÉÇ=Ñççç=Ü~ò~êÇëI=~ë=åç=~å~äõëäë=çÑ Ñççç=Ü~ò~êÇë=Ü~ë=ÄÉÉå=ÅçåÇì ÅíÉÇ Ecbj ^ OMNQ¥ëÉÉ=^ éêÉåÇãñ=^ I=cäÜ êÉ PFK

<u>t Éíä~åÇë</u>

t Éíä~åÇë=~êÉ=ÇÉÑëåÉÇ=Äó=íÜÉ ` çêéë ~åÇ=bm^ =~ë=íÜçëÉ=~êÉ~ë=íÜ~í=~êÉ=ëåì åÇ~íÉÇ=çê=ë~íì ê~íÉÇ=Äó ëì êÑ¶ÄÉ=çê=Öêçì åÇï ~íÉê=~í=~Ñ¶ÉêìÉåÅó=~åÇ=Çì ê~íáçå=ëì Ñçëëëåí=íç=ëì éêçãI=~åÇ=íÜ~í=ì åÇÉêëåçãã ~ä ÅëãÅì ã ëí~åÅÉë=Çç=ëì éêçãI=~êÉÉî ~ÄÉåÅÉ=çÑ¶ÉÇÉí~íáçå=íóéëÅ~äõó=~Ç~éíÉÇ=Ñçê=äÑÉ=ãë=~íì ê~íÉÇ=ëçãã ÅçåÇáçåëëK^ ë=ÇÉÑëåÉÇ=ãë=NVUQI=ï Éíä~åÇë=ÖÉåÉê~äõó=ãëÅì ÇÉ=ëï ~ã éëI=ã ~êëÜÉëI=ÅçÖëI=~åÇ=ëãã ãë~ê

~ãÉ~ë =EPP=` co=PCUKP=xÄzFK<t Éíä~åÇë=éêçî áÇÉ=~=î ~êãÉíó=çÑ=ÑÌ åÅíçåë=ãÅà ÇãÖ=ÖêçÌ åÇ ~íÉê ãÉÅÜ~êÖÉ=~åÇ=ÇãëÅÜ~êÖÉX=Ñçç Ç=Ñçï =~ãÉê~íçåX=ëÉÇãã Éåí=ëí~Äãäó~íçåX=ëÉÇãã Éåí=~åÇ=íçñÅ~åí ãÉíÉåíçåX=åì íêãÉåí=ãÉã çî ~ä~åÇ=íê~åëÑçêã ~íçåX=è ì ~íÅ=~åÇ=íÉêãÉëíêá~ä~ÇãÉêáó=~åÇ=~Äì åÇ~åÅÉX ~åÇ=ì åêì ÉåÉëëK=gì êãëÇÅíçå~äï Éíä~åÇë=~ãÉ=íÜçëÉ=ëì ÄãÉÅí=íç=ãÉÖì ä~íçêó=~ì íÜçêáó=ì åÇÉê=pÉÅíçå QMQ=çÑ=íÜÉ=` ãÉ~å t ~íÉê ^ ÅíX=bñÉÅì íâÉ I êÇÉê NNVVM *mêçíÉÅíçå=çÑ=t Éíä~åÇë*I=~åÇ=ãÉèì ãÉë ~å~äëëÉë=çÑ=éçíÉåíá~äãã é~ÅíëíçíÉ=Éíä~åÇë=ãÉä~íÉÇíçíçêçëÉÇ=cÉÇÉê~ä~ÅíçåëK

qÜÉ r åáÉÇ=pí~íÉë cãëÜ=~åÇ=t ãçãÑÉ=pÉãíáÉ Er pct pFk ~íçå~ät Éíä~åÇë fåî Éåíçêó Ek t fFÇãÇ åçí=ãÇÉåíÑ=~åó=ï Éíä~åÇ=ÑÉ~íì ãÉë ï áÜåë=íÜÉ=éêçãÉÅí=ëáÉK=qÜÉ=k t f=ãÇÉåíÑÉÇ=ëÉÌ Éê~ä=ëã ~äã ÑÉëÜï ~íÉê éçåÇë ~åÇ=íÜÉ ` ^ m ` ~å~äëêãÉÅÉF=~ë=çÅÅì êãëÅÖ ï áÜåë=~=çåÉÜã ãÉ=ê~Çä ë=çÑ=íÜÉ éêçãÉÅí=ëáÉ Er pct p OMNQX=ëÉÉ=^ ééÉåÇãñ=^ I=cãÖ ãÉ=OFKr pd p=íçéçÖê~éÜåÅ=ã ~éë=~åÇ=~Éêá~ä ãã ~ÖÉëó=ãÉÌ ãÉì ÉÇ ÇãÇ åçí=ãÇãÅ~íÉ=~åó=ï Éíä~åÇë=çê=ëì êÑ=ÅÉ=ï ~íÉê=ãã éçì åÇã Éåíë ~í=íÜÉ=éêçãÉÅí ëáÉK

qÜÉ= éêçãÉÅí= ëáÉ= ï ~ë= ëì êã ÉóÉÇ= Ñçê= íÜÉ= éçíÉåíá~ä= éêÉëëÉåÅÉ= çÑ=ï Éíä~åÇë= Çì êãÖ= íÜÉ= ëáÉ ãîî ÉëíáÖ~íçåK=k ç=ï Éíä~åÇë=ï ÉêÉ=çÄëÉêã ÉÇ=ï áÜåë=íÜÉ=éêçãÉÅí=~ãÉ~K

SKM `lk`irpflk

k ç=éÉêÉåáá~äçê ÉéÜÉã Éê~äëì êÑ=ÅÉ=ï ~íÉêë=çê=ï Éíä~åÇë=ï ÉêÉ çÄëÉêã ÉÇ=~í=íÜÉ=éêçãÉÅí=ëáÉ ~åÇ=åç ëçãÉ=ëçì êÅÉ=~èì ãÑÉêë=~ëÉ=ãçÅ~íÉÇ=ï áÜåë=íÜÉ=éêçãÉÅí=î ãÅåáóKqÜÉ=éêçãÉÅí=ëáÉ ãë Åä~ëëãÉÇ=~ë cãççÇ wçåÉ=a I=ãÅçÅ~íãÖ=åç=~å~äëëãë=çÑ=ãççÇ=Ü~ò~êÇë=Ü~ë=ÄÉÉå=éÉêÑçêã ÉÇK

THWI obcbobk` bp

^êêôçå~=aÉé~êãã ÉåÍ=çÑ+båÍãçåãã ÉåÍ~ä=nì~äãó=E^abnFK=OMNQ~K=t ~íÉê=nì~äãó=aÍãéçåW
mÉêãáëW ^êêôçå~=mçäìÍ~åÍ=aãéÅÜ~êÖÉ=bäãáåÍ~íçå=póëíÉãá dÉåÉê~ä=fåÑçêã~íçåK
^Í~ãä~ÄäÉ= ~í ÜíéWWï ïï K~òÇÉèKÖçÍLÉåÍãçåÍï ~íÉêÍéÉêãáëL~òéÇÉëKÜíãäK= = t ÉÄëáÉ
~ÅÅÉëëÉÇ=çå kçÍÉãÄÉê=QI=OMNQK

^êêôçå~=aÉé~êãã ÉåÍ=çÑ+båÍãçåãã ÉåÍ~ä=nì~äãó=E^abnFK=OMNQÄK=t ~íÉê=nì~äãó=aÍãéçåW
mÉêãáëW mÉêãáWW` äÉ~å=t ~íÉê=^ÅÍ=E t ^F=OMN=` ÉêíÑÅ~íçå\K= =^Í~ãä~ÄäÉ= ~í
ÜíéWWï ïï K~òÇÉèKÖçÍLÉåÍãçåÍï ~íÉêÍéÉêãáëLÅï ~OMNKÜíãäK= = t ÉÄëáÉ= ~ÅÅÉëëÉÇ= çå
kçÍÉãÄÉê=QI=OMNQK

^êêôçå~=aÉé~êãã ÉåÍ=çÑ+båÍãçåãã ÉåÍ~ä=nì~äãó=E^abnFK OMNQÅK t ~íÉê=nì~äãó=aÍãéçåWmÉêãáëW
^èìÍÑÉê= mêçíÉÅíçå= mÉêãáë= E^mmF dÉåÉê~ä= fåÑçêã~íçåK= = ^Í~ãä~ÄäÉ= ~í
ÜíéWWï ïï K~òÇÉèKÖçÍLÉåÍãçåÍï ~íÉêÍéÉêãáëL~éé KÜíãäQÉåÉê~äK=t ÉÄëáÉ=~ÅÅÉëëÉÇ=çå
kçÍÉãÄÉê=QI=OMNQK

^êêôçå~=aÉé~êãã ÉåÍ=çÑ+båÍãçåãã ÉåÍ~ä=nì~äãó=E^abnFK=OMNOK=t ~íÉê=nì~äãó=aÍãéçåWmÉêãáëW
^êêôçå~= mçäìÍ~åÍ= aãéÅÜ~êÖÉ= bäãáåÍ~íçå= póëíÉãáK= = ^Í~ãä~ÄäÉ= ~í
ÜíéWWï ïï K~òÇÉèKÖçÍLÉåÍãçåÍï ~íÉêÍéÉêãáëLÇçï åäç~ÇLÉé~äêK=ÇÑK=t ÉÄëáÉ=~ÅÅÉëëÉÇ=çå
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^êêôçå~=aÉé~êãã ÉåÍ=çÑ+t ~íÉê=oÉëçìêÅÉëK=OMNQK mÜçÉåãñ=^ÅÍãÍÉ=j ~å~ÖÉãã ÉåÍ=^êÉ~=E^j ^F
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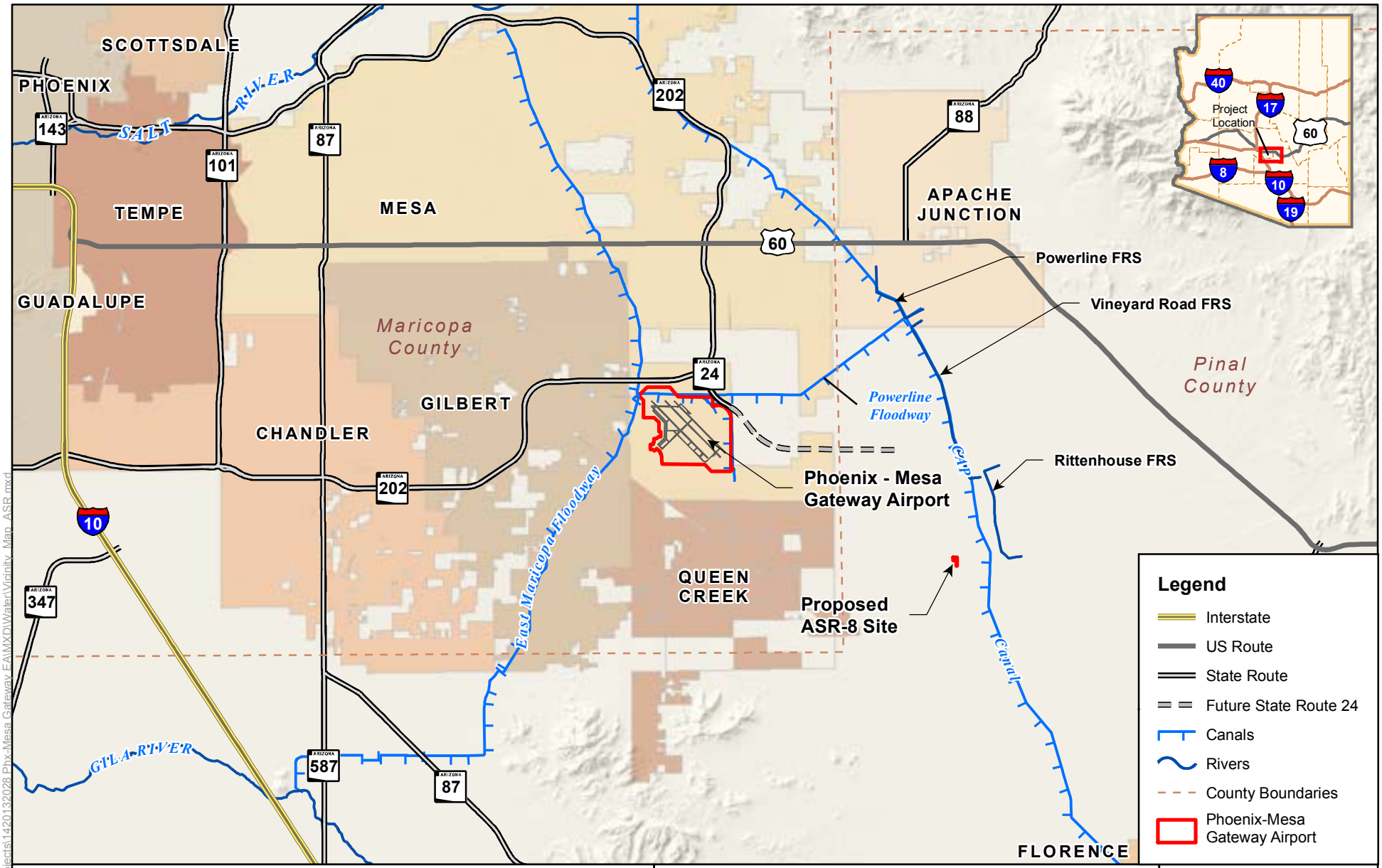

0 2 4 8 Miles

Job No.	1420132028
PM:	KR
Date:	11/24/2014
Scale:	1" = 4 miles

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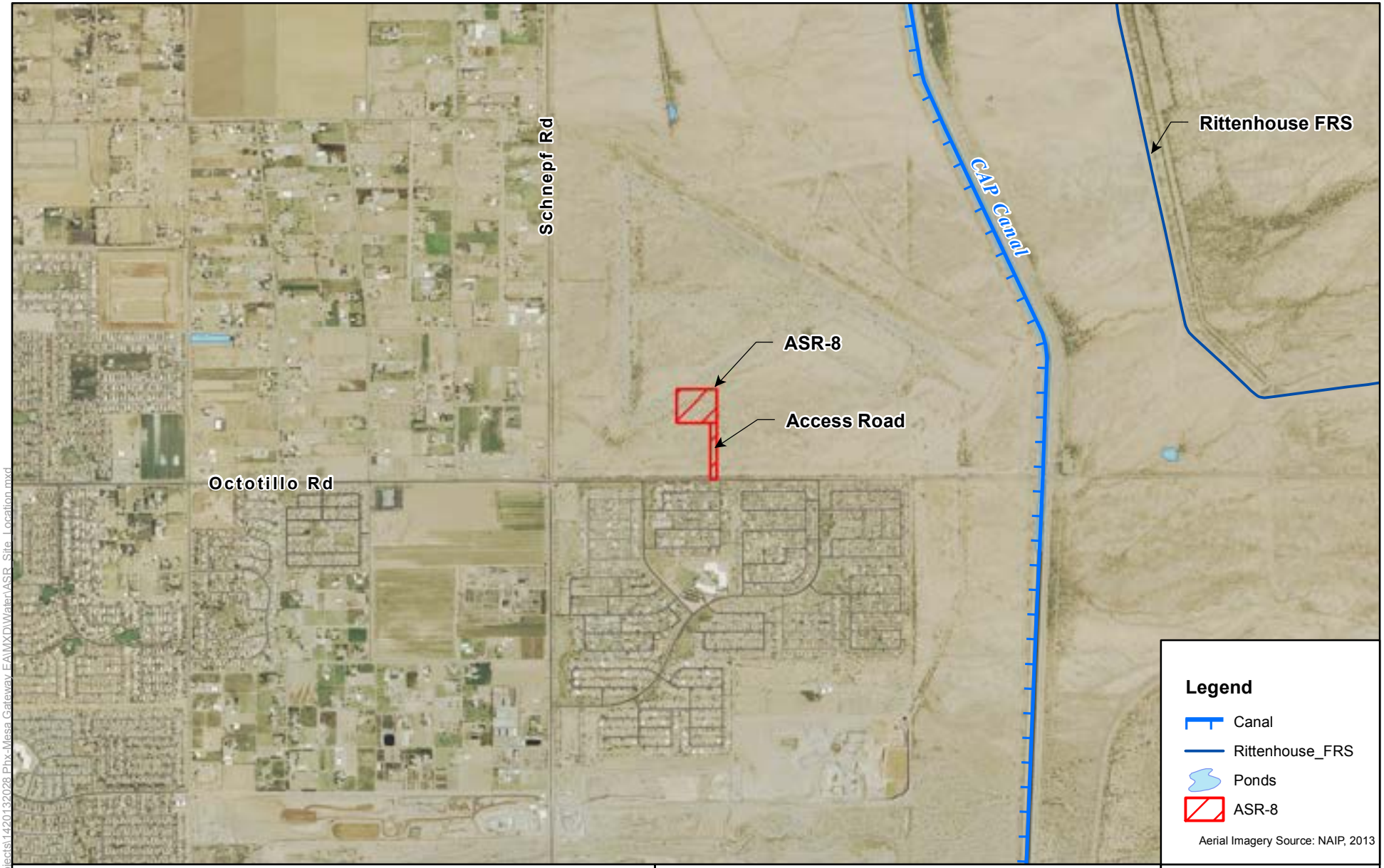
Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Vicinity Map

FIGURE 1

amec

Path: X:\Projects\2013 Projects\1420132028 Phx-Mesa Gateway EA\MXD\Water\Vicinity_Map_ASR.mxd



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Job No.	1420132028
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Date:	11/7/2014
Scale:	1" = 2000'

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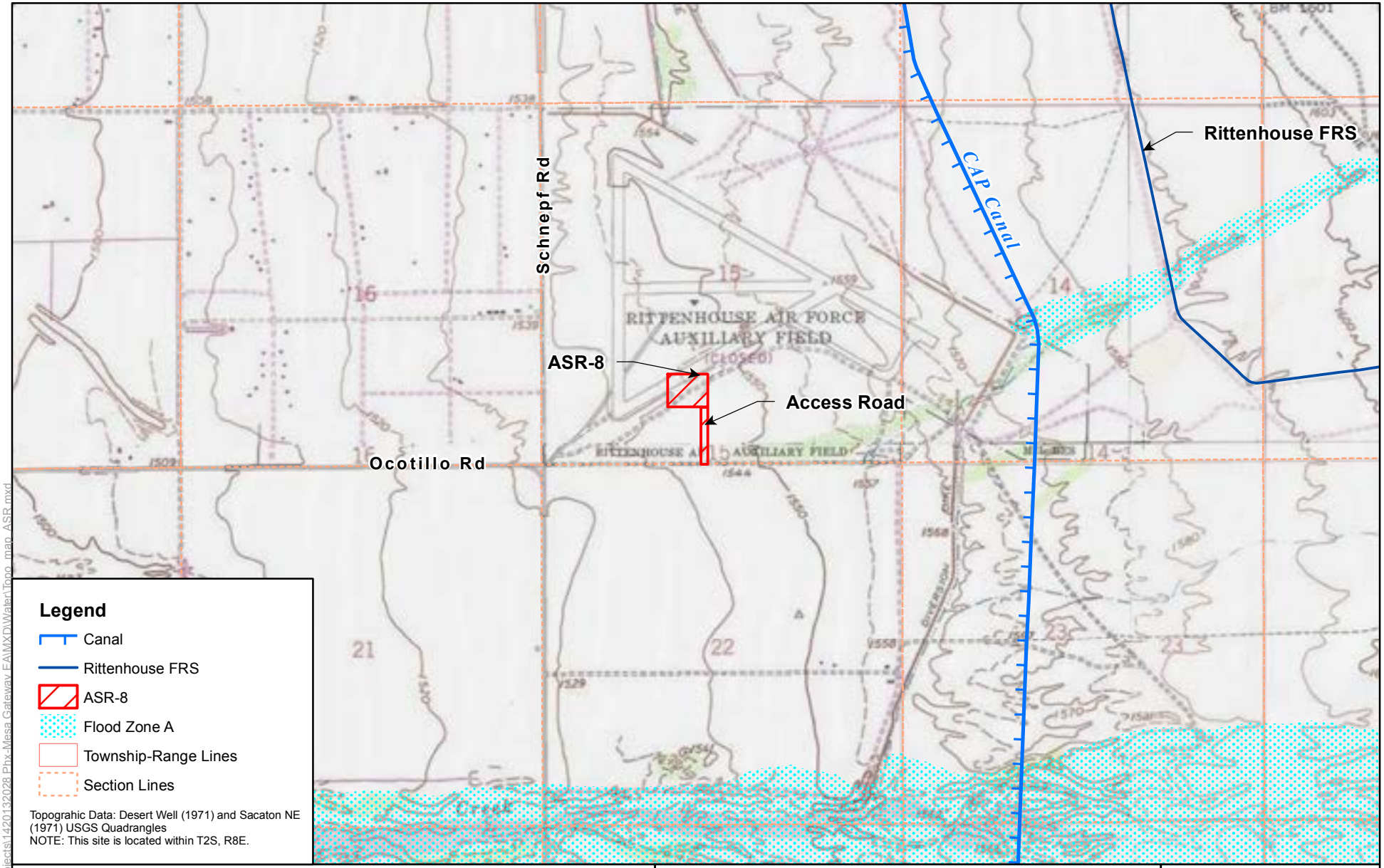
Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Project Site Location

FIGURE
2

amec

Path: X:\Projects\2013 Projects\1420132028 Phx-Mesa Gateway EA\MXD\Water\ASR_Site_Location.mxd



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Scale:	1" = 2000'

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Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Topographic Map

FIGURE
3

amec

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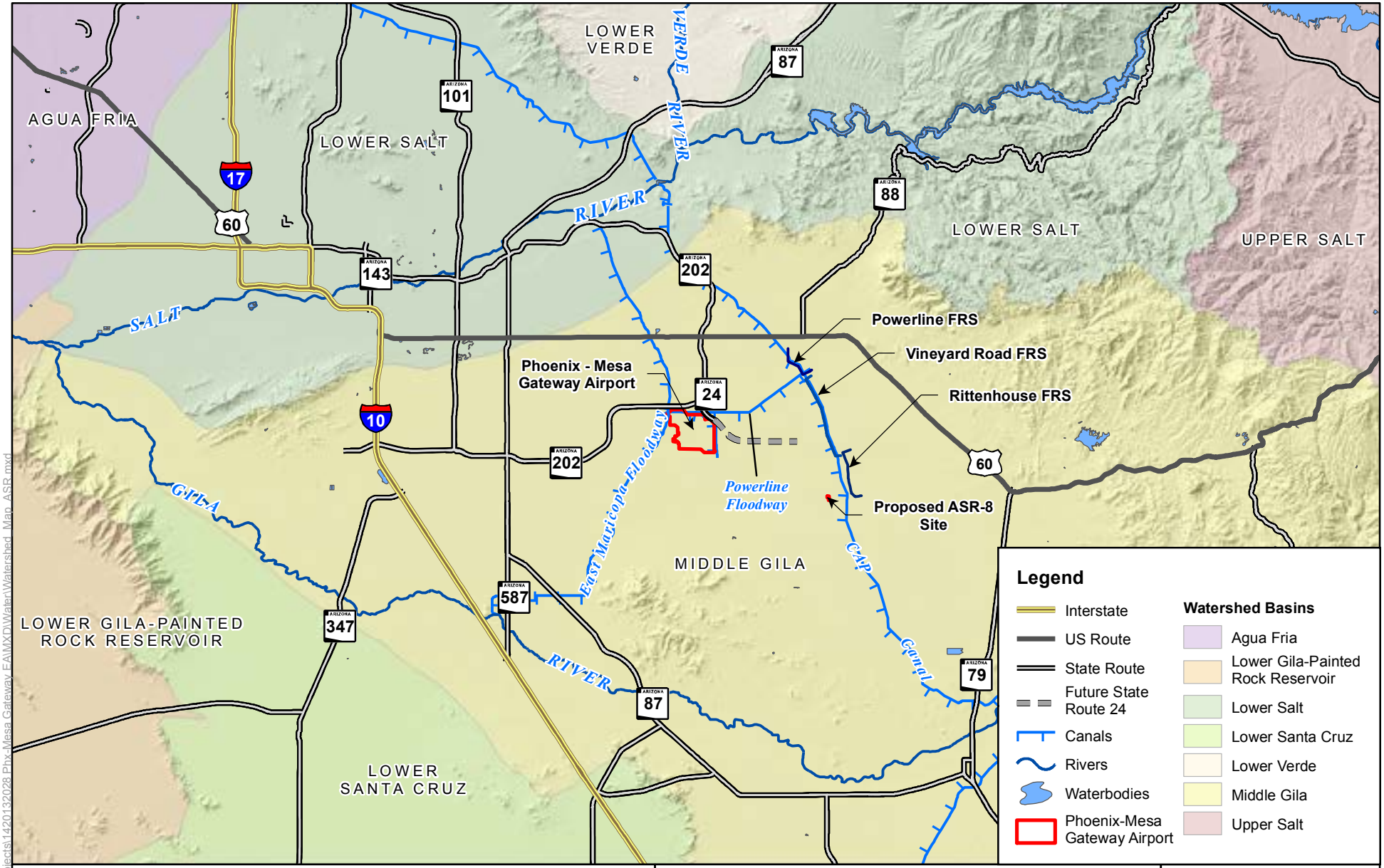

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Job No.	1420132028
PM:	Kr
Date:	11/24/2014
Scale:	1" = 8 miles

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Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Watershed Map

FIGURE 4

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FINAL
ENVIRONMENTAL ASSESSMENT

PROPOSED NORTHEAST AREA DEVELOPMENT PLAN AND
ASSOCIATED IMPROVEMENTS PROJECT

APPENDICES: VOLUME 2

Phoenix-Mesa Gateway Airport
Mesa, Arizona

Prepared for:

PHOENIX-MESA GATEWAY AIRPORT AUTHORITY

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
As lead Federal Agency pursuant to the National Environmental Policy Act of 1969

Prepared by:

Ricondo & Associates, Inc.

January 2017

GENERAL INFORMATION ABOUT THIS DOCUMENT

WHAT'S IN THIS DOCUMENT? This document contains a Final Environmental Assessment (EA) for the Phoenix-Mesa Gateway Airport (IWA) proposed Northeast Area Development Plan and Associated Improvement Project (Proposed Action). The Proposed Action includes relocation of the passenger terminal complex and ancillary facilities to the northeast section of the airport, construction of associated infrastructure and site improvements, relocation of an airport surveillance radar (ASR-8) off-airport, and completion of site preparation for future revenue generating commercial development including retail and office space. This document discloses the analysis and findings of the potential impacts associated with the Phoenix-Mesa Gateway Airport Authority's (PMGAA) proposal and the No Action Alternative.

BACKGROUND. The project would provide a purpose-built replacement passenger terminal complex that will provide the users of Phoenix-Mesa Gateway Airport with a modern, efficient, and expandable passenger terminal complex at a level of service that is consistent and competitive with other air carrier airports in the southwestern United States.

The Draft EA was released for public and agency review on November 10, 2016. The notice of availability of the Draft EA was advertised in the Arizona Business Gazette newspaper to inform the general public and other interested parties.

The document presented herein represents the Final EA for the federal decision-making process, in fulfillment of FAA's policies and procedures relative to NEPA and other related federal requirements. Copies of the document are available for inspection at libraries in the cities of Mesa, Queen Creek, and Gilbert, PMGAA Administrative Offices, the FAA Airports District Office in Phoenix, and the FAA Western-Pacific Region Office in Hawthorne, CA. The addresses for these locations are provided in Chapter 5 of this Final EA.

WHAT SHOULD YOU DO? Read this Final EA to understand the actions that PMGAA and FAA intend to take relative to the Proposed Action at IWA.

WHAT HAPPENS AFTER THIS? Following review of the Final EA, the FAA will either issue a Finding of No Significant Impact/Record of Decision (FONSI/ROD) or decide to prepare an Environmental Impact Statement (EIS).

Appendix H

Air Quality

H.1 Modeling Data

H.2 Air Quality Protocol

H.3 Agency Correspondence

Appendix H.1

Modeling Data

Appendix H Air Quality

Table H-1 (1 of 2): Aircraft Operations

AIRCRAFT/ENGINE TYPES	NO BUILD/BUILD 2022	NO-BUILD/BUILD 2027
Boeing 737-300/CFM56-3B-1	22	24
Boeing 737-400/CFM56-3C-1	11	12
Boeing 737-700/CFM56-7B24	4	5
Boeing 737-800/CFM56-7B26	25	27
Boeing 757-300/RB211-535E4B	12	13
Boeing 767-300/PW4060	4	5
A319-131\IAE V2522-A5	4,847	5,908
A320-211\CFM56-5A1	2,154	3,545
CL-600-2D15/CL-600-2D24/CF34-8C5	2	2
DC10-10/CF6-6D	266	267
DC9-30/JT8D-9 w/ ABS Lightweight hushkit	31	31
ERJ190-100	61	67
MD-81/JT8D-217	1,138	1,249
MD-83/JT8D-219	3,770	2,363
LOCKHEED HERCULES T56-A15 C130E	1,261	1,261
GENERAL DYNAMICS FALCON PW200	1,880	1,880
MCDONNELL DOUGLAS HORNET F404-GE-400 NM	479	479
BOEING STRATOTANKER KC135R F108-CF100 NM	972	972
BAE146-200/ALF502R-5	54	54
CIT 3/TFE731-3-100S	281	286
CL600/ALF502L	474	488
CL601/CF34-3A	202	205
CIT 2/JT15D-4	3,242	3,306
Cessna Mustang Model 510 / PW615F	1,570	1,596
Cessna Citation CJ4 525C /FJ44-4A	3,535	3,603

Table H-1 (2 of 2): Aircraft Operations

AIRCRAFT/ENGINE TYPES	NO BUILD/BUILD 2022	NO-BUILD/BUILD 2027
Cessna 550 Citation Bravo / PW530A	192	196
Cessna Citation Sovereign 680 / PW306C	701	728
Citation X / Rolls Royce Allison AE3007C	999	1,038
Eclipse 500 / PW610F	132	136
Embraer 145 ER/Allison AE3007	5,447	5,627
F100/TAY 620-15	437	445
Gulfstream GIV-SP/TAY 611-8	126	128
Gulfstream GV/BR 710	43	43
ASTRA 1125/TFE731-3A	95	96
LEAR 36/TFE731-2	2,025	2,055
MU300-10/JT15D-5	3,974	4,096
Beech 1900D / PT6A67	38	40
BARON 58P/TS10-520-L	18,573	18,916
Cessna 172R / Lycoming IO-360-L2A	37,921	38,687
Cessna 182H / Continental O-470-R	1,097	1,117
Cessna 206H / Lycoming IO-540-AC	937	954
Cessna 208 / PT6A-114	2,622	2,697
CONQUEST II/TPE331-8	2,290	2,332
DASH 6/PT6A-27	1,745	1,795
DASH 7/PT6A-50	34	34
DASH 8-100/PW121	6	6
Dornier 328-100 / PW119C	91	91
Embraer 120 ER/ Pratt & Whitney PW118	4	4
1985 1-ENG FP PROP	676	688
1985 1-ENG VP PROP	47,627	49,091
PIPER NAVAJO CHIEFTAIN PA-31-350 / TIO-5	32	32
SD330/PT6A-45AR	40	42
Robinson R44 Raven / Lycoming O-540-F1B5	5,343	5,425
Sikorsky S-70 Blackhawk (UH-60A)	555	555
Sikorsky S-76 Spirit	742	780
	160,841	**165,522**

SOURCE: Ricondo & Associates, Inc., February 2016.
PREPARED BY: KBE Environmental Sciences, Inc., March 2016

Table H-2: Criteria Pollutants (Example: Build 2022) in Tons

	POLLUTANT					
SOURCE	**CO**	**VOC**	**NOX**	**SOX**	**PM-10**	**PM-2.5**
Aircraft	1,138	57	86	10	5	5
APUs	4	0	3	0	0	0
GSE	27	1	3	0	0	0
GAV (on-site)	41	2	2	0	1	0
Total Proposed Action	**1,209**	**60**	**95**	**10**	**6.1**	**5.5**
Total No Action	1,214	65	94	11	5.6	5.5
Net Increase (project-related)	-5	-5	1	-0.4	0.5	0.0

SOURCE: Federal Aviation Administration, *EDMS Version 5.1.4.1*, June 2014.
PREPARED BY: KBE Environmental Sciences, Inc., March 2016

Table H-3: Hazardous Air Pollutants (Example: No-Build 2022) in Tons

POLLUTANT	AIRCRAFT	GSE	APU	GAV ON-AIRPORT	TOTAL (AIRCRAFT/GSE/APU/ ON-AIRPORT VEH)	GAV OFF-AIRPORT
1,3-butadiene	1.02	N/A	0.00	0.000	1.027	0.001
2,2,4-trimethylpentane	N/A	0.01	N/A	0.004	0.016	0.024
2-methylnaphthalene	0.09	N/A	0.00	--	0.090	--
Acetaldehyde	2.66	0.01	0.01	0.000	2.680	0.001
Acetone	0.71	N/A	0.00	--	0.712	--
Acrolein	1.44	N/A	0.01	0.000	1.450	0.000
Benzaldehyde	0.30	0.00	0.00	--	0.307	--
Benzene	1.06	0.01	0.00	0.002	1.082	0.012
Ethylbenzene	0.10	0.01	0.00	0.002	0.110	0.014
Formaldehyde	7.97	0.04	0.03	0.000	8.044	0.003
Isopropylbenzene (cumene)	0.00	N/A	0.00	--	0.001	--
M & P-xylene	0.17	N/A	0.00	--	0.172	--
Methyl alcohol	0.78	N/A	0.01	--	0.784	--
M-xylene	N/A	0.01	N/A	--	0.014	--
Naphthalene	0.33	N/A	0.00	0.000	0.330	0.000
N-heptane	0.04	0.01	0.00	--	0.045	--
N-hexane	N/A	0.01	N/A	0.004	0.016	0.026
O-xylene	0.11	0.01	0.00	0.007	0.119	0.049
Phenol (carbolic acid)	0.36	N/A	0.00	--	0.357	--
Propionaldehyde (CAA)	0.48	0.01	0.00	0.000	0.493	0.000
Styrene	0.20	N/A	0.00	0.000	0.204	0.000
Toluene	0.37	0.02	0.00	0.014	0.408	0.095
Total HAPs	18.2	0.2	0.1	<1.0	18.4	<1.0

SOURCE: Federal Aviation Administration, *EDMS Version 5.1.4.1*, June 2014.
PREPARED BY: KBE Environmental Sciences, Inc., March 2016

Table H-4: Greenhouse Gas Emissions: Example No-Build 2022 (Metric Tons)

AIRCRAFT	GSE	APU	GAV ON-AIRPORT	TOTAL (AIRCRAFT/GSE/APU/ON-AIRPORT VEH)	GAV OFF-AIRPORT
24,472	N/A	N/A	332	24,805	2,215

SOURCE: Federal Aviation Administration, *EDMS Version 5.1.4.1*, June 2014.
PREPARED BY: KBE Environmental Sciences, Inc., March 2016

Table H-5: Construction Emissions in Tons

Units for Non-Greenhouse Gases Emission: Short Ton										
Units for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton										
Commercial Development Project (3 months):	Year	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O
ACEIT Run	2016	6.74	14.45	0.04	1.56	0.85	1.44	4,104	0.07	0.01
did not adjust because assumed a 50/50 split	2017	5.84	11.95	0.03	1.35	0.66	1.40	4,128	0.06	0.01
Airside Projects (8 months):	Year	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O
ACEIT Run	(8 months) 2016	23.88	26.39	0.15	3.20	1.53	83.62	8,855	0.31	0.03
Adjusted based on actual months	(5 months) 2016	14.92	16.49	0.10	2.00	0.96	52.26	5,534	0.19	0.02
	(3 months) 2017	8.95	9.90	0.06	1.20	0.57	31.36	3,321	0.12	0.01
Landside Projects (24 months):										
	Year	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O
ACEIT Run	(12 months) 2016	26.40	19.87	0.10	2.48	1.14	42.88	7,451	0.56	0.05
	(12 months) 2017	24.62	17.89	0.09	3.21	0.97	42.94	8,099	0.49	0.05
		51.02	37.76	0.19	5.70	2.11	85.82	15,551	1.05	0.10
Adjusted based on actual months	(8 months) 2016	17.01	12.59	0.06	1.90	0.70	28.61	5,184	0.35	0.03
	(12 months) 2017	25.51	18.88	0.10	2.85	1.05	42.91	7,775	0.53	0.05
	(4 months) 2018	8.50	6.29	0.03	0.95	0.35	14.30	2,592	0.18	0.02

SOURCE: Airport Cooperative Research Program, *Airport Construction Emissions Inventory Tool,* September 2013.
PREPARED BY: KBE Environmental Sciences, Inc., March 2016

Appendix H.2

Air Quality Protocol

Air Quality Assessment Protocol

Phoenix-Mesa Gateway Airport
Northeast Area Development Plan
Environmental Assessment

Prepared for the:

Phoenix-Mesa Gateway Airport Authority (PMGAA)

and

Federal Aviation Administration (FAA)

DRAFT Final

Prepared by:

KB Environmental Sciences. Inc.

June 2014

EXECUTIVE SUMMARY

The Phoenix-Mesa Gateway Airport Authority (PMGAA) conducted the *Northeast Area Development Plan* study to identify development needed at the Phoenix-Mesa Gateway Airport (Airport or IWA[1]) to support forecast enplaned passengers through 2030. Subsequent to the completion of the *Northeast Area Development Plan*, the PMGAA and the City of Mesa formed a partnership to examine the feasibility of phasing the project to meet the Airport's needs, the results of which were published in the *Gateway 2030, A Vision for the Northeast Area Development, Executive Summary* (June 2012). To accommodate the forecast number of enplaned passengers at an acceptable level of service, the PMGAA has determined that a new passenger terminal and associated facilities are needed. The proposed passenger terminal and associated facilities would be located northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel.

The PMGAA and the Federal Aviation Administration (FAA) are preparing an *Environmental Assessment* (EA) for the *Northeast Area Development Plan*, which includes development of a new passenger terminal and associated facilities at the Airport. Prepared in accordance with the National Environmental Policy Act (NEPA), the EA will address the potential impacts to a wide assortment of environmental factors associated with the Proposed Action and feasible alternatives, including the impacts to air quality.

The purpose of this document, referred to as the *Air Quality Assessment Protocol*, is described as follows:

Purpose of the *Air Quality Assessment Protocol*

The purpose of this document is to describe the overall technical approach for conducting the air quality analysis prepared in support of the EA being prepared for the proposed Northeast Area Development Plan at Phoenix-Mesa Gateway Airport. The protocol will be submitted to the U.S. Environmental Protection Agency - Region 9, Arizona Department of Environmental Quality, the Maricopa County Air Quality Department, and the Maricopa Association of Governments for their review and concurrence on the proposed methodology.

The air quality assessment will be conducted following FAA guidelines including Order 1050.1E Change 1, *Environmental Impacts: Policies and Procedures* (Appendix A, Section 2, *Air Quality*); Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*; and the A*ir Quality Procedures for Civilian Airports and Air Force Bases.* The majority of the technical analysis will be accomplished using the latest version of the FAA *Emissions and Dispersion Modeling System* (EDMS Version 5.1.4.1) and other U.S. Environmental Protection Agency (EPA) approved models.

The focus of the air quality assessment will be on the EPA criteria air pollutants, which are carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10}/$PM_{2.5}$), and lead (Pb). Ozone-forming (O_3) emissions will also be addressed through the analysis of the precursors of volatile organic compounds (VOCs) and nitrogen oxides (NO_x). Hazardous (or "toxic") air pollutants (HAPs) will similarly be evaluated. For HAPs the assessment will take the form of an emissions inventory – both with and without the planned improvements. Greenhouse gases (GHG) emissions attributable to the planned airport improvements will also be addressed. To the extent necessary, dispersion modeling of select criteria air pollutants within the vicinity of the alternatives will be conducted.

The results of the air pollutant assessment will be compared to appropriate regulatory criteria including the federal Clean Air Act (CAA) General Conformity Rule applicability thresholds and the National Ambient Air Quality

[1] Phoenix-Mesa Gateway Airport is assigned the code "IWA" by the FAA. However, "AZA," the International Air Transport Association's (IATA) designation for the Airport, is more commonly used by the PMGAA to abbreviate the Airport.

Standards (NAAQS). The overall goal is to help ensure that the alternatives would be constructed and operated in compliance with NEPA, the State Implementation Plan (SIP) and other applicable federal, state and local air quality regulations.

The information provided in this document should be treated as a synopsis of the technical approach of the air quality assessment, which will be expanded upon in the EA.

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1. INTRODUCTION

This section provides introductory and background information on the purpose of this *Air Quality Assessment Protocol*.

1.1 Background Information and Project Description

Phoenix-Mesa Gateway Airport (Airport or IWA) is the second busiest commercial service airport within the greater Phoenix metropolitan area and is experiencing significant growth in numbers of enplaned passengers and passenger aircraft operations. By 2020, the Airport is forecast to accommodate approximately 900,000 annual enplaned passengers, increasing to approximately 1.1 million enplaned passengers by 2030. The Airport is located within Maricopa County, approximately 26 miles southeast of downtown Phoenix and is owned and operated by the Phoenix-Mesa Gateway Airport Authority (PMGAA).

In accordance with the National Environmental Policy Act (NEPA), the PMGAA and the FAA are preparing an *Environmental Assessment* (EA) analyzing the environmental effects associated with the proposed improvements through 2020 identified in the *Northeast Area Development Plan* (i.e., the Proposed Action). The EA will address the impacts of the Proposed Action on a wide assortment of environmental factors, including the potential impacts to both local and regional air quality.

The alternatives which will be discussed in the EA are the expansion of the existing terminal, on- and off-Airport terminal alternatives, the Proposed Action, and the No Action Alternative. The PMGAA has determined that it is infeasible to expand the existing terminal any further. The existing terminal buildings would be re-used (would not be demolished). The PMGAA has identified a suitable on-Airport alternative site for a new passenger terminal that would accommodate the anticipated five to ten year activity levels and also allow for future expansion if aviation demand continues to increase (see **Exhibit 1**).

The proposed facilities, depicted on **Exhibit 2**, include:

- Terminal Building: 300,000 square foot building with 14 gates
- Construct access roadways and terminal curbfront improvements
  - Provide access to the terminal curbfront via a proposed roadway, which would have three through lanes and include a loop roadway northeast of the proposed terminal
  - Construct a departures curb approximately 830 feet in length and an arrivals curb approximately 969 feet in length
  - Provide access to the loop road from Ellsworth Road
  - Provide access to the loop road from Ray Road
- Construct 3,300 passenger parking spaces, 550 employee spaces, and 525 ready/return rental car spaces
  - Construct surface parking facilities to serve the proposed parking spaces within a new loop road and new access road that are capable of vertical expansion
- Construct airfield, taxiway, and taxilane improvements to provide airfield access capable of supporting the proposed air carrier operations

- Construct a full parallel taxiway northeast of Runway 12L-30R
- Provide an access taxilane and apron edge taxilane
- Construct an aircraft apron
- Construct two high-speed exit taxiways

- Relocate and expand utilities, service roads, and perimeter fencing
  - Relocate and expand utilities: water, electrical, gas, sanitary sewer, communications
  - Relocate portions of the existing Ellsworth Channel outside of the proposed terminal area, and enhance the Powerline Canal to maintain existing flood storage capacity
  - Construct service road segments
  - Install perimeter fencing
- Relocate FAA-owned or –operated facilities
  - Relocate the Airport Surveillance Radar (ASR-8), which is currently located on the site of the new terminal facilities and would be impacted by the proposed terminal development
  - Decommission and remove existing ASR-8
- Construct ancillary/support facilities
  - Provide an additional aircraft rescue and fire fighting (ARFF) station to provide adequate service to the north side of the Airport and passenger terminal
  - Construct a belly cargo facility to process, sort, and distribute cargo items efficiently
  - Construct a central receiving facility to serve deliveries for concessions in the terminal area
  - Install a fuel farm capable of providing a seven-day storage reserve
    - Total tank capacity of 750,000 gallons
    - Two unloading islands for fuel receiving
    - Four truck loading islands for aircraft fuel trucks
  - Install a triturator (a machine that processes and transports airplane sewage through sewer lines)
  - Construct/accommodate an aircraft maintenance facility/yard
- Land Acquisition: 20-plus acres in Airport's northeast area
- Site preparation: demolish existing buildings and structures within the northeast development area, grading, site preparation
  - The buildings that are part of the existing passenger terminal complex will not be demolished, but will be repurposed for other Airport uses

- Prepare areas for commercial development (grading, site preparation, and utility connections)

Exhibit 1 Project Location

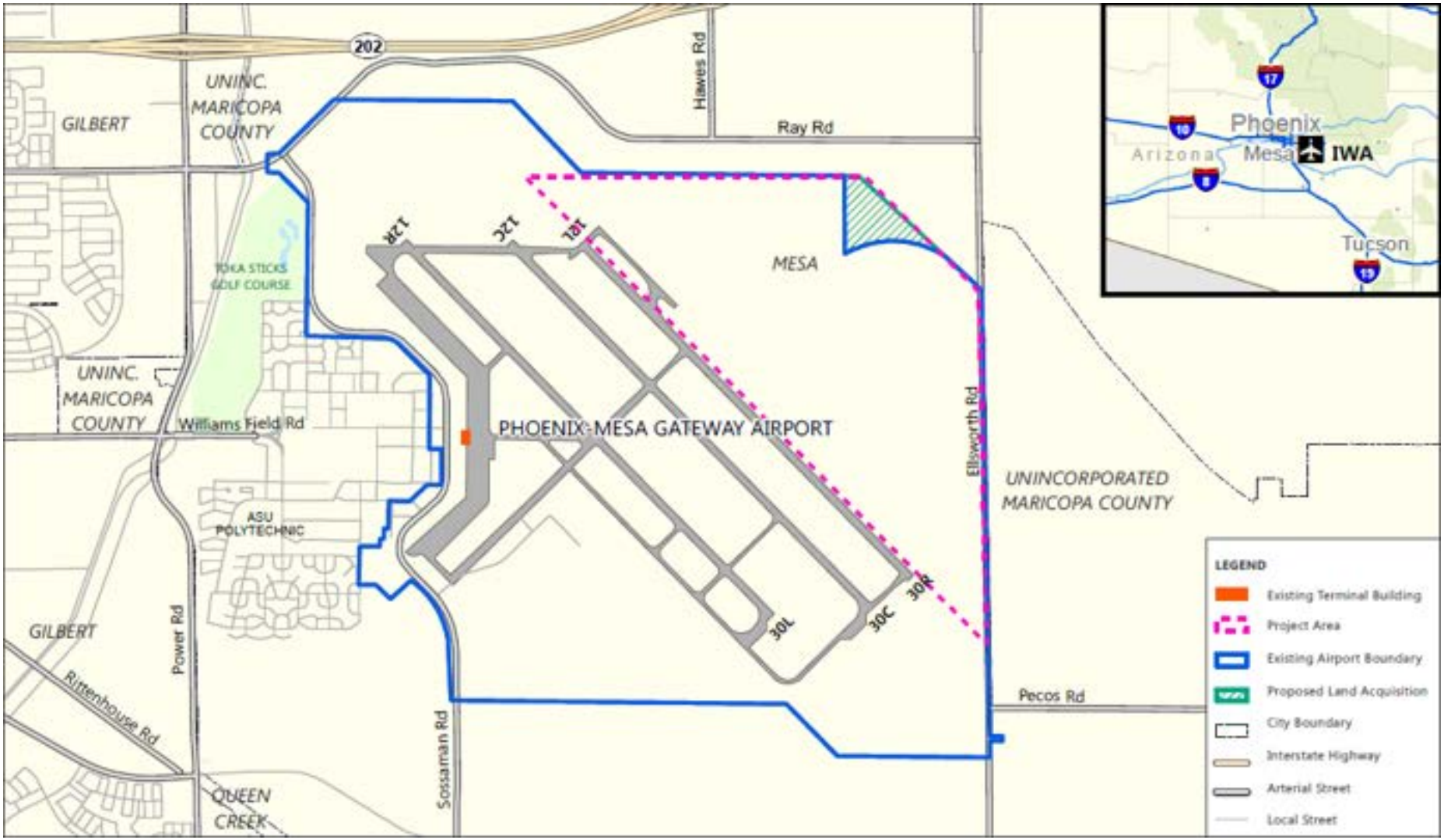
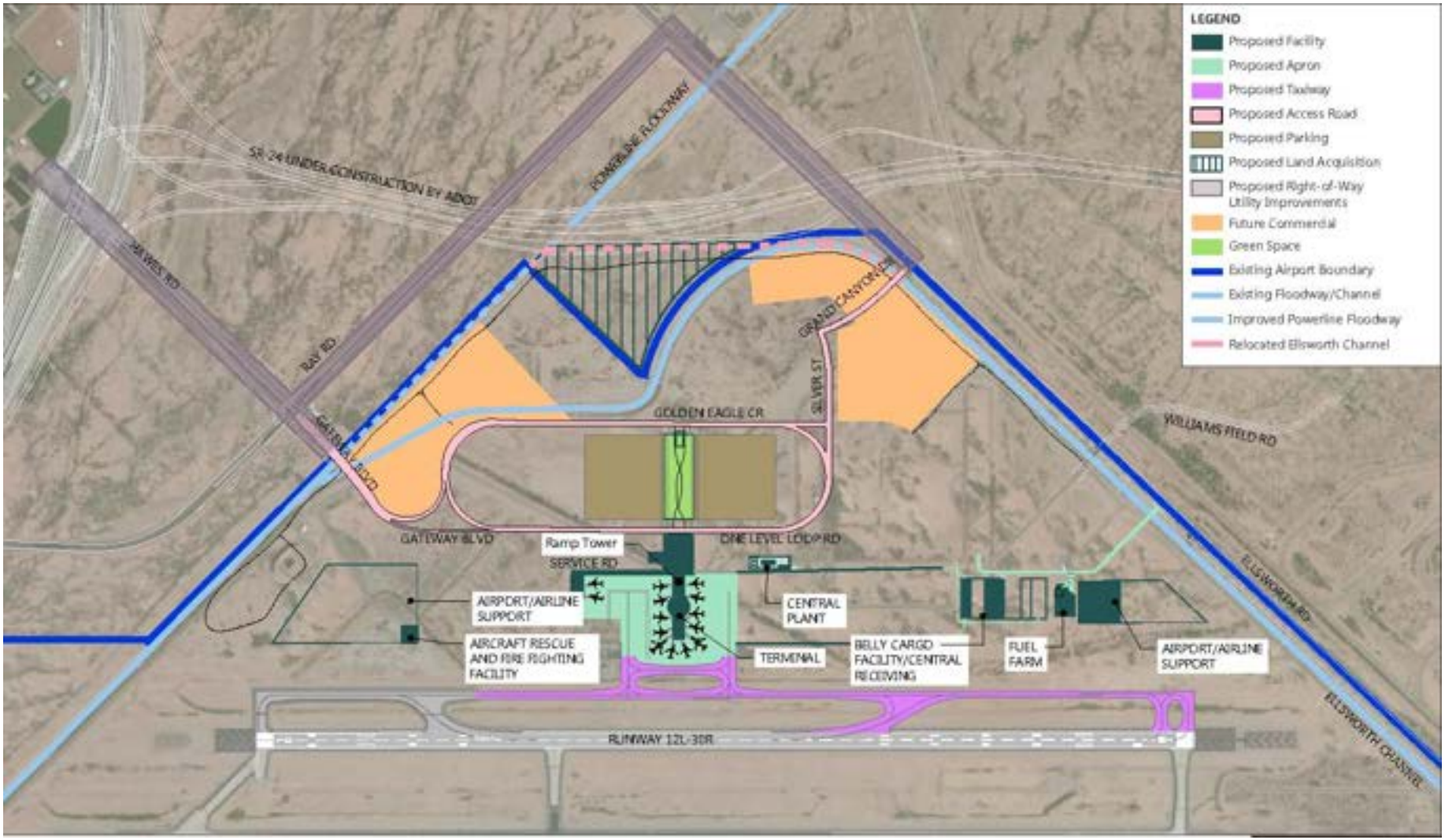


Exhibit 2 Proposed Action



In addition, development of the proposed passenger terminal at this location will necessitate the relocation of the Airport Surveillance Radar (ASR) that exists on the Airport property to a site southeast of the Airport in Pinal County (see **Exhibit 3**). The relocation of the ASR will necessitate construction of a platform and access road/utility corridor from North Schempf Road, east to the ASR site (see **Exhibit 4**).

1.2 Purpose of the Protocol

This document, referred to as the *Air Quality Assessment Protocol*, outlines and describes the overall technical approach and methodology for conducting the air quality analysis contained in the EA. The primary objective for producing this document is to advise the PMGAA, FAA and regulatory agencies of the scope of the air quality analysis and to obtain concurrence from the appropriate agencies on the methodology prior to conducting the analyses. This will help ensure that work is completed in an acceptable manner and that the construction and operation of the Proposed Action will comply with applicable federal, state and local air quality regulations.

2. REGULATORY BACKGROUND

This section provides information pertaining to air quality conditions in the Phoenix-Mesa metropolitan area and identifies the applicable regulatory criteria that will be applied to the results of the air quality assessment.

2.1 Regulatory Agencies

For airport projects, the FAA is involved in the assessment of air quality impacts under NEPA as well as compliance with the General Conformity Rule of the CAA. The management of air quality conditions in Arizona, including the Airport property, is the responsibility of federal, state, and local governmental air quality regulatory agencies. On the federal level, the U.S. Environmental Protection Agency (EPA) establishes the guiding principles and policies for protecting air quality conditions throughout the nation.

On the state level, the Arizona Department of Environmental Quality (ADEQ) is responsible for enforcing the CAA including the compliance with the National Ambient Air Quality Standards (NAAQS), the issuance of air emission source permits, the monitoring of air quality conditions, and assisting in the preparation of the State Implementation Plan (SIP). Maricopa Association of Governments (MAG) is responsible for the preparation of the Maricopa SIP and conformity issues within Arizona. The MAG is also responsible for preparing Transportation Improvement Plans (TIP) and CAA conformity documentation for the Phoenix-Mesa Metropolitan Area.

The Maricopa County Air Quality Department (MCAQD) is responsible for air quality compliance, permitting, and dust control enforcement to preserve, protect and improve the air resources within the region.

Table 1 provides a summary listing of the roles and responsibilities of each of these agencies.

Exhibit 3 Airport Surveillance Radar Relocation Site

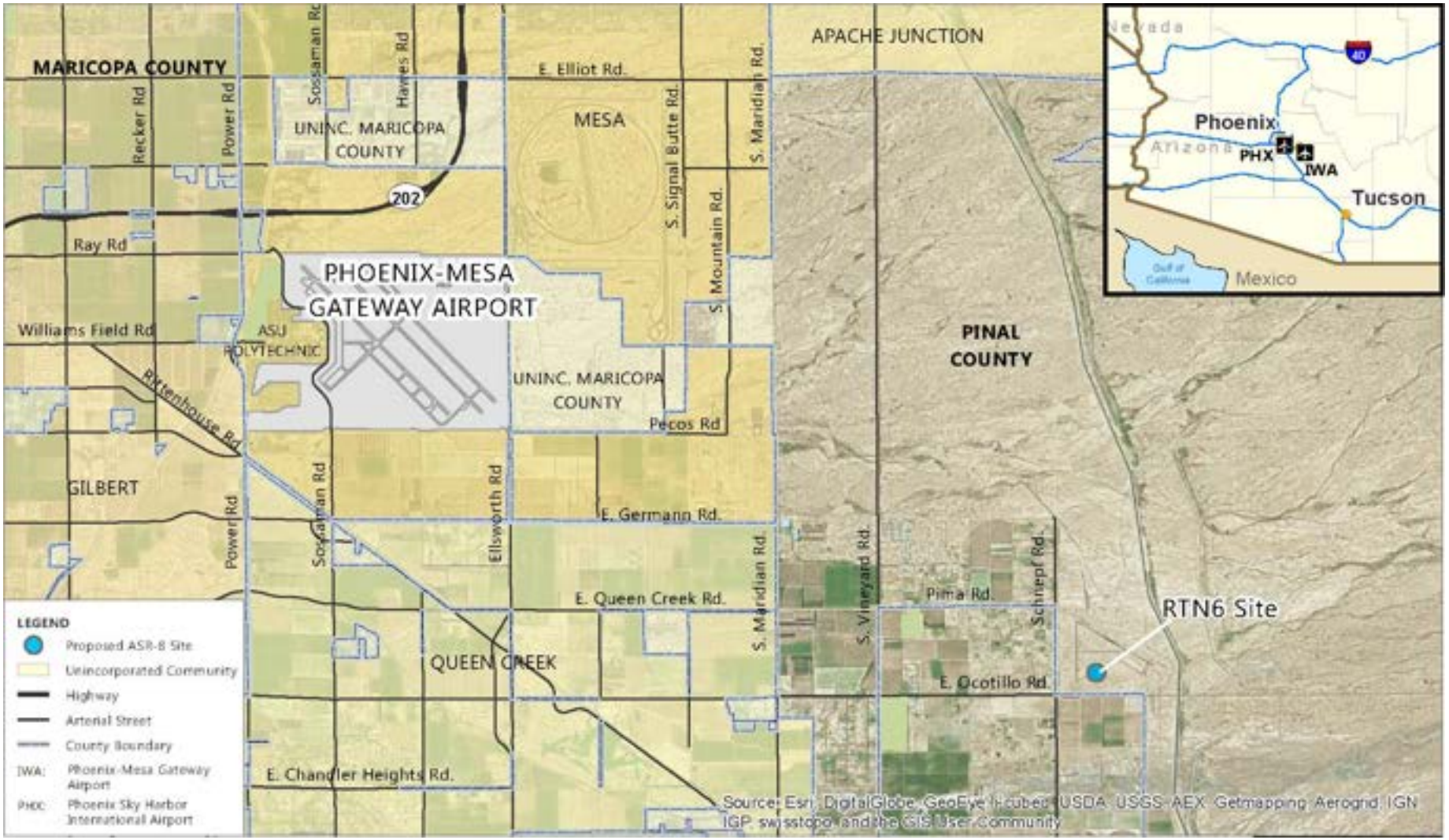


Exhibit 4 Airport Surveillance Radar Site Details

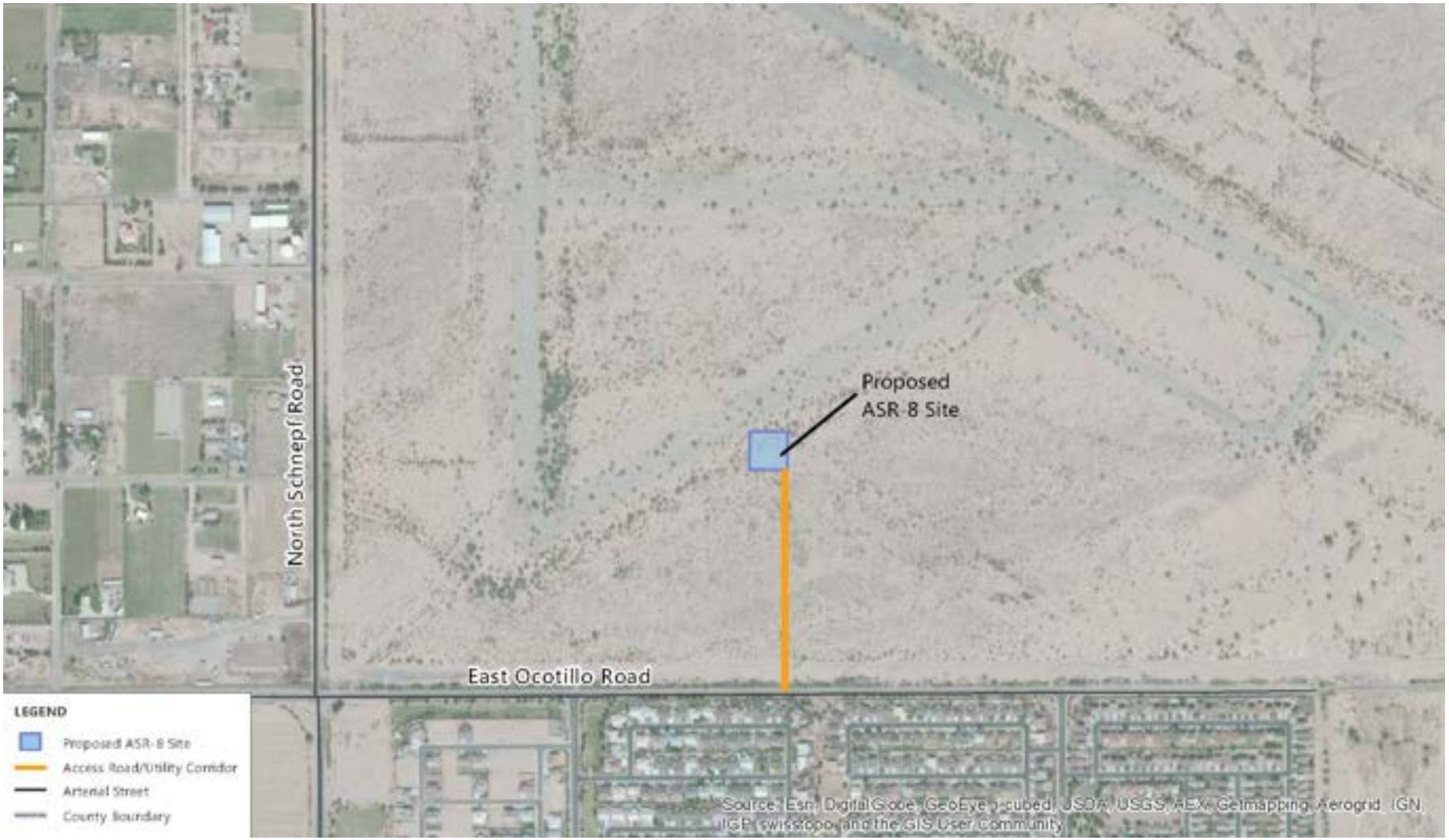


Table 1: Agencies Involved in Air Quality Issues Associated with the Alternatives

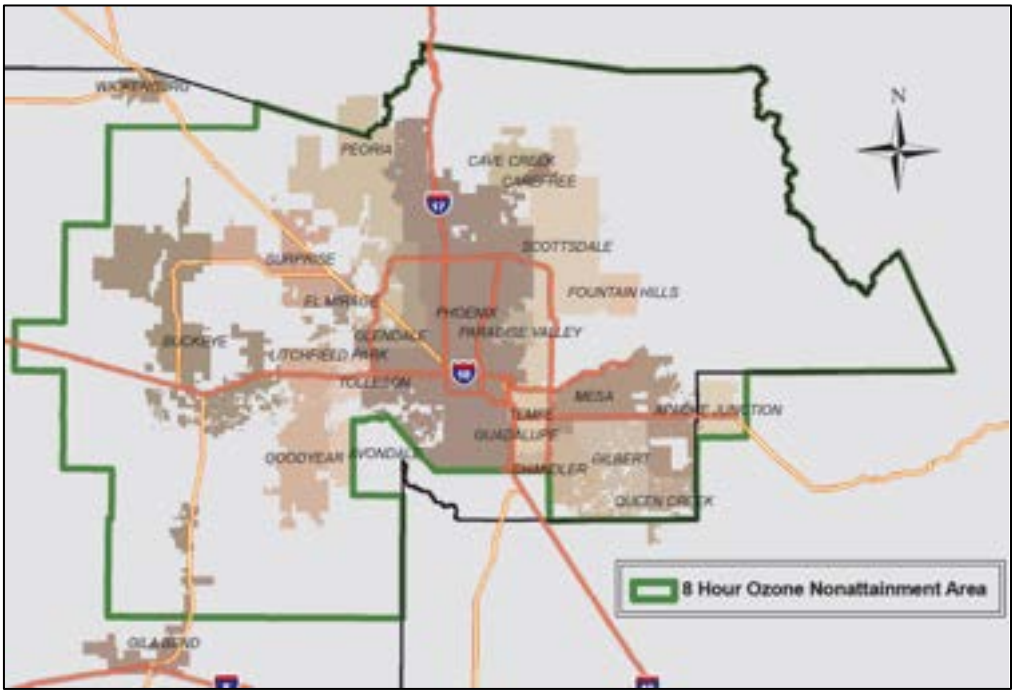
Agency	Roles and Responsibilities
U.S. Environmental Protection Agency (EPA)	*Federal agency* - Sets national clean air policies under the federal CAA; promulgates the NAAQS; reviews and approves SIPs. Also regulates motor vehicle, off-road equipment and aircraft engine emissions nation-wide.
Federal Aviation Administration (FAA)	*Federal agency* – In cooperation with the PMGAA, responsible for reviewing and approving the EA under NEPA and ensuring compliance with the General Conformity Rule of the CAA.
Arizona Department of Environmental Quality (ADEQ)	*State agency* - Involved in the preparation of the Arizona SIP and primarily responsible for the management of air quality within Arizona.
Arizona Department of Transportation (ADOT)	*State agency* - Involved in the preparation of the Transportation Improvement Plan (TIP) and Conformity Documentation for the Phoenix-Mesa Metropolitan Area
Maricopa Association of Governments (MAG)	*Regional agency* – Responsible for the preparation of the Maricopa SIP and conformity issues within Arizona.
Maricopa County Air Quality Department (MCAQD)	*Local agency* - Responsible for ambient monitoring, permitting, and motor vehicle trip reduction planning within Maricopa County.

Source: KB Environmental Sciences, 2013.

2.2 Attainment / Nonattainment Designations

Maricopa County, is currently designated by the EPA to be in "attainment" of all the NAAQS, with the exception of carbon monoxide (CO), ozone (O_3), and particulate matter less than 10 microns in size (coarse or PM_{10}). The Airport lies within nonattainment areas for O_3 (**Exhibit 5**) and PM_{10} and a maintenance area for CO.

Exhibit 5 8-Hour Ozone Nonattainment Area



The current attainment/nonattainment designations for the Phoenix-Mesa metropolitan area are listed in **Table 2**. As shown, the area (including IWA) is in "attainment" for lead (Pb), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter less than 2.5 microns in size (fine or $PM_{2.5}$). The "attainment" designations mean that pollutant levels are either below or meet the NAAQS for these criteria pollutants.

However, the area is designated as "attainment/maintenance" with respect to the NAAQS for CO. This maintenance designation signifies that violations of the NAAQS for CO have occurred in the past, that the area is currently in attainment, and that the area is required to perform certain air quality conformance activities with respect to CO such as the CO Maintenance Plan discussed in **Section 2.3**. The area is designated as "nonattainment" for 8-hour O_3 (marginal classification) and PM_{10} (serious classification). This nonattainment designation signifies that violations of the NAAQS for O_3 and PM_{10} have recently occurred and the region has developed a SIP. The maintenance plan for 1-hour O_3 is still federally enforceable through 2015. A second ten year plan will likely not be required.

Table 2: Attainment/Non-attainment Designations

Pollutant	Status[1]
Carbon monoxide (CO)	Attainment/Maintenance
Lead (Pb)	Attainment
Nitrogen dioxide (NO_2)	Attainment
Ozone (O_3), 8-Hour	Nonattainment/Marginal
Particulate matter (PM_{10})	Nonattainment/Serious
Particulate matter ($PM_{2.5}$)	Attainment
Sulfur dioxide (SO_2)	Attainment

Source: EPA, 2014.
1 Maintenance areas are areas that are in transition from non-attainment to attainment. Attainment areas meet the NAAQS.

2.3 Air Quality Management Plans

Based on the region's nonattainment status, MAG has prepared SIP and maintenance plans for O_3, PM_{10}, and CO. **Table 3** provides a summary of the applicable SIPs. Prepared principally by the MAG with assistance from the ADEQ, ADOT, and MCAQD, and approved by the EPA, these SIPs and maintenance plan establish area-wide emission budgets, control strategies, and timeframes for achieving the attainment status. Air quality plans have been prepared to address CO, one-hour O_3, eight-hour O_3, and PM_{10}:

- The *Revised MAG 1999 Serious Area Carbon Monoxide Plan*, reflecting the repeal of the remote sensing program by the Arizona Legislature in 2000, was submitted to EPA in March 2001 and approved by EPA effective April 8, 2005. [Applicable SIP]
- The *MAG 2003 Carbon Monoxide Redesignation Request and Maintenance Plan* for the Maricopa County Nonattainment Area was submitted to EPA in June 2003 and approved by EPA effective April 8, 2005. [Applicable SIP]
- The *MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County Area* was submitted to EPA in April 2013. [Applicable SIP, once/if approved]
- The *2000 Serious Area Ozone State Implementation Plan for Maricopa County* was prepared by ADEQ and submitted to EPA in December 2000 to meet the Serious Area requirements. No budget is contained in the Serious Area Ozone Plan. EPA approved the *Serious Area Ozone Plan*, effective June 14, 2005.
- The *MAG 2004 One-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area* was submitted to EPA in May 2004 and approved by EPA effective June 14, 2005.
- The *MAG 2007 Eight-Hour Ozone Plan for the Maricopa Nonattainment Area* was submitted to EPA by June 15, 2007 and approved by EPA effective July 13, 2012. [Applicable SIP]
- The *MAG 2009 Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area* was submitted to EPA in March 2009. [Applicable SIP, once/if approved]

- The *Revised MAG 1999 Serious Area Particulate Plan for PM_{10}* was submitted to EPA in February 2000 and approved by EPA effective August 26, 2002. [Applicable SIP]
- The *MAG 2007 Five Percent Plan for PM_{10} for the Maricopa County Nonattainment Area* was submitted to EPA by December 31, 2007. On January 25, 2011, prior to any final EPA action, Arizona withdrew the Five Percent Plan from EPA consideration. [Withdrawn]
- The *MAG 2012 Five Percent Plan for PM_{10} for the Maricopa County Nonattainment Area* was submitted to EPA on May 25, 2012. On July 20, 2012, EPA issued a completeness finding that stopped the 18-month clock for mandatory application of sanctions. On April 19, 2013 and August 23, 2013, EPA proposed approval of several statutes included in the MAG 2012 Five Percent Plan for PM_{10} that regulate PM_{10} emissions from fugitive dust sources. Approved by EPA effective May 30, 2014. [Applicable SIP]

Carbon Monoxide

EPA initially identified the MAG region as a moderate nonattainment area for the eight-hour CO standard, with a design value of 12.6 parts per million (ppm), exceeding the NAAQS of 9.0 ppm. The standard was not achieved by the CAA deadline of December 31, 1995. The area was reclassified to serious with an effective date of August 28, 1996.[2] The new CO attainment date was December 31, 2000. No violations of the CO standard have occurred since 1996.

The *MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area*[3] was submitted to the EPA in July 1999. The *MAG 1999 Serious Area Carbon Monoxide Plan* assessed the emission reduction measures required to demonstrate attainment. The EPA issued a notice of adequacy effective December 14, 1999 in the *Federal Register* finding that the submitted CO motor vehicle emissions budget contained in the *MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area* was adequate for transportation conformity purposes.[4]

In June 2003, the *MAG 2003 Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*[5] was submitted to EPA. The *2003 CO Maintenance Plan* demonstrated that all CAA requirements have been met and requested that EPA redesignate the area to attainment for CO. On September 22, 2003, EPA published a final attainment determination for the CO standard.[6] On March 9, 2005, EPA published the final rule in the

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2 *Clean Air Act Reclassification; Arizona-Phoenix Area; Carbon Monoxide*. Federal Register, July 29, 1996, Vol. 61, No. 146, p. 39343. http://www.gpo.gov/fdsys/pkg/FR-1996-07-29/pdf/96-19194.pdf

3 *MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area* (September 1999). http://www.azmag.gov/Documents/pdf/cms.resource/CO99EX-SUM_805.pdf

4 *Adequacy Status of the Maricopa County Submitted CO Attainment Plan for Transportation Conformity Purposes*. U.S. Environmental Protection Agency. Federal Register, November 29, 1999, Vol. 64, No. 228, p. 66634. http://www.gpo.gov/fdsys/pkg/FR-1999-11-29/pdf/99-30899.pdf

5 *MAG 2003 Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area* (May 2003) http://www.azmag.gov/Documents/pdf/cms.resource/CO-MaintenancePlan.pdf

6 *Determination of Attainment for the Carbon Monoxide National Ambient Air Quality Standard for the Phoenix Metropolitan Area, Arizona*. Federal Register, September 22, 2003, Vol. 68, No. 183, p. 55008. http://www.gpo.gov/fdsys/pkg/FR-2003-09-22/pdf/03-24002.pdf

Federal Register approving the *Revised MAG 1999 Serious Area Carbon Monoxide Plan* and the *MAG 2003 Carbon Monoxide Maintenance Plan* and designating the CO area to attainment, effective April 8, 2005.[7]

In April 2013, the *MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County Area*[8] was submitted to EPA. This plan satisfies Section 175A(b) of the CAA that requires an additional plan revision for maintaining the primary air quality standard for ten years after the expiration of the initial ten-year period be submitted to EPA eight years after redesignation of the area to attainment.

Thus, the *MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area* and MAG *2003 Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area* are applicable for CO General Conformity analyses. If/once *MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County Area* is approved by EPA, then it would also be applicable for CO General Conformity analyses.

Ozone

Under the 1990 Clean Air Act Amendments of 1990 (CAAA), the Maricopa County nonattainment area was classified as moderate for the one-hour ozone standard. The standard was not achieved by the deadline of November 19, 1996. On November 6, 1997, EPA reclassified the area to serious for ozone, effective February 13, 1998.[9] The new ozone attainment date was November 19, 1999. Prior to EPA's revocation of the one-hour ozone standard in 2005, no violations of the one-hour ozone standard had occurred since 1996. On May 30, 2001, the EPA published a final attainment determination for the one-hour ozone standard.[10]

The *MAG 2004 One-hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*[11] was submitted to EPA in May 2004. The *MAG One-Hour Ozone Maintenance Plan* demonstrated that all CAA requirements had been met and requested that EPA redesignate the area to attainment for one-hour ozone. On June 14, 2005, EPA published the final rule in the *Federal Register* approving the *One-Hour Ozone Maintenance Plan* and

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7 *Approval and Promulgation of Implementation Plans and Designation of Areas for Air Quality Planning Purposes; Arizona.* U.S. Environmental Protection Agency. Federal Register, March 9, 2005, Vol. 70, No. 45, p. 11553. http://www.gpo.gov/fdsys/pkg/FR-2005-03-09/pdf/05-4585.pdf

8 *MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County Area* (March 2013) http://www.azmag.gov/Documents/EP_2013-03-29_MAG-2013-Carbon-Monoxide-Maintenance-Plan-for-the-Maricopa-County-Area.pdf

9 *Technical Amendments to Clean Air Act Reclassification; Arizona-Phoenix Nonattainment Area; Ozone; Correction of Effective Date Under Congressional Review Act (CAA).* Federal Register, February 13, 1998, Vol. 63, No. 30, p. 7290. http://www.gpo.gov/fdsys/pkg/FR-1998-02-13/pdf/98-3754.pdf

10 *Determination of Attainment of the 1-Hour Ozone Standard for the Phoenix Metropolitan Area, Arizona and Determination Regarding Applicability of Certain Clean Air Requirements.* Federal Register, May 30, 2001, Vol. 66, No. 104, p. 29230. http://www.gpo.gov/fdsys/pkg/FR-2001-05-30/pdf/01-13512.pdf

11 *MAG 2004 One-hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area* (March 2004) http://www.azmag.gov/Documents/pdf/cms.resource/Ozone_Maintenance_Plan.pdf

redesignating the one-hour ozone area to attainment.[12] EPA revoked the one-hour ozone standard on June 15, 2005.

On April 30, 2004, EPA published the final rule designating eight-hour ozone nonattainment areas, effective June 15, 2004. The eight-hour ozone nonattainment area in Maricopa and Pinal Counties is classified under Section D, Subpart 1, of the CAA, referred to as "Basic" nonattainment, with an attainment date of June 15, 2009. The *MAG 2007 Eight-Hour Ozone Plan for the Maricopa Nonattainment Area*[13] was submitted to EPA by June 15, 2007. The *MAG 2009 Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area*[14] was submitted to EPA in March 2009. EPA approved the *MAG 2007 Eight-Hour Ozone Plan* including the emissions budgets, effective July 13, 2012.[15]

Thus, the *MAG 2007 Eight-Hour Ozone Plan for the Maricopa Nonattainment Area* is applicable for ozone General Conformity analyses. If/once final approval of the *MAG 2009 Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area* is made by EPA, then it will also be applicable for ozone General Conformity analyses

Particulate Matter

Under Section 107(d)(4) of the 1990 CAAA, the PM_{10} nonattainment area was initially classified as moderate, with an attainment deadline of December 31, 1994. The standard was not achieved by that date. EPA reclassified the region to serious in May 1996, with an effective date of June 10, 1996.[16] The new attainment date for PM_{10} was December 31, 2001 for serious areas; however, the *Revised MAG 1999 Serious Area Particulate Plan for PM_{10} for the Maricopa County Nonattainment Area*[17] contained a request to extend the attainment date to December 31, 2006, as allowed in the CAAA. In the July 25, 2002 *Federal Register*, the EPA published the final approval of the *Revised MAG 1999 Serious Area Particulate Plan for PM_{10},* including the request to extend the attainment date to December 31, 2006.

On May 25, 2007, EPA issued a final rule finding that the Maricopa County nonattainment area did not attain the PM_{10} standard by December 31, 2006. In accordance with Section 189(d) of the CAA, MAG prepared a *MAG 2007 Five Percent Plan for PM10 for the Maricopa County*

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12 *Approval and Promulgation of Implementation Plans and Designation of Areas for Air Quality Planning Purposes; Arizona; Redesignation of Phoenix to Attainment for the 1-Hour Ozone Standard.* Federal Register, June 14, 2005, Vol. 70, No. 113, p. 34362. http://www.gpo.gov/fdsys/pkg/FR-2005-06-14/pdf/05-10792.pdf

13 *MAG 2007 Eight-Hour Ozone Plan for the Maricopa Nonattainment Area* (June 2007) https://www.azmag.gov/Documents/ES_2007_8-HourOzonePlan.pdf

14 *MAG 2009 Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area* (February 2009) http://www.azmag.gov/Documents/pdf/cms.resource/ES_2009_8Hour-Ozone-Final_MAINTENANCE-PLAN.pdf

15 *Approval of Air Quality Implementation Plan; Arizona; Attainment Plan for 1997 8-Hour Ozone Standard*. Federal Register, June 13, 2012, Vol. 77, No. 114, p. 35285. http://www.gpo.gov/fdsys/pkg/FR-2012-06-13/pdf/FR-2012-06-13.pdf

16 *Clean Air Act Reclassification; Arizona-Phoenix Nonattainment Area; PM-10*. Federal Register, May 10, 1996, Vol. 61, No. 92, p. 21372. http://www.gpo.gov/fdsys/pkg/FR-1996-05-10/pdf/96-11736.pdf

17 *Revised MAG 1999 Serious Area Particulate Plan for PM_{10} for the Maricopa County Nonattainment Area* http://www.azmag.gov/Documents/pdf/cms.resource/pm-10-exsum99_941.pdf

Nonattainment Area[18] that was submitted to EPA by December 31, 2007. On September 9, 2010, EPA proposed to partially approve and partially disapprove the *2007 Five Percent Plan*. On January 25, 2011, prior to any final EPA action, Arizona withdrew the *2007 Five Percent Plan* from EPA consideration. On February 9, 2011, EPA published a notice of withdrawal of the May 30, 2008 adequacy finding on the PM_{10} motor vehicle missions budget from the *2007 Five Percent Plan*, effective January 31, 2011. On February 14, 2011, EPA made a finding that Arizona failed to submit the plan as required under the CAA, which triggered the sanctions clocks and obligation to impose a federal implementation plan if a new complete plan is not submitted. This EPA finding began an 18-month clock for mandatory application of sanctions and a two-year clock for a Federal Implementation Plan. The EPA published a corrected notice of withdrawal on February 28, 2011.

The *MAG 2012 Five Percent Plan for PM_{10} for the Maricopa County Nonattainment Area*[19] was submitted to EPA on May 25, 2012. On July 20, 2012, EPA issued a completeness finding that stopped the 18-month clock for mandatory application of sanctions. On January 15, 2014, the EPA proposed approval, pending comments, of the *MAG 2012 Five Percent Plan*.[20] The Plan was approved by EPA on May 30, 2014.

Thus, the *Revised MAG 1999 Serious Area Particulate Plan for PM_{10}* is applicable for PM_{10} General Conformity analyses. If/once final approval of the *MAG 2012 Five Percent Plan for PM_{10} for the Maricopa County Nonattainment Area* is made by EPA then it would also be applicable for PM_{10} General Conformity analyses.

In addition, on July 18, 1997 EPA promulgated NAAQS for $PM_{2.5}$. On January 5, 2005, EPA published a notice designating the Maricopa County area as an attainment area for $PM_{2.5}$, effective April 5, 2005.

[18] *MAG 2007 Five Percent Plan for PM10 for the Maricopa County Nonattainment Area* (December 2007) http://www.azmag.gov/Documents/pdf/cms.resource/PM10_2007_Main-Plan.pdf

[19] *MAG 2012 Five Percent Plan for PM_{10} for the Maricopa County Nonattainment Area* (May 2012) http://www.azmag.gov/Documents/EP_2012-06-06_FINAL-MAG-2012-Five-Percent-Plan-for-PM10-for-the-Maricopa-County-Nonattainment-Area.pdf

[20] *Approval and Promulgation of Implementation Plans – Maricopa County (Phoenix) PM_{10} Nonattainment Area; Serious Area Plan for Attainment of the 24-Hour PM_{10} Standard* http://www.epa.gov/region9/air/actions/pdf/az/phoenix/proposed-rule-frn-epa-r09-oar-2013-0762-prepub.pdf

Table 3: Applicable State Implementation Plans

Pollutant	Document Title	Comments
Carbon monoxide (CO)	*MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area* *MAG 2003 Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*	Maintenance plan control measures; emissions inventories; maintenance demonstration; monitoring network and verification of continued attainment; contingency provisions; transportation conformity budget; and subsequent maintenance plan revisions.
Ozone (O_3)	*MAG 2007 Eight-Hour Ozone Plan for the Maricopa Nonattainment Area*	This Plan demonstrated attainment of the 1997 eight-hour ozone standard assuming emission reduction credits for seven attainment measures.
Particulate matter (PM_{10})	*Revised MAG 1999 Serious Area Particulate Plan for PM_{10}* *MAG 2012 Five Percent Plan for PM_{10} for the Maricopa County Nonattainment Area*	The plan is required to include Best Available Control Measures which are designed to achieve the maximum degree of emissions reduction from a PM_{10} source.

Source: KB Environmental Sciences, 2014.

2.4 Regulatory Standards and Criteria for Air Quality

There are an assortment of regulatory standards and criteria pertaining to air quality in the Phoenix-Mesa area. The most relevant of these to the air quality assessment are briefly discussed.

Federal and State Standards

Under the federal CAA, the EPA has promulgated NAAQS for several "criteria" air pollutants to protect public health, welfare and the environment. The ADEQ and MCAQD have adopted these standards and they are shown in **Table 4**.

Table 4: National Ambient Air Quality Standards

Pollutant	Averaging Time	Standards
Carbon monoxide (CO)	1-hour	35 ppm (40 mg/m^3)
	8-hour	9 ppm (10 mg/m^3)
Ozone (O_3)	8-hour	0.075 ppm (147 µg/m^3)
Nitrogen dioxide (NO_2)	1-hour	0.10 ppm (188 µg/m^3)
	Annual	0.053 ppm (100 µg/m^3)
Sulfur dioxide (SO_2)	1-hour	0.075 ppm (196 µg/m^3)
	3-hour	0.5 ppm (1300 µg/m^3)
Particulate matter (PM_{10})	24-hour	150 µg/m^3
Particulate matter ($PM_{2.5}$)	24-hour	35 µg/m^3
	Annual	12 µg/m^3
Lead (Pb)	3-month rolling average	0.15 µg/m^3

Source: EPA, 2013.

ppm = parts per million, µg/m^3 = micrograms/cubic meter, mg/m^3 = milligrams/cubic meter

General Conformity Requirements

The General Conformity Rule of the federal CAA prohibits federal agencies (including the FAA) from permitting or funding projects or actions that do not conform to an applicable SIP. Following a two-step process, the "Applicability Analysis" first determines whether or not a project's emissions are subject to the Conformity Rule. Secondly, if the emissions are subject to the Rule, a formal "Conformity Determination" is conducted. While the General Conformity requirements are separate from NEPA, the two analyses are often performed concurrently.

The applicable General Conformity "*de-minimis*" levels for the Phoenix-Mesa metropolitan area are shown in **Table 5** based on an ozone nonattainment severity of marginal and PM_{10} nonattainment severity of serious.

Table 5: General Conformity Rule

Applicability Analysis *De-minimis* Thresholds

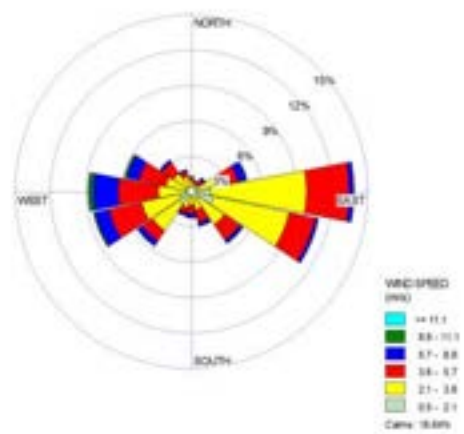
Pollutant	***De-minimis* Thresholds (tons/year)**
Carbon monoxide (CO)	100
Ozone (O_3)	100 (VOC) 100 (NOx)
Particulate matter (PM_{10})	70

Source: General Conformity Rule (40 CFR Part 93, Subpart B).

3. EXISTING CONDITIONS

This section briefly describes existing meteorological and air quality conditions in the IWA area.

Phoenix Area Wind Rose



3.1 Meteorological Conditions

A wind rose for data collected at Phoenix-Mesa Gateway Airport during 2008 through 2012 is shown. As shown, the average wind speed for the region is 6.53 miles per hour (2.95 meters per second) and the wind direction varies but is predominately from the east and west.

3.2 Air Quality Monitoring Data

ADEQ and MCAQD operate several ambient ("outdoor") air quality monitoring stations in the Phoenix-Mesa area as part of their permanent, state-wide air monitoring program. These stations sample and record levels of the EPA criteria air pollutants and an assortment of hazardous air pollutants (HAPs).

Table 6 provides the most recent data (2010 through 2012) from the nearest air monitoring stations including the pollutants measured and the highest recorded levels. Information also is provided indicating whether or not the highest recorded levels at these sites represent violations of the NAAQS. The closest of these air monitoring stations to IWA are 310 South Brooks in Mesa, 1645 East Roosevelt Street at Central Phoenix Station, and 4530 East Mckellips Road at Falcon Field Station in Mesa.

Table 6: Air Monitoring Data in the IWA Area (2010 – 2012)

Site Name	Pollutant	Averaging Period	NAAQS	Year			Exceeds NAAQS
				2010	2011	2012	
310 S Brooks, Mesa	$PM_{2.5}$	Annual	15.0 µg/m³	6.3	8.9	5.8	No
		24-hour (98th percentile)	35 µg/m³	12	20	23	No
310 S Brooks, Mesa	PM_{10}	24-hour	150 µg/m³	86	127	64	No
310 S Brooks, Mesa	CO	8-hour	9 ppm	1.4	1.3	1.3	No
		1-hour	35 ppm	2.0	1.8	2.1	No
1645 E Roosevelt St Central Phoenix Station	SO_2	24-hour	0.14 ppm	0.005	0.004	0.003	No
		1-hour	0.075 ppm	0.012	0.010	0.009	No
1645 E Roosevelt St Central Phoenix Station	NO_2	Annual	0.053 ppm	0.019	0.020	0.021	No
		1-hour (98th percentile)	0.100 ppm	0.059	0.060	0.063	No
4530 E Mckellips Road, Falcon Field Station, Mesa	O_3	8-hour	0.075 ppm	0.074	0.074	0.075	Yes

Source: EPA AIRData – Monitor Data Queries 2013; and EPA Air Quality System – Detailed AQS Data, 2013.
Indicates highest measured for the year unless indicated otherwise noted.
ppm = parts per million, µg/m³ = micrograms/cubic meter

4. AIR QUALITY ASSESSMENT

The following section describes the approach, methodologies, models, data sources, and other supporting information that will be used in conducting the air quality assessment.

4.1 Overall Approach and Methodologies

The overall approach to conducting the air quality assessment follows FAA Orders for preparing NEPA documents. Principal among these are the following publications:

- FAA Order 1050.1E, Change 1 (March 20, 2006), *Environmental Impacts: Policies and Procedures* - This document provides general guidelines for the *air quality assessment of all airport-related projects* or actions evaluated under NEPA [Currently under revision].[21]
- FAA Order 5050.4B (April 28, 2006), *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions* - Developed specifically for projects or actions under the jurisdiction of the Airports Division of the FAA, this document provides general guidelines for the assessment of NEPA-related air quality impacts.[22]
- FAA, *Air Quality Procedures for Civilian Airports and Air Force Bases* and *Addendum* – (April 1997 and September 2004) Referred to as the *Air Quality Handbook*, this document provides detailed guidelines for preparing airport-related air quality assessments for FAA-sponsored projects or actions involving emissions inventory, dispersion modeling, CO hotspot intersection analysis, and General Conformity.[23]

Additionally, FAA also provides guidance in the *An Environmental Desk Reference for Airport Actions* (October 2007), which summarizes applicable special purpose laws. Its function is to help FAA integrate the compliance of NEPA and applicable special purpose laws (including those pertaining to air quality). [24]

Following these guidelines, the air quality assessment will include emission inventories of the EPA criteria pollutants (or their precursors), HAPs, and GHG. For ease of reference, **Table 7** provides a listing of each analysis, the intended purpose, and the basis for inclusion in the air quality assessment.

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[21] FAA *Order 1050.1E*, Change 1, *Environmental Impacts: Policies and Procedures*, *Appendix A*: Section 2. Air Quality, March 20, 2006.

[22] FAA *Order 5050.4B*, *National Environmental Policy Act Implementing Instructions for Airport Actions*, April 28, 2006.

[23] FAA, *Air Quality Procedures for Civilian Airports & Air Force Bases*, 1997 and 2004 (*Supplement*).

[24] FAA, *An Environmental Desk Reference for Airport Actions*, October 10, 2007.

Table 7: Summary Matrix of Air Quality Impact Analyses

Analysis	Purpose	Applicable Regulations or Guidelines
Emissions Inventory	To identify the sources and types, and quantify the amounts of air emissions associated with the operation/construction of the alternatives. The results will also be used to compare future-year conditions for the alternatives, used in support of the General Conformity Rule Applicability Analysis.	FAA Order 1050.1E, Change 1, *Environmental Impacts: Policies & Procedures* FAA Order 5050.4B *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions* FAA *Air Quality Procedures for Civilian Airports & Air Force Bases* including the *Addendum*
Atmospheric Dispersion Analysis	To predict existing and future-year ambient (i.e., outdoor) levels of CO, PM_{10}, and $PM_{2.5}$ both on and off the airport site and ensure that the project-related emissions do not cause or contribute to violations of the NAAQS.	FAA *Air Quality Procedures for Civilian Airports & Air Force Bases* & *Addendum*
CO, PM_{10}, and $PM_{2.5}$ "Hot-Spot" Intersection Analysis	To predict existing and future-year ambient levels of CO, PM_{10}, and $PM_{2.5}$ in the vicinities of roadway intersections both on and off the airport, and to ensure that the project-related traffic emissions do not cause or contribute to violations of the NAAQS.	EPA, *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*, March 2006 EPA, *Using MOVES in Project-Level Carbon Monoxide Analyses*, December 2010 EPA, *Guideline for Modeling Carbon Monoxide from Roadway Intersections,* November 1992
HAPs Emissions Inventory	To identify, quantify and disclose the sources, types and amounts of HAPs associated with operation of the alternatives.	FAA *Guidance for Quantifying Speciated Organic Gas Emissions from Airport Sources*.
General Conformity Rule Applicability Analysis	To determine if project-related emissions exceed the CAA General Conformity Rule *de-minimis* levels and if a formal determination is needed to demonstrate the alternatives will conform to the applicable SIP.	FAA Order 1050.1E, Change 1, *Environmental Impacts: Policies & Procedures*, Section 2. *Air Quality* 40 CFR Part 93, Subpart B, *Determining Conformity of General Federal Actions to State or Federal Implementation Plans* FAA, EPA *General Conformity Guidance for Airports - Questions & Answers*
Greenhouse Gas (GHG) Emissions Inventory	To disclose the amounts of GHGs associated with the alternatives.	Considering Greenhouse Gases and Climate Change Under the NEPA: Interim Guidance (FAA, January 12, 2012)

Source: KB Environmental Sciences, 2014.

4.2 Models

The majority of the technical analysis will be accomplished using the latest version of the Emissions and Dispersion Modeling System (EDMS version 5.1.4.1)[25]. EDMS is the FAA-required model for assessing airport-related air quality impacts. Other models that will be used include the EPA Motor Vehicle Emissions Simulator (MOVES version 2010b)[26] motor vehicle emission factor model, the CAL3QHC roadway dispersion model for hot-spot CO, PM_{10}, and $PM_{2.5}$ concentrations, and the NONROAD (Version 2008a)[27] emission factor model for construction-related emissions. For ease of reference, **Table 8** provides a listing of each model, the intended application, and other relevant information.

Table 8: Air Quality Assessment Models

Model	Application	Comments
EDMS5.1.4.1	Emissions model used to compute aircraft main engine and APU, GSE and fueling emissions of CO, NO_x, SO_x, PM_{10}, $PM_{2.5}$ and VOC and HAPs.	EDMS is the FAA-required model for assessing airport-related air emissions.
MOVES2010b	Source of federal emission factors for motor vehicle and road-registered GSE engines.	MOVES is the EPA database of on-road emission factors and is the most recent version of this model. Source of on-road construction vehicle emissions factors.
NONROAD2008a	Source of construction vehicle/ equipment emission factors.	NONROAD is the EPA database of emission factors for vehicles and equipment that are not road-registered or otherwise not contained in MOVES.
CAL3QHC	Roadway dispersion model for hot-spot CO, PM_{10}, and $PM_{2.5}$ concentrations,	CAL3QHC is the EPA model for assessing air emissions near roadways.

Source: KB Environmental Sciences, 2014.

4.3 Emissions Inventory

In general terms, an emissions inventory is a quantification of the amount, or weight, of pollutants emitted from a source (or combination of sources) over a period of time. The outcome is a product of source activity levels (i.e., aircraft operations) combined with appropriate emission factors (i.e., grams of pollutant/operation). The results are segregated by pollutant type (i.e., CO, NO_x, VOC, etc.), emission source (i.e., aircraft, ground support equipment, motor vehicles, etc.) and project milestone year. The data are commonly reported in units of tons per year (tpy).

[25] FAA, *Emissions and Dispersion Modeling System (EDMS) User's Manual*, Version 5.1.4, June 2013.

[26] EPA, *Motor Vehicle Emissions Simulator (MOVES) User Guide for MOVES2010b*, June 2012.

[27] EPA, *User's Guide for the Final NONROAD2005 Model*, December 2005 and EPA NONROAD Model Updates for 2008, April 2009.

Under NEPA, the results of the emissions inventory are used to compare the build alternatives to the future no-action alternative and to compare the proposed action-related emissions to appropriate regulatory criteria or thresholds. In this case, these criteria are the CAA General Conformity Rule "*de-minimis*" levels.

For this assessment, the EPA criteria pollutants to be included in the emissions inventory are CO, NO_x, PM_{10}, $PM_{2.5}$ and SO_x and Pb. Because emissions of O_3 cannot be calculated directly, VOC and NO_x (the primary precursors to O_3 formation) will be used as surrogates for this pollutant. Lead (Pb) will also be included in the criteria pollutant emissions inventory because airports with a large component of general aviation and aviation gasoline (i.e., avgas) usage can be considered as potentially significant sources of this pollutant.[28] The emissions inventory will focus on the 2020 date of beneficial occupancy, plus 2025 as the planning horizon year (5 years after implementation).

The selection of years for which a *de minimis* comparison will be conducted will be selected with discretion to ensure that General Conformity requirements are fully addressed. These years include the following:

- The attainment year specified in the approved SIP, or the latest attainment year possible under the CAA;
- The last year for which emissions are projected in a maintenance plan;
- The year during which the total direct and indirect emissions from the action is expected to be greatest on an annual basis; and
- Any year for which the approved SIP contains an emissions budget.

4.4 Data Sources and Other Supporting Information

The sources of emissions that will be analyzed include aircraft (both main engines and auxiliary power units [APUs]); ground support equipment (GSE); motor vehicles traveling to, from and moving about the airport site; stationary sources and fuel facilities; and construction equipment/vehicles. The sources of operational data to be used for this air quality assessment are listed in **Table 9**.

Table 9: Air Quality Assessment Data and Information Summary

Emission Source	Parameter - Source of Data and Information
Aircraft	• Total operations, fleet mix, and runway utilization – operational data and forecasts. • Times-in-mode - EDMS default data and FAA Operations and Performance Database for IWA.
GSE/APU	• GSE fleet mix and operating times – IWA-specific data from in-the-field surveys combined with EDMS default data. • APU types and operating times - IWA-specific data from the airlines combined with the EDMS default data and FAA

[28] The EPA, the FAA and others are undertaking research on atmospheric lead and lead-containing avgas in the vicinity of general aviation airports.

	guidance.
Motor vehicles	• Traffic volumes and fleet mix – existing and forecast traffic volume, classifications counts, traffic forecasts and analysis. • Parking ticket counts - existing and forecast parking volume. • Roadway and intersection level of service (LOS) and operating speeds. • Regional network related traffic – existing and forecasts volumes and speeds. • Vehicle registration files for MOVES.
Stationary sources and fuel facilities	• Source and fuel types – Information and data obtained from the PMGAA and FBO. • Fuel throughput volumes – Same as above.
Construction equipment and activities	• Project construction schedules and equipment requirements - Construction schedules and equipment needs estimates for the Proposed Action.
Other supporting information and materials	• Temporal profiles - IWA monthly, daily, and hourly operations of aircraft obtained from FAA Operations and Performance Database for IWA by aircraft category (air carrier, cargo, general aviation, etc.). • Meteorological data – National Climatic Data Center data.

Source: KB Environmental Sciences, 2013.

Aircraft

Emissions Factors

Aircraft emissions of CO, NO_x, SO_x VOCs, PM_{10}, and $PM_{2.5}$ will be calculated using EDMS. EDMS contains up-to-date emissions factors for the vast majority of U.S. aircraft, by engine type and operational modes (e.g., take-off, climbout, approach, single engine taxi, and taxi/idle). If EDMS does not contain emissions data for a specific aircraft or aircraft/engine combination currently in operation or forecasted to be in use, supplemental information will be used. These data will come from the EDMS database if an aircraft can be found to have the same engine type, number of engines and aircraft category or be based on manufacturer data.

Piston aircraft fuel consumption will be calculated using EDMS internal databases to determine avgas usage. This fuel consumption will then be factored with an avgas lead emissions factor of 2.12 grams per gallon to determine the total lead emissions. However, EPA guidance states that approximately five percent of the lead is retained in the piston engine and engine oil, and accordingly the total lead emissions will be adjusted to account for this retention.[29] Lead emissions will be compared to the EPA air monitoring requirement threshold of 1.0 tons per year to determine if dispersion modeling is warranted.

[29] EPA, *Documentation for Aircraft Component of the National Emissions Inventory Methodology*, April 2010. Prepared by Eastern Research Group, ERG No. 0245.02.302.001, Contract No. EP-D-07-097.

Operational Data

Aircraft movements that taken together make up the typical landing-and-takeoff cycle (LTO) are divided into four modes: (1) approach, (2) taxi/idle (including delay, taxi-in, and taxi-out), (3) takeoff and (4) climbout. EDMS automatically calculates the times-in-mode (TIM) for approach, takeoff, and climbout for each aircraft based on its category (e.g., commercial, heavy, passenger jet, etc.). These EDMS TIM data, which are based on FAA guidance, will be used in this analysis, unless airport-specific data is available. Taxi times for the existing condition will be determined based on the FAA Operations and Performance Database for IWA.

Future year taxi times will be based on these same "existing" conditions data and typical aircraft travel speeds and adjusted (if necessary) to reflect any changes in aircraft taxipaths or distances caused by the alternatives. IWA operational data, fleet mix, and runway utilization for existing and future conditions will be projected based on existing data. Taxi times will be based on aircraft ground-based speeds designated as five knots within the terminal areas, 10 knots within taxiways with tight turns, 15 knots for most remaining taxiways, and 35 knots for high speed runway exits. The EDMS default value is 15 knots.

Ground Support Equipment/Auxiliary Power Units

Emission Factors

GSE represents an array of specially designed vehicles and equipment that support and service aircraft in the gate and terminal areas. The GSE fleet typically includes baggage tugs, belt loaders, fuel trucks and aircraft tugs but also includes airfield maintenance vehicles (i.e., mowers, tractors, etc.). APUs are used to provide power to an aircraft while its engines are shut down and gate-power/pre-conditioned air (PCA) are not used. For this analysis, emissions of CO, NO_x, VOC, SO_x PM_{10}, and $PM_{2.5}$ from GSE, including any applicable APUs, will be calculated using EDMS.

Operational Data

GSE fleet data from default EDMS GSE/APU fleet data, fuel type, and operating times will be used to define the type of GSE used and operating times at IWA. However, additional site-specific data and information will be used to supplement the GSE/APU fleet mix, fuel type, and operating times, as appropriate.

Motor Vehicles

Emissions Factors

On-airport and off-site motor vehicles include privately owned vehicles (e.g., cars, vans, trucks, cabs, rental cars, etc.), mass transit vehicles (e.g., buses and vans), government vehicles and cargo-related vehicles (e.g., trucks). For this assessment, the latest version of MOVES will be used as the source of emission factors.

Input data for the MOVES emission factor model specific to the Phoenix-Mesa metropolitan area, such as the fleet mix and parameters affecting emissions (e.g., ambient temperature and humidity), will be obtained from the ADEQ, MCAG, and/or MCAQD.

Estimates of entrained roadway dust will also be included in the emission inventory. The entrained roadway dust includes emissions of fugitive PM_{10} and $PM_{2.5}$ entrained by vehicular travel on paved roads. In areas such as the Phoenix-Mesa metropolitan area (i.e., drier

climate), entrained dust can be an important contributor to local and regional levels of PM_{10} and $PM_{2.5}$. The emission factors for entrained paved road dust were obtained using EPA's methodology (Section 13.2.1 of AP-42, *Compilation of Air Pollution Emissions Factors*, dated January 2011).

The equation for deriving the paved road dust emission factor is shown below:

$$E = K * [(sL)^{0.91} * (W)^{1.02}] * (1-P/4N)$$

where:

E = Particulate emission factor in units of grams per vehicle mile traveled.

K = Particle size multiplier (used to compute PM_{10} and $PM_{2.5}$ in the units of the emission factor).

sL = Roadway silt loading in grams/square meter

W = Average weight (tons) of vehicles on the road

P = Number of "wet" days with at least 0.254 mm (0.01 in) of precipitation

N = Number of days in the averaging period (e.g., 365 days for an annual estimate)

The final term in the equation (1-P/4N) is the rainfall correction factor, which effectively reduces the emission factor based on the number of rain days within the period of estimation (i.e., 46 days per year). The factor of "4" in the denominator accounts for the drying of paved roads during the rainy days (greater than 0.01 inches of rain) and for days when rain does not occur over a full 24-hour period.

Inputs to the paved road dust equation were developed from area-specific roadway silt loading and average vehicle weight data measured by Midwest Research Institute (MRI). The statewide average vehicle weight for Arizona will be assumed to be 2.4 tons. Road dust emissions for the following four classes of roads: 1) freeways/expressways, 2) major streets/highways, 3) collector streets, and 4) local streets. The following silt loadings will be used for the four road categories: 0.02 g/m^2 for freeways, 0.035 g/m^2 for major roads, and 0.32 g/m^2 for both collector and local roads. The $PM_{2.5}/PM_{10}$ ratio for paved road dust is 0.169 (or 16.9 percent of PM_{10} is considered $PM_{2.5}$).[30]

Operational Data

Specific data for motor vehicles operating on the airport access/egress roads, on the nearby roadway network, and within parking lots terminal curbsides will include existing and forecasted traffic volumes, travel speeds, delay periods and other operating characteristics. These data will be obtained from existing and forecasted conditions and/or developed in support of the EA for the alternatives.

Airport-related traffic volumes and average speeds on the regional network will be obtained from ADOT and PMGAA and used to estimate changes in regional CO, PM_{10}, and $PM_{2.5}$ emissions associated with the planned airport and roadway improvements. This traffic is

[30] WRAP Fugitive Dust Handbook, September 7, 2006. http://www.wrapair.org/forums/dejf/fdh/content/fdhandbook_rev_06.pdf

usually accounted for in the region-wide TIP. However, while not included in the project-related emissions inventory used to determine General Conformity; these will be reported separately as a regional effect associated with the airport improvements for disclosure purposes only.

Stationary Sources

Emissions Factors

Stationary sources may include steam boilers, back-up generators, engine testing and fuel storage facilities. These sources are subject to individual operating permits and typically make up only a small portion of overall airport emissions. Other stationary sources at the airport such as the storage and use of deicing chemicals, industrial solvents, paints and other coatings that contain VOCs, also constitute a minor portion of the emissions.

EDMS includes emission factors for most airport-related stationary sources based on the amount of fuel or material consumed. Depending on the type of source, emissions will be calculated for some or all of the following pollutants: CO, VOC, NO_x, SO_x, PM_{10}, and $PM_{2.5}$. For any stationary emissions for which emissions are not revealed in the operating permits or for those that EDMS does not contain emissions factors, other appropriate EPA-accepted data, such as AP-42 (*Compilation of Air Pollutant Emission Factors*), will be used.

The sources of VOC emissions from the storage and handling of fuel include breathing and working losses from storage tanks, and losses from the filling of tanker trucks. VOC emissions from fuel storage and handling will be calculated using EDMS.

Operational Data

The operational characteristics (including type of fuel used, amount of fuel, and equipment size) and emission rates of the individual stationary sources at IWA will be used to estimate emissions. Site-specific data and information will be used to estimate stationary source emissions. This information will be based on site surveys, air quality permits, equipment logs, and (if necessary) analysis of airports of a similar size and function as IWA.

5. HAZARDOUS AIR POLLUTANTS

Hazardous air pollutants (HAPs) are pollutants that do not have established NAAQS but present potential human health risks from short- (acute) or long-term (chronic) exposures.[31] Given the inherent uncertainties and state of the science, the FAA's current policy is to compute emissions inventories of HAPs for NEPA disclosure purposes only. Toxicity ranking, dispersion analysis, or risk assessments are too speculative to be appropriate for incorporating into an EA. Therefore, the emissions-inventory approach described herein is only designed to disclose the types and amounts of HAPs associated with the alternatives that the EA will consider.

Typically, formaldehyde is expected to occur in the greatest amounts followed by acetaldehyde, benzene, acrolein, 1,3-butadiene, methyl alcohol, and toluene. These compounds are emitted in the exhaust of aircraft, GSE/APUs, and motor vehicle engines and, to a lesser extent, from boilers, fuel facilities, and other stationary sources at an airport. Air

[31] For the purposes of this discussion, the terms hazardous air pollutants, HAPs, toxic air pollutants and air toxics are considered to be synonymous.

toxics such as ethylbenzene, hexane, styrene, toluene, and xylene are found in airport-related emissions, especially motor vehicles.

In September of 2009, FAA released its guidance for quantifying airport-related HAP emissions from airport sources.[32] The guidance provides detailed recommendations on the preparation of the analysis and references HAPs speciation profiles for airport emission sources.[33]

5.1 Sources of HAPs

For the HAPs emissions inventory, the same operational sources (i.e., aircraft, GSE, etc.) that will be evaluated for EPA criteria pollutants will be included. For consistency, the same operational data (i.e., LTOs, TIM, etc.) and information used to conduct the criteria air pollutant emissions inventory also will be used.

5.2 Potential HAPs to be Evaluated

Based on FAA's guidance for quantifying airport-related HAPs, only those compounds identified in the EDMS as being a HAP or included in the EPA's Integrated Risk Information System (IRIS) database should be reported in NEPA documentation. The current version of EDMS provides estimates of 45 organic gas species that meet these criteria.[34] The number of these organic gases (OGs) reported in the EA will depend on the type of airport sources that are evaluated and, in some case, the type of fuel that powers the source. All of the HAP/IRIS-identified compounds for which EDMS provides estimates are listed in **Table 10**, although not all of the listed HAPs may be emitted by the Proposed Action or alternatives.

Table 10: Potential HAPs to be Included in the Emissions Inventory

1,1,1-trichloroethane	cyclohexane	methyl alcohol	phenol (carbolic acid)
1,3-butadiene	dichloromethane	methyl chloride	phthalic anhydride
2,2,4 trimethylpentane	thyl acetate	methyl ethyl ketone	propionaldehyde
2-ethoxyethanol	ethyl chloride	methyl isobutyl ketone	p-xylene
2-methylnaphthalene	ethyl ether	methyl tert butyl ether	styrene
acetaldehyde	ethylbenzene	m-xylene	toluene
acetone	ethylene bromide	naphthalene	trichloroethylene
acrolein (2-propenal)	ethylene glycol	n-butyl alcohol	trichlorotrifluoroethan
benzaldehyde	formaldehyde	n-heptane	vinyl acetate
benzene	isomers of xylene	n-hexane	
butyl cellosolve	Isopropylbenzene	o-xylene	
chlorobenzene	m & p-xylene	perchloroethylene	

Source: KB Environmental Sciences, 2013.

[32] FAA, *Guidance for Quantifying Speciated Organic Gas Emissions from Airport Sources*, September 2, 2009.

[33] A speciation profile is the amount of an individual HAP per the amount of VOC or PM emitted by that emission source.

[34] The number of HAPs reported in the EA will depend on the type of airport-sources evaluated and, in some cases, the type of fuel that powers the sources.

6. DISPERSION MODELING FOR ON-AIRPORT SOURCES

To the extent necessary and as a function of the estimated project-related emissions, agency coordination, the level of public controversy, the location of sensitive receptors, and nonattainment status, atmospheric dispersion modeling for CO, PM_{10}, and $PM_{2.5}$ will be conducted to predict the effects of the alternatives on local air quality conditions. The dispersion modeling analysis will be completed in accordance with the FAA *Air Quality Handbook* and ADEQ *Air Dispersion Modeling Guidelines*.

6.1 Approach

Consistent with FAA guidance for conducting dispersion modeling at airports, the EDMS will be used and has the capability to assess CO, PM_{10}, and $PM_{2.5}$. The most current version of EDMS (Version 5.1.4.1) contains AERMOD, EPA's preferred regulatory model.

All standard methods will be used except where project-specific conditions and inputs will be more appropriate and allowable under FAA and EPA modeling conventions. Any non-standard approaches will be coordinated and approved in writing, by FAA's Office of Environment and Energy.

As O_3 is a regional pollutant and because emissions and concentrations of O_3 cannot be computed directly using EDMS, AERMOD or other conventional models, VOC and NO_x (the primary precursors to O_3 formation) will be used as surrogates for this pollutant. Specifically, the results of the emissions inventory for VOC and NO_x will be compared to the appropriate CAA General Conformity Rule *de-minimis* levels to determine if the project-related emissions conform to the applicable SIP.

While AERMOD is generally considered a non-chemistry model, it offers two methods for modeling NO_2 formation: (i.) the Ozone Limiting Method (OLM) and (ii.) the Plume Volume Molar Ratio Method (PVMRM). Notably, neither of these methods is accessible through the current version of EDMS (Version 5.1.4.1).

Currently, both the OLM and PVMRM options in AERMOD are considered non-regulatory options, meaning they cannot be used for normal regulatory modeling purposes. Without these options, AERMOD treats all NO_x as NO_2 (i.e., 100 percent conversion) – essentially, this is identical to treating NO_x as a non-reactive pollutant (similar to CO). This air quality assessment will conduct an analysis using the OLM and PVMRM to determine NO_2 concentrations.

The use of the OLM and PVMRM options in AERMOD requires the specification of an in-stack ratio (ISR) of NO_2/NO_x for each source. The USEPA guidance emphasizes the importance of these in-stack ratios for the one-hour NO_2 NAAQS, recommending that in-stack ratios used with either the OLM or PVMRM options be justified based on the specific application (i.e., there is no "default" in-stack NO_2/NO_x ratio for either OLM or PVMRM). Additional USEPA guidance allows for a default ISR of 0.5 in the absence of more appropriate source-specific information.[35] However, the recommended default ISR may still be too conservative for the airport application.

[35] EPA, *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO2 National Ambient Air Quality Standard*, March 1, 2011,

The NO_2/NO_x emission ratio for aircraft differs markedly from most other NO_x sources. Extensive emission testing has been conducted on a wide range of aircraft engines in the last decade. NO, NO_2 and total NO_x emissions were quantified during the three APEX projects[36], the two Alternate Aviation Fuels Emissions Experiment (AAFEX1 and 2), and ACRP project 02-03a[37]. Engines utilized by aircraft representative of the U.S. and global aircraft fleet were characterized during these experiments, including the CFM56-300 and -700 series, PW4158, PW4090, RB211-535, AE3007, CJ6108A, V2527-A5, JT8D-219 and PW2037[38]. These emission tests have also been conducted over a wide range of ambient temperatures. Additional studies have also quantified NO and NO_2 emission indices.

6.2 Background Concentrations

Because the dispersion modeling will address emissions from airport-related sources and the surrounding roadway networks only, background concentrations will be added to the results to account for air pollutants generated by other sources or originating from outside the Study Area. These background concentrations will be derived from existing air monitoring data collected by ADEQ and MCAQD.

6.3 Meteorological and Physical Conditions

Meteorological data will be obtained from the National Climatic Data Center (NCDC). Hourly meteorological data will be acquired to represent the Phoenix-Mesa area. Data for the most recent five-year period (2008 through 2012) available will be used in a screening process to determine which year, of the five years, would result in the predicted highest ambient concentrations of pollutants for the existing condition. This worst-case year will be used for all alternatives.

Based on EPA guidance contained in Appendix W of 40 CFR Part 51 (*Guideline on Air Quality Models*), most municipal airports are classified as rural. The daily average mixing height of 1,425 meters (4,670 feet) above ground level will be used for this assessment.

6.4 Receptors

For CO, PM_{10}, and $PM_{2.5}$, concentrations will be predicted at a sufficient number of receptor locations to identify the maximum concentrations. The term *receptor* generically describes outdoor land uses or activities which it can be reasonably expected that the public would occupy for a period ranging from one hour to one year. Because EDMS is designed to handle only a moderate number of receptors, a strategy will be developed to help limit the run time of the model while optimizing the results. This involves the identification of sensitive receptors and the use of grid receptors. Overall, the dispersion analysis is expected to use no more than 50 receptors for each alternative evaluated, selected as follows:

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http://www.epa.gov/ttn/scram/guidance/clarification/Additional_Clarifications_AppendixW_Hourly-NO2-NAAQS_FINAL_03-01-2011.pdf.

36 Aircraft Particulate Emissions eXperiment – APEX (2004), JETS-APEX2 (2005), and APEX3 (2005).

37 ACRP project 02-03a focused on near-idle emissions of HAPs; NO and NO_2 emissions were also quantified. Herndon et al., ACRP report 63.

38 Wood et al., *Environmental Science and Technology*, 42 (6) pp 1884-1891, 2008; Timko et al., *Journal of Engineering for Gas Turbines and Power*, 2010 132 pp 061504-1 to -14.

- **Boundary receptors —** Boundary receptors will be located in areas along the airport boundary at a spacing of approximately 10 degrees.
- **Sensitive receptors —** Sensitive receptors will include schools, parks, residential areas and health-/day-care centers located in the vicinity of IWA based on current and future land use plans.
- **Worst-case receptors —** Worst-case receptors will be selected in close proximity to air emissions sources such as near runway ends, terminal area access/egress roads, and off-site intersections. These receptors represent sites where the pollutant concentrations are expected to be the highest and the public has access.

The overall number and locations of the receptors will be justified as part of the EA. This will comprise both quantitative and illustrative demonstrations verifying that the selected receptors represent the highest project-related air quality impacts and those potential receptors located elsewhere (or farther away) have lower impacts, by comparison.

7. CO, PM_{10}, AND $PM_{2.5}$ INTERSECTION HOT-SPOT DISPERSION ANALYSIS

Where applicable and as a function of the project-related traffic volumes and intersection level of service (LOS), the effects of motor vehicle CO, PM_{10}, and $PM_{2.5}$ emissions at intersections will be modeled using the EPA's recommended CAL3QHC model.[39] Emissions factors for motor vehicles will be obtained from EPA's MOVES based upon Phoenix-Mesa metropolitan area specific input parameters such as vehicle speed, fleet mix, and ambient temperature.

The criteria that will require analysis include LOS, traffic volume, delay, and the percentage of diesel vehicles. The criteria that will be used to determine the required analysis include: 1) for CO, intersections that are at Level-of-Service D, E, or F or that will change to Level-of-Service D, E, or F with the Proposed Action, 2) for $PM_{2.5}$, intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles or that will change to Level-of-Service D, E, or F with the Proposed Action, and 3) the top three intersections with regard to traffic volumes, delay, and the worst level of service.

Receptors will be located where the maximum project concentrations are likely to occur and where the general public is likely to have access (i.e., along sidewalks, in vacant lots, residences, businesses, parks, etc.). Receptors will be located three meters from the travel roadways and at a height of 1.8 meters (i.e., breathing height). Receptors will be located at the corner of the intersections to a distance of at least 50 meters from the intersection along the roadway. Link lengths will be no more than 300 meters and will include running lanes and queue lanes, for the appropriate turning movements. Data such as approach volumes, signal timing cycle, and queue delay, will be based on the Highway Capacity Model Synchro datasheets.

For CO, screening worst case meteorological conditions will be modeled (such as 1 meter per second wind speed, wind directions every 10 degrees from 0 to 360, neutral atmospheric stability, a mixing height of 1,000 meters, and a surface roughness length of 175 meters). CO concentrations will be estimated for a one-hour averaging period and adjusted to an eight-hour averaging period based on a factor of 0.7. For $PM_{2.5}$, five years of hourly meteorological

[39] EPA, *User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections*, September 1995.

data will be used. $PM_{2.5}$ concentrations will be estimated for the 24-hour and annual averaging period. Roadway emissions include motor vehicle running exhaust, brake and tire wear, and entrained road dust. Inputs to the paved road dust calculation will be developed from area-specific roadway silt loading, average vehicle weight data, roadway type, and precipitation.

8. PRESENTATION OF RESULTS

As discussed, the results of the emissions inventory will be expressed in tons per year for each year of interest, pollutant, and emission source. **Table 11** provides a sample format that could be used to present the emission inventory results.

For ease in reviewing the dispersion modeling results and comparison to the NAAQS, CO, PM_{10}, and $PM_{2.5}$ will be reported as ppm and micrograms per cubic meter ($\mu g/m^3$). The highest predicted concentrations (with background included) will be reported. A sample tabular form for the dispersion modeling results is provided in **Table 12**.

The HAPs emission inventory results (expressed in units of tons per year) will be summarized by individual HAP (i.e., formaldehyde, benzene, etc.) and source (aircraft, GSE, etc.) as shown in **Table 13**.

Table 11: Air Emissions Inventory Results (tons per year) [Sample Format]

	Pollutant					
Source	**CO**	**VOC**	**NOx**	**SOx**	**PM_{10}**	**$PM_{2.5}$**
Aircraft	-	-	-	-	-	-
Auxiliary Power Units (APU)/Ground Support Equipment (GSE)	-	-	-	-	-	-
On-site Motor Vehicles	-	-	-	-	-	-
Fuel Storage Facilities	-	-	-	-	-	-
Stationary Sources	-	-	-	-	-	-
Construction Activities	-	-	-	-	-	-
Totals	-	-	-	-	-	-

Source: KB Environmental Sciences, 2013.

Table 12: Dispersion Modeling Results [Sample Format]

Pollutant	Averaging Time	Maximum Concentration	NAAQS
Carbon monoxide	1-hour	x ppm	35 ppm
	8-hour	x ppm	9 ppm

Source: KB Environmental Sciences, 2013.

Table 13: HAPs Emissions Inventory Results (tons per year) [Sample Format]

	Sources				
Pollutant	Aircraft	APU/GSE	Motor Vehicles	Other	Totals
Formaldehyde	-	-	-	-	-
Acetaldehyde	-	-	-	-	-
Benzene	-	-	-	-	-
Toluene	-	-	-	-	-

Source: KB Environmental Sciences, 2013.

9. GREENHOUSE GASES

The effect of greenhouse gases (GHG) on climate change is presently a dynamic and emerging topic and will be addressed as part of the air quality assessment. Both naturally occurring and anthropogenic (i.e., man-made), GHG include water vapor (H_2O), carbon dioxide (CO_2),[40] methane (CH_4), nitrous oxide (N_2O), and ozone (O_3). Research has also shown that there is a direct link between fuel combustion and GHG emissions. Therefore, sources that require fuel or power at an airport are the primary sources that would generate GHG, with aircraft being the most often cited source.

However, according to most international reviews, aviation emissions comprise a small percentage of anthropogenic GHG and other emissions that contribute to climate change. For example, the Intergovernmental Panel on Climate Change (IPCC) estimates that global aircraft emissions account for about 3.5 percent of the total quantity of GHG from human activities. In terms of U.S. contribution, the U.S. General Accounting Office (GAO) reports that aviation accounts "for about 3 percent of total U.S. GHG emissions from human sources" compared with other industrial sources, including the remainder of the transportation sector (23 percent) and industry (41 percent). Based upon forecasted operational levels alone, GHG associated with the project will be significantly less than the total U.S. aviation sector as a whole.

In response to this growing concern about GHG and climate change, the scientific community is developing areas of further study to enable a more precise estimate of aviation's effects on

[40] All greenhouse gas inventories measure carbon dioxide emissions but beyond carbon dioxide, different inventories include different greenhouse gases (GHGs).

the global atmosphere. In particular, the FAA is currently leading or participating in several efforts intended to clarify the role that commercial aviation plays in GHG formation and climate change. The most comprehensive and multi-year program geared towards quantifying climate change effects of aviation is the Aviation Climate Change Research Initiative (ACCRI) funded by FAA and NASA. ACCRI will reduce key scientific uncertainties in quantifying aviation-related climate impacts and provide timely scientific input to inform policy-making decisions. FAA also funds Project 12 of the Partnership for AiR Transportation Noise & Emissions Reduction (PARTNER) Center of Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition. Finally, the Transportation Research Board's (TRB) Airport Cooperative Research Program (ACRP) prepared a guidebook on preparing airport GHG emission inventories.

Because aviation activity associated with the proposed project is expected to represent such a small amount of U.S. and global GHG emissions, combined with the present uncertainties involving the assessment of such emissions associated with individual projects, it is FAA's view that the incremental contribution of the proposed action cannot be adequately assessed in the EA given the current state of the science and assessment methodology.[41] For these reasons, GHG will be addressed in the EA with an up-to-date discussion of the FAA's guidelines and research efforts into GHG and supplemented with a semi-quantitative estimate of the project's impacts.

The primary resource for the GHG analysis is FAA's guidance document entitled Considering Greenhouse Gases and Climate Change Under the NEPA: Interim Guidance (FAA, January 12, 2012).

Additional guidance may be provided by the following references, if needed:

- ACRP Report 11, *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories*;
- EPA *Climate Leaders Greenhouse Gas Inventory Protocol Core Module Guidance, Optional Emissions from Commuting, Business Travel and Product Transport*; and the
- IPCC *Guidelines for National Greenhouse Gas Inventories*.

In addition, the majority of the technical analysis will be accomplished using the latest version of the FAA EDMS and the EPA's MOVES emission model. EDMS will be used for aircraft, APU, and GSE. MOVES will be used to determine emission factors for motor vehicles along roadways. Construction emissions will be determined based on fuel usage rate with the EPA's NONROAD. GHG emissions due to refrigerant usage and recycling programs (i.e., waste diversion) will also be included.

10. CONSTRUCTION ACTIVITIES

The construction requirements for the Proposed Action will involve a variety of air emissions sources including on- and off-road construction vehicles, machinery and equipment. These emission sources are associated with the following activities:

[41] NEPA regulations, Council on Environmental Quality, 40 CFR 1502.22, Incomplete or unavailable information.

- Site preparation and earth-moving;
- Material transport;
- Leveling and grading of project footprint;
- Construction operations; and
- Storage and movement of raw and construction materials.

This section outlines the procedures, data sources, and other analytical parameters to be used in developing the air emissions estimates for constructing the Proposed Action.

Construction Equipment Types

For the purposes of this analysis, the construction equipment types will be subdivided into two categories: off-road equipment and on-road vehicles. Off-road equipment is used to move and grade fill materials, install utilities, pave runway/taxiway/apron surfaces, construct buildings and install other miscellaneous airfield support features. These include a wide array of scrapers, loaders, dozers, cranes and off-road haul trucks. On-road vehicles include transport trucks for the delivery of raw materials, supplies and equipment, as well as the personal vehicles used by the construction workers. Typical on-road vehicles include automobiles, vans and trucks of various sizes and functions.

Activity Levels and Load Factors

Activity levels are defined as the hours of operation for a piece of equipment over a given time, and load factors are the engine performance demands, as a percent of maximum power. Equipment type and duration of each project component will be developed with assistance from construction engineers. Activity level will be determined by the estimated construction time in months relative to average 12-month activity for each type of equipment. Average load factors (i.e., percent of full throttle) obtained from the EPA NONROAD will be used to determine emission levels for each type of equipment. The emission factors will be based on the age distribution in the NONROAD model.

Equipment & Vehicle Emissions Factors

The construction-related emission inventories will be calculated using emission factors obtained from the EPA's NONROAD model and MOVES emission models.

Additionally, the construction emissions inventories for fugitive dust sources can be calculated using emission factors within EPA's AP-42 (*Compilation of Air Pollutant Emission Factors*), and other publications. Fugitive dust emissions can result from the following activities: grading, moving soil, and digging, loading/unloading of trucks, movement of trucks on unpaved surfaces, and wind erosion of stockpiles. A fugitive dust emission factor of 1.2 tons per acre disturbed per month during construction can be used, consistent with AP-42, assuming that 25 percent of the construction project area would be disturbed per construction month. $PM_{2.5}$ is assumed to be 10 percent of PM_{10}.[42] Erosion control measures and water programs are typically taken to minimize these fugitive dust and particulate emissions. A dust control efficiency of 75 percent due to daily watering and other measures can be estimated.

[42] WRAP Fugitive Dust Handbook, September 7, 2006.

Evaporative VOC emissions associated with the application of hot mix asphalt on areas requiring paving (e.g., roadways, parking lots, and taxiways) should be estimated using raw materials quantities, as well as an emission factor of 0.053 tons of VOC per acre of asphalt material laid, following methodology outlined by the National Association of Clean Air Agencies (NACAA).[43]

11. GENERAL CONFORMITY

As discussed previously in Section 2.4, the General Conformity Rule of the federal CAA prohibits federal agencies (including FAA) from permitting or funding projects or actions that do not conform to an applicable SIP. The principal aim of this requirement is to help ensure that the project/action does not:

- Cause or contribute to a new violation of a NAAQS;
- Increase the severity of an existing violation of an NAAQS; or
- Delay the timely attainment of an NAAQS.

As IWA is located in a CO attainment/maintenance area and nonattainment area for ozone and PM_{10} subject to a SIP, the project will be evaluated with respect to its conformity.

Following EPA and FAA guidance, the applicability of the General Conformity Rule will first be determined based upon the comparison of project-related emissions to the proper "*de-minimis*" thresholds. Both "direct" and "indirect" sources of emissions will be evaluated.

Should the net change in emissions be less than the *de-minimis* thresholds, the alternatives will be shown to conform and no further analysis will be necessary. If the outcome reveals a net increase(s) in emissions above the applicability thresholds, a formal General Conformity Determination will be conducted.

12 TRANSPORTATION CONFORMITY

Off-site roadway projects associated with the alternatives will also be evaluated under the Transportation Conformity Rule of the federal CAA. In addition to the FAA and PMGAA, this process may involve the FHWA, the ADOT, and the MCAQD.

In summary, the Transportation Conformity Rule requires that off-site roadway projects that are deemed "regionally significant" (i.e., arterials, freeways, etc.) be included in a conforming TIP.[44] In other words, the entire TIP (including the project-related roadway projects) must conform to the SIP (i.e., the individual roadway projects are not shown to conform to the SIP). Transportation Conformity also applies to transit-related projects, in which case the Federal Transit Administration is involved.

Only funded and approved projects are included in the TIP and evaluated for Transportation Conformity. If FAA is funding or approving any project affecting construction on a regionally significant roadway, the transportation conformity process will be complete prior to finalizing the environmental document. Any required transportation conformity analyses and

[43] EPA, Emission Inventory Improvement Program, Asphalt Paving, Chapter 17, Volume III, April 2001, http://www.epa.gov/ttn/chief/eiip/techreport/volume03/iii17_apr2001.pdf.

44 Off-site roadway projects include any project whose limits extend (entirely or partially) beyond airport layout boundary.

determinations in the future will be coordinated with the appropriate federal, state, and local agencies and any available outcomes would be fully disclosed in the EA.

REFERENCES

40 CFR Part 93, Subpart A, *Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs and Projects Developed, Funded or Approved Under Title 23 U.S.C or the Federal Transit Laws* (1998).

40 CFR Part 93, Subpart B, *Determining Conformity of General Federal Actions to State or Federal Implementation Plans* (1993).

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MAG, *2004 One-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area*, May 2004.

MAG, *2007 Eight-Hour Ozone Plan for the Maricopa County Area*, June 2007.

MAG, *Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area, February 2009.*

MAG, *Final Revised 8-hour Ozone Boundary Reconsideration, December 2011.*

MAG, *2012 Five Percent Plan for PM_{10} for the Maricopa County Nonattainment Area, May 2012.*

MAG, *2013 Carbon Monoxide Maintenance Plan for the Maricopa Area, March 2013.*

MAG, *Draft Conformity Analysis for the FY 2014-2018 Transportation Improvement Program and the 2035 Regional Transportation Plan*, October 2013.

WRAP, *Fugitive Dust Handbook*, September 7, 2006.

Appendix H.3

Agency Correspondence

U.S Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division

P.O. Box 92007
Los Angeles, CA 90009-2007

July 17, 2014

Mr. Michael Sundblom
Director
Pinal County Air Quality Control District
31 N. Pinal Street, Building F
Florence, AZ 85132

Subject: Air Quality Assessment Protocol for the Phoenix-Mesa Gateway Airport, Northeast Area Development Plan, Environmental Assessment

Dear Mr. Sundblom:

The Federal Aviation Administration (FAA) and the Phoenix-Mesa Gateway Airport Authority (PMGAA) are preparing an Environmental Assessment (EA) to evaluate the proposed Northeast Area Development Plan (NADP) at Phoenix-Mesa Gateway Airport (Airport) in Mesa, Arizona. The NADP includes development of a new passenger terminal and associated facilities at the Airport in order to accommodate the forecast number of enplaned passengers at an acceptable level of service. The FAA and the PMGAA have prepared the enclosed *Draft Final Air Quality Assessment Protocol* dated June 2014, to describe the overall technical approach for conducting the air quality analysis in the EA for the proposed NADP at the Airport. The FAA is requesting your review and concurrence regarding the proposed methodology in the document.

The enclosed protocol document is also being submitted to the U.S. Environmental Protection Agency, the Arizona Department of Environmental Quality, the Maricopa County Air Quality Department, and the Maricopa Association of Governments for their review and comment.

If you have any questions about the enclosed document, please contact me at (310) 725-3612 or by e-mail at pete.ciesla @faa.gov.

Sincerely,

Peter F. Ciesla

Peter F. Ciesla
Regional Environmental Protection Specialist

Enclosure

U.S Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division

P.O. Box 92007
Los Angeles, CA 90009-2007

July 17, 2014

Mr. Dennis Dickerson
Director
Maricopa County Air Quality Department
1001 North Central Avenue, Suite 125
Phoenix, AZ 85004

Subject: Air Quality Assessment Protocol for the Phoenix-Mesa Gateway Airport, Northeast Area Development Plan, Environmental Assessment

Dear Mr. Dickerson:

The Federal Aviation Administration (FAA) and the Phoenix-Mesa Gateway Airport Authority (PMGAA) are preparing an Environmental Assessment (EA) to evaluate the proposed Northeast Area Development Plan (NADP) at Phoenix-Mesa Gateway Airport (Airport) in Mesa, Arizona. The NADP includes development of a new passenger terminal and associated facilities at the Airport in order to accommodate the forecast number of enplaned passengers at an acceptable level of service. The FAA and the PMGAA have prepared the enclosed *Draft Final Air Quality Assessment Protocol* dated June 2014, to describe the overall technical approach for conducting the air quality analysis in the EA for the proposed NADP at the Airport. The FAA is requesting your review and concurrence regarding the proposed methodology in the document.

The enclosed protocol document is also being submitted to the U.S. Environmental Protection Agency, the Arizona Department of Environmental Quality, the Maricopa Association of Governments, and the Pinal County Air Quality Control District for their review and comment.

If you have any questions about the enclosed document, please contact me at (310) 725-3612 or by e-mail at pete.ciesla @faa.gov.

Sincerely,

Peter F. Ciesla

Peter F. Ciesla
Regional Environmental Protection Specialist

Enclosure

U.S Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division

P.O. Box 92007
Los Angeles, CA 90009-2007

July 17, 2014

Mr. Eric Massey
Air Quality Division Director
Arizona Dept. of Environmental Quality
1110 W. Washington Street
Phoenix, AZ 85007

Subject: Air Quality Assessment Protocol for the Phoenix-Mesa Gateway Airport, Northeast Area Development Plan, Environmental Assessment

Dear Mr. Massey:

The Federal Aviation Administration (FAA) and the Phoenix-Mesa Gateway Airport Authority (PMGAA) are preparing an Environmental Assessment (EA) to evaluate the proposed Northeast Area Development Plan (NADP) at Phoenix-Mesa Gateway Airport (Airport) in Mesa, Arizona. The NADP includes development of a new passenger terminal and associated facilities at the Airport in order to accommodate the forecast number of enplaned passengers at an acceptable level of service. The FAA and the PMGAA have prepared the enclosed Draft Final *Air Quality Assessment Protocol* dated June 2014, to describe the overall technical approach for conducting the air quality analysis in the EA for the proposed NADP at the Airport. The FAA is requesting your review and concurrence regarding the proposed methodology in the document.

The enclosed protocol document is also being submitted to the U.S. Environmental Protection Agency, the Maricopa County Air Quality Department, the Maricopa Association of Governments, and the Pinal County Air Quality Control District for their review and comment.

If you have any questions about the enclosed document, please contact me at (310) 725-3612 or by e-mail at pete.ciesla @faa.gov.

Sincerely,

Peter F. Ciesla
Regional Environmental Protection Specialist

Enclosure

U.S Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division

P.O. Box 92007
Los Angeles, CA 90009-2007

July 17, 2014

Ms. Deborrah Martinkovic
Division Manager, Planning and Analysis Division
Maricopa County Air Quality Department
1001 North Central Avenue, Suite 125
Phoenix, AZ 85004

Subject: Air Quality Assessment Protocol for the Phoenix-Mesa Gateway Airport, Northeast Area Development Plan, Environmental Assessment

Dear Ms. Martinkovic:

The Federal Aviation Administration (FAA) and the Phoenix-Mesa Gateway Airport Authority (PMGAA) are preparing an Environmental Assessment (EA) to evaluate the proposed Northeast Area Development Plan (NADP) at Phoenix-Mesa Gateway Airport (Airport) in Mesa, Arizona. The NADP includes development of a new passenger terminal and associated facilities at the Airport in order to accommodate the forecast number of enplaned passengers at an acceptable level of service. The FAA and the PMGAA have prepared the enclosed *Draft Final Air Quality Assessment Protocol* dated June 2014, to describe the overall technical approach for conducting the air quality analysis in the EA for the proposed NADP at the Airport. The FAA is requesting your review and concurrence regarding the proposed methodology in the document.

The enclosed protocol document is also being submitted to the U.S. Environmental Protection Agency, the Arizona Department of Environmental Quality, the Maricopa Association of Governments, and the Pinal County Air Quality Control District for their review and comment.

If you have any questions about the enclosed document, please contact me at (310) 725-3612 or by e-mail at pete.ciesla @faa.gov.

Sincerely,

Peter F. Ciesla

Peter F. Ciesla
Regional Environmental Protection Specialist

Enclosure

U.S Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division

P.O. Box 92007
Los Angeles, CA 90009-2007

July 17, 2014

Ms. Lindy Bauer
Environmental Director
Maricopa Association of Governments (MAG)
302 North First Avenue, Suite 200
Phoenix, AZ 85003

Subject: Air Quality Assessment Protocol for the Phoenix-Mesa Gateway Airport, Northeast Area Development Plan, Environmental Assessment

Dear Ms. Bauer:

The Federal Aviation Administration (FAA) and the Phoenix-Mesa Gateway Airport Authority (PMGAA) are preparing an Environmental Assessment (EA) to evaluate the proposed Northeast Area Development Plan (NADP) at Phoenix-Mesa Gateway Airport (Airport) in Mesa, Arizona. The NADP includes development of a new passenger terminal and associated facilities at the Airport in order to accommodate the forecast number of enplaned passengers at an acceptable level of service. The FAA and the PMGAA have prepared the enclosed *Draft Final Air Quality Assessment Protocol* dated June 2014, to describe the overall technical approach for conducting the air quality analysis in the EA for the proposed NADP at the Airport. The FAA is requesting your review and concurrence regarding the proposed methodology in the document.

The enclosed protocol document is also being submitted to the U.S. Environmental Protection Agency, the Arizona Department of Environmental Quality, the Maricopa County Air Quality Department, and the Pinal County Air Quality Control District for their review and comment.

If you have any questions about the enclosed document, please contact me at (310) 725-3612 or by e-mail at pete.ciesla @faa.gov.

Sincerely,

Peter F. Ciesla

Peter F. Ciesla
Regional Environmental Protection Specialist

Enclosure

U.S Department
of Transportation

**Federal Aviation
Administration**

Western-Pacific Region
Airports Division

P.O. Box 92007
Los Angeles, CA 90009-2007

July 17, 2014

Ms. Connell Dunning (CED-2)
Environmental Scientist
U. S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

Subject: Air Quality Assessment Protocol for the Phoenix-Mesa Gateway Airport, Northeast Area Development Plan, Environmental Assessment

Dear Ms. Dunning:

The Federal Aviation Administration (FAA) and the Phoenix-Mesa Gateway Airport Authority (PMGAA) are preparing an Environmental Assessment (EA) to evaluate the proposed Northeast Area Development Plan (NADP) at Phoenix-Mesa Gateway Airport (Airport) in Mesa, Arizona. The NADP includes development of a new passenger terminal and associated facilities at the Airport in order to accommodate the forecast number of enplaned passengers at an acceptable level of service. The FAA and the PMGAA have prepared the enclosed *Draft Final Air Quality Assessment Protocol* dated June 2014, to describe the overall technical approach for conducting the air quality analysis in the EA for the proposed NADP at the Airport. The FAA is requesting your review and concurrence regarding the proposed methodology in the document.

The enclosed protocol document is also being submitted to the Arizona Department of Environmental Quality, the Maricopa County Air Quality Department, the Maricopa Association of Governments, and the Pinal County Air Quality Control District for their review and comment.

If you have any questions about the enclosed document, please contact me at (310) 725-3612 or by e-mail at pete.ciesla @faa.gov.

Sincerely,

Peter F. Ciesla

Peter F. Ciesla
Regional Environmental Protection Specialist

Enclosure

Janice K. Brewer
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov

Henry R. Darwin
Director

August 7, 2014

Mr. Peter F. Ciesla
Regional Environmental Protection Specialist
U.S. Department of Transportation
Federal Aviation Administration
P.O. Box 92007
Los Angeles, CA 90009-2007

RE: Maricopa County: Air Quality Assessment Protocol for the Phoenix-Mesa Gateway Airport, Northeast Area Development Plan, Environmental Assessment

Dear Mr. Ciesla:

On July 22, ADEQ received your request for review and concurrence with your Air Quality Assessment Protocol for the Phoenix-Mesa Gateway Airport Northeast Area Development Plan.

On page 8 in Section 202, the first sentence is misleading regarding carbon monoxide (CO). This area is "currently designated attainment" for carbon monoxide and it is subject to a maintenance plan. The only exceptions in the first sentence should be ozone and particulate matter less than 10 microns in size (PM10).The first sentence in this paragraph is inconsistent with the second sentence in the same paragraph and with Table 2 on page 10. Please denote in Table 2 which version of the ozone and particulate matter standards the status reflects. For example, plans for both the 1997 and 2008 ozone standards apply to this area.

On page 9, the third sentence refers to the Marginal Nonattainment classification for the 2008 ozone standard but not pending nonattainment status for the *1997* ozone standard. EPA revoked the 1-hour ozone standard in 1997, although this area remains subject to the maintenance plan for this standard that EPA approved on June 14, 2005.

On page 13, please add that on March 26, 2014 EPA proposed that this area be redesignated to "attainment" for the *1997* ozone standard and also proposed approval of the ten-year maintenance plan submitted on May 21, 2012 [79 FR 16734]. That maintenance plan also contains applicable requirements.

On page 14, you explain that the *MAG 2012 Five Percent Plan for PM_{10} for the Maricopa County Nonattainment Area* was approved by EPA on May 30, 2014, but two sentences later it states "If/once final approval of the…Five Percent plan is made…" Please correct the sentence to state that since it has been approved it is also applicable for PM10 General Conformity analysis.

Please revise the information on page 18, including Table 6. EPA bases its designations of "attainment" and "nonattainment" areas on Design Values, not on the "highest recorded levels" at each monitor. The calculation method for the design value varies by pollutant. ADEQ's Air Quality Division Assessment Section has calculated the design values for each pollutant at the monitors nearest the airport. ADEQ is including an attachment that should replace Table 6. For further discussion on this topic, please contact Heather Colson, Unit Manager, at (602) 771-4488.

Please confirm in the protocol that the statewide average vehicle weight, silt loadings, and the $PM_{2.5}/PM_{10}$ ratio noted on page 25 are consistent with the *MAG 2012 Five Percent Plan for PM_{10} for the Maricopa County Nonattainment Area* approved by EPA on May 30, 2014.

Should you have further questions, please do not hesitate to call me at (602) 771-2375, or Lhamo LeMoine at (602) 771-2373.

Very truly yours,

Diane L. Arnst, Manager
Air Quality Legal Support Section

Enclosure

cc: Sherri Zendri, Administrative Counsel
Lhamo LeMoine, Administrative Secretary
File No. 328154

Air Monitoring Data in the IWA Area (2010-2012)

				YEAR			
Site Name	**Pollutant**	**Averaging Period**	**NAAQS**	**2010**	**2011**	**2012**	**Exceeds NAAQS**
310 S Brooks, Mesa	$PM_{2.5}$	Annual	15.0 $\mu g/m^3$	6.25	8.94	8.51	No
310 S Brooks, Mesa	$PM_{2.5}$	24 Hour (98 Percentile)	35 $\mu g/m^3$	11.8	20.4	23.3	No
310 S Brooks, Mesa	PM_{10}	24-Hour	150 $\mu g/m^3$	86	127	64	No
310 S Brooks, Mesa	CO	8-Hour	9 ppm	1.4	1.3	1.3	No
310 S Brooks, Mesa	CO	1-Hour	35 ppm	2.0	1.8	2.1	No
1645 E Roosevelt St. Central Phoenix Station	SO_2	24-Hour	0.14 ppm	5.3	3.5	3	No
1645 E Roosevelt St. Central Phoenix Station	SO_2	1-Hour	0.075 ppm	12.0	10.0	9.0	No
1645 E Roosevelt St. Central Phoenix Station	NO_2	Annual	0.053 ppm	18.8	19.8	21.2	No
1645 E Roosevelt St. Central Phoenix Station	NO_2	1-Hour (98 Percentile)	0.100 ppm	59.0	60.0	63.0	No
4530 E McKellips Road, Falcon Field Station, Mesa	O_3	8-Hour	0.075 ppm	0.070	0.070	0.069	No

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

Aug. 5, 2014

PM2.5 - Local Conditions (88101) Arizona Micrograms/cubic meter (LC) (105)

24-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	NUM CRED DAYS	1ST MAX	2ND MAX	3RD MAX	4TH MAX	98TH PERCENTILE VALUE	WTD ARITH MEAN	CERT and EVAL	EDT
04-013-1003	1	0643	Mesa	Maricopa	310 S BROOKS, MESA	2010	145	120	14.0	11.9	11.8	11.1	11.8	6.25		0
04-013-1003	1	0643	Mesa	Maricopa	310 S BROOKS, MESA	2011	145	119	102.3	20.7	20.4	18.0	20.4	8.94		5
04-013-1003	1	0643	Mesa	Maricopa	310 S BROOKS, MESA	2012	145	9	23.3	11.5	9.4	9.2	23.3	8.51*		0
04-013-1003	3	0643	Mesa	Maricopa	310 S BROOKS, MESA	2012	182	61	16.0	10.4	10.0	9.7	10.4	5.84*		0

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

Aug. 5, 2014

PM10 Total 0-10um STP (81102) | Arizona | Micrograms/cubic meter (25 C) (001)

24-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	#OBS	NUM REQ	VALID DAYS	%OBS	1ST MAX	2ND MAX	3RD MAX	4TH MAX	DAY MAX >STD	EST DAYS >STD	WTD ARITH MEAN	CERT and EVAL EDT
04-013-1003	1	0643	Mesa	Maricopa	310 S BROOKS, MESA	2010	064	58	61	58	95	86	39	37	31	0	0	17.4	0
04-013-1003	1	0643	Mesa	Maricopa	310 S BROOKS, MESA	2011	064	55	61	55	90	127	90	75	54	0	0	26.7*	0
04-013-1003	1	0643	Mesa	Maricopa	310 S BROOKS, MESA	2012	000	63	112	63	56	64	57	56	54	0	0	22.8*	0
04-013-1003	2	0643	Mesa	Maricopa	310 S BROOKS, MESA	2012	079	1455	366	61	17	63	57	56	54	0	0	31.5*	0

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

Aug. 5, 2014

Carbon monoxide (42101) — Arizona — Parts per million (007)

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	# OBS	1ST MAX 1-HR	2ND MAX 1-HR	OBS >1HR STD	1ST MAX 8-HR	2ND MAX 8-HR	OBS >8HR STD	CERT and EVAL	EDT
04-013-1003	1	0643	Mesa	Maricopa	310 S BROOKS, MESA	2010	093	4600	2.0	2.0	0	1.4	1.4	0		0
04-013-1003	1	0643	Mesa	Maricopa	310 S BROOKS, MESA	2011	093	4909	1.9	1.8	0	1.5	1.3	0		0
04-013-1003	1	0643	Mesa	Maricopa	310 S BROOKS, MESA	2012	093	2171	2.1	2.1	0	1.4	1.3	0		0

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

Aug. 5, 2014

Sulfur dioxide (42401) Arizona Parts per billion (008)

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	OBS	COMP QTRS	1ST MAX 1-HR	2ND MAX 1-HR	99TH PCTL 1-HR	1ST MAX 24-HR	2ND MAX 24-HR	Days >24HR STD	ARITH MEAN AN-STD	CERT and EVAL EDT
04-013-3002	4	0643	Phoenix	Maricopa	1645 E ROOSEVELT ST-CENTRAL PHOENIX STN	2010	100	8475	4	12.0	10.0	10.0	5.4	5.3	0	1.74	0
04-013-3002	4	0643	Phoenix	Maricopa	1645 E ROOSEVELT ST-CENTRAL PHOENIX STN	2011	100	8487	4	10.0	9.0	8.0	4.1	3.5	0	1.21	0
04-013-3002	4	0643	Phoenix	Maricopa	1645 E ROOSEVELT ST-CENTRAL PHOENIX STN	2012	100	8573	4	9.0	9.0	8.0	3.4	3.0	0	1.23	0

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

Aug. 5, 2014

Nitrogen dioxide (NO2) (42602) Arizona Parts per billion (008)

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	COMP QTRS	1ST MAX 1-HR	2ND MAX 1-HR	98TH PCTL	OBS	PCT COMP	ARITH MEAN	CERT and EVAL	EDT
04-013-3002	6	0643	Phoenix	Maricopa	1645 E ROOSEVELT ST-CENTRAL PHOENIX STN	2010	099	4	69.0	64.0	59.0	8435	96	18.82		0
04-013-3002	6	0643	Phoenix	Maricopa	1645 E ROOSEVELT ST-CENTRAL PHOENIX STN	2011	099	4	70.0	65.0	60.0	8427	96	19.82		0
04-013-3002	6	0643	Phoenix	Maricopa	1645 E ROOSEVELT ST-CENTRAL PHOENIX STN	2012	099	4	75.0	69.0	63.0	8493	97	21.16		0

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
PRELIMINARY DESIGN VALUE REPORT

Report Date: Aug. 5, 2014

Pollutant: Ozone(44201)
Standard Units: Parts per million(007)
NAAQS Standard: Ozone 8-Hour 2008
Statistic: Annual 4th Maximum **Level:** .075

Design Value Year: 2012
REPORT EXCLUDES MEASUREMENTS WITH REGIONALLY CONCURRED EVENT FLAGS.
State: Arizona

Site ID	Poc	STREET ADDRESS	2012 Valid Days	2012 Percent Complete	2012 4th Max	2012 Cert& Eval	2011 Valid Days	2011 Percent Complete	2011 4th Max	2011 Cert& Eval	2010 Valid Days	2010 Percent Complete	2010 4th Max	2010 Cert& Eval	3 - Year Percent Complete	3 - Year Design Value	D. V. Validity
04-013-1010	1	4530 E MCKELLIPS RD-FALCON FIELD STATION	213	100	.069		208	97	.070		214	100	.070		99	.069	Y

Notes: 1. Computed design values are a snapshot of the data at the time the report was run (may not be all data for year).
2. Some PM2.5 24-hour DVs for incomplete data that are marked invalid here may be marked valid in the Official report due to additional analysis.
3. Annual Values not meeting completeness criteria are marked with an asterisk ('*').

August 11, 2014

MAG Comments on the Air Quality Assessment Protocol for the Phoenix-Mesa Gateway Airport Northeast Area Development Plan Environmental Assessment

1. On page 5, under 2.1 Regulatory Agencies, revise the last two sentences in paragraph two to read "The Maricopa Association of Governments (MAG) is responsible for the preparation of the SIPs for the Maricopa nonattainment and maintenance areas. MAG is also responsible for preparing the Transportation Improvement Program (TIP), Regional Transportation Plan (RTP), and corresponding conformity analyses for all jurisdictions in Maricopa County, including the Phoenix urbanized area and the contiguous urbanized area in Pinal County, including the Town of Florence and City of Maricopa."

2. On page 8, Table 1, for the Arizona Department of Transportation, revise the Roles and Responsibilities to read "Involved in the approval of the Transportation Improvement Program (TIP) and Regional Transportation Plan (RTP)". For the Maricopa Association of Governments, revise the Roles and Responsibilities to read "MAG is the regional air quality planning agency and metropolitan planning organization for transportation for all jurisdictions in Maricopa County, including the Phoenix urbanized area and the contiguous urbanized area in Pinal County, including the Town of Florence and City of Maricopa."

3. On page 8, under 2.2 Attainment/Nonattainment Designations, revise the sentence to read "Maricopa County is currently designated by the EPA to be in attainment of all of the NAAQS, with the exception of eight-hour ozone (O_3), and particulate matter less than or equal to 10 microns in size (coarse or PM_{10})."

4. On page 9, in the second sentence of the first paragraph, add "or equal to" after "particulate matter less than".

5. On page 10, replace the Status footnote at the bottom of Table 2 with: "Maintenance areas are areas that were designated as nonattainment and have been re-designated to attainment by EPA". The source of this definition is the version of 40 CFR Section 93.152 updated on April 5, 2010. In the first sentence of section 2.3, change "SIP" to "SIPs". In the second sentence, change "maintenance plan" to "maintenance plans". Add "for the Maricopa County Nonattainment Area" to the titles of the "Revised MAG 1999 Serious Area Carbon Monoxide Plan" and the "Revised MAG 1999 Serious Area Particulate Plan for PM_{10}".

6. On page 11, under the second bullet for the MAG 2012 Five Percent Plan for PM_{10}, revise the last sentence to read: "Approved by EPA, effective July 10, 2014."

7. On page 14, replace the last sentence of the second paragraph with "On May 30, 2014, the EPA signed a final notice approving the MAG 2012 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area. On June 10, 2014, the final notice of approval was published in the Federal Register with an effective date of July 10, 2014." Also replace the third paragraph with "The Revised MAG 1999 Serious Area Particulate Plan for PM_{10} and

the MAG 2012 Five Percent Plan for PM_{10} are both applicable for PM_{10} General Conformity analyses."

8. On page 15, in Table 3 add "for the Maricopa County Nonattainment Area" to the Document Title of the "Revised MAG 1999 Serious Area Particulate Plan for PM_{10}".

9. On page 18, in the second sentence, replace "violations of the NAAQS", with "exceedances of the NAAQS". A "violation" of the NAAQS is defined as the fourth highest concentration over a three-year period, rather than the highest recorded level in a single year.

10. On page 18, Table 6, Air Monitoring Data in the IWA Area (2010-2012), revise the $PM_{2.5}$ annual monitoring data for 2012 from 5.8 to 8.5 micrograms per cubic meter. In addition, revise the Carbon Monoxide 8-hour monitoring data for 2011 from 1.3 to 1.5 ppm and for 2012 from 1.3 to 1.4 ppm.

11. On page 20, Table 7, Summary Matrix of Air Quality Impact Analyses, in the column for Applicable Regulations or Guidelines, EPA has published new transportation conformity guidance: Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas, November 2013.

12. On page 22, add the following sentence after the sentence that refers to 2025 as the planning horizon year: "EPA has proposed approval of the 2025 conformity budgets for VOC and NOx in the MAG 2009 Eight-Hour Ozone Maintenance Plan."

13. On page 24, at the end of the next to the last paragraph, replace "MCAG" with "MAG".

14. On page 25, in the second sentence of the second paragraph, insert "are calculated" between "Road dust emissions" and "for the following four classes of roads". In the last sentence of this paragraph, replace the $PM_{2.5}/PM_{10}$ ratio of 0.169 and 16.9 percent with 0.25 and 25 percent, respectively, and replace footnote #30 with: "Table 13.2.1-1 of EPA's AP-42 for Paved Roads, January 2011." We also recommend that you obtain average speeds for the regional network from MAG, rather than ADOT, and replace "ADOT and PMGAA" in the first sentence of the last paragraph on page 25 with "PMGAA and MAG."

15. On page 29, change the mixing height from 4,670 feet to 3,000 feet and refer to the following source in a new footnote: 40 CFR 93.153(c)(2)(xxii), April 5, 2010.

16. On page 30, in the last paragraph, add "PM_{10} and" before "$PM_{2.5}$" in the sentence referring to the five years of meteorological data. Before the sentence that refers to estimation of $PM_{2.5}$ concentrations for the annual and 24-hour period, add the sentence "PM_{10} concentrations will be estimated for the 24-hour period."

17. On page 35, in the next to the last paragraph, add "and RTP" after "TIP" in the first and second sentences.

18. On page 36, change the date of the 40 CFR 93, Subpart B reference from "1993" to "2010".

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

AUG 15 2014

Peter F. Ciesla
U.S. Department of Transportation
Federal Aviation Administration
Airports Division – Western-Pacific Region
PO BOX 92007
Los Angeles, CA 90009-2007

Subject: EPA Review of proposed Phoenix Airport Air Quality Assessment Protocol (June 2014 Version)

Dear Mr. Ciesla:

The U.S. Environmental Protection Agency (EPA) has reviewed the proposed Phoenix Airport Air Quality Assessment (Protocol) dated June 2014. We appreciate the opportunity to provide early feedback. Once the Draft Environmental Assessment or Draft Environmental Impact Statement (Draft EIS) is completed for this project, please send the document to our agency for review pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

Hazardous Air Pollutants

EPA commends Federal Aviation Administration AA on their intention to quantify total airport hazardous air pollutant emissions, broken down by pollutant and source category. The Protocol acknowledges that exposure to HAPs may potentially lead to adverse human health risks from both short-term (acute) and longer-term (chronic) exposures. As a reasonably foreseeable, potentially adverse impact, it is appropriate to include information on airport-related HAPs emissions to help determine whether or not the proposed action will have significant effects pursuant to the National Environmental Policy Act. However, the Protocol explicitly states (page 25) that the analysis is for disclosure purposes only and further evaluation of this information will not be performed:

> *"Given the inherent uncertainties and state of the science, the FAA's current policy is to compute emissions inventories of HAPs for NEPA disclosure purposes only. Toxicity ranking, dispersion analysis, or risk assessments are too speculative to be appropriate for incorporating into an EA. Therefore, the emissions-inventory approach described herein is only designed to disclose the types and amounts of HAPs associated with the alternatives that the EA will consider."*

FAA outlines this policy in its "Guidance For Quantifying Speciated Organic Gas Emissions From Airport Sources," dated September 2, 2009.

As noted in the CEQ Regulations (40 CFR Part 1502.1), analysis to comply with NEPA ".. is more than a disclosure document" and should be used "to plan actions and make decisions." While including information on HAP emissions in is an important first step in evaluating reasonably

foreseeable, adverse impacts from airport-related HAP emissions, this information, by itself, is not easily applied for purposes of either disclosure or decision-making in the absence of further analysis. For example, those making decisions about the project at FAA, as well as the general public, will not have sufficient information to evaluate whether a given emissions increase for a specific pollutant is significant. Furthermore, they will not be able to compare the importance of emissions for a specific pollutant, e.g., acetaldehyde, versus another pollutant, e.g., benzene, that may have drastically different relative toxicities.

Recommendations:

- FAA should toxicity-weight the emissions and sum the results by source category, similar to the procedure in Appendix I of the Chicago O'Hare Final EIS (http://www.faa.gov/airports/airport_development/omp/eis/feis/Media/Appendix%20I.pdf) and further described in EPA's Air Toxics Risk Assessment Library, Volume 3 (http://www2.epa.gov/sites/production/files/2013-08/documents/volume_3_communityassess.pdf).

- The total toxicity-weighted emissions should be reported for each alternative for the year prior to construction, the year with peak toxicity-weighted emissions, and the year of project completion.

- As a first indicator of significance, FAA should discuss whether total toxicity-weighted emissions will increase for each alternative compared to the toxicity-weighted emissions prior to construction and for the peak and build years for the no-build alternative.

- Furthermore, to inform air quality mitigation decisions, FAA should calculate the toxicity-weighted emissions benefits of proposed mitigation measures, including information separated by source category for each of the alternatives, in order to demonstrate the effectiveness of those measures.

EPA disagrees with FAA's statement that any ranking, dispersion analysis, or risk assessment would be too speculative for decision-making purposes. While we acknowledge that emissions information, toxicity information, and to a lesser extent dispersion modeling, are inherently uncertain, this information is nonetheless readily available and has been extensively, scientifically peer-reviewed. Also, in the case of dispersion modeling and toxicity information, EPA has itself used this information to inform and support regulatory actions. The Council on Environmental Quality (CEQ) NEPA Regulations (40 CFR Part 1502.22(b)(4)) state that, in the case of incomplete or unavailable information, an agency should include in the EIS "the agency's evaluation of [reasonably foreseeable significant adverse] impacts based upon theoretical approaches or research methods generally accepted in the scientific community." The dispersion model that FAA has proposed for use with criteria pollutants, AERMOD, is EPA's officially approved dispersion model for regulatory purposes and is appropriate for use in the dispersion analysis of HAPs. With respect to toxicity information, EPA maintains a database, called the Integrated Risk Information System (IRIS) of information on human health effects that may result from exposure to various chemicals in the environment. The information in IRIS has undergone extensive peer-review, both internally and externally, and represents a broad scientific consensus on the toxicity, with a characterization of the uncertainty, for each of the chemicals listed.

A more definitive approach to demonstrating significance, or insignificance, of changes in airport-related HAP emissions is to perform dispersion modeling and compare the predicted ambient concentrations to risk-based levels. In the absence of a human health risk assessment, it is still possible to provide an estimate of potential significance by assessing the proximity of high levels of toxicity-weighted emissions to potentially exposed populations for the majority of HAP concerns, which tend to have more localized, or "hotspot," impacts. For example, FAA could show that toxicity-weighted emissions that are in close proximity (meaning 300-1,000 feet, depending on the type of emissions) to potentially exposed populations will not increase. A dispersion modeling analysis would also be useful for informing future land-use decisions outside of the airport, even those outside of FAA's control.

Recommendations:

- FAA should use an approach similar to the dispersion modeling proposed for criteria pollutants (pages 28-30 of the Protocol) to assess potential HAPs hotspots in the area of the proposed airport expansion location, in the vicinity of existing residential receptors, and in the area of potential future residences.

- For purposes of disclosure, the information of potential HAP hotspots in residential areas should be communicated to local agencies with land-use authority, notifying them of potential HAP concerns in areas of future development.

It is not clear in the protocol if HAPs will be included in the inventory of construction emissions. Construction activities, especially emissions from diesel-fueled construction equipment, are well known sources of HAPs and may lead to significant acute and chronic impacts, even from short-duration activities. For potential cancer impacts, EPA's "Guidelines for Carcinogenic Risk Assessment" (1986) state that "the assumption is made that a high dose of a carcinogen received over a short period of time is equivalent to a corresponding low dose spread over a lifetime." Thus, shorter-term construction activities may still lead to adverse cancer outcomes if HAP emissions are high. With respect to potential non-cancer impacts, a useful source of information on acute, intermediate, and chronic effects are the Agency for Toxics Substances and Disease Registry (ATSDR) ToxFAQs (http://www.atsdr.cdc.gov/toxfaqs/index.asp) and toxicological profiles (http://www.atsdr.cdc.gov/toxprofiles/index.asp) and California's Office of Environmental Health Hazard Assessment (OEHHA, http://www.oehha.ca.gov/air/acute_rels/index.html).

Recommendations:

- FAA should discuss the potential for acute and chronic health impacts from construction-related HAP emissions.

- FAA should quantify construction-related emissions and include this information with the total toxicity-weighted emissions, especially with respect to a potential year of peak toxicity-weighted emissions, for each alternative.

- FAA should also quantify the toxicity-weighted emissions benefits of construction-related air quality mitigation measures.

Mitigation Measures

EPA recommends that the following be considered as the environmental impacts of the proposed project are being analyzed. Commitment to specific measures to reduce the impacts of the project should be acknowledged, to the extent feasible, in the assessment and disclosure of air quality impacts. This has heightened importance if such commitments are required to reduce the impacts of the project to less than significant to determine a Finding of No Significant Impact following the completion of an Environmental Assessment. The Air Quality Assessment Protocol should reflect how analysis of impacts and presentation of results would be affected if air quality reduction measures were included as project commitments.

Recommendations:
Evaluate the feasibility of the following measures to minimize emissions during operation and include a quantification of the reduction in impacts that will be achieved by adopting such measures:

- Expand electric and alternative fuel infrastructure facilities for ground support equipment and for ground access vehicles.

- Adopt and encourage incentive programs, including pricing structures, to reduce commute trips for airport and tenant employees.

- Establish specific, quantifiable goals to reduce emissions from ground support equipment and auxiliary power units (APU) and establish incentive programs to motivate airlines to minimize APU use, thus reducing fuel use and emissions. Provide specific incentives to airlines to replace older, more polluting APUs with newer, more fuel efficient APUs with electronic engine control units and integration of the APU and aircraft control systems.

- Identify specific, quantifiable targets to reduce emissions for any strategy that is adopted by FAA.

- Identify alternative fuel projects to reduce emissions from on-airport and off-airport sources and other methods.

Construction

EPA recommends considering the feasibility of incorporating the following measures to minimize emissions during construction. Given the need to reduce particulate matter impacts within the Phoenix area, FAA should highlight specific measures to be taken during construction and should include these measures in contract bid specifications. The Air Quality Assessment protocol should indicate that the EA or EIS will provide a range of possible air quality impacts based on adoption of specific construction mitigation measures. Include applicable measures in a Construction Emissions Mitigation Plan, as appropriate, in order to reduce impacts associated with emissions of PM10, diesel particulate matter (DPM), and air toxics from construction-related activities.

- Use particle traps and other appropriate controls to reduce emissions of DPM and other air pollutants.

- Minimize construction-related trips of workers and equipment, including trucks and heavy equipment and establish an activity schedule designed to minimize traffic congestion around the construction site.

- Lease or buy newer, cleaner equipment and utilize low sulfur fuel.

- Employ periodic, unscheduled inspections to ensure that construction equipment is properly maintained at all times, is tuned to manufacturer's specifications, and is not modified to increase horsepower, except in accord with established specifications.

- Identify a construction schedule to minimize cumulative impacts from multiple development and construction projects in the region, if feasible, to minimize cumulative impacts, and adopt appropriate construction dust control procedures.

- Locate construction equipment and staging zones away from sensitive receptors such as children and the elderly, as well as away from fresh air intakes to buildings and air conditioners and reduce idling.

Growth Related Impacts

The Air Quality Assessment Protocol should have a placeholder for assessing any growth-related impacts linked to adverse effects to air quality. For example, if the environmental analysis shows that construction of the project would induce vehicle traffic and/or affect the timing/location of planned growth in the area that would then cause an increase in vehicle travel, then associated impacts to air quality need to be disclosed. If this is already accounted for in the protocol, EPA recommends more clearly stating that analysis of growth-related air quality impacts will be analyzed, disclosed, and mitigated.

Additional Comments:

- On page 17, please provide a map with the location of the monitoring sites.
- On page 20, Table 8 – please add line describing AERMOD, the model to be used to conduct the atmospheric dispersion analysis. Also, MOVES2014 has been released and is now the official tool for estimating mobile source emissions. Please insure that contractor bid specifications indicate a need to use this version of MOVES for the analysis.

Thank you for the opportunity to review the Phoenix Airport Air Quality Assessment Protocol. If you have any questions concerning our comments on the Protocol, please contact me at 415-947-4161 or by electronic mail at dunning.connell@epa.gov.

Sincerely,

Connell Dunning

Connell Dunning, Transportation Team Supervisor
Environmental Review Section -

U.S Department
of Transportation

**Federal Aviation
Administration**

Western-Pacific Region
Airports Division

P.O. Box 92007
Los Angeles, CA 90009-2007

January 13, 2015

Ms. Connell Dunning (CED-2)
Transportation Team Supervisor
Environmental Review Section
U. S. Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, CA 94105

Subject: Air Quality Assessment Protocol for the Phoenix-Mesa Gateway Airport, Northeast Area Development Plan, Environmental Assessment

Dear Ms. Dunning:

Thank you for your August 15, 2014, letter providing review comments on the *Draft Final Air Quality Assessment Protocol* for the proposed Northeast Area Development Plan (NADP) Environmental Assessment (EA) at Phoenix-Mesa Gateway Airport (Airport) in Mesa, Arizona. The Federal Aviation Administration (FAA) and the Phoenix-Mesa Gateway Airport Authority are preparing the NADP EA for the proposed development of a new passenger terminal and associated facilities on the northeast side of the Airport. These new facilities would replace existing facilities on the west side of the Airport and allow for potential future growth on the northeast side of the Airport in accordance with local and regional plans. The Airport is located approximately 25 miles to the southeast of Phoenix Sky Harbor International Airport.

We have also reviewed your recommendations regarding the approach for conducting the air quality analysis for the proposed NADP. Some of these recommendations extend beyond our existing FAA policy in *Guidance for Quantifying Speciated Organic Gas Emissions from Airport Sources*, dated September 2, 2009. This is our current FAA policy document that establishes a uniform approach to document airport related emissions from organic gases (OG) and hazardous air pollutants (HAP). We will follow procedures in this FAA document for the NADP EA air quality assessment, thus the additional analysis for OG/HAPS noted in your recommendations is not included.

If you have any questions, you may contact me at (310) 725-3612.

Sincerely,

Peter F. Ciesla

Peter F. Ciesla
Regional Environmental Protection Specialist

Appendix I

Public and Agency Involvement

I.1 Scoping Meetings

I.2 April 2016 Public Information Meeting

Appendix I.1

Scoping Meetings

Phoenix-Mesa Gateway Airport

Northeast Area Development Plan Environmental Assessment Scoping Report

PREPARED FOR:

Phoenix-Mesa Gateway Airport Authority

PREPARED BY:

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IN ASSOCIATION WITH:

AMEC Environment & Infrastructure

C&S Companies

KB Environmental Sciences, Inc.

PSM^2

SWCA Environmental Consultants

October 2013

Draft

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1.1 Agency Scoping Meeting 1

1.2 Public Scoping Meeting 2

1.3 Scoping Comments Received 2

1. Scoping Meetings

Agency and public scoping meetings were conducted to disseminate information about the proposed Northeast Area Development Plan, the Environmental Assessment (EA) process, and identify concerns federal, state, and local agencies; Native American tribes; community groups; special interest groups; and the general public may have about the proposed project and EA process. This report contains the information provided to attendees of the scoping meetings, mailing lists, sign-in sheets, and comments received.

1.1 Agency Scoping Meeting

An agency scoping meeting was held on September 12, 2013 from 10:00 a.m. to approximately 11:00 a.m. at the Phoenix-Mesa Gateway Airport Authority's offices at Phoenix-Mesa Gateway Airport. Letters describing the project and inviting federal, state, and local agencies, as well as Native American tribes, were sent to 46 individuals. A copy of the scoping letter and mailing list is included in **Attachment 1**. Presentation boards describing the proposed project were displayed in the board room for review, and Airport and consultant staff were available to describe the project and answer questions. A presentation of the proposed project was also given.

Seven individuals (excluding Phoenix-Mesa Gateway Airport Authority [PMGAA] staff) representing five agencies or Native American tribes attended the agency scoping meeting. Representatives from the following organizations were present:

- Ak-Chin Indian Community
- Arizona State Land Department
- Arizona Game and Fish Department
- Flood Control District of Maricopa County
- Gila River Indian Community

A summary of the scoping meeting, along with a copy of the presentation materials and sign-in sheets are also included in Attachment 1.

1.2 Public Scoping Meeting

A public scoping meeting was held on September 12, 2013 from 5:00 p.m. to 8:00 p.m. at the Student Union – Cooley Ballroom at Arizona State University Polytechnic Campus. A public notice announcing the scoping meeting was published in the *Arizona Republic* on August 16, 2013. An email notice describing the project and inviting the public and interested parties was also sent directly to 123 individuals. A copy of the newspaper notice, email notice, and mailing list is included in **Attachment 2**. Presentation boards describing the proposed project and the EA process were displayed in the ballroom for review, and Airport and consultant staff were available to describe the project and answer questions.

Twenty-one (excluding PMGAA staff) members of the public or individuals representing a variety of organizations attended the public scoping meeting. Copies of the sign-in sheet, project Fact Sheet, and presentation boards are also provided in Attachment 2.

1.3 Scoping Comments Received

Scoping comments were solicited over a 46-day period, commencing on August 16, 2013 with publication of the public notice in the *Arizona Republic* and concluding on September 30, 2013. During this time, interested parties, responsible agencies, and the general public were encouraged to provide input on the purpose and need for the project, alternatives to be examined, and to identify any specific concerns that should be examined in the EA.

A total of 12 comment letters, comment forms, or emails were received during the scoping period (see **Attachment 3**). The commenters and their comments are summarized in **Table 1-1**.

Table 1-1 Summary of Scoping Comments Received

DATE	COMMENTER	SUMMARY OF COMMENT(S)
August 27, 2013	Wayne Miller, Federal Projects Unit, Waste Programs Division, Arizona Department of Environmental Quality	Requested clarification on the purpose of the scoping meeting and whether a Draft Environmental Assessment had already been prepared.
September 4, 2013	Leigh J. Kuwanwisiwma, Director, Hopi Cultural Preservation Office	Requested that copies of any cultural resources survey reports be provided to the Hopi Tribe for review if any prehistoric sites are identified that could potentially be adversely affected by the proposed project. Also requested that any proposed treatment plan be provided for review and comment. Also recommended that if any cultural features or deposits are encountered during project activities that all work be stopped in the immediate area until the State Historic Preservation Office (SHPO) is consulted and can evaluate the finds. Also stated that if any Native American human remains or funerary objects are discovered during construction, they must be reported by law.
September 6, 2013	Sallie Diebolt, Chief, Arizona Branch Regulatory Division, U.S. Army Corps of Engineers	Letter stated that a Corps of Engineers permit is required for the discharge of dredged or fill material into "water of the U.S." and adjacent wetlands pursuant to Section 404 of the Clean Water Act, the transportation of dredged or fill material by vessel or other vehicle for the purpose of dumping the material into ocean waters pursuant to Section 103 of the Marine Protection, Research and Sanctuaries Act, or any combination of the above.
September 11, 2013	Diane L. Arnst, Manager, Air Quality Legal Support Services, Arizona Department of Environmental Quality	Noted that the proposed project is located in a maintenance area for carbon monoxide (CO), a nonattainment area for particulate matter with a diameter of 10 microns (PM10), and a nonattainment area for 8-hour ozone (O3). Ms. Arnst noted that disturbance of particulate matter and possible asbestos may occur during construction. She noted that federal law requires a survey for the presence of asbestos prior to demolition or renovation activities. Commenter also requested that the range of estimated emissions for each criteria pollutant needs to be provided and compared to the de minimis levels in 40 CFR 93.153 to determine whether mitigation measures for air quality emissions would be required.
September 12, 2013	Larry Benallie, Tribal Historic Preservation Office, Gila River Indian Community	Requested that the EA preparers be respectful of Native American cultural resources and naming conventions. He requested that all sites should be referred to by site number instead of by colloquial names.
September 16, 2013	Peter Steere, Tribal Historic Preservation Officer, Tohono O'odham Nation	Requested copies of archaeological survey reports related to the proposed project.

Table 1-1 Summary of Scoping Comments Received (continued)

DATE	COMMENTER	SUMMARY OF COMMENT(S)
September 16, 2013	Kelly Wolff-Krauter, Habitat Program Manager, Region VI, Arizona Game and Fish Department	Comment letter stated that adjacent areas around the existing airport are of low to moderate value for wildlife consisting of mostly disturbed, creosote flats with minimal opportunity for connectivity of wildlife. Requested that the Department's guidelines on desert tortoise handling and burrowing owl guidance be reviewed as they are likely present in the area. Also requested that the Department's Environmental Review On-Line tool be utilized to obtain a special status species list and additional guidance specific to the type of project proposed for consideration during development of the environmental documentation. Also recommended that consideration be provided for the "Arizona's Species of Greatest Conservation Need", Arizona's State Wildlife Action Plan (SWAP), and the Department's HabiMap tool.
September 17, 2013	Andrew Smith, Senior Planner, Maricopa County Public Works	Stated that the Maricopa County Department of Transportation Systems Planning has no issues with the proposed project. Staff with the Environmental Planning department would like to review environmental documentation related to the project as it becomes available, and have identified that cultural resources and hazardous material may be located within the study area. Noted that any structures over 50 years old that would be impacted needs to be evaluated under the National Register of Historic Places criteria for historic significance. Also noted that other historic features may be affected and need to be evaluated by a professional historian Also noted that although hazardous materials at the site may have been previously investigated and remediated, the prior data should be carefully analyzed to prevent unanticipated discoveries during construction.
September 25, 2013	Rebecca Yedlin, Environmental Coordinator, Federal Highway Administration, Arizona Division	Requested that FHWA be kept updated on the project and that documents be submitted to them for review, as they are available.
September 26, 2013	Mike Hutchinson, Project Manager, East Valley Aviation & Aerospace Alliance	Supportive of the proposed Northeast Area Development Plan and the timely completion of the EA.
September 26, 2013	Roc Arnett, President/CEO, East Valley Partnership	Supportive of the proposed Northeast Area Development Plan and believe that economic growth and projected forecasts for the area support the need for the continued expansion of the airport.
September 30, 2013	Morgan Neville, Mesa Airport Growth Properties	Oppose potential location of Airport Surveillance Radar (ASR) and its associated critical area on land outside/adjacent to airport property and request that alternative locations for this facility on airport property be evaluated.

Attachment 1

Agency Scoping Meeting Materials

PHOENIX-MESA GATEWAY AIRPORT
5835 SOUTH SOSSAMAN ROAD
MESA, ARIZONA 85212-6014

PHONE (480) 988 7600
FAX (480) 988 2315

August 26, 2013

Mr. Luis Manuel, Jr.
Chairman
Ak-Chin Indian Community
42507 W. Peters & Nall Rd.
Maricopa, Arizona 85138

RE: Agency Scoping Meeting
Environmental Assessment for Phase I of the Northeast Area Development Plan
Phoenix-Mesa Gateway Airport

Dear Mr. Manuel,

The Phoenix-Mesa Gateway Airport Authority (PMGAA) has initiated on behalf of the Federal Aviation Administration (FAA) the preparation of an Environmental Assessment (EA) for the Northeast Area Development Plan (NADP) at Phoenix-Mesa Gateway Airport. Before the proposed NADP can be approved or determined eligible for FAA funding, an EA is required. In accordance with FAA regulations, the EA is being conducted in compliance with FAA guidance that implements the National Environmental Policy Act (NEPA) of 1969. An agency scoping meeting will be held on September 12, 2013 from 10:00 a.m. to 12:00 p.m. at PMGAA offices and a public scoping meeting will be held that evening from 5:00 to 8:00 p.m. at Arizona State University – Polytechnic Campus adjacent to the airport.

Phoenix-Mesa Gateway Airport (Airport) is a growing airport, located in the East Valley of the Phoenix Metropolitan Area, which has made the transition from a former military airfield to a commercial airport. Since commercial flights became regularly scheduled in 2007, the Airport has experienced significant growth in numbers of enplaned passengers and passenger airline aircraft operations. The PMGAA is undertaking the NADP, a phased development program, to incrementally expand airport capacity to match facility needs as commercial airline traffic and passengers increase. Phase I of the NADP is needed to accommodate the forecast number of passengers at the Airport at an acceptable level of service within the next 5 to 10 years. The proposed facilities would be located northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel, south of Ray Road and west of Ellsworth Road.

PURPOSE AND NEED FOR THE PROJECT

In 2008, the Airport's first full year of regularly scheduled commercial service, there were 150,000 enplanements. The passenger terminal building, located on the western portion of Airport property, had the effective use of 2 gates in 2008.[1] The PMGAA has since expanded the terminal building to 8 gates, and is currently adding an additional 2 gates that will open by the end of 2013, for a total of 10 gates in operation by 2014.

In calendar year 2012, the Airport served 744,000 enplanements (or nearly 1.5 million passengers). However, due to physical constraints, the current terminal will be unable to add any more gates after the 2 gate-

[1] Williams Gateway Airport Authority, *Airport Master Plan*, February 2009.

expansion is completed at the end of this year. Although the passenger terminal will be able to accommodate the Airport's current operations, the terminal will quickly reach capacity based on FAA's aviation demand forecasts indicating that the Airport will need to accommodate 1.5 million annual enplanements (3.0 million annual passengers) in the next 5 to 10 years.[2] To accommodate this level of passenger enplanements, the PMGAA has determined that a larger passenger terminal building must be constructed to accommodate future Airport needs. The purpose of the proposed Project is to provide the necessary terminal and support facilities for the anticipated increase in passenger traffic in the next 5 to 10 years at Phoenix-Mesa Gateway Airport, and to allow for future phased expansion to accommodate future passenger growth (beyond 10 years) at the Airport.

ALTERNATIVES

The alternatives which will be discussed in the EA are the expansion of the existing terminal, on- and off-Airport terminal alternatives, the Proposed Action, and the No Action Alternative. The PMGAA has determined that it is infeasible to expand the existing terminal any further. The PMGAA has identified a suitable on-Airport alternative site for a new aircraft passenger terminal that would accommodate the anticipated 5 to 10-year activity levels and also allow for future expansion if aviation demand continues to increase (see **Exhibit 1**).

The EA will document the methodology used to determine the alternatives to be considered as well as the screening process used to conclude which alternatives would feasibly satisfy the purpose of and need for the proposed Project. The selected range of reasonable alternatives along with the No Action Alternative will be examined and evaluated in the EA.

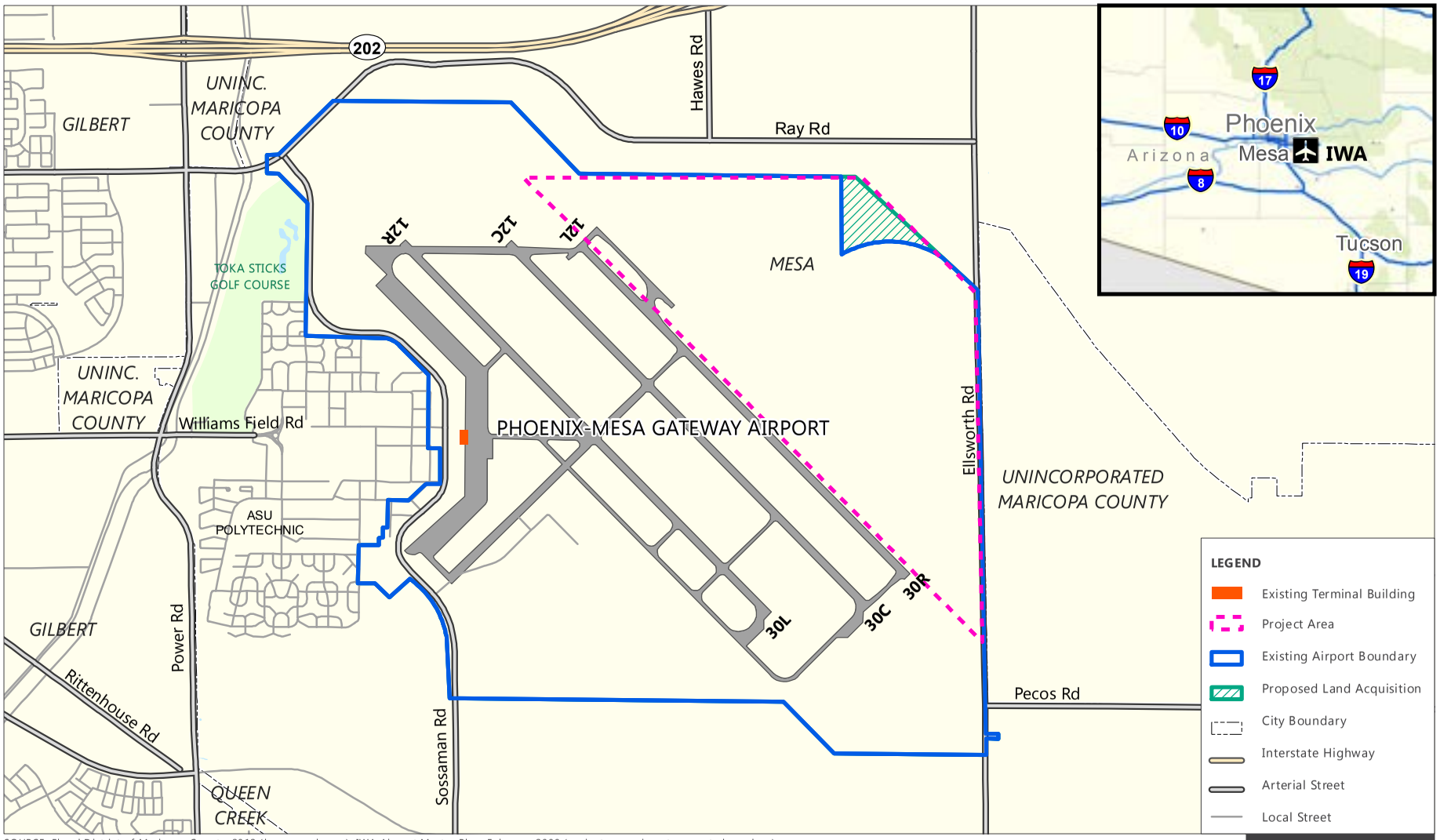
COMPONENTS OF THE PROPOSED ACTION

The proposed facilities, depicted on **Exhibit 2**, include:

- Terminal Building: 300,000 square foot building with 14 gates
- Access Roadways
- Passenger & employee parking, rental car facilities
- Airfield, taxiway, and taxilane improvements
- Infrastructure Improvements: relocated and expanded utilities, service roads, perimeter fencing
- Ancillary/Support Facilities including: Airport Traffic Control Tower (ATCT) and Aircraft Rescue and Firefighting Facility (ARFF)
- Land Acquisition: 30 acres in Airport's northeast area
- Site Preparation: Grading, demolition of existing buildings and structures
- Provisions for commercial development

[2] Federal Aviation Administration, APO Terminal Area Forecast Detail Report, January 2013.

[Preliminary Draft for Discussion Purposes Only]



SOURCE: Flood District of Maricopa County, 2012 (base map layers); IWA Airport Master Plan, February 2009 (project area, airport property boundary).
PREPARED BY: Ricondo & Associates, Inc., August 2013.

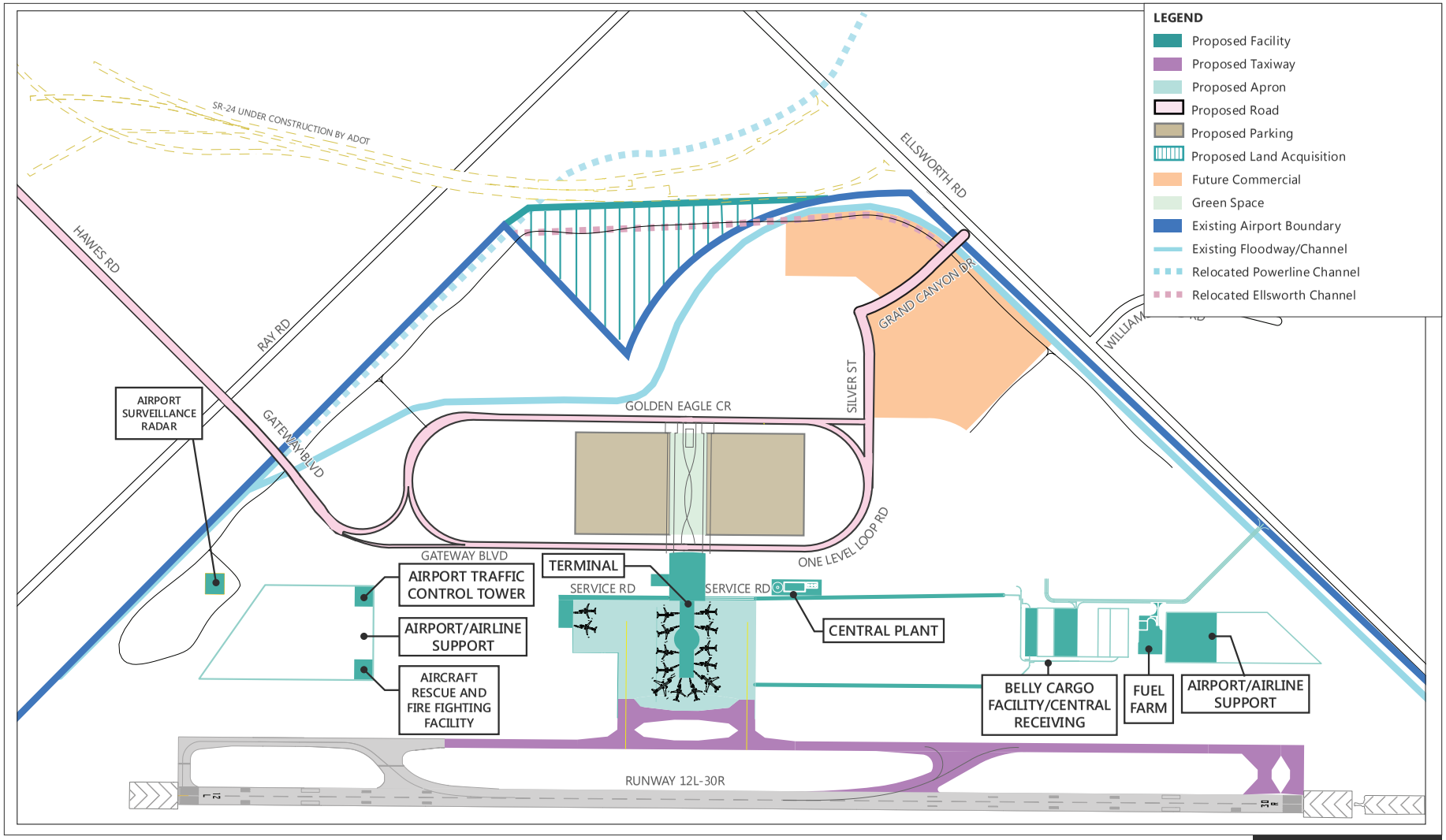
EXHIBIT 1

NORTH 0 3,000 ft.

G:\Projects\Phoenix\MXD\PMGAA NADP Project Location.mxd

Northeast Area Development Plan
Project Location

[Preliminary Draft for Discussion Purposes Only]



SOURCE: IWA Gateway 2030, June 2012.
PREPARED BY: Ricondo & Associates, Inc., August 2013.

EXHIBIT 2

NORTH 0 Not to Scale

Z:\PMGAA\Graphics\NADP EA\NADP EA Project Components - Titleblock-REV-USE-082113.indd

Northeast Area Development Plan
Project Components

POTENTIAL AREAS OF CONCERN

The potential environmental impacts of the proposed project will be analyzed and documented in the EA. Federal guidance for the environmental process encourages public involvement and identifies the analysis to be completed to determine the potential impacts in a number of environmental categories. Known potential environmental issues that will be assessed include:

- Aircraft overflight and resulting noise concerns
- Compatible land use
- Historic and archaeological resources
- Air and water quality
- Stormwater management, and
- Traffic impacts

EA PROCESS AND SCHEDULE

The PMGAA is in the process of developing the EA, and anticipates releasing the draft EA for agency and public review in summer 2014. The EA will document the project's purpose and need, the proposed action and alternatives to the proposed action, the affected environment, and environmental consequences. If you or someone in your organization has any specific concerns with the project, or recommend that a particular issue(s) should be addressed in the EA, we would appreciate written correspondence by September 30, 2013 to discuss your concerns. Please address all comments to:

Carmen Williams, C.M.
Planning, Design & Construction Manager
Phoenix-Mesa Gateway Airport Authority
5835 South Sossaman Road
Mesa, Arizona 85212-6014
Fax: (480) 988-2315
Email: EAComments@phxmesagateway.org

If you would like to attend the scoping meeting for the project, please RSVP to Alissa Rivera at (480) 988-7628 by September 10. The meeting will be held on September 12 from 10:00 a.m. to 12:00 p.m. at the following location:

Phoenix-Mesa Gateway Airport Authority
5835 South Sossaman Road
Mesa, Arizona 85212-6014

We look forward to working with you on this project!

Sincerely,
Phoenix-Mesa Gateway Airport Authority

Carmen Williams, C.M.
Planning, Design & Construction Manager

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State Parks
1300 W. Washington St.
Phoenix, Arizona 85007

Joe Joaquin
Cultural Resource Specialist
Tohono O'odhamNation
Cultural Affairs Office, P.O. Box 837
Sells, Arizona 85634

Peter Steer
Tribal Historic Preservation Officer
Tohono O'odhamNation
Cultural Affairs Office, P.O. Box 837
Sells, Arizona 85634

Ned Norris, Jr.
Chairman
Tohono O'odhamNation
P.O. Box 837
Sells, Arizona 85634

David L. McKay
U.S. Department of Agriculture, Natural Resources Conservation Service, Arizona State Office
230 N. First Ave., Suite 509
Phoenix, Arizona 85003-1733

Dr. Benjamin Tuggle
Regional Director
U.S. Fish and Wildlife Service, Region 2
Mailing Address: P.O. Box 1306, Albuquerque, New Mexico 87103-1306. FedEx/UPS Address: 500 Gold Avenue SW, Rm#
Albuquerque, New Mexico 87102

Alan Hansen
Team Leader
US Department of Transportation, Federal Highway Administration, Arizona Division, Planning, Environment, Air Quality, and Realty
4000 North Central Ave., Suite 1500, Phoenix, Arizona 85012-1906

Deborah Jordan
Director
US EPA Region 9, Air Quality Division
75 Hawthorne St.
San Francisco, California 94105

Sallie Diebolt
USACE- Los Angeles District, Arizona-Nevada Area Office
3636 N. Central Ave., Suite 900
Phoenix, Arizona 85012

Enrique Manzanilla
Director
USEPA- Region 9, Communities and Ecosystem Division
75 Hawthorne St.
San Francisco, California 94105

Phoenix-Mesa Gateway Airport
Public Agency Scoping Meeting
Thursday, September 12

SIGN-IN SHEET - PLEASE PRINT

Name	Organization	Address	Phone Number	E-Mail Address
Carmen Williams	PMGAA	5835 S. Sossaman	480 988 7705	cwilliams@phxmesa airport.org
Mike Jones	FCDMC	2801 W. Durango, Phoenix	602-506-4718	michael.jones@mail.maricopa.gov
Mary Soliz	AK-Chin Cultural Res. Dept	42507 W Peters & Nall, Maricopa AZ 85138	(520) 568-1337	msoliz@ak-chin.nsn.us

PhxMesa Gateway Airport

Phoenix-Mesa Gateway Airport
Public Agency Scoping Meeting
Thursday, September 12

SIGN-IN SHEET - PLEASE PRINT

Name	Organization	Address	Phone Number	E-Mail Address
LARRY BENALLIE	GRIC THPO		520-562-7153	LARRY.BENALLIE@GRIC.NSN.US
Michelle Green	ASLD		602-364-2502	mgreen@[illegible]azland.gov
Dennis Orr	Phx Mesa Gateway Airport	5835 S. Sossaman Rd	480-988-7617	dorr@phxmesagateway.org
Felicia Terry	FCDMC	2801 W. Durango Phx, AZ	602-506-8111	fet@mail.maricopa.gov
Jane Morris	PMGAA			
Caroline Antone	Ft. Chin Ind Comm		520-568-1372	CAntone@atchin.nsn.us
Kellyn Wolff-Krauter	AZGFD	7200 E. University Dr.	480-324-3550	kwolff-krauter@azgfd.gov

Phoenix-Mesa Gateway Airport
Northeast Area Development Plan Environmental Assessment
Agency Scoping Meeting
Thursday, September 12 – 10:00 AM

Committee Attendees	
Name	**Organization**
Mike Jones	Flood Control District of Maricopa County
Felicia Terry	Flood Control District of Maricopa County
Mary Soliz	Ak-Chin Cultural Res. Department
Larry Benallie	Gila River Indian Community
Michelle Green	Arizona State Land Department
Carline Antorce	Ak-Chin Indian Community
Kelly Wolff-Krauter	Arizona Game and Fish Department

Airport Staff	
Name	**Organization**
Jane Morris	Phoenix-Mesa Gateway Airport Authority
Carmen Williams	Phoenix-Mesa Gateway Airport Authority
Dennis Orr	Phoenix-Mesa Gateway Airport Authority

Consultant Staff	
Name	**Organization**
John Williams	Ricondo & Associates, Inc.
Stephen Culberson	Ricondo & Associates, Inc.
Kelly Phelps	PSM²
Michael Ratte	KB Environmental Sciences, Inc.
Serelle Laine	AMEC

I. Welcome – *Stephen Culberson, Ricondo & Associates Inc.*

II. Introductions of the Steering Committee

III. PowerPoint Presentation

IV. Open Discussion:

- **Comment** – *Felicia Terry, Flood Control District of Maricopa County:* In regards to Flood Control and the Power Line Floodway, when Ellsworth is moved, Power Line will be increased to contain that capacity. We have seen the drainage report which shows discharging the flow from the Airport site directly into the Power Line Floodway. The main purpose of the Power Line Floodway is to drain the dams located in Pinal County. With the added volumes there is a chance during larger storms that the Power Line Floodway would not be able to hold all the required stormwater flows.

- **Question** – *Mike Jones, Flood Control District of Maricopa County:* With the intended improvements the channel would need to be widened. Would that be included in this Environmental Assessment (EA)?

- **Response** – *Stephen Culberson, Ricondo & Associates Inc.*: This EA will include an evaluation of changes required to Power Line and Ellsworth channels.

- **Comment** – *Mike Jones, Flood Control District of Maricopa County:* If the project needs access to the channel the Flood Control District of Maricopa County will need to issue a permit. The contact for obtaining this permit is Shelby Brown and information can be found online.

- **Comment** – *Carmen Williams, Phoenix Mesa Gateway Airport*: The flood control concerns expressed by the Flood Control District of Maricopa County were addressed in the East Side Drainage Master Plan which Dibble Engineering was working on and the Flood Control District and the City of Mesa was consulted on.

- **Comment** – *Felicia Terry, Flood Control District of Maricopa County:* The Flood Control District has seen these concerns mentioned in the East Side Drainage Master Plan but wanted to ensure that the EA project team was also aware. With the extension of SR24, the Arizona Department of Transportation (ADOT) is planning on widening the Power Line Channel. Flood Control District suggests the EA project team coordinates with ADOT. What is the Phoenix Mesa Gateway Airport Northeast Area Development Plan timeframe?

- **Response** – *Stephen Culberson, Ricondo & Associates Inc.*: The first phase is anticipated to be completed by 2018.

- **Comment** – *Mike Jones, Flood Control District of Maricopa County:* On the east side of the SR24, parallel to the new extension the channel will be widened and will pick-up a lot of flow in that area This portion of the project has an unknown timeframe.

- **Comment** – *Felicia Terry, Flood Control District of Maricopa County:* This extension would be Phase 2 of SR 24 Project.

- **Question** – *Mike Jones, Flood Control District of Maricopa County:* Is there a work plan on the EA? Is the project requesting comment from the Flood Control District of Maricopa County on the work plan?

- **Response** – *Stephen Culberson, Ricondo & Associates Inc.*: If the Flood Control District of Maricopa County has specific concerns they want addressed in the EA, comments should be submitted in writing.

- **Response** – *Stephen Culberson, Ricondo & Associates Inc.*: The project team can send the Flood Control District of Maricopa County the EA work plan if needed.

- **Response** – *Felicia Terry, Flood Control District of Maricopa County:* The EA work plan is not needed.

V. Meeting Concluded

I. Submitted Comments

- **Comment** – *Larry Benelli, Gila River Indian Community*: Regarding the previous cultural sites in the project area, the sites were given "names" which is insensitive and offensive. Sites should be referred to by their site number and not a colloquial name. – Outer Limits, Rader, Will E. Coyote. (*Comment Captured after the Meeting by Serelle Laine, AMEC, 9-12-13)*

- **Comment –** *Peter Steere, Tohono O'odham Nation*: Requested copies of the archaeological surveys completed in the past and those which are in process once complete. Comments from the Tohono O'odham Nation will depend on their review of the archaeological reports. (*Comment emailed to Phoenix Mesa Gateway Airport, 9-13-13)*

Phoenix-Mesa Gateway Airport

Agency Scoping Meeting

Northeast Area Development Plan

Environmental Assessment

September 12, 2013

Agenda

- Purpose of Scoping Meeting
- Proposed Action
- Environmental Review Process
- Federal Actions
- Next Steps

National Environmental Policy Act (NEPA)

- Requires federal agencies to disclose a clear description of potential environmental effects resulting from proposed federal actions and reasonable alternatives to those actions
- Provides information to decision makers to determine whether a proposed project would cause significant adverse environmental impacts
- For the proposed Northeast Area Development Plan EA, the Federal Aviation Administration (FAA) must review the potential environmental effects of the proposed project before it can be approved

Purpose of Scoping Meeting

- Provides an opportunity for public and agency comment concerning the scope of issues to be addressed in the proposed Northeast Area Development Plan Environmental Assessment (EA)
- Identifies concerns with the purpose and need for the proposed project
- Identifies range of alternatives to be considered
- Identifies significant environmental issues to be addressed

Project History

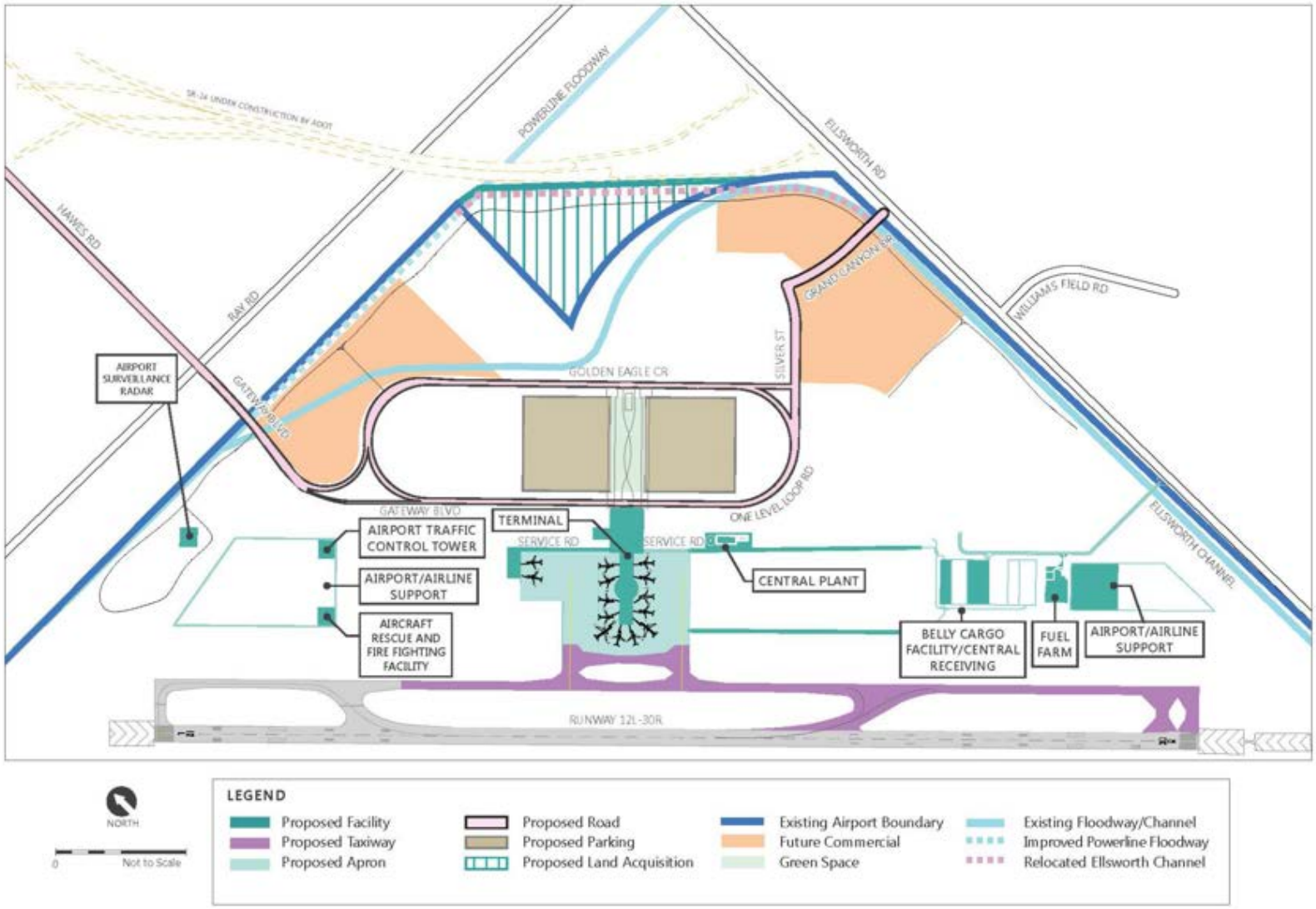
- Williams Air Force Base redeveloped as Williams Gateway Airport in March 1994
- Allegiant Airlines began passenger air service in October 2007
- Number of passengers increased from 320,000 in 2008 to 1.3 million in 2012
- Number of passengers is forecast to double to 2.6 million by 2018
- Phoenix-Mesa Gateway Airport Authority adopted Master Plan Update in 2009
- West Terminal Expansion began in 2010 (complete this year)
- *Northeast Area Development Plan* adopted in June 2012
- *Gateway 2030* examined phasing and feasibility of plan

Proposed Action

Specific project elements to be addressed in the EA:

- Terminal Building: 300,000 square foot building with 14 gates
- Access Roadways
- Passenger & employee parking, rental car facilities
- Airfield, taxiway, and taxilane improvements
- Infrastructure Improvements: relocated and expanded utilities, service roads, perimeter fencing
- Ancillary/Support Facilities including: Airport Traffic Control Tower (ATCT), Airport Surveillance Radar (ASR), and Aircraft Rescue and Firefighting Facility (ARFF)
- Land Acquisition: 30 acres northeast of existing Airport property
- Site Preparation: Grading, demolition of existing buildings and structures
- Provisions for commercial development

Proposed Action



Preliminary Purpose & Need

Purpose of the Project

- To accommodate the forecast increases in the numbers of passengers and passenger airline operations at the Airport at an adequate level of service

Need for the Project

- FAA Terminal Area Forecast projects that the number of passengers will nearly double over the next 6 years
  - 2012 744,000 enplanements (1.5 million total passengers)
  - 2018 1,297,645 enplanements (2.6 million total passengers)
- Existing Passenger Terminal is being expanded to its maximum capacity (10 gates), scheduled to be completed by the end of 2013
- 14 gates will be needed at the Airport to accommodate the projected number of passengers

Environmental Review Process

Alternatives Considered

- No Action
- Use of Other Airports
- Expand Existing Terminal
- Proposed Northeast Area Development Plan
- Relocation of Passenger Terminal to Other On-Airport Locations

Environmental Impact Categories

- Air Quality
- Compatible Land Use
- Construction Impacts
- Department of Transportation Act Section 4(f)
- Fish, Wildlife, and Plants
- Floodplains
- Hazardous Materials and Solid Waste
- Historical, Architectural, Archaeological, and Cultural Resources
- Light Emissions and Visual Impacts
- Natural Resources and Energy Supply
- Noise
- Secondary (Induced) Impacts
- Socioeconomic Impacts, Environmental Justice, Children's Health and Safety Risks
- Water Quality
- Wetlands
- Other Considerations

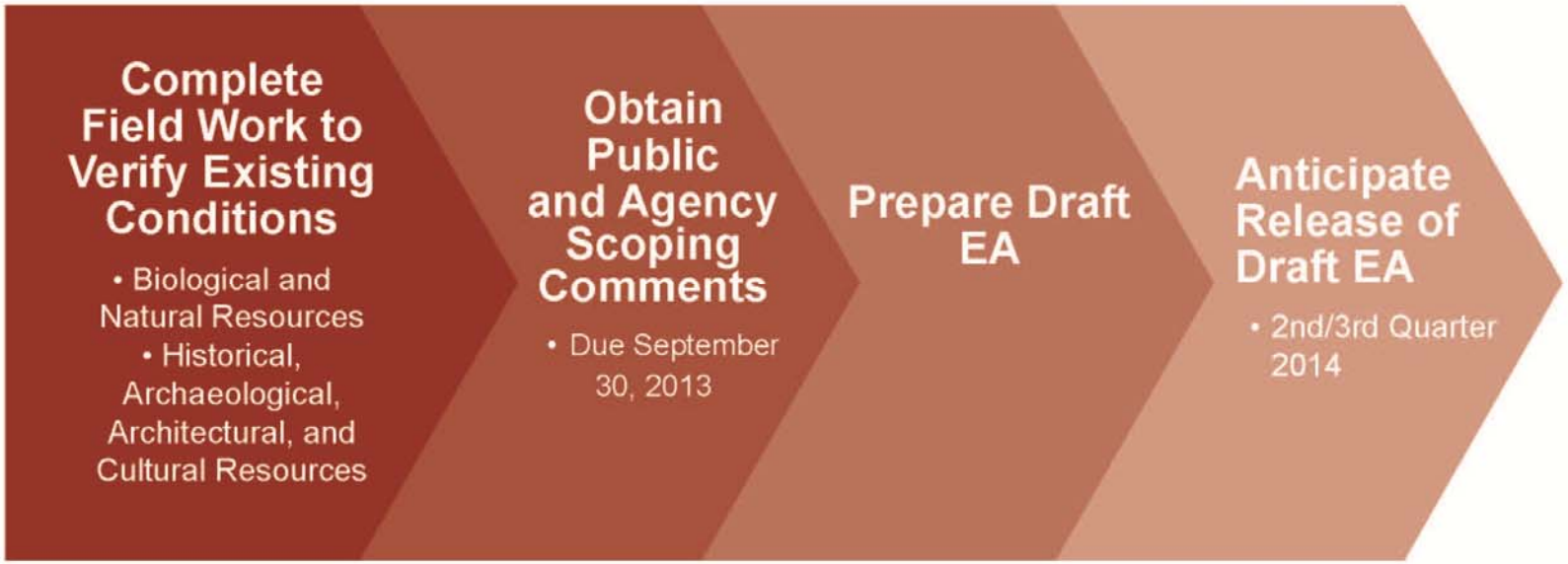
Known Resources/Potential Effects

- Air quality – nonattainment for ozone and particulate matter (PM_{10})
- Aircraft noise
- Biological resources
- Water resources
- Archaeological and cultural resources – existing Programmatic Agreement
- Historical resources
- Hazardous materials

Federal Actions

- Approval of Airport Layout Plan
- Determination of potential eligibility for Federal Assistance under the Federal Grant-in-aid program or passenger facility charges
- Installation, relocation, operation of navigations aids and FAA equipment
- Coordination with PMGAA to maintain aviation and airfield safety during construction

Next Steps


Complete Field Work to Verify Existing Conditions
• Biological and Natural Resources
• Historical, Archaeological, Architectural, and Cultural Resources
Obtain Public and Agency Scoping Comments
• Due September 30, 2013
Prepare Draft EA
Anticipate Release of Draft EA
• 2nd/3rd Quarter 2014

Agency and Public Comments

- Leave Written Comments in the Comment Box
- Submit Comments to:

  Phoenix-Mesa Gateway Airport Authority

  5835 South Sossaman Road

  Mesa, Arizona 85212-6014

  Email: EAComments@phxmesagateway.org
- Comments must be received by 5 p.m. MST, Monday, September 30, 2013

202
UNINC. MARICOPA COUNTY
GILBERT
Hawes Rd
Ray Rd
12R
12C
12L
Power Rd
Sossaman Rd
UNINC. MARICOPA COUNTY
PHOENIX-MESA GATEWAY AIRPORT
ASU POLYTECHNIC
Williams Field Rd
Ellsworth Rd
UNINC. MARICOPA COUNTY
30R
30C
30L
Pecos Rd
Ironwood Rd
Sossaman Rd
LEGEND
Existing Terminal Building
Existing Airport Boundary
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmap

Attachment 2

Public Scoping Meeting Materials

valley&state
Metro News: 602-444-NEWS metronews@arizonarepublic.com

State Rep. Thorpe apologizes for recent tweets

By Mary Jo Pitzl
The Republic | azcentral.com

A day after sparking accusations of racism, a state lawmaker on Thursday issued an apology to anyone he might have offended with tweets about Attorney General Eric Holder and President Barack Obama.

It's the latest apology to come from freshman state Rep. Bob Thorpe, R-Flagstaff, who has a track record of writing controversial e-mails and tweets that he later retracts, saying his electronic missives are misconstrued.

The latest flap prompted him to delete the offensive tweets and lock his Twitter account.

State Rep. Bob Thorpe's comments on Attorney General Eric Holder and President Barack Obama drew criticism.

The actions came after Democrats and a civil-rights activist denounced a tweet in which Thorpe commented on Holder's decision to drop mandatory minimum prison sentences for low-level, non-violent drug offenders.

Tweeting as @azrepbob thorpe, he said: "Why is Holder now Soft on Crime? Perhaps: blacks = 12%-13% US population, but make up 40.1% (2.1 million) of male inmates in jail or prison!"

Thorpe also called a rodeo clown at the Missouri State Fair who wore an Obama mask in the bull-riding ring "crowd pleasing," drawing more complaints.

House Minority Leader Chad Campbell, D-Phoenix, said he was dumbfounded at the racist tone of the messages.

He got into a Twitter exchange with Thorpe, tweeting: "w/ all due respect, that is offensive, ridiculous & exactly why the Tea Party needs to go."

The Rev. Jarrett Maupin, an African-American who advocates for civil rights, called the comments Thorpe's "teachable moment" and called on him to directly apologize to African-American leaders.

In a statement, Thorpe said his tweets were "poorly worded and did not reflect what I genuinely wanted to communicate about recent national news stories."

Thorpe did not return a phone call seeking to understand the intent of his tweets.

During the legislative session, he caused a commotion when he sent an e-mail message to all lawmakers inviting them to a session in the Arizona House where a representative of a bulletproof-vest vendor would be sizing people for vests. He later moved the event to a site away from the state Capitol.

Thorpe also sent an e-mail to supporters urging them to contact fellow Republicans who backed Medicaid expansion and try to discourage them from voting to expand the health-insurance program.

He later apologized for that e-mail, after state Rep. Kate Brophy McGee, R-Phoenix, said she received an obscene and threatening voice mail from a foe of Medicaid expansion.

Brewer is paid less than most governors, subordinates

By Emilie Eaton
Cronkite News Service

Besides having one of the lowest governor's salaries in the nation, Arizona Gov. Jan Brewer also makes less than almost all of the state's top administrative officials, according to a recent report.

Brewer's $95,000 annual salary was less than that of 44 other governors in 2013 and was topped by 37 Arizona administrators out of 44 included in an April survey by the Council of State Governments.

The top Arizona salaries in the report went to state officials who direct higher-education and commerce departments, each of whom made $300,000, the survey said.

But governors across the country consistently make less than the bureaucrats who reported to them, according to the data, which came as no surprise to experts.

"We don't pay our elected officials a lot. Period," said Ruth Jones, a professor at the School of Politics and Global Studies at Arizona State University.

The author of the survey said salary is not why governors run for the office.

"You don't want to be governor just to make a lot of money," said Audrey Wall, the managing editor for the Council of State Governments. "That's not what your goal is if you're running for that office."

Wall said there is no single reason why governors make such little money relative to administrators.

The recession played a big role. But although states "are on the road to recovery," Wall said governors' salaries will not rebound as quickly as those in the private sector.

"States have a tendency sometimes to move a little slower," she said.

Wall said many governors do not receive pay raises because citizens don't want to see their governors receiving huge CEO salaries.

"Governors are even more closely linked to the electorate, to the people," Wall said.

Among governors, Brewer made more than only those in Arkansas, Maine, Oregon, Colorado and Alabama in 2013.

Among top officials in her own state, Brewer's salary was higher than only the secretary of state, treasurer, attorney general and administrators in public-library development, employment services and education.

> *"You don't want to be governor just to make a lot of money."*
> **AUDREY WALL**
> Managing editor, Council of State Governments

A state administrator's pay in Arizona should not be compared with that of a comparable bureaucrat in another state, Wall said, because the structure of the state governments might be different.

The official overseeing border security in Arizona, for example, might have more responsibilities than an official with the same job in Nebraska. That could account for a difference in state administrators' pay, she said.

But Jones said the governor's salary should not be compared with state administrator salaries at all. They are two different jobs, she said: One is an elected office, and many of the others, like the administrator for higher education, are not.

Jones noted that Brewer receives other perks with her job. Governors get free transportation and probably don't have to pay for many meals, she said. The biggest perk is the power and influence that come with being governor.

Jones said she knows many people who say the state should not be giving more money to the governor. State voters and legislators are weary of raising the governor's pay, Jones said, adding that, "it's not good politics to raise your own pay."

Brewer's office did not return calls seeking comment on the report.

Wall said it is hard to predict if Brewer's pay will be raised anytime soon. A lot has to do with politics and whether or not it's an election year.

With or without a raise, Jones said the state is getting its money's worth from whomever is in the Governor's Office.

"It's a hard job. It's not an easy job," she said. "It isn't paid with what the job demands."

TOP SALARIES IN STATE GOVERNMENT

Salaries of some top officials in Arizona in 2013, according to a survey by the Council of State Governments. Job titles are those used by the council for its survey:

Commerce: $300,000.
Higher education: $300,000.
Social services: $173,250.
Welfare: $173,250.
Administration: $160,000.
Corrections: $160,000.
Fish and wildlife: $160,000.
Revenue: $145,000.
Budget: $140,000.
State police: $139,549.
Health: $136,000.
Environmental protection: $135,000.
Transportation: $130,000.
Highways: $128,700.
Parks and recreation: $122,200.
Mental health: $109,037.
Emergency management: $100,000.
Energy: $100,000
Solid-waste management: $96,510.
Governor: $95,000.
Attorney general: $90,000.
Education: $85,000.
Employment services: $77,970.
Public-library development: $70,048.
Secretary of state: $70,000.
Treasurer: $70,000.

NOTICE OF PUBLIC SCOPING MEETING
Phoenix-Mesa Gateway Airport
Environmental Assessment

PhxMesa Gateway Airport

The Phoenix-Mesa Gateway Airport Authority (PMGAA) will hold a public scoping meeting/information workshop on an Environmental Assessment (EA) of the proposed Northeast Area Development Plan at Phoenix-Mesa Gateway Airport.

Thursday, September 12, 2013
5:00 PM until 8:00 PM

Arizona State University Polytechnic Campus
Student Union– Cooley Ballroom
5999 S Backus Mall
Mesa, AZ 85213
Free parking will be provided adjacent to the Student Union in Lot 10.

PROPOSED ACTION: The PMGAA is undertaking the Northeast Area Development Plan, a phased development program, to incrementally expand airport capacity to match facility needs as commercial airline traffic and passengers increase. Phase I of the Gateway 2030 plan includes a new passenger terminal and associated facilities, which are needed to accommodate the forecast number of passengers at the Airport at an acceptable level of service within the next 5 to 10 years. The Proposed Action is to construct a passenger terminal and associated facilities located northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel.

PURPOSE OF PUBLIC SCOPING MEETING: The meeting will provide an opportunity for public comment concerning the Proposed Action, purpose and need for the Proposed Action, alternatives to the Proposed Action, and potential environmental effects of the Northeast Area Development Plan to be analyzed in the Draft EA. The scoping meeting will be held in an informal open house format. Representatives from the airport and study team will be available to talk with citizens about the environmental review. Graphics will be on display so citizens can review project details and attendees will have an opportunity to provide oral and written comments on the scope and content of the Draft EA.

ENVIRONMENTAL ASSESSMENT: The EA will be prepared in accordance with the National Environmental Policy Act (NEPA) to examine potential impact categories as required by Federal Aviation Administration Order 5050.4B. Once prepared, the Draft EA will be available for public and agency review and comment at the PMGAA website www.phxmesagateway.org.

SCOPING COMMENTS: Comments should be addressed to the Phoenix-Mesa Gateway Airport Authority. **The deadline for receiving written scoping comments is September 30, 2013.** Comments may be submitted by:

- Mail to the Authority offices at PMGAA, Administration Offices, 5835 South Sossaman Road, Mesa, AZ 85212 (these comments must be postmarked by Monday, September 30, 2013).
- Sending an e-mail to the Authority office at EAcomments@phxmesagateway.org. The Airport Authority will accept comments to this notice via e-mail received by 5:00 p.m. on Monday, September 30, 2013, if the comments: (i) contain less than 2,000 words; and (ii) the e-mail comments do not contain any attachments. Any comments or responses to this notice containing more than 2,000 words, or which are accompanied by any attachments, must be delivered in writing to the address specified above, or they will not be considered as a valid response to this notice.
- Delivery to the Authority offices at Phoenix-Mesa Gateway Airport or faxed to (480) 988-2315 by 5:00 p.m. on Monday, September 30, 2013.

AR-00080408913-01

CITY OF PHOENIX
YOUR VOTE IS YOUR VOICE ★ CITY OF PHOENIX ELECTIONS ★

AUGUST 2013 COUNCIL ELECTION

NOTICE OF AUTOMATIC ELECTION TABULATING EQUIPMENT AND PROGRAMS TESTING

Notice is hereby given that on Thursday, August 22, at 9 a.m. the Logic and Accuracy Test of the automatic tabulating equipment and programs that will be used for the August 2013 City of Phoenix Council Election will be conducted in accordance with applicable election laws of the City of Phoenix and State of Arizona.

This test will be conducted at 149 N. 4th Ave., 1st floor, Phoenix, Arizona.

CLOSE OF EARLY VOTING
VOTING AT VOTING CENTERS

The last day to vote early in the City of Phoenix Council Election is Friday, August 23. In this election, registered voters who reside in City Council Districts 2, 4, 6 and 8 will elect council members. There is no election for Council Districts 1, 3, 5 and 7 this year because the mayor and council members for these districts were elected to four-year terms in 2011, and there are no propositions on the ballot in this election. The deadline to register to vote in this election was Monday, July 29.

Early Voting by Mail
Voted early ballots for the City election must be mailed or delivered to the City Clerk Department so that they are **received** by 7 p.m. on Election Day (Tuesday, Aug. 27). If you return your ballot by mail, be sure to allow sufficient time for delivery by Election Day. Voters may also deliver their voted early ballots to early voting locations or to any city voting center on Saturday, Aug. 24, Monday, Aug. 26, or on Election Day, Tuesday, Aug. 27, before the polls close at 7 p.m.

Voters should take the time they need to consider the choices and mark their ballot. However, voters who complete their ballots early are encouraged to return the ballot as soon as it is voted. Returning voted ballots as early as possible provides more time for signature verification and processing so that final results are available sooner.

Early Voting Locations and Accessible Voting Equipment
Several early voting sites are available on Saturday, Aug. 10 and Saturday, Aug. 17 for voters to cast an early ballot or exchange a damaged or spoiled early ballot for the City election. Any voter may cast an early ballot at any of these locations. Accessible voting devices that allow voters with disabilities to vote independently also are available at these sites. The list of locations, along with the schedule, can be found in the Sample Ballot Pamphlet as well as on the Internet at **phoenix.gov/elections.**

Voting at the Polls
City Election: The City of Phoenix Council Election will be a Voting Center Election. Any City voter may vote in the City election in person at any of the 18 Voting Centers on Saturday, Aug. 24, Monday, Aug. 26, or Tuesday, Aug. 27. A list and map of the Voting Centers along with the hours of operation are available on the Web at **phoenix.gov/elections** and in the Sample Ballot Pamphlet sent to each registered voter household in late July. For additional assistance locating a voting center that is convenient, voters can call the Election Information Line listed below or use the voting center locator at phoenix.gov/elections. CITY VOTERS WHO DO NOT VOTE BY MAIL ARE ENCOURAGED TO VISIT ANY ONE OF THE 18 VOTING CENTERS ON SATURDAY, AUG. 24, MONDAY AUG. 26 OR TUESDAY, AUG. 27 TO VOTE IN THE COUNCIL ELECTION.

Voter Identification at Voting Centers
Each voter must show proof of identity at a voting center before receiving a ballot. Specific forms of photo or non-photo identification with the voter's name and address are required. The acceptable forms of identification are listed at phoenix.gov/elections and in the Sample Ballot Pamphlet.

Voters who do not present acceptable identification may vote a Provisional Ballot at a voting center, but may be required to present acceptable identification to an election official by 5 p.m. on the third business day after the election.

For more information about the election, please visit **phoenix.gov/elections** or call the City Clerk Department.

CITY CLERK DEPARTMENT
ELECTION INFORMATION
200 W. WASHINGTON ST., 15TH FLOOR, PHOENIX, AZ 85003
602-261-VOTE (8683)
TTY/602-534-2737

PHOENIX-MESA GATEWAY AIRPORT
5835 SOUTH SOSSAMAN ROAD
MESA, ARIZONA 85212-6014

PHONE (480) 988 7600
FAX (480) 988 2315

The Phoenix-Mesa Gateway Airport Authority (PMGAA) would like to invite you to the public scoping meeting/information workshop on the Environmental Assessment (EA) for the proposed Northeast Area Development Plan at Phoenix-Mesa Gateway Airport.

The meeting will be held on **Thursday, September 12, 2013 from 5:00 PM until 8:00 PM**. The meeting will be held at:

Arizona State University Polytechnic Campus
Student Union– Cooley Ballroom
5999 S Backus Mall
Mesa, AZ 85212
*Free parking will be provided adjacent to the Student Union in Lot 10.

The PMGAA is undertaking the Northeast Area Development Plan, a phased development program, to incrementally expand airport capacity to match facility needs as commercial airline traffic and passengers increase. Phase I of the Gateway 2030 plan includes a new passenger terminal and associated facilities, which are needed to accommodate the forecast number of passengers at the Airport at an acceptable level of service within the next 5 to 10 years. The Proposed Action is to construct a passenger terminal and associated facilities located northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel.

The meeting will provide an opportunity for public comment concerning the Proposed Action, purpose and need for the Proposed Action, alternatives to the Proposed Action, and potential environmental effects of the Northeast Area Development Plan to be analyzed in the Draft EA. The scoping meeting will be held in an informal open house format. Representatives from the airport and study team will be available to talk with participants about the environmental process. Graphics will be on display so participants can review project details and attendees will have an opportunity to provide oral and written comments on the scope and content of the Draft EA.

If you are unable to attend, you can still provide feedback on the Environmental Assessment process. Please send all comments before September 30, 2013 to PMGAA by:

- Mail to the Authority offices at PMGAA, Administration Offices, 5835 South Sossaman Road, Mesa, AZ 85212 (these comments must be postmarked by Monday, September 30, 2013).
- Sending an e-mail to the Authority office at EAcomments@phxmesagateway.org. The Airport Authority will accept comments to this notice via e-mail received by 5:00 p.m. on Monday, September 30, 2013, if the comments: (i) contain less than 2,000 words; and (ii) the e-mail comments do not contain any attachments. Any comments or responses to this notice containing more than 2,000 words, or which are accompanied by any attachments, must be delivered in writing to the address specified above, or they will not be considered as a valid response to this notice.
- Delivery to the Authority offices at Phoenix-Mesa Gateway Airport or faxed to (480) 988-2315 by 5:00 p.m. on Monday, September 30, 2013.

Interested Parties

Janavee Bricker
Adobe Club of Gold Canyon

Rodney Bragg
AECOM/ADOT SR802

Thayne Klingler
Manager, Airports
Allegiant Air

Larry Johnson
Apache Junction Chamber of Commerce

Mary Niemczyk
Aviation Chair & Associate Professor
ASU Faculty for Aviation

Susan Demmitt
Beus Gilbert, PLLC

Brent Moser
Land Broker
Cassidy Turley/BRE

Steve Wilcox
AECOM

Jeff Keating
Allegiant Air

Sara Lenn
Allegiant Air

Dr. Mitzi Montoya
Vice Provost and Dean
ASU College of Technology and Innovation

Michael Shirley
AZTEC Engineering

Alan Jackson
Manager
CMC Steel Arizona (Business in area)

Michael Sutton
Cassidy Turley/BRE

Gilbert Bracamonte
Century Link

Jean Killingsworth
Century Link

Chris Nielsen
Century Link

Paul Dixon
Cessna GM

Dr. Linda Lujan
President
CGC, Pecos Campus

George Hoffman
City Manager
City of Apache Junction

Janine Solly
ED Manager
City of Apache Junction

Brad Steinke
Director
City of Apache Junction, Development Services

Anthony Abalos
City of Mesa Police

Chris Brady
City Manager
City of Mesa

Daniel Cleavenger
City of Mesa

Beth Huning
City of Mesa

William J. Jabjiniak
Economic Development Director
City of Mesa

Scot Rigby
City of Mesa

Alan Sanderson
City of Mesa

Chris Scott
City of Mesa

Mark Venti
City of Mesa

Christine Zielonka
City of Mesa

John Wesley
Planning Director
City of Mesa

Lenny Hulme
City of Mesa Transportation

Scott Somers
Councilman
City of Mesa, District 6

Chris Andres
City of Phoenix Aviation

Tamie Fisher
City of Phoenix Aviation

Randy Payne
Project Manager
City of Phoenix Aviation, Planning & Environment

James Harris
Coffman Associates

Chuck Gray
District Director
Congressman Salmon's Office

Kent Dibble
Dibble Engineering

Ken Snyder
Dibble Engineering

Jill Hegardt
DMB

Dea McDonald
DMB

Sandra Kukla
DWL

Steve Rao
Executive Vice President
DWL

Eric Emmert
Consultant
East Valley Chambers of Commerce Alliance

Mike Hutchinson
Project Director, East Valley Aviation & Aerospace Alliance/Superstition Vistas
East Valley Partnership

Rick Merritt
Elliott Pollack

Jim Rounds
Elliott Pollack

Al Mittelstaedt
Aviation Program Director
EVIT

Kyler Erhard
FAA

Michael Fink
Environmental Protection Specialist
FAA

Mike Williams
FAA

Casey Giddens
Air Traffic Manager
Gateway Air Traffic - SerCo

Casey Denny
Gateway Airport

Carmen Williams
Gateway Airport

David White
Community Manager
Gila River Indian Community

Kathy Tilque
President
Gilbert Chamber of Commerce

Barry Broome
President and CEO
Greater Phoenix Economic Council

Candace S. Hughes
Interested Citizen/Freelance Writer
Interested Citizen

Spence Ballard
Jacobs Consultancy (LeighFisher)

Bill Cunningham
Jacobs

Michael Floyd
Jacobs

Patrizia Gonella
Jacobs

Shanthi Krishnan
Jacobs

Rick Leisner
Jacobs

Keith O'Connor
Jacobs

Steve Reeder
Kimley-Horn

Ryan Cochran
Kitchell

Gary Kim
Kitchell

Ken Grimm
La Casa Blanca of Apache Junction

Andrew Cohn
Levine

Sally Harrison
Mesa Chamber of Commerce

Keith Belden
Morrison Maierle

Jeff Cutler
Chief Operations Officer
My Brother's Office

John Gamero
Najafi

Michael Blenis
Paragon

Doug Dragoo
Paragon

Kelly Park
Park Properties

Sandie Smith
President and CEO
Pinal Partnership

Mayor Gail Barney
Vice Chair
PMGAA Board of Directors

Mayor John Lewis
Treasurer
PMGAA Board of Directors

Mayor Scott Smith
Director
PMGAA Board of Directors

Don & Donna Huisinga
Property Owner

Howard Morrisson
Property Owner

Morgan T. Neville
Park Corporation, Acquisition & Asset Management

Brian Howard
Parsons Brinckerhoff

Lt. Governor Stephen R. Lewis
Chair
PMGAA Board of Directors

Councilwoman Thelda Williams
Secretary
PMGAA Board of Directors

Mayor John L. Insalaco
Director
PMGAA Board of Directors

Jon Nielson
Partner
PRI Graphics

Dennis O'Neil
Property Owner

Marquis Scott
President
Queen Creek Chamber of Commerce

Jan Runyon
Activities Director
Road Haven Resort of Apache Junction

Brad Vokes
Senior Project Designer
Saemisch + Di Bella Architects

Tony Alvarado
Salt River Project

John Ballard
Salt River Project

Chris Banks
Salt River Project

Jason Baran
Salt River Project

Tania Barks
Salt River Project

Brian Bednar
Salt River Project

Kaye Bockmann
Salt River Project

Bob Maldonado
Salt River Project

Roland Reed
Salt River Project

Bob Roessel
Salt River Project

Bob Trzepkowski
Salt River Project

Randy Payne
Sky Harbor Airport

Gene Florez
Southwest Gas

Ed Hempelman
Southwest Gas

Alvin Scott
Southwest Gas

Brian Vivian
Owner
Thompson's Auto Repair and Towing

Linda Edwards
Planning Manager
Town of Gilbert

Norma Hernandez
Town of Queen Creek

Wayne Balmer
Planning Administrator
Town of Queen Creek, Planning Services

Hector Bezares
Security Manager
TSA

Marc Garcia
CEO
Visit Mesa

Michael Cronin
TerraWest Communities

Patrick Banger
City Manager
Town of Gilbert

Doreen Cott
Economic Development Director
Town of Queen Creek

John Kross
City Manager
Town of Queen Creek

Sarah Hancotte
Branch Manager
TruWest Credit Union, Arizona District

Rex Ginder
Staff
UND Aerospace University

Phoenix-Mesa Gateway Airport
Public Scoping Meeting
Thursday, September 12

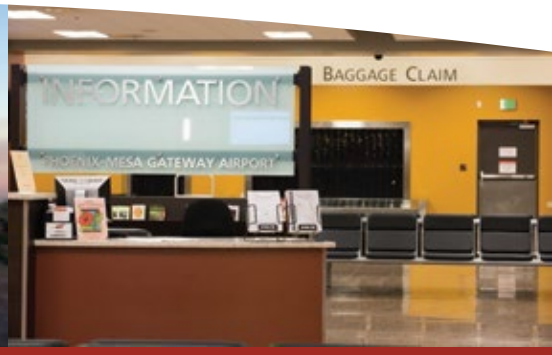
SIGN-IN SHEET - PLEASE PRINT

Name	Representing (if applicable)	Address	Phone Number	E-Mail Address
PATRICK OAKLEY	PMGAA	5835 S. SOSSAMAN RD	480-988-7637	poakley@phxmesagateway.org
Dennis Orr	PMGAA	5835 S. Sossaman RD	480-988-7612	dorr@phxmesagateway.org
Carmen Williams	PMGAA	"	480 9887705	cwilliams@phxmesagateway.org
Chuck Gray	Congressman Salmon	Gilbert OFC	480 699 8239	Chuck.Gray@mail.house.gov
Doug Jensen	SEZF	19870 E VIA DEL PALO	480-627-4721	DJENSEN8021@GMAIL
CASEY DENNY	PMGAA	5835 S. Sossaman Rd	480-988-7608	CDENNY@PHXMESAGATEWAY.ORG
Chris Banks	SRP	1521 N Project Drive	602-236-8175	chris.banks@srpnet.com
MATT NELSON	PMGAA	5803 S SOSSAMAN RD	4809887707	mnelson@phxmesagateway
FRED KAPLAN	PMGAA	5835 S. Sossaman Rd	480-988-7615	fkaplan@phxmesagateway.org
Scott Rigby	CITY OF MESA	20 E. MAIN	489-644-5176	SCOTT.RIGBY@MESAAZ.GOV
Eric Sexton	PMGAA	5835 S. Sossaman Road	480-988-7618	esexton@phxmesagateway.org
Bob Draper	City of Mesa	20 E. Main	4886443822	bob.draper@MESAAZ.gov
Ron Cemett	EVIP	535 W. BASELINE RD #107 MESA	602 9753442	RARKETT@EVIP-AZ.ORG

Phoenix-Mesa Gateway Airport
Public Scoping Meeting
Thursday, September 12

SIGN-IN SHEET - PLEASE PRINT

Name	Representing (if applicable)	Address	Phone Number	E-Mail Address
Sarah Hancock		4149 E San Angelo Ave	602-763-3023	Shancock@truwestern
Bradley Kendrex	CEGC	20210 E Pecos Rd. 85225	480-730-7379	bradley.kendrex@cgc.edu
GARY FERRARA		19865 E. Via del Rio	602-617-8791	KATZCA@yahoo.com
Sandra Kukla		2333 N. Central Phx 85004	602.261.9731	kukla@dwlarchitects.com
CHUCK TRAPANI	MESA PD	130 N. ROBSON MESA, AZ 85201	480-644-3667	CHARLES.TRAPANI@MESAAZ.GOV
Tanna Fitzpatrick	Gila River Indian Community	PO Box 97, Sacaton AZ 85147	520 562-9760	tanna.fitzpatrick@gric.nsn.us
CASEY GIDDENS	IWA TOWER		480-988-7678	CASEY.GIDDENS@SERCO-NA.com
TREVOR HANSEN		4255 S ANTONIO 85212		trevor.j.hansen@gmail.com
Otto Shill	Mesa Chamber of Commerce		480-464-1111	oshill@jacksonwhite.com
Peter Knudsen	Dibble Engineering	7500 N. Dreamy Draw Dr	602 957-1155	Peter.Knudsen@dibblecorp.com
Ryan Bailey	Irontree Construction	4723 E. Ingram St. Mesa, AZ 85205	480-969-9966	ryan@irontree.net
Ron Blegen	Golder Associates	1430 W. Broadway Rd Tempe AZ	480-966-0153	rblegen@golder.com
Ken Snyder	Dibble Engineering	7500 N. Dreamy Draw Dr.	602 957 1155	Ken.Snyder@dibblecorp.com
MORGAN NEVILLE	PARK CORP/MESA Airport Authority		480 586 4300	MNeville@parkcorp.com
Tony Bianchi		2266 E Egret Ct Gilbert	480-298-5267	tcbianchi@cox.net



PHOENIX-MESA GATEWAY AIRPORT
Environmental Assessment for Northeast Area Development Plan

The Phoenix-Mesa Gateway Airport Authority (PMGAA) has initiated on behalf of the Federal Aviation Administration (FAA) the preparation of an Environmental Assessment (EA) for the Northeast Area Development Plan (NADP) at Phoenix-Mesa Gateway Airport.

The PMGAA is undertaking the NADP, a phased development program, to incrementally expand airport capacity to match facility needs as commercial airline traffic and passengers increase. Phase I of the NADP is needed to accommodate the forecast number of passengers at the Airport at an acceptable level of service within the next 5 to 10 years.

The proposed facilities would be located northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel, south of Ray Road and west of Ellsworth Road.

WHAT IS AN ENVIRONMENTAL ASSESSMENT?

Before the proposed NADP can be approved or determined eligible for FAA funding, an EA is required. In accordance with FAA regulations, the EA is being conducted in compliance with FAA guidance that implements the National Environmental Policy Act (NEPA) of 1969.

Federal guidance for the environmental process encourages public involvement and identifies the analysis to be completed to determine the potential impacts in a number of environmental categories. Some of the categories with local concerns include: aircraft overflight and resulting noise concerns, compatible land use, historic and archaeological resources, air and water quality, stormwater management, and traffic impacts.

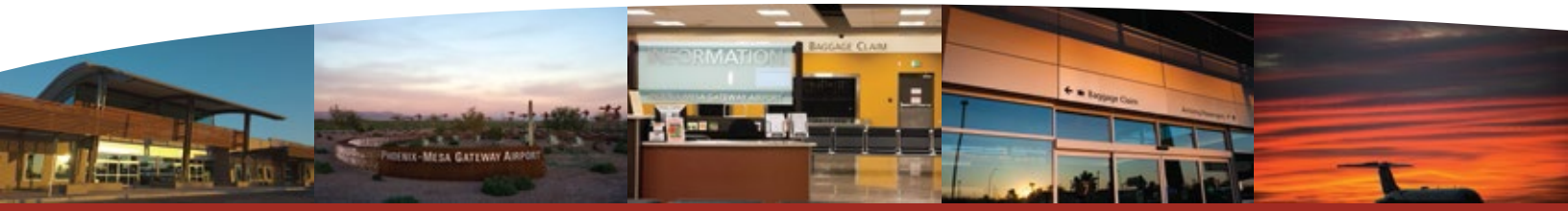
Alternatives evaluated during the NADP process as well as other viable alternatives for the passenger terminal development will be evaluated in the EA. Where actions are found to have environmental consequences, mitigation measures will be identified and considered by the FAA.

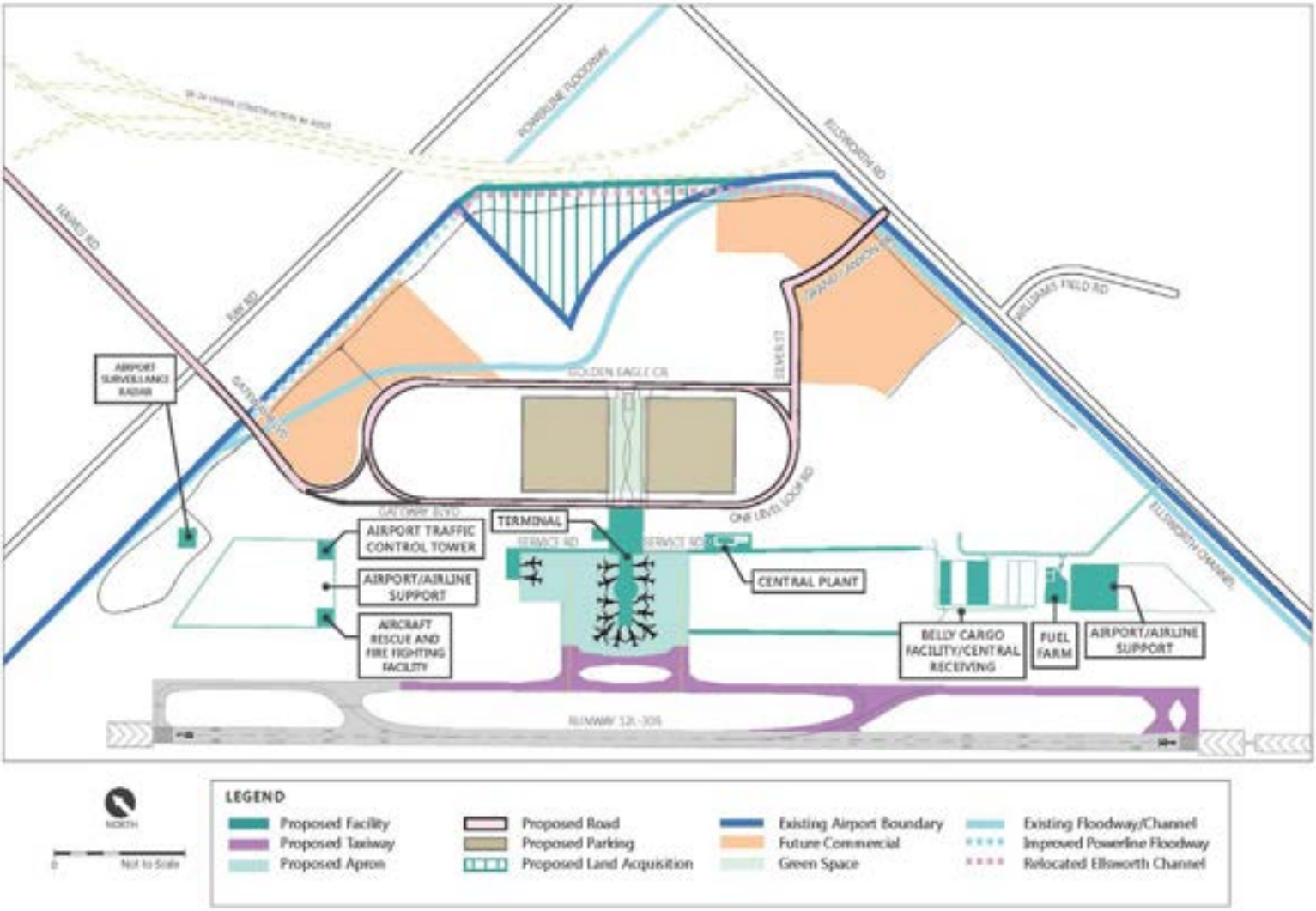
PUBLIC INVOLVEMENT

- Scoping meetings will be held on September 12 to inform the public about the project and EA process and gain input on issues and concerns to be addressed in the EA.
- The public scoping meeting will include a public information workshop from 5:00 p.m. to 8:00 p.m. at Arizona State University - Polytechnic Campus. Comments are due by 5:00 p.m. on September 30, 2013.
- An additional public meeting/workshop will be held after release of the Draft EA anticipated in summer 2014.
- Project progress will be posted on the Airport's website (http://www.phxmesagateway.org).
- PMGAA staff contact:
  Carmen Williams
  Phone: 480.988.7600
  Email: EAComments@phxmesagateway.org

THE ENVIRONMENTAL ASSESSMENT (EA) PROCESS

Decision to Prepare an EA → **Scoping Meetings / Public Information Workshop** → Refinement of Work Plan as needed → Prepare Draft EA → Distribute Draft EA to Agencies and Public → **Public Meeting / Information Workshop** → Review and Revise Document → Prepare and Publish Final EA → FAA Finding Issued





COMPONENTS OF THE PROPOSED PROJECT

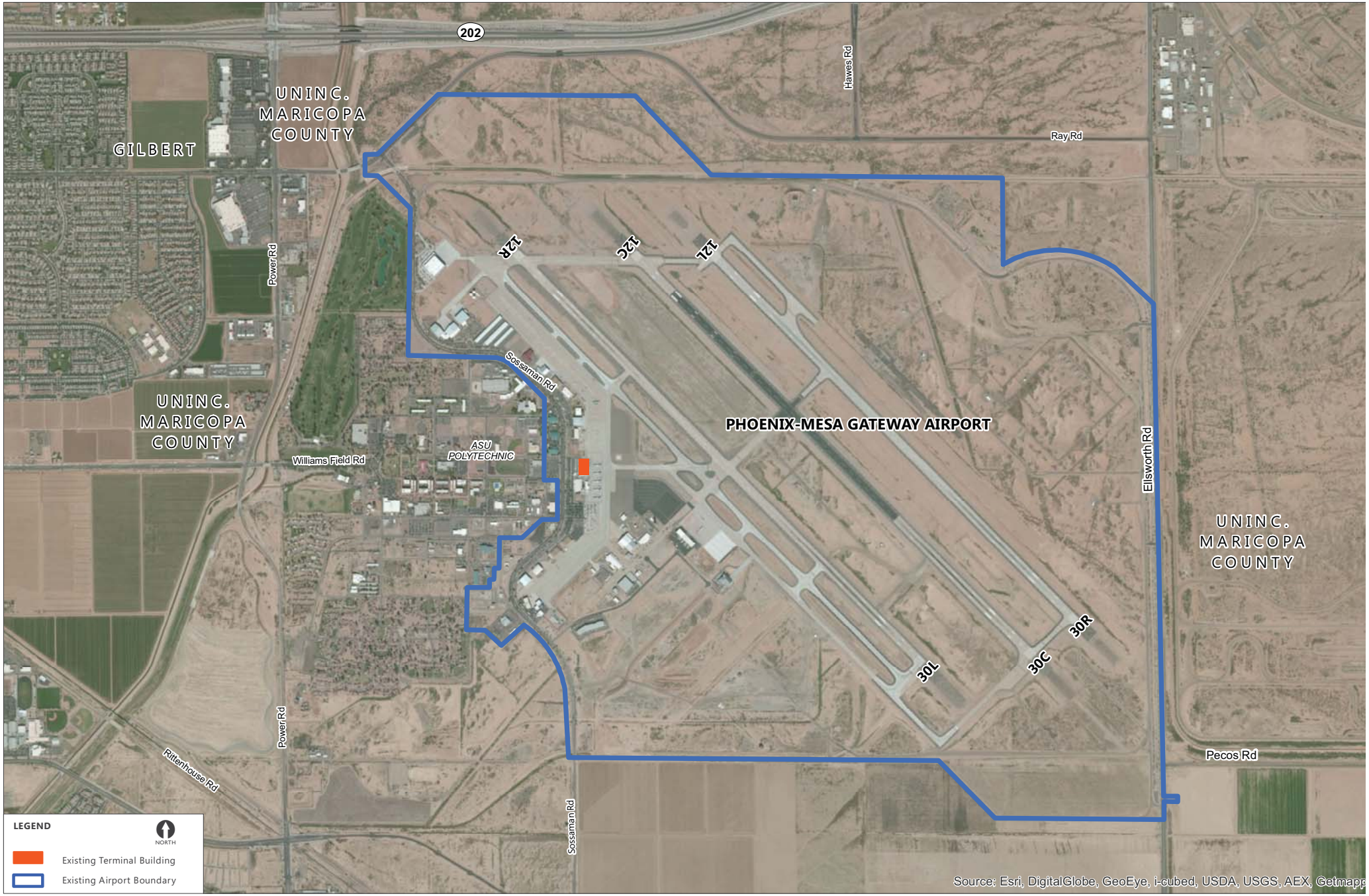
- Terminal Building: 300,000 square foot building with 14 gates
- Access Roadways
- Passenger & employee parking, rental car facilities
- Airfield, taxiway, and taxilane improvements
- Infrastructure Improvements: relocated and expanded utilities, service roads, perimeter fencing
- Ancillary/Support Facilities including: Airport Traffic Control Tower (ATCT) and Aircraft Rescue and Firefighting Facility (ARFF)
- Land Acquisition: 30 acres in Airport's northeast area
- Site Preparation: Grading, demolition of existing buildings and structures
- Provisions for commercial development

PhxMesa Gateway Airport

Phoenix-Mesa Gateway Airport

Public Scoping Meeting
Northeast Area Development Plan
Environmental Assessment

September 12, 2013


202
UNINC.
MARICOPA
COUNTY
GILBERT
Hawes Rd
Ray Rd
12R
12C
12L
Power Rd
Sossaman Rd
UNINC.
MARICOPA
COUNTY
PHOENIX-MESA GATEWAY AIRPORT
ASU
POLYTECHNIC
Williams Field Rd
Ellsworth Rd
UNINC.
MARICOPA
COUNTY
30R
30C
30L
Pecos Rd
Power Rd
Rittenhouse Rd
Sossaman Rd
LEGEND
NORTH
Existing Terminal Building
Existing Airport Boundary
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapp

What is a Scoping Meeting?

PhxMesa Gateway Airport

- A scoping meeting provides an opportunity for public and agency comment concerning the scope of issues to be addressed in the proposed Northeast Area Development Plan Environmental Assessment (EA)
- Identifies concerns with the purpose and need for the proposed project
- Identifies the range of alternatives to be considered
- Identifies significant environmental issues to be addressed

National Environmental Policy Act (NEPA)

PhxMesa Gateway Airport

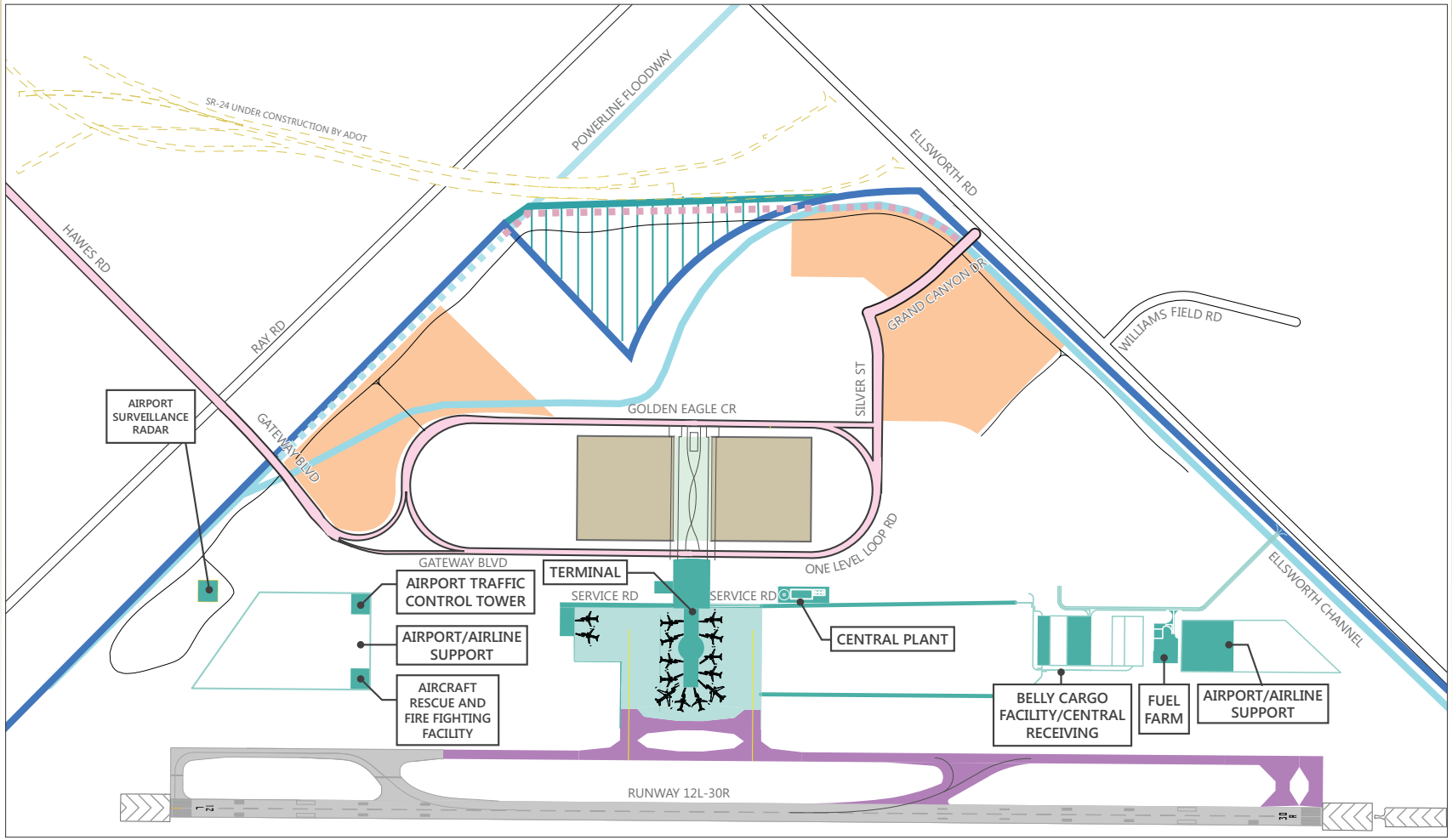
- Requires federal agencies to disclose a clear description of potential environmental effects resulting from proposed federal actions and reasonable alternatives to those actions
- Provides information to decision makers to determine whether a proposed project would cause significant adverse environmental impacts
- For the proposed Northeast Area Development Plan EA, the Federal Aviation Administration (FAA) must review the potential environmental effects of the proposed project before it can be approved

The Environmental Assessment (EA) Process

PhxMesa Gateway Airport

Project Components

PhxMesa Gateway Airport



NORTH

0 Not to Scale

LEGEND

- Proposed Facility
- Proposed Taxiway
- Proposed Apron
- Proposed Road
- Proposed Parking
- Proposed Land Acquisition
- Existing Airport Boundary
- Future Commercial
- Green Space
- Existing Floodway/Channel
- Improved Powerline Floodway
- Relocated Ellsworth Channel

Project Components

PhxMesa Gateway Airport

- Terminal Building: 300,000 square foot building with 14 gates
- Access Roadways
- Passenger & employee parking, rental car facilities
- Airfield, taxiway, and taxilane improvements
- Infrastructure Improvements: relocated and expanded utilities, service roads, perimeter fencing
- Ancillary/Support Facilities including: Airport Traffic Control Tower (ATCT), Airport Surveillance Radar (ASR), and Aircraft Rescue and Firefighting Facility (ARFF)
- Land Acquisition: 30 acres northeast of existing Airport property
- Site Preparation: Grading, demolition of existing buildings and structures
- Provisions for commercial development

Purpose & Need

PhxMesa Gateway Airport

Purpose of the Project

- To accommodate the forecast growth in enplaned passengers and passenger airline operations at the airport at an adequate level of service

Need for the Project

- FAA Terminal Area Forecast projects growth in enplanements at the airport will nearly double over the next 6 years
  - 2012 744,000 enplanements (1.5 million passengers)
  - 2018 1,297,645 enplanements (2.6 million passengers)
- Existing Passenger Terminal is being expanded to its maximum capacity (10 gates), scheduled to be completed by the end of 2013

Alternatives Considered

PhxMesa Gateway Airport

- No Action
- Use of Other Airports
- Proposed Northeast Area Development Plan
- Relocation of Passenger Terminal to Other On-Airport Locations

Environmental Impact Categories

PhxMesa Gateway Airport

- Air Quality
- Compatible Land Use
- Construction Impacts
- Department of Transportation Act Section 4(f)
- Fish, Wildlife, and Plants
- Floodplains
- Hazardous Materials and Solid Waste
- Historical, Architectural, Archaeological, and Cultural Resources
- Light Emissions and Visual Impacts
- Natural Resources and Energy Supply
- Noise
- Secondary (Induced) Impacts
- Socioeconomic Impacts, Environmental Justice, Children's Health and Safety Risks
- Water Quality
- Wetlands
- Other Considerations

Next Steps

PhxMesa Gateway Airport

Complete Field Work to Verify Existing Conditions

- Biological and Natural Resources
- Historical, Archaeological, Architectural, and Cultural Resources

Obtain Public and Agency Scoping Comments

- Due September 30, 2013

Prepare Draft EA

Anticipate Release of Draft EA

- 2nd/3rd Quarter 2014

Public Comments

PhxMesa Gateway Airport

- Leave Written Comments in the Comment Box
- Submit Comments to:

Phoenix-Mesa Gateway Airport Authority
5835 South Sossaman Road
Mesa, Arizona 85212-6014
Email: EAComments@phxmesagateway.org

- Comments must be received by
  5 p.m. MST, Monday, September 30, 2013

Attachment 3

Scoping Comments

Stephen Culberson

From: EA Comments <eacomments@phxmesagateway.org>
Sent: Wednesday, August 28, 2013 5:30 PM
To: Stephen Culberson
Cc: Carmen Williams
Subject: FW: 2013-8-27 - PMGAA - Northeast Area Development Plan - EA - Viewing access

Hi Stephen,

Our IT staff made some setting adjustments and we should now be able to forward the emails. Can you please confirm that you received this?

Thank you,
Alissa

From: Wayne Miller [mailto:Miller.Wayne@azdeq.gov]
Sent: Tuesday, August 27, 2013 10:11 AM
To: EA Comments
Cc: Delfina C. Olivarez
Subject: 2013-8-27 - PMGAA - Northeast Area Development Plan - EA - Viewing access

Can you clarify the Thursday Sept. 12 2013 public meeting purpose? Does the Environmental Assessment (EA) document already exist, or is the meeting (public comment period) purpose to collect public input on what the EA scope should include? If the EA document is to be developed, can you provide a conceptual time frame to Draft EA release for public comment on the EA's findings?

If the EA already exists, and the meeting is to solicit public comments on the EA content, can you provide an electronic link to, or physical location of, the actual Northeast Area Development Plan Environmental Assessment document?

Thank you.

Wayne Miller
Arizona Department of Environmental Quality
Waste Programs Division
Federal Projects Unit

e-mail: miller.wayne@azdeq.gov
telephone: 602.771.4121

NOTICE: This e-mail (and any attachments) may contain PRIVILEGED OR CONFIDENTIAL information and is intended only for the use of the specific individual(s) to whom it is addressed. It may contain information that is privileged and confidential under state and federal law. This information may be used or disclosed only in accordance with law, and you may be subject to penalties under law for improper use or further disclosure of the information in this e-mail and its attachments. If you have received this e-mail in error, please immediately notify the person named above by reply e-mail, and then delete the original e-mail. Thank you.

THE HOPI TRIBE

LeRoy N. Shingoitewa
CHAIRMAN

Herman G. Honanie
VICE-CHAIRMAN

September 4, 2013

Carmen Williams, C.M., Planning, Design & Construction Manager
Phoenix-Mesa Gateway Airport Authority
5835 South Sossaman Road
Mesa, Arizona 85212-6014

Re: Environmental Assessment for Phase I of the Northeast Area Development Plan

Dear Ms. Williams,

This letter is in response to your correspondence on behalf of the Federal Aviation Administration dated August 26, 2013, regarding Phoenix-Mesa Gateway Authority developing an environmental assessment for the Northeast Area Development Area at the Phoenix-Mesa Gateway Airport. The Hopi Tribe claims cultural affiliation to prehistoric cultural groups in Arizona. The Hopi Cultural Preservation Office supports identification and avoidance of prehistoric archaeological sites and Traditional Cultural Properties, and we consider the archaeological sites that are "footprints" of our ancestors to be Hopi Traditional Cultural Properties. Therefore, we appreciate your solicitation of our input and your efforts to address our concerns.

The Hopi Cultural Preservation Office is interested in consulting on any proposal with the potential to adversely affect prehistoric cultural resources in Arizona. We understand the environment assessment will address historic and archaeological resources. Therefore, if prehistoric sites are identified that will be adversely affected by project activities, please provide us with copies of the cultural resources survey report and any proposed treatment plan for review and comment.

In addition, we recommend that if any cultural features or deposits are encountered during project activities, these activities must be discontinued in the immediate area of the remains, and the State Historic Preservation Office must be consulted to evaluate their nature and significance. If any Native American human remains or funerary objects are discovered during construction they shall be immediately reported as required by law. Should you have any questions or need additional information, please contact Terry Morgart at tmorgart@hopi.nsn.us. Thank you for your consideration.

Respectfully,

Leigh J. Kuwanwisiwma, Director
Hopi Cultural Preservation Office

xc: Arizona State Historic Preservation Office

DEPARTMENT OF THE ARMY

LOS ANGELES DISTRICT, CORPS OF ENGINEERS
ARIZONA-NEVADA AREA OFFICE
3636 NORTH CENTRAL AVENUE, SUITE 900
PHOENIX, ARIZONA 85012-1939

September 6, 2013

REPLY TO
ATTENTION OF:
Office of the Chief
Regulatory Division

Ms. Carmen Williams
Planning, Design & Construction Manager
Phoenix-Mesa Gateway Airport Authority
5835 S. Sossaman Road
Mesa, Arizona 85212-6014

File Number: 2013-00629-AP

Dear Ms. Williams:

I have received your letter dated August 26, 2013 regarding your proposed Phase I of the Northeast Area Development Plan Phoenix-Mesa Gateway Airport project. The proposed project may require a U.S. Army Corps of Engineers permit.

A Corps of Engineers permit is required for:

a) the discharge of dredged or fill material into, including any redeposit of dredged material other than incidental fallback within, "waters of the United States" and adjacent wetlands pursuant to Section 404 of the Clean Water Act of 1972. Examples include, but are not limited to,

1. creating fills for residential or commercial development, placing bank protection, temporary or permanent stockpiling of excavated material, building road crossings, backfilling for utility line crossings and constructing outfall structures, dams, levees, groins, weirs, or other structures;

2. mechanized landclearing, grading which involves filling low areas or land leveling, ditching, channelizing and other excavation activities that would have the effect of destroying or degrading waters of the United States;

3. allowing runoff or overflow from a contained land or water disposal area to re-enter a water of the United States;

4. placing pilings when such placement has or would have the effect of a discharge of fill material;

b) the transportation of dredged or fill material by vessel or other vehicle for the purpose of dumping the material into ocean waters pursuant to Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972;

c) any combination of the above.

An application for a Department of the Army permit is available on our website: http://www.spl.usace.army.mil/Missions/Regulatory/PermitProcess.aspx. If you have any questions, please contact Ann Palaruan of my staff at 602-230-6955 or via e-mail at cynthia.a.palaruan@usace.army.mil. Please refer to this letter and SPL-2013-00629-AP in your reply.

Sincerely,

Sallie Diebolt

Sallie Diebolt
Chief, Arizona Branch
Regulatory Division

Janice K. Brewer
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov

Henry R. Darwin
Director

September 11, 2013

Ms. Carmen Williams, C.M.
Planning, Design & Construction Manager
Phoenix-Mesa Gateway Airport Authority
5835 South Sossaman Road
Mesa, AZ 85212-6014

RE: Maricopa County: Scoping Letter for the Phoenix-Mesa Gateway Airport Northeast Area Development Plan

Dear Ms. Carmen Williams:

The ADEQ Air Quality Division has reviewed your letter dated August 26, 2013, requesting a scoping letter for the Phoenix-Mesa Gateway Airport Northeast Area Development Plan. Your project is located in a maintenance area for carbon monoxide (CO), a nonattainment area for 10-micron particulate matter (PM_{10}), and a nonattainment area for 8-hour ozone (O3). As described, it may have a de minimis impact on air quality. Disturbance of particulate matter and possible asbestos is anticipated during construction. Considering prevailing winds, to comply with other applicable air pollution control requirements and minimize adverse impacts on public health and welfare, the following information is provided for consideration:

PREVENT RELEASE OF REGULATED ASBESTOS FIBERS

Title 40 Code of Federal Regulations § 61.145 contains requirements to survey for the presence of asbestos at each demolition or renovation activity prior to demolition or renovation (Asbestos National Emission Standards for Hazardous Air Pollutants. A 10-business days advance notification of demolition is required for every demolition project (unless at an exempt facility)

In order to determine whether mitigation measures would be required, please include the range of estimated emissions for each pollutant, for comparison to the de minimis levels in 40 CFR 93.153

Should you have further questions, please do not hesitate to call me at (602) 771-2375, or Lhamo LeMoine at (602) 771-2373.

Very truly yours,

Diane L. Arnst, Manager
Air Quality Legal Support Section

Enclosures (2)

cc: Sherri Zendri, Administrative Counsel
Lhamo LeMoine, Administrative Secretary
File No. 313750

applicant being a customer. Permits issued under this subsection shall comply with the requirements in subsection (D)(3) and be in a format prescribed by the Director. Each delegated authority shall:

1. Maintain a copy of each permit issued for the previous five years available for inspection by the Director;
2. For each permit currently issued, have a means of contacting the person authorized by the permit to set an open fire if an order to extinguish open burning is issued; and
3. Annually submit to the Director by May 15 a record of daily burn activity, excluding household waste burn permits, on a form provided by the Director for the previous calendar year containing the information required in subsections (D)(3)(e) and (D)(3)(f).

H. The Director shall hold an annual public meeting for interested parties to review operations of the open outdoor fire program and discuss emission reduction techniques.

I. Nothing in this Section is intended to permit any practice that is a violation of any statute, ordinance, rule, or regulation.

Historical Note

Adopted effective May 14, 1979 (Supp. 79-1). Amended effective October 2, 1979 (Supp. 79-5). Correction, subsection (C) repealed effective October 2, 1979, not shown (Supp. 80-1). Former Section R9-3-602 renumbered without change as Section R18-2-602 (Supp. 87-3). Amended effective September 26, 1990 (Supp. 90-3). Former Section R18-2-602 renumbered to R18-2-802, new Section R18-2-602 renumbered from R18-2-401 effective November 15, 1993 (Supp. 93-4). Amended by final rulemaking at 10 A.A.R. 388, effective March 16, 2004 (Supp. 04-1).

R18-2-603. Repealed

Historical Note

Adopted effective May 14, 1979 (Supp. 79-1). Former Section R9-3-603 renumbered without change as Section R18-2-603 (Supp. 87-3). Amended effective September 26, 1990 (Supp. 90-3). Former Section R18-2-603 renumbered to R18-2-803, new Section R18-2-603 renumbered from R18-2-403 effective November 15, 1993 (Supp. 93-4). Repealed effective October 8, 1996 (Supp. 96-4).

R18-2-604. Open Areas, Dry Washes, or Riverbeds

A. No person shall cause, suffer, allow, or permit a building or its appurtenances, or a building or subdivision site, or a driveway, or a parking area, or a vacant lot or sales lot, or an urban or suburban open area to be constructed, used, altered, repaired, demolished, cleared, or leveled, or the earth to be moved or excavated, without taking reasonable precautions to limit excessive amounts of particulate matter from becoming airborne. Dust and other types of air contaminants shall be kept to a minimum by good modern practices such as using an approved dust suppressant or adhesive soil stabilizer, paving, covering, landscaping, continuous wetting, detouring, barring access, or other acceptable means.

B. No person shall cause, suffer, allow, or permit a vacant lot, or an urban or suburban open area, to be driven over or used by motor vehicles, trucks, cars, cycles, bikes, or buggies, or by animals such as horses, without taking reasonable precautions to limit excessive amounts of particulates from becoming airborne. Dust shall be kept to a minimum by using an approved dust suppressant, or adhesive soil stabilizer, or by paving, or by barring access to the property, or by other acceptable means.

C. No person shall operate a motor vehicle for recreational purposes in a dry wash, riverbed or open area in such a way as to cause or contribute to visible dust emissions which then cross property lines into a residential, recreational, institutional, educational, retail sales, hotel or business premises. For purposes of this subsection "motor vehicles" shall include, but not be limited to trucks, cars, cycles, bikes, buggies and 3-wheelers. Any person who violates the provisions of this subsection shall be subject to prosecution under A.R.S. § 49-463.

Historical Note

Adopted effective May 14, 1979 (Supp. 79-1). Former Section R9-3-604 renumbered without change as Section R18-2-604 (Supp. 87-3). Amended effective September 26, 1990 (Supp. 90-3). Former Section R18-2-604 renumbered to R18-2-804, new Section R18-2-604 renumbered from R18-2-404 and amended effective November 15, 1993 (Supp. 93-4).

R18-2-605. Roadways and Streets

A. No person shall cause, suffer, allow or permit the use, repair, construction or reconstruction of a roadway or alley without taking reasonable precautions to prevent excessive amounts of particulate matter from becoming airborne. Dust and other particulates shall be kept to a minimum by employing temporary paving, dust suppressants, wetting down, detouring or by other reasonable means.

B. No person shall cause, suffer, allow or permit transportation of materials likely to give rise to airborne dust without taking reasonable precautions, such as wetting, applying dust suppressants, or covering the load, to prevent particulate matter from becoming airborne. Earth or other material that is deposited by trucking or earth moving equipment shall be removed from paved streets by the person responsible for such deposits.

Historical Note

Adopted effective May 14, 1979 (Supp. 79-1). Former Section R9-3-605 renumbered without change as Section R18-2-605 (Supp. 87-3). Amended effective September 26, 1990 (Supp. 90-3). Former Section R18-2-605 renumbered to R18-2-805, new Section R18-2-605 renumbered from R18-2-405 effective November 15, 1993 (Supp. 93-4).

R18-2-606. Material Handling

No person shall cause, suffer, allow or permit crushing, screening, handling, transporting or conveying of materials or other operations likely to result in significant amounts of airborne dust without taking reasonable precautions, such as the use of spray bars, wetting agents, dust suppressants, covering the load, and hoods to prevent excessive amounts of particulate matter from becoming airborne.

Historical Note

Section R18-2-606 renumbered from R18-2-406 effective November 15, 1993 (Supp. 93-4).

R18-2-607. Storage Piles

A. No person shall cause, suffer, allow, or permit organic or inorganic dust producing material to be stacked, piled, or otherwise stored without taking reasonable precautions such as chemical stabilization, wetting, or covering to prevent excessive amounts of particulate matter from becoming airborne.

B. Stacking and reclaiming machinery utilized at storage piles shall be operated at all times with a minimum fall of material and in such manner, or with the use of spray bars and wetting agents, as to prevent excessive amounts of particulate matter from becoming airborne.

Historical Note

Section R18-2-607 renumbered from R18-2-407 effective

ARTICLE 8. EMISSIONS FROM MOBILE SOURCES (NEW AND EXISTING)

R18-2-801. Classification of Mobile Sources

A. This Article is applicable to mobile sources which either move while emitting air contaminants or are frequently moved during the course of their utilization but are not classified as motor vehicles, agricultural vehicles, or agricultural equipment used in normal farm operations.

B. Unless otherwise specified, no mobile source shall emit smoke or dust the opacity of which exceeds 40%.

Historical Note

Adopted effective February 26, 1988 (Supp. 88-1). Amended effective September 26, 1990 (Supp. 90-3). Amended effective February 3, 1993 (Supp. 93-1). Former Section R18-2-801 renumbered to Section R18-2-901, new Section R18-2-801 renumbered from R18-2-601 effective November 15, 1993 (Supp. 93-4).

R18-2-802. Off-road Machinery

A. No person shall cause, allow or permit to be emitted into the atmosphere from any off-road machinery, smoke for any period greater than 10 consecutive seconds, the opacity of which exceeds 40%. Visible emissions when starting cold equipment shall be exempt from this requirement for the first 10 minutes.

B. Off-road machinery shall include trucks, graders, scrapers, rollers, locomotives and other construction and mining machinery not normally driven on a completed public roadway.

Historical Note

Adopted effective February 26, 1988 (Supp. 88-1). Amended effective September 26, 1990 (Supp. 90-3). Former Section R18-2-802 renumbered to Section R18-2-902, new Section R18-2-802 renumbered from R18-2-602 effective November 15, 1993 (Supp. 93-4).

R18-2-803. Heater-planer Units

No person shall cause, allow or permit to be emitted into the atmosphere from any heater-planer operated for the purpose of reconstructing asphalt pavements smoke the opacity of which exceeds 20%. However three minutes' upset time in any one hour shall not constitute a violation of this Section.

Historical Note

Adopted effective February 26, 1988 (Supp. 88-1). Amended effective September 26, 1990 (Supp. 90-3). Former Section R18-2-803 renumbered to Section R18-2-903, new Section R18-2-803 renumbered from R18-2-603 effective November 15, 1993 (Supp. 93-4).

R18-2-804. Roadway and Site Cleaning Machinery

A. No person shall cause, allow or permit to be emitted into the atmosphere from any roadway and site cleaning machinery smoke or dust for any period greater than 10 consecutive seconds, the opacity of which exceeds 40%. Visible emissions when starting cold equipment shall be exempt from this requirement for the first 10 minutes.

B. In addition to complying with subsection (A), no person shall cause, allow or permit the cleaning of any site, roadway, or alley without taking reasonable precautions to prevent particulate matter from becoming airborne. Reasonable precautions may include applying dust suppressants. Earth or other material shall be removed from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water or by other means.

Historical Note

Adopted effective February 26, 1988 (Supp. 88-1). Amended effective September 26, 1990 (Supp. 90-3). Amended effective February 3, 1993 (Supp. 93-1). Former Section R18-2-804 renumbered to Section R18-2-904, new Section R18-2-804 renumbered from R18-2-604 effective November 15, 1993 (Supp. 93-4).

R18-2-805. Asphalt or Tar Kettles

A. No person shall cause, allow or permit to be emitted into the atmosphere from any asphalt or tar kettle smoke for any period greater than 10 consecutive seconds, the opacity of which exceeds 40%.

B. In addition to complying with subsection (A), no person shall cause, allow or permit the operation of an asphalt or tar kettle without minimizing air contaminant emissions by utilizing all of the following control measures:

1. The control of temperature recommended by the asphalt or tar manufacturer;
2. The operation of the kettle with lid closed except when charging;
3. The pumping of asphalt from the kettle or the drawing of asphalt through cocks with no dipping;
4. The dipping of tar in an approved manner;
5. The maintaining of the kettle in clean, properly adjusted, and good operating condition;
6. The firing of the kettle with liquid petroleum gas or other fuels acceptable to the Director.

Historical Note

Adopted effective February 26, 1988 (Supp. 88-1). Amended effective September 26, 1990 (Supp. 90-3). Former Section R18-2-805 renumbered to Section R18-2-905, new Section R18-2-805 renumbered from R18-2-605 effective November 15, 1993 (Supp. 93-4).

ARTICLE 9. NEW SOURCE PERFORMANCE STANDARDS

R18-2-901. Standards of Performance for New Stationary Sources

Except as provided in R18-2-902 through R18-2-905, the following subparts of 40 CFR 60, New Source Performance Standards (NSPS), and all accompanying appendices, adopted as of July 1, 2006, and no future editions or amendments, are incorporated by reference as applicable requirements. These standards are on file with the Department and shall be applied by the Department. These standards can be obtained from the U.S. Government Printing Office, Superintendent of Documents, Mail Stop SSOP, Washington D.C. 20402-9328.

1. Subpart A - General Provisions.
2. Subpart D - Standards of Performance for Fossil-Fuel-Fired Steam Generators for Which Construction is Commenced After August 17, 1971.
3. Subpart Da - Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978.
4. Subpart Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units.
5. Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.
6. Subpart E - Standards of Performance for Incinerators.
7. Subpart Ea - Standards of Performance for Municipal Waste Combustors for Which Construction is Commenced after December 20, 1989 and on or Before September 20, 1994.
8. Subpart Eb - Standards of Performance for Large Municipal Waste Combustors for Which Construction is Commenced after September 20, 1994 or for Which

PhxMesa **Gateway** Airport

Northeast Area Development Plan Environmental Assessment
Public Scoping Meeting – Comment Form – AGENCY
Thursday, September 12, 2013

This comment form is provided to receive your input concerning the Proposed Action, purpose and need for the Proposed Action, alternatives to the Proposed Action, and potential environmental effects of the Northeast Area Development Plan to be analyzed in the Draft EA. The deadline for receiving written scoping comments is September 30, 2013.

In conversation with Barry Benally, Gila River Indian Community regarding the previous sites in the project area the sites were given "names"*, which he said is very offensive. Sites should be referred to by their site number and not a name

* Outer Limits, Radar, Ordnance, Will E. Coyote,

Giselle E. Kane 9/12/13

Comments may be submitted to the Public Scoping Meeting Comment Box or by September 30, 2013 to:

MAIL:

PMGAA, Administration Offices
5835 South Sossaman Road
Mesa, AZ 85212

EMAIL:

EAcomments@phxmesagateway.org

FAX:

(480) 988-2315

Stephen Culberson

From: Alissa Rivera <ARivera@phxmesagateway.org>
Sent: Monday, September 16, 2013 9:34 AM
To: Stephen Culberson; Carmen Williams
Cc: Dennis Orr
Subject: FW: Archaeological Survey of Northeast Area Development at Phoenix-Mesa Gateway Airport

Good morning,

Please see Peter Steere's response below.

Thank you,
Alissa

From: Peter Steere [mailto:Peter.Steere@tonation-nsn.gov]
Sent: Friday, September 13, 2013 2:20 PM
To: Alissa Rivera
Subject: Re: Archaeological Survey of Northeast Area Development at Phoenix-Mesa Gateway Airport

Alissa
Thanks

Please send me copies of all archaeological survey reports

Our comments to a large extent will depend on review of archaeological

Peter Steere, THPO
Tohono O'odham Nation

From: Alissa Rivera <ARivera@phxmesagateway.org>
To: Peter Steere
Sent: Wed Sep 11 15:16:00 2013
Subject: Archaeological Survey of Northeast Area Development at Phoenix-Mesa Gateway Airport

Good afternoon Peter,

I brought your question to the attention of our Consultant and he asked me to let you know that some archaeological surveys have been completed in the past and that additional surveys are in process or will be completed for this project in the near future. If you have any additional questions, please let me know or you may email them to: EAcomments@phxmesagateway.org. Thank you!

Alissa Rivera
Administrative Secretary, Planning, Design & Construction
Phoenix-Mesa Gateway Airport
5835 South Sossaman Road
Mesa, Arizona 85212-6014
Office: 480-988-7628
Fax: 480-988-2315
arivera@phxmesagateway.org
www.phxmesagateway.org

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Stephen Culberson

From: EA Comments <eacomments@phxmesagateway.org>
Sent: Tuesday, September 17, 2013 9:44 AM
To: Stephen Culberson
Cc: Carmen Williams; Dennis Orr
Subject: FW: Northeast Area Development Plan Environmental Assessment

Comment received yesterday from the Arizona Game and Fish Department.

From: Kelly Wolff-Krauter [mailto:KWolff-Krauter@azgfd.gov]
Sent: Monday, September 16, 2013 3:57 PM
To: EA Comments
Cc: Barbara Cook; Rod Lucas; Kriselle Colvin; Laura Canaca
Subject: Northeast Area Development Plan Environmental Assessment

The Arizona Game and Fish Department (Department) has reviewed the public scoping notice for the Phoenix Mesa Gateway Airports proposed Northeast Area Development Plan EA. We participated in the agency scoping meeting on September 12th to learn more about the proposed project. We provide the following comments for your consideration in the development of the EA for the project.

The proposed project area includes acquisition of 30 acres, northeast of the existing airport and would include several components (ie. access roads, terminal building, parking, expanded utilities, grading, etc.). The adjacent areas around the existing airport are of low to moderate value for wildlife (area of acquisition). Much of the area is disturbed, creosote flats with minimal opportunity for connectivity of wildlife (much in part due to the existing infrastructure and lack of drainage features). Common desert species may be present within the area such as quail, doves, coyotes, javelina, etc. Please refer to the Department's Wildlife Friendly Guidelines for information on desert tortoise handling and burrowing owl guidance as they are likely present within the area http://www.azgfd.gov/w_c/WildlifePlanning.shtml. In addition, please query the Department's Environmental Review On-Line tool http://www.azgfd.gov/hgis/ for obtaining a special status species list and additional guidance specific to the type of project proposed for consideration during the development of your compliance documentation.

We recommend consideration be provided for the "Arizona's Species of Greatest Conservation Need (SGCN)" (see below table). These species have historic, present, or potential distributions within the project area. The SGCN are species that the State has identified as most in need of conservation actions in Arizona's State Wildlife Action Plan: 2012-2022 (SWAP), and those that are indicative of the diversity and health of the State's wildlife (AGFD 2012). Many of these species are currently listed as Threatened or Endangered under the ESA, and many have low and declining populations. We recommend consideration of the SWAP as part of the DEIS and analysis. Additional information related to the stressors affecting wildlife, conservation actions, and each SGCN vulnerability ratings can be found in the plan. Please refer to the SWAP document for additional information.

The Department's newest tool, the HabiMap™ http://habimap.org/ is intended to display the spatial components of the SWAP and can be used to view the potential habitat distributions of SGCN, as well as economically important game species, and information from Arizona's Breeding Bird Atlas. Within HabiMap you can also view the Species and Habitat Conservation Guide (SHCG). The guide can be used to visually explore how wildlife is distributed throughout the State and where conservation can have the greatest impact. Areas categorized 5 and 6, as areas of the "highest conservation potential" (darker blue); mean the importance of the landscape for maintaining biodiversity is highest at the statewide scale.

The Department appreciates the opportunity to review and provide comment on these projects. If you have any questions about the information provided or if you need additional information, please contact me.

☎ 480-324-3550 | ✉ kwolff-krauter@azgfd.gov |

Learn more about getting connected to the outdoors by visiting **Get Outside Arizona**.
Click here to buy an Arizona Hunting and/or Fishing License Online **https://az.gov/app/huntfish/home.xhtml**

Kelly Wolff-Krauter
Habitat Program Manager| Region VI, Mesa| 7200 E. University Dr. Mesa Arizona 85207

Maricopa County
Public Works

2901 W. Durango St
Phoenix, AZ. 85009
602-506-7108
Fax: 602-506-4882
www.maricopa.gov

September 17, 2013

Ms. Carmen Williams
Planning, Design, Construction Manager
Phoenix-Mesa Gateway Airport Authority
Mesa, Arizona 85212-6014

Re: Environmental Assessment for Phase 1 Northern Area Development Plan

Dear Ms. Williams,

We are in receipt of and have reviewed your letter dated August 26th, addressed to Mr. Tim Oliver. Maricopa County Department of Transportation Systems Planning has no issues with this project.

Environmental Planning has expressed a desire to review more of the environmental documents as they become available. We have attached the full list of comments from our Environmental Planning Section to this document. In addition, they have identified there may be cultural resources and hazardous materials located within the study area.

Thank you for allowing us this opportunity to provide comments on the Phoenix-Mesa Gateway Airport Authority Environmental Assessment. Please direct further correspondence to Hugh Davidson, Environmental Program Analyst, for Maricopa County Department of Transportation.

Sincerely,

Andrew Smith
Senior Planner

Attachment

Cc: Jack Lorbeer McDOT Planning, Department Manager
Denise Lacey McDOT Planning, Senior Planner
Hugh Davidson McDOT Planning, Environmental Planner

Andrew Smith - MCDOTX

From: Hugh Davidson - MCDOTX
Sent: Monday, September 09, 2013 10:01 AM
To: Denise Lacey - MCDOTX; Andrew Smith - MCDOTX
Cc: Joe Pinto - MCDOTX
Subject: PHX-Mesa Gateway Airport NE Area Expansion proposed NEPA EA
Attachments: PHX-Mesa Gateway Airport expansion EA.pdf

Addressed to former Branch Manager Tim Oliver we recently received a scoping letter for a NEPA Environmental Assessment (EA). Planner Andy Smith brought the scoping letter to my attention. I attach a PDF of the scoping letter document.

MCDOT's primary interest in the project is perhaps indirect, but linked to the numerous roadway improvement projects in the area. There is also the fact the airport authority is a cooperative effort by Mesa, Gilbert, Queen Creek, Gila River Indian Community and others, jurisdictions we consistently join in partnership for roadway projects. Whether we should be represented at the initial scoping kick-off meeting is debatable, but I would have genuine interest in seeing the EA documentation as it is generated. For example, when they actually begin the EA process itself and initiate full NEPA environmental and National Historic Preservation Act (NHPA) compliance activities I would be very interested in receiving project documentation related to that element of the process.

As MCDOT's cultural resource manager and hazardous materials analysis coordinator I offer a few comments on the proposed 'Northeast Area Development Plan' scoping letter. These areas will command the project proponent's attention in advancing the EA.

Cultural resources—Fifty year old (and older) sites, structures, buildings will demand systematic identification and evaluation under the National Register of Historic Places criteria. In this case NEPA EA requirements will coincide with fulfilling the FAA's requirement it ensure that the National Historic Preservation Act, Section 106 compliance is fulfilled by the project proponents.

A casual perusal of the state's main database for cultural resources (AZSITE) shows this 'NE Development' effort will have to broach already identified pre-historic archaeology (5 sites or more) but also historical sites or architectural features within the airport that might be affected by development—e.g. former wagon roads, developed well sites, fencing, landscape elements and structures/buildings to be demolished. Professionally qualified historians and architectural historians, not archaeologists, should systematically evaluate the historical (ca. 1860s-1960s) features that might also include historical *airport* facilities that might be affected by construction of new facility.

Hazardous materials--Based on my previous airport survey and environmental compliance experience, careful evaluation of past hazardous materials events or disposal procedures at the former military facility will have thoroughly investigated by EA analysts. Undoubtedly prior airport environmental reviews provide a foundation for this effort. However, this prior data will have to be re-investigated since projected direct impacts to the undeveloped portions of the airport property are now being considered. It has been my experience at former Army Air Corps and Air Force facilities thoroughgoing analysis is demanded to prevent unanticipated discoveries during construction. Normally, proper due diligence via systematic documentary research can eliminate this possibility, but it has to executed properly.

Hugh Davidson
Environmental Program Analyst
Maricopa County Dept. of Transportation
Planning Div. - Environmental Planning
2901 W. Durango St.

Stephen Culberson

From: EA Comments <eacomments@phxmesagateway.org>
Sent: Wednesday, September 25, 2013 8:11 PM
To: Stephen Culberson
Cc: Carmen Williams; Dennis Orr
Subject: FW: Agency Scoping Response - FHWA AZ Division

Message from the EA Comments email.

From: Rebecca.Yedlin@dot.gov [mailto:Rebecca.Yedlin@dot.gov]
Sent: Wednesday, September 25, 2013 8:47 AM
To: EA Comments
Subject: Agency Scoping Response - FHWA AZ Division

Hello. My name is Rebecca Yedlin and I am the Environmental Coordinator for the Federal Highway Administration (FHWA) Arizona Division. Our office received your agency scoping letter and wanted to respond requesting that we be kept updated on the progress of this study and be sent any documents for review that the Project Team would like our input on. Please contact myself, Alan Hansen or Aryan Lirange (contact info below). Thanks, Rebecca

Alan R. Hansen, P.E.
Team Leader Planning, Environment, and Realty
FHWA Arizona Division
(602) 382-8964
Alan.hansen@dot.gov

Aryan Lirange
Senior Urban Engineer
FHWA Arizona Division
(602) 382-8973
Aryan.lirange@dot.gov

EAST VALLEY
AVIATION & AEROSPACE
ALLIANCE

September 26, 2013

Mrs. Jane Morris
Executive Director
Phoenix-Mesa Gateway Airport Authority
Administration Office
5835 South Sossaman Road
Mesa, AZ 85212

Dear Mrs. Morris:

We are pleased to be allowed the opportunity to provide comments supporting Phase I of the proposed Northeast Area Development Plan (NAPD) improvements at Phoenix-Mesa Gateway Airport. I am the Project Manager for the East Valley Aviation & Aerospace Alliance and am writing on behalf of this organization. The Alliance was formed several years ago to promote aviation and aerospace interests and development in the East Valley, and to protect the airports in the region. We strongly support the proposed improvements currently under consideration in the ongoing Environmental Assessment.

Since our formation, many of our members have been keenly interested and supportive of the many public and private improvements being constructed at the Phoenix-Mesa Gateway Airport (PMGA). Several of our members have business locations at the airport. The expansion of the current terminal and other public infrastructure improvements have been critical additions to the airport infrastructure, and have allowed the airport to keep pace with business demands.

We believe that it is essential for the PMGA management team and Authority Governing Board, to proactively plan for future growth at the airport. The recent increase in commercial passenger traffic and the continued commercial/industrial expansion adjacent to the airport makes it imperative that long term planning occur today so that needed facilities can be planned, financed, and constructed in a timely manner. There is little doubt that the various components of the NAPD will be needed over the next ten to fifteen year period.

In addition, as the Phoenix Metropolitan area recovers from the recent economic downturn, the property surrounding the airport will be a prime development area. A number of important projects are already underway. Thoughtful infrastructure planning will attract a diverse mix of users to this region who will be anxious to use the commercial and private facilities envisioned in the NAPD planning documents.

For all the reasons stated above, the East Valley Aviation & Aerospace Alliance supports the timely completion of the Environmental Assessment that will allow Phase I of the NAPD improvements to move forward. We applaud the decision of the PMGA management team to think creatively about the future, so that needed public facilities will be in place to serve the business and pleasure traveler at the airport.

We look forward to active participation in the public input process as this project progresses through the Environmental Assessment process.

Sincerely,

Mike Hutchinson
Project Manager
East Valley Aviation & Aerospace Alliance

CHAIR
Michael Stull
Cox Communications

VICE CHAIR
Brian Campbell
Campbell Law Group, Chtd

SECRETARY
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Anne Hamilton, Highground
Terry Horne, East Valley Tribune
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Becky Kuhn, Banner Health
Jill Kuzy Hegardt, DMB
Hon. John Lewis, Town of Gilbert
Bridget Lovett, Apollo Group, Inc.
Linda Lujan, Chandler-Gilbert Community College
Paul Maryniak, The Arizona Republic
Tracy Meyer, FirstBank
Jeff Mirabela, CenturyLink
Howard Morrison, Morrison Ranch
Garret Newland, Westcor
Kevin Olson, Steptoe & Johnson, LLP
Deborah Ostreicher, Phx Sky Harbor Int'l Airport
Shoon Pan, Mesa Community College
Bryan Powell, City of Apache Junction
Greg Ricks, Intel Corporation
Roy Ryals, Southwest Ambulance
Caryn Sanchez, SRP
Ann Seiden, Southwest Gas Corporation
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Hon. Scott Somers, City of Mesa
Tony Tannirello, The Boeing Company
Richmond Vincent, Goodwill of Central Arizona
Rebecca Whitehead, University of Advancing Technology
Chris Zaharis, Empire Southwest

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Hon. Scott Smith, City of Mesa
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Charles Wahlheim, WCB Enterprises, LLC

EAST VALLEY PARTNERSHIP

Improving business and quality of life in the East Valley

September 26, 2013

Mrs. Jane Morris
Executive Director
Phoenix-Mesa Gateway Airport Authority
Administration Office
5835 South Sossaman Road
Mesa, AZ 85212

Dear Mrs. Morris:

Thank you for the opportunity to provide comments on the Environmental Assessment being prepared regarding Phase I of the proposed Northeast Area Development Plan Program. I am President/CEO of the East Valley Partnership which is a regional coalition of community, business, educational and government leaders whose goal is to provide leadership, improve public and private services, support economic development and improve the quality of life in the East Valley.

We are extremely supportive of the continued development of the Phoenix-Mesa Gateway Airport (PMGA) through projects and improvements such as those identified in the Northeast Area Development Plan.

We feel that we are uniquely suited to comment on this project. The East Valley Partnership was the lead agency in the preparation of the 2006 Urban Land Institute (ULI) Advisory Service Panel Report of the 50+ square miles that surrounded the then Williams Gateway Airport (www.evp-az.org/resources/, see Williams Gateway Area Advisory Services Panel Report). This stakeholder driven process identified a number of strategies and became the unifying document to focus efforts on the most effective way to develop the area, to achieve the multiple goals envisioned by the property owners, public bodies, cities and towns, and many others involved in the area. The report predicted if planned and developed appropriately, over the next 25 years, the Gateway Areas has the ability to generate 100,000 high wage jobs, 68,000 students, 165,000 residents and become a major reliever airport. In short, the report described this area as "having the capacity to become an unprecedented economic engine in the PHX East Valley". To date, progress of many of the goals, recommendations and projections of the ULI report are being accomplished. Examples include nearly 20,000 jobs in the area, 15,000 students and nearly 1.5 million passengers annually.

535 W. Baseline Road, Ste. 107 • Mesa, Arizona 85210 • Tel: 480.834.8335 • www.evp-az.org

Since the report was completed, the East Valley Partnership has aggressively supported the many private and public projects that have been constructed both on the airport itself and in the surrounding area. We are pleased with the significant progress that has been made to date but feel strongly that the work is not yet finished. To maximize the potential of the airport for both the traveling public and for surrounding business development, it is imperative that long term projects such as the NAPD be planned and developed. Most economic forecasts for the Phoenix Metropolitan Region suggest that commercial, industrial and residential growth will continue in this part of the region. We simply must take the steps to be prepared to accommodate this economic activity as it occurs over the next several decades.

We appreciate the work done by the PMGA staff and Governing Authority to prepare the NAPD. We are very supportive of the many components included in the plan and look forward to their completion over the upcoming years.

We will continue to be a supportive partner with the airport into the future.

Sincerely,

Roc Arnett

Roc Arnett
President/CEO
East Valley Partnership

Comment Form

PhxMesa Gateway Airport

NE Development Plan Environmental Assessment ("EA")

30 September, 2013

Dear Sirs;

I am writing these comments in regards to the information presented at the Public Scoping Meeting held Sept. 12th, 2013. I represent approximately 30 acres of land immediately adjacent to the airport on the western corners of Ray and Hawes Rd's.

Airport Surveillance Radar ("ASR"):

The location of the proposed ASR as depicted on your plan is highly objectionable. The location of this device as proposed, and its 1000 foot radius of "Critical Area" for operation, would dramatically encumber our property and adversely affect the highest and best use of our property under its current zoning entitlements. We understand that there are many potential alternative locations for this system, and certainly many of them that would contain the entire Critical Area to the boundaries of the Airport, without affecting the commercial potential of neighboring private property. I respectfully request that the Airport Authority and its planning and environmental consultants carefully evaluate alternative locations, within the airport property for this facility.

Beyond that, we are **highly supportive** of the proposed project and see it as a necessary and desirable action to accommodate the forecast growth of the passengers and operation s at the airport at an adequate level of service.

Please feel free to contact me at any time with questions, and I look forward to future opportunities to review and comment on the Draft EA.

Thank you for the opportunity to provide comment and feedback in this process.

Cordially Yours,

Morgan Neville
Mesa Airport Growth Properties LLC
9920 S. Rural Road, Suite 108-16
Tempe, AZ 85284-4100
480-586-4300

Appendix I.2

April 2016 Public Information Meeting

From the Front Page

Cactus

Continued from Page 1A

on the hotel, restaurant and bar sectors," he said. "The people who depend on those sectors will feel some reverberations."

Why are fewer people going to games?

There's no one reason for the decline, but there are several possibilities:

» Warmer weather: Arizona's appeal may not be as great in March when the past winter was the warmest on record for most of the country. It was 70 degrees in Cleveland on Dec. 12.

» Economic tumult: The opening week of January turned out to be the worst in stock market history. A frenzy of bad economic news about oil, China, Japan and other problems lingered for weeks, leading to worries about slipping into a repeat of the Great Recession.

The market has mostly stabilized, but it's unclear whether consumers are as eager to open their wallets. Consumer confidence in January was higher in Arizona than it was a year ago, but nationally, confidence has slipped since the start of 2015.

» High prices: During the first week of the Cactus League, hotel rooms in Scottsdale averaged $250 per night. That's more than it costs to stay in West Palm Beach, Fla. Throw in "convenience fees," along with "order fees," to buy game tickets online and the various extra charges for flying, and baseball games may not seem as relaxing for many fans.

» Waning popularity: Baseball's regular-season attendance hasn't recovered after slipping during the last recession, though the Cactus League has been setting annual records most years since. It may not help when Goose Gossage, a Hall of Fame pitcher, rips today's players as a "disgrace" and executives as "nerds" making the game a "joke," while Bryce Harper, a contemporary star, describes baseball as "a tired sport."

Jan Freitag, senior vice president for STR, said hotel occupancy was down about 1 percent nationally in the first week of March.

The Florida hotels showed a steeper slowdown, suggesting the Grapefruit League is also feeling a pinch.

Looking at the various baseball markets, Freitag said hotels were busy, but less so than they were a year ago. "The room demand dropped and dropped pretty significantly," he said.

Mark Coronado, president of the Cactus League, could not be reached for comment.

DANNY MILLER/THE REPUBLIC

Fans watch the Diamondbacks take on the Los Angeles Angels of Anaheim amid empty seats at Tempe Diablo Stadium on Thursday. Twelve teams have seen attendance decline since last year.

'People are really missing out'

Fans who are heading to the ballparks are puzzled why others are not.

"That's a surprise, but I guess there are a lot of empty seats," said Kim Roehl, 52, of San Tan Valley, during a Milwaukee Brewers game Thursday in Maryvale.

Vi Simpson, a 69-year-old San Francisco Giants fan living in Bloomington, Ind., was at her fourth game in a week. "People are really missing out," she said.

Not surprisingly, one of the exceptions so far has been the Kansas City Royals, who have seen an 11 percent boost in attendance, no doubt due to the team's first world championship in 30 years.

By contrast, the Oakland Athletics have seen their crowds at Mesa's Hohokam Stadium fall nearly 30 percent in the team's second year at that site. On Tuesday — the second Tuesday of the league schedule — the A's drew 4,224 for a game at home against the Texas Rangers.

The second Tuesday a year ago, on March 10, the A's drew 6,434 when they hosted the Arizona Diamondbacks.

On Tuesday this year, the San Diego Padres drew 3,829 for a game in Peoria against the D-Backs. A year ago, the Padres drew 6,729 to see the Giants.

Even the D-Backs, a team that generated plenty of hot-stove buzz heading into this season, have seen attendance dip 11 percent in their first six home games.

A rally is needed, but time is running short

Lower gas prices, unseasonably warm weather here and more excitement about the home team seemed like a mix that could add up to an even bigger year for the Cactus League. If that is to happen, it's going to take a rally.

That's because it's already later than it may seem for the Cactus League season.

Last year, the biggest week for attendance was the second week of the season, when the games drew 489,000 fans. This year, the second week attracted 442,000 in the same number of games.

The third week of the season last year had the highest average attendance, nearly 9,400, but there were nine fewer games that week. There is a similar drop-off in scheduled games this season from the second week to the third.

The fourth week also has a lighter schedule, and this year the final weekend falls on Easter, which could impact attendance as well. It's possible that could provide a sudden burst, but that didn't happen last year, when Easter was the day after the last Cactus League games were played. The Friday and Saturday games last year were far below the average for the same days one week earlier.

Goodyear, Maryvale continue to struggle

As usual, attendance remains anemic in Goodyear and Maryvale, only more so.

The Cleveland Indians and Cincinnati Reds have combined to average about 4,100 fans in Goodyear in 13 games this year. That's down from more than 4,700 at the same point last year. Both teams finished at the bottom for Cactus League attendance.

The Brewers are averaging about 5,000 fans in Maryvale in seven games so far this year. Last year, they averaged nearly 5,700 after seven games. A spokesman for the Brewers said it was premature to label spring training a disappointment.

"To draw any conclusions at this time would be impossible," said Tyler Barnes, a spokesman for the club. "Ultimately, we expect our attendance will be at or close to what we have seen in the past."

The Chicago Cubs, the league's best draw, are up 4 percent at Sloan Park in Mesa so far.

The Los Angeles Dodgers may have turned their clubhouse upside down, but they are the most improved team at the gate. Their attendance is up 13 percent over last year.

That's good news for Glendale, where the Dodgers share a ballpark with the Chicago White Sox, whose attendance has dipped 15 percent so far this year.

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NOTICE OF PUBLIC INFORMATION MEETING

Phoenix-Mesa Gateway Airport
Environmental Assessment

PhxMesa Gateway Airport

The Phoenix-Mesa Gateway Airport Authority (PMGAA) will hold a public information workshop on the Environmental Assessment (EA) for the proposed Northeast Area Development Plan at Phoenix-Mesa Gateway Airport.

Thursday, April 7, 2016

6:30 PM to 8:30 PM

Chandler-Gilbert Community College
Gateway (Williams) Campus
Higley Room in Bridget Hall
7360 E. Tahoe Ave, Mesa
Mesa, AZ 85213

PROPOSED ACTION: Phoenix-Mesa Gateway Airport Authority (PMGAA) proposes to relocate the passenger terminal complex and ancillary facilities at Phoenix-Mesa Gateway Airport to the northeast section of the airport, construct associated infrastructure and site improvements, relocate an Airport Surveillance Radar (ASR-8) off-airport, and complete site preparation for future revenue generating commercial development including retail and office space. The proposed project is known as the Northeast Area Development Plan (NADP). The project would provide a purpose-built replacement passenger terminal complex that will provide the users of Phoenix-Mesa Gateway Airport with a modern, efficient, and expandable passenger terminal complex at a level of service that is consistent and competitive with other air carrier airports in the southwestern United States.

PURPOSE OF PUBLIC SCOPING MEETING: The meeting will provide an opportunity for public review of the Proposed Action, purpose and need for the Proposed Action, alternatives to the Proposed Action, and potential environmental effects of the Northeast Area Development Plan to be analyzed in the Draft EA. The meeting will be held in an informal open house format. Representatives from the airport and study team will be available to talk with citizens about the environmental review. Graphics will be on display so citizens can review project details and attendees will have an opportunity to provide oral and written comments.

ENVIRONMENTAL ASSESSMENT: The EA will be prepared in accordance with the National Environmental Policy Act (NEPA) to examine potential impact categories as required by Federal Aviation Administration Order 5050.4B. Once prepared, the Draft EA will be available for public and agency review and comment at the PMGAA website www.phxmesagateway.org.

AR-0008527628-01

Industrial Users In Significant Noncompliance (SNC) with Applicable Pretreatment Requirements in 2015

The Cities of Glendale, Mesa, Phoenix, Scottsdale, and Tempe, and the Town of Gilbert, Arizona are responsible for implementing and operating industrial wastewater control (pretreatment) programs in each of their communities. Each program is designed to protect the wastewater treatment plants (POTW), the safety of personnel operating the wastewater collection system, and the environment from adverse impacts that might occur when toxic wastes are discharged into a wastewater collection system. Each municipality issues wastewater discharge permits to Industrial Users (Users) in their communities and the Users are responsible for ensuring that they comply with its respective local ordinance and federal regulations.

In accordance with the Federal Clean Water Act and the public participation requirements of 40 CFR Part 25 in the enforcement of the National Pretreatment Standards as defined by 40 CFR 403.8(f)(2)(viii), **the Cities of Glendale, Mesa, Phoenix, Scottsdale, and Tempe, and the Town of Gilbert, Arizona** are hereby publishing the following list of Users in Significant Noncompliance(SNC) with applicable pretreatment requirements. **This notice covers the period from January 1, 2015 through December 31, 2015.**

An Industrial User is in a state of SNC when violations meet one or more of the following:

A. Chronic violations (CSNC) of wastewater discharge limits defined here as those in which sixty-six percent or more of all of the measurements taken during a six-month period exceed (by any magnitude) the daily maximum limit or the average limit for the same pollutant parameter.
B. Technical Review Criteria violations (TRCSNC), defined here as those in which thirty-three percent or more of all of the measurements taken during a six-month period equal or exceed the product of the daily maximum limit or the average limit multiplied by the applicable TRC (TRC= 1.4 for BOD, TSS, fats, oil and grease; and 1.2 for all other pollutants except pH).
C. Any other violation of a pretreatment effluent limit (daily maximum or long term average) that the POTW determines has caused alone or in combination with other discharges interference or pass through (including endangering the health of POTW personnel or the general public);
D. Any discharge of a pollutant that has caused imminent endangerment of human health, welfare or to the environment or has resulted in the POTW s exercise of its emergency authority to halt or prevent such as discharge;
E. Failure to meet, within 90 days after the schedule date, a compliance schedule milestone contained in a permit or enforcement order for starting construction, completing construction, or attaining final compliance;
F. Failure to provide within 30 days after the due date the required report such as a Baseline Monitoring Report, a 90 day compliance report, periodic self-monitoring reports, and reports on compliance with compliance schedules;
G. Failure to accurately report noncompliance; or
H. Any other violation or group of violations, which the POTW determines will adversely affect the operation or implementation of the local pretreatment program.

Public participation and cooperation are important to a successful industrial pretreatment program. If you have comments or witness a situation that you believe may involve an illegal discharge of pollutants or hazardous material into a municipality s sewer system, please immediately notify the appropriate municipality: Gilbert (480) 503-6411, Glendale (623) 930-4758, Mesa (480) 644-2131, Phoenix (602) 495-5926, Scottsdale (480) 391-5687, or Tempe (480) 350-2678.

Industrial User	Nature of Violation/ Type of Pollutant	Date Of Last Non-Compliance	Has User Returned to Compliant Status as of 12/31/2015?	Number of Times Published	Nature of Enforcement Action(s)	Comments
City of Glendale						
Magellan Aerospace, Glendale Inc. 5440 West Missouri Avenue Glendale, Arizona 85301-6008	TRCSNC daily maximum effluent violations for Silver in the 4th Quarter of 2015	12/07/2015	No	2	Notice of Violation Temporary Increase in Self-Monitoring SNC Notification	IU voluntarily ceased all discharge immediately upon learning of Silver violation. IU discovered a part failure in the Silver recovery system and will be increasing the capacity of the Silver recovery system with larger canisters to prevent future violation.
City of Mesa No Users in SNC						
City of Phoenix						
Barrel O'Fun Snack Foods Southwest, Inc. 7330 West Sherman Street Phoenix, Arizona 85043-4751	Late Reporting monthly Self-Monitoring Report submitted greater than 30-days late	09/02/2015	No	2	Notices of Violation Demand Inspections SNC Notification	Violations other than late reporting include: 6 instantaneous pH effluent violations. Show Cause Hearing imposing monetary penalties will be held during the 1st or 2nd Quarter of 2016
Mega Metals Unlimited Inc. 1323 North 22nd Avenue Phoenix Arizona 85009-3714	TRCSNC monthly average effluent violations for Titanium in the 3rd Quarter of 2015	09/30//2015	Yes	1	Notices of Violation Demand Inspection SNC Notification	Violations other than late reporting include: 3 daily maximum effluent violations for Titanium. IU voluntarily ceased all discharge until upgraded wastewater pretreatment system is installed. Production-based permit limits to be recalculated. Show Cause Hearing imposing monetary penalties will be held during the 1st or 2nd Quarter of 2016
Abrazo Central Campus (Phoenix Baptist Hospital) 2000 West Bethany Home Road Phoenix, Arizona 85015-2443	Late Reporting - Water Balance Data Report submitted greater than 30-days late	05/18/2015	Yes	2	Notices of Violation Temporary Increase in Self-Monitoring Demand Inspection SNC Notification	Violations other than late reporting include: 8 additional late reports in response to the following effluent violations - 2 Copper, 1 Zinc, and 1 pH effluent violations occurred during chiller tube descaling by contracted servicer. Show Cause Hearing imposing monetary penalties will held during the 1st or 2nd Quarter of 2016
City of Scottsdale No Users in SNC						
City of Tempe No Users in SNC						
Town of Gilbert No Users in SNC						

Virginia Jackson

From: Jeanine Rogers <JRogers@phxmesagateway.org>
Sent: Wednesday, March 16, 2016 2:09 PM
To: Jeanine Rogers
Subject: Environmental Assessment (EA) for the proposed Northeast Area Development Plan Open House

The Phoenix-Mesa Gateway Airport Authority (PMGAA) would like to invite you to the public information meeting (Open House format, no formal presentation) on the Environmental Assessment (EA) for the proposed Northeast Area Development Plan at Phoenix-Mesa Gateway Airport.

The meeting will be held on **Thursday, April 7, 2016 from 6:30 P.M. to 8:30 P.M.** The meeting will be held at:

Chandler-Gilbert Community College
Williams (Gateway) Campus
Higley Room in Bridget Hall
7360 E. Tahoe Ave, Mesa
Mesa, AZ 85213

PMGAA proposes to relocate the passenger terminal complex and ancillary facilities at Phoenix-Mesa Gateway Airport to the northeast section of the airport, construct associated infrastructure and site improvements, relocate an Airport Surveillance Radar (ASR-8) off-airport, and complete site preparation for future revenue generating commercial development including retail and office space. The proposed project is known as the Northeast Area Development Plan (NADP). The project would provide a purpose-built replacement passenger terminal complex that will provide the users of Phoenix-Mesa Gateway Airport with a modern, efficient, and expandable passenger terminal complex at a level of service that is consistent and competitive with other air carrier airports in the southwestern United States.

The meeting will provide an opportunity for public comment concerning the Proposed Action, purpose and need for the Proposed Action, alternatives to the Proposed Action, and potential environmental effects of the Northeast Area Development Plan to be analyzed in the Draft EA. The public information meeting will be held in an informal open house format. Representatives from the airport and study team will be available to talk with participants about the environmental process. Graphics will be on display so participants can review project details and attendees will have an opportunity to provide written comments.

For more information on the project and EA, please visit PMGAA's website at: http://www.phxmesagateway.org/Ea

Jeanine Rogers
Administrative Specialist, Engineering and Facilities
Phoenix-Mesa Gateway Airport Authority
5835 South Sossaman Road
Mesa, Arizona 85212-6014
Office: 480-988-7628
Fax: 480-988-2315
jrogers@phxmesagateway.org
www.phxmesagateway.org

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Please be advised that our office hours are Monday - Thursday 7 a.m. to 6 p.m. We are closed Fridays.

Phoenix-Mesa Gateway Airport
Public Information Meeting
Thursday, April 7, 2016

SIGN-IN SHEET - PLEASE PRINT

Name	Organization	Address	Phone Number	E-Mail Address
M. Truman	DINC	P.O. Box 13031 Scottsdale	602 418 1811	michelle@dinc.info
Kyle Mieras	Gilbert	90 E. Civic Center Dr	480 503 6705	kyle.mieras@gilbertaz.gov
M. Evanson	PMGAA			
David Barnes	Four Points	6850 E Williams Field Rd.	480 579 2161	david.barnes@fourpoints.com
Mike Dickerson	MD Acoustics	4966 S Gilbert Rd. Chandler	602.774.1950	mike@mdacoustics.com
Mike Hutchinson	East Valley Partnership	~~[illegible]~~ 535 N Baseline Rd Suite 107 Mesa	602-363-5033	mhutchinson@evpaz.org

PhxMesa **Gateway** Airport

Phoenix-Mesa Gateway Airport
Public Information Meeting
Thursday, April 7, 2016

SIGN-IN SHEET - PLEASE PRINT

Name	Organization	Address	Phone Number	E-Mail Address
Sarah Johnson	BSA	7162 E. Trent Ave, Mesa AZ	480-726-6803	missbuzzybee@yahoo.com
Josh Johnson	merit	↓	↓	↓
Seth Johnson	Boy	↓	↓	↓
Abinidi Slade	↓	↓	↓	↓
Eddie Arge	ABM	2344 N Terrace St Mesa AZ 85213	602-717-2068	eddie.arge@abm.com
Mark Cocheran	MAIR Dev. Grp.	P.O. Box 636 Scottsdale AZ 85252	602-689-3038	mac@mairdevelopment.com
Stacy Brimhall	Langley	2845 E Robin ct Gilbert AZ 85296	602 571 5691	stacy@langleyland.com
Peter Knudson	Dibble Engineering	7500 N. Dreamy Draw	602-957-1157	Peter.Knudson@dibblecorp.com
DAVID JARVIS	APH	2251 N. 32nd St, Mesa	480-650-1441	djarvis55@hotmail.com
JIM BESINGER	JETSTRIP INC	7744 E VELOCITY WY	480-988-9190	jim@jetstrip.com

PhxMesa Gateway Airport

PHOENIX-MESA GATEWAY AIRPORT AUTHORITY
Environmental Assessment for Northeast Area Development Plan

The Phoenix-Mesa Gateway Airport Authority (PMGAA) has initiated on behalf of the Federal Aviation Administration (FAA) the preparation of an Environmental Assessment (EA) for the Northeast Area Development Plan (NADP) at Phoenix-Mesa Gateway Airport.

PMGAA is undertaking the NADP to provide a developable area that can provide the users of Phoenix-Mesa Gateway Airport with a modern, efficient, and expandable passenger terminal complex at a level of service that is consistent and competitive with other air carrier airports in the southwestern United States, and to provide additional development and revenue opportunities.

The proposed facilities would be located northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel, south of Ray Road and west of Ellsworth Road.

WHAT IS AN ENVIRONMENTAL ASSESSMENT?

Before the proposed NADP can be approved or determined eligible for FAA funding, an EA is required. In accordance with FAA regulations, the EA is being conducted in compliance with FAA guidance that implements the National Environmental Policy Act (NEPA) of 1969.

Federal guidance for the environmental process encourages public involvement and identifies the analysis to be completed to determine the potential impacts in a number of environmental categories. Some of the categories with local concerns include: aircraft overflight and resulting noise concerns, compatible land use, historic and archaeological resources, air and water quality, stormwater management, and traffic impacts.

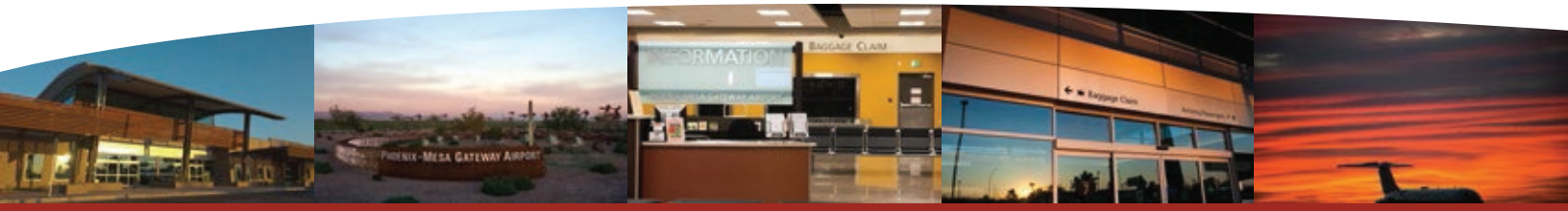
Alternatives evaluated during the NADP process as well as other viable alternatives for the passenger terminal development will be evaluated in the EA. Where actions are found to have environmental consequences, mitigation measures will be identified and considered by the FAA.

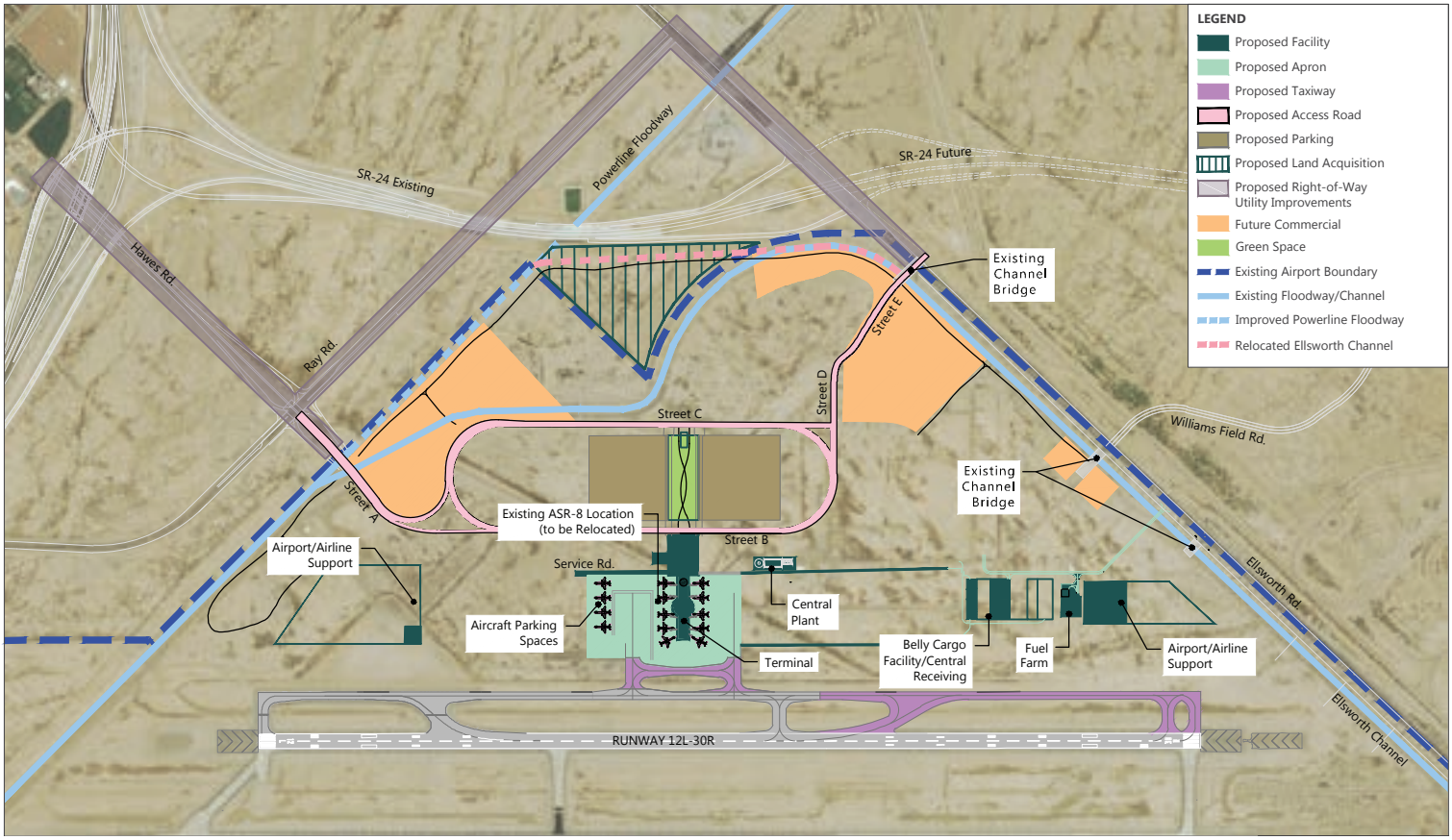
PUBLIC INVOLVEMENT

- Scoping meetings were held on September 12, 2013 to inform the public about the project and EA process and gain input on the issues and concerns to be addressed in the EA.
- A public information meeting will be held on Thursday April 7, 2016 to provide the public an opportunity for comment concerning the Proposed Action, purpose and need for the Proposed Action, alternatives to the Proposed Action, and potential environmental effects of the Northeast Area Development Plan to be analyzed in the Draft EA.
- The public information meeting will be from 6:30 P.M. to 8:30 P.M at the Chandler-Gilbert Community College - Williams (Gateway) Campus in the Higley Room in Bridget Hall.
- An additional public hearing/workshop will be held after release of the Draft EA anticipated in summer 2016.
- Project progress will be posted on the Airport Authority's website (http://www.phxmesagateway.org).
- PMGAA staff contact:
  Tony Bianchi Phone: 480.988.7649
  Email: TBianchi@phxmesagateway.org

THE ENVIRONMENTAL ASSESSMENT (EA) PROCESS

1. Decision to Prepare an EA
2. Scoping Meetings / Public Information Workshop
3. Refinement of Work Plan as needed
4. Prepare Draft EA
5. Public Meeting / Information Workshop April 2016
6. Distribute Draft EA to Agencies and Public July 2016
7. Public Meeting / Information Workshop August 2016
8. Review and Revise Document
9. Prepare and Publish Final EA December 2016
10. FAA Finding Issued





COMPONENTS OF THE PROPOSED ACTION

- Provide grading, site preparation, and utility connections for commercial development
- Passenger terminal complex with 10 gates and aircraft parking spaces
- Airfield, taxiway, and taxilane improvements
- Complete construction of full length parallel taxiway northeast of Runway 12L-30R
- Aircraft apron
- Access roadways and terminal curbfront improvements
- Vehicle parking spaces
- Relocation of utilities, service roads, and perimeter fencing
- Ancillary/support facilities for aviation
- Relocate Airport Surveillance Radar (ASR) off airport
- Relocate Ellsworth Channel
- Improve Powerline Floodway
- Demolition of existing buildings and structures within the northeast development area, grading for site preparation

PhxMesa Gateway Airport

Public Information Meeting

Northeast Area Development Plan Environmental Assessment

Chandler-Gilbert Community College Gateway (Williams) Campus
Higley Room in Bridget Hall
6:30 P.M. to 8:30 P.M.

April 7, 2016

PUBLIC WORKSHOP OBJECTIVES

- Provide information about Proposed Action and Alternatives
- Describe the National Environmental Policy Act (NEPA) process
- Update the public on the project's progress since the Public Scoping Meeting
- Collect community comments on the purpose and need for the project, alternatives, and environmental concerns

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

PhxMesa Gateway Airport

- Required for projects receiving federal funding or approval
- Informs decision makers, agencies, organizations, and the public whether a federal action would significantly affect the environment
- Identifies environmental impacts of the proposed action, no action, and other reasonable alternatives
- Identifies measures to avoid, minimize, or mitigate adverse environmental impacts

ENVIRONMENTAL ASSESSMENT PROCESS

PhxMesa Gateway Airport

Septemeber 12, 2013
PUBLIC SCOPING AND AGENCY MEETING

July 2013 - November 2015
SURVEYS AND BASELINE CONDITIONS

November 2013 - January 2016
DOCUMENTATION
TECHNICAL REPORTS

January 2016 - July 2016
IMPACT ANALYSIS

April 2016
PUBLIC OPEN HOUSE

July 2016
DOCUMENTATION
DRAFT ENVIRONMENTAL ASSESSMENT

July - August 2016
PUBLIC COMMENT PERIOD

August 2016 - December 2016
RESPONSE TO COMMENTS AND REVISIONS

December 2016
DOCUMENTATION
FINAL ENVIRONMENTAL ASSESSMENT

PURPOSE AND NEED OF THE PROPOSED PROJECT

PhxMesa Gateway Airport

Project Purpose/Benefits

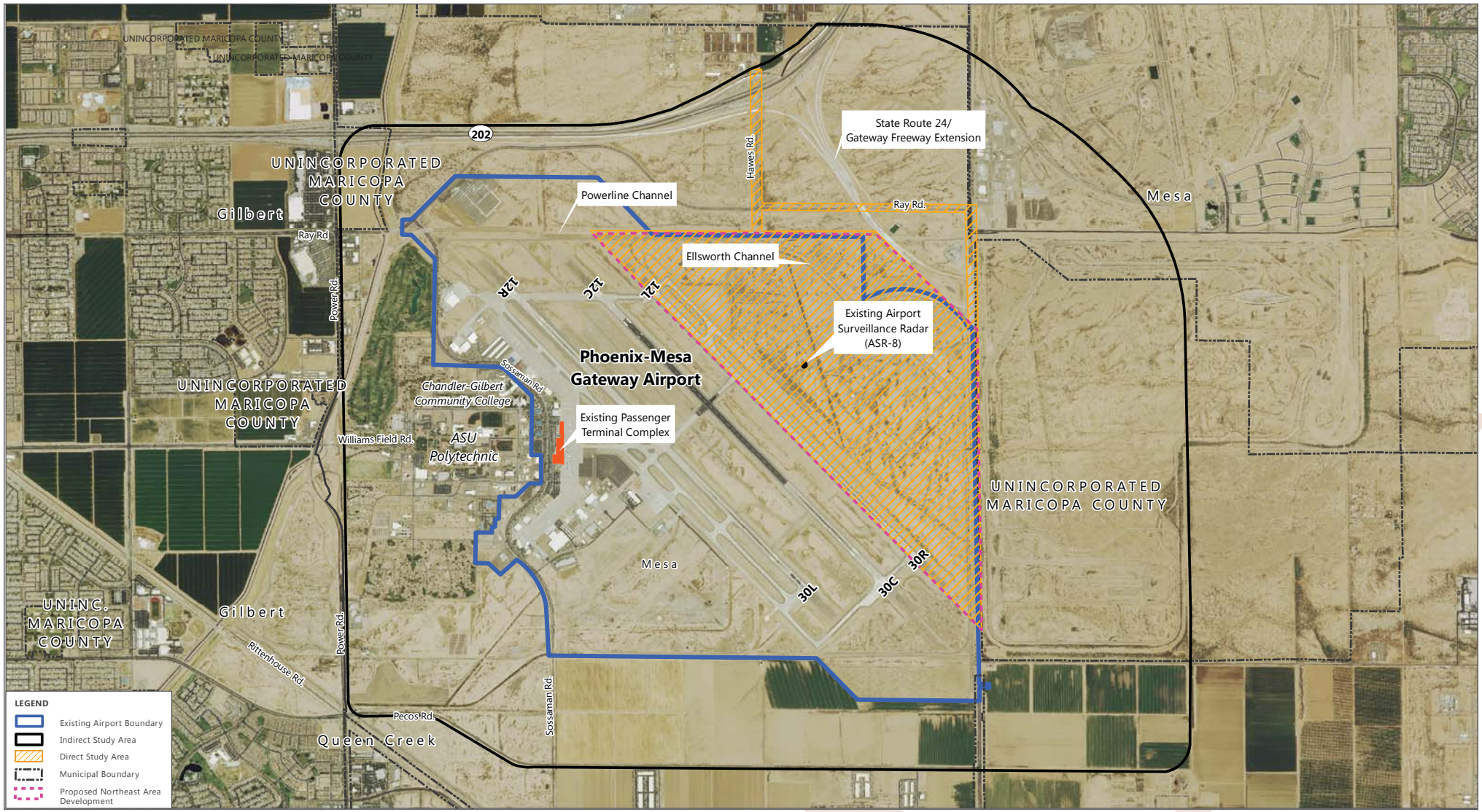
- Provide a modern, efficient and expandable centralized passenger terminal complex
- Provide adequate space for potential future revenue-producing commercial development
- Provide direct connections to Santan Freeway and SR 24

Project Need

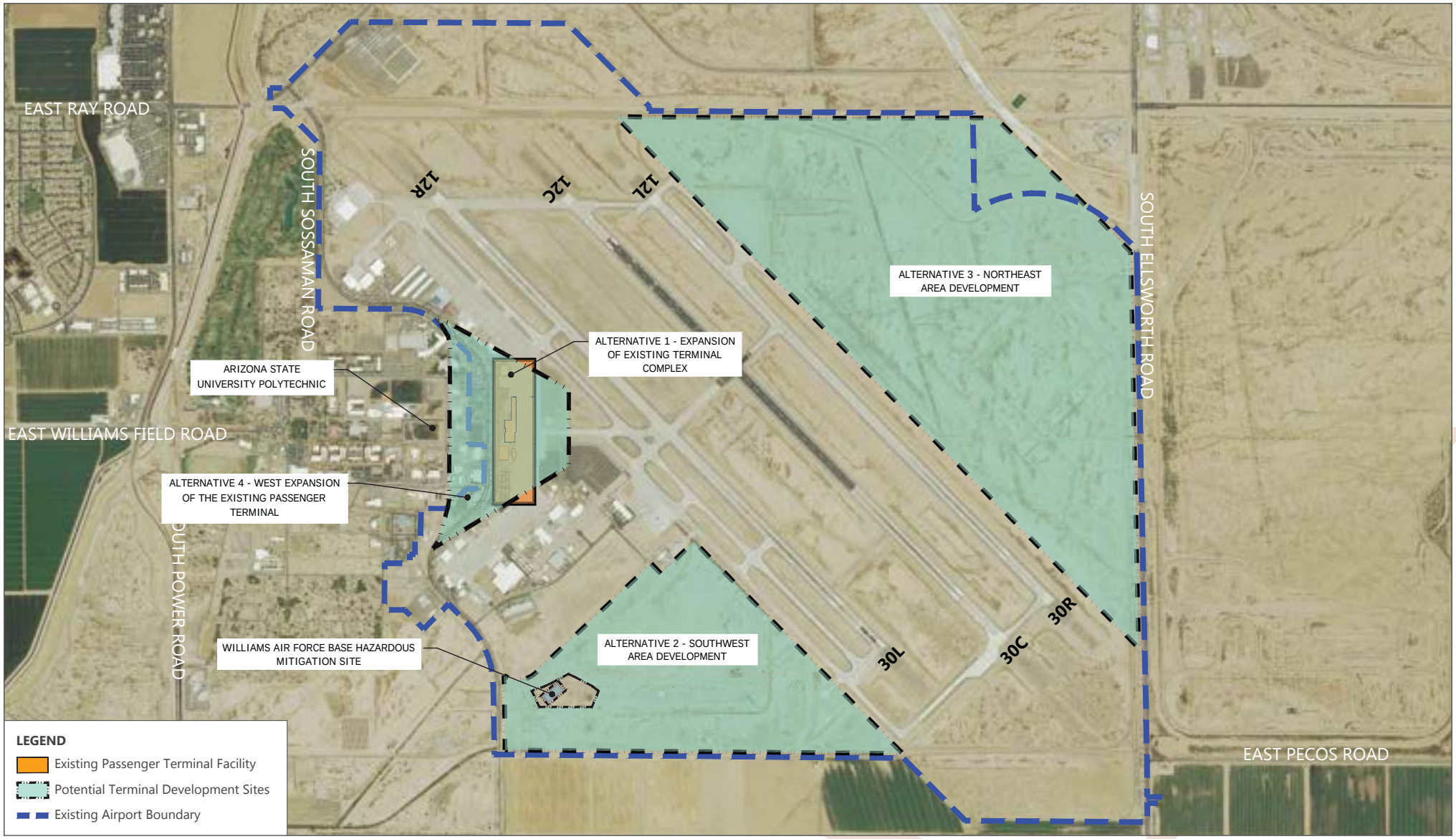
- Existing terminal complex, in its current configuration, is a disparate, inefficient collection of terminal buildings
- Space constraints prohibit any further expansion of either the passenger terminal area or landside areas in their current locations
- Existing terminal complex lacks direct freeway access

TERMINAL PROJECT LOCATION

PhxMesa Gateway Airport



TERMINAL ALTERNATIVES



SUMMARY OF TERMINAL ALTERNATIVES SCREENING PROCESS

PhxMesa Gateway Airport

STEP 1

Would the Alternative Provide an Efficient Centralized Passenger Terminal Complex?

YES → **STEP 2**

Would the Alternative Provide Opportunity for Future Revenue-Producing Commercial Development?

YES → **STEP 3**

Would the Alternative Provide Direct Access to Major Highways?

YES → **EVALUATE ENVIRONMENTAL CONSEQUENCES**

Retain for detailed analysis of environmental impacts within Chapter 4.0, Environmental Consequences and Mitigation Measures of this EA.

NO → **ELIMINATED** from further consideration

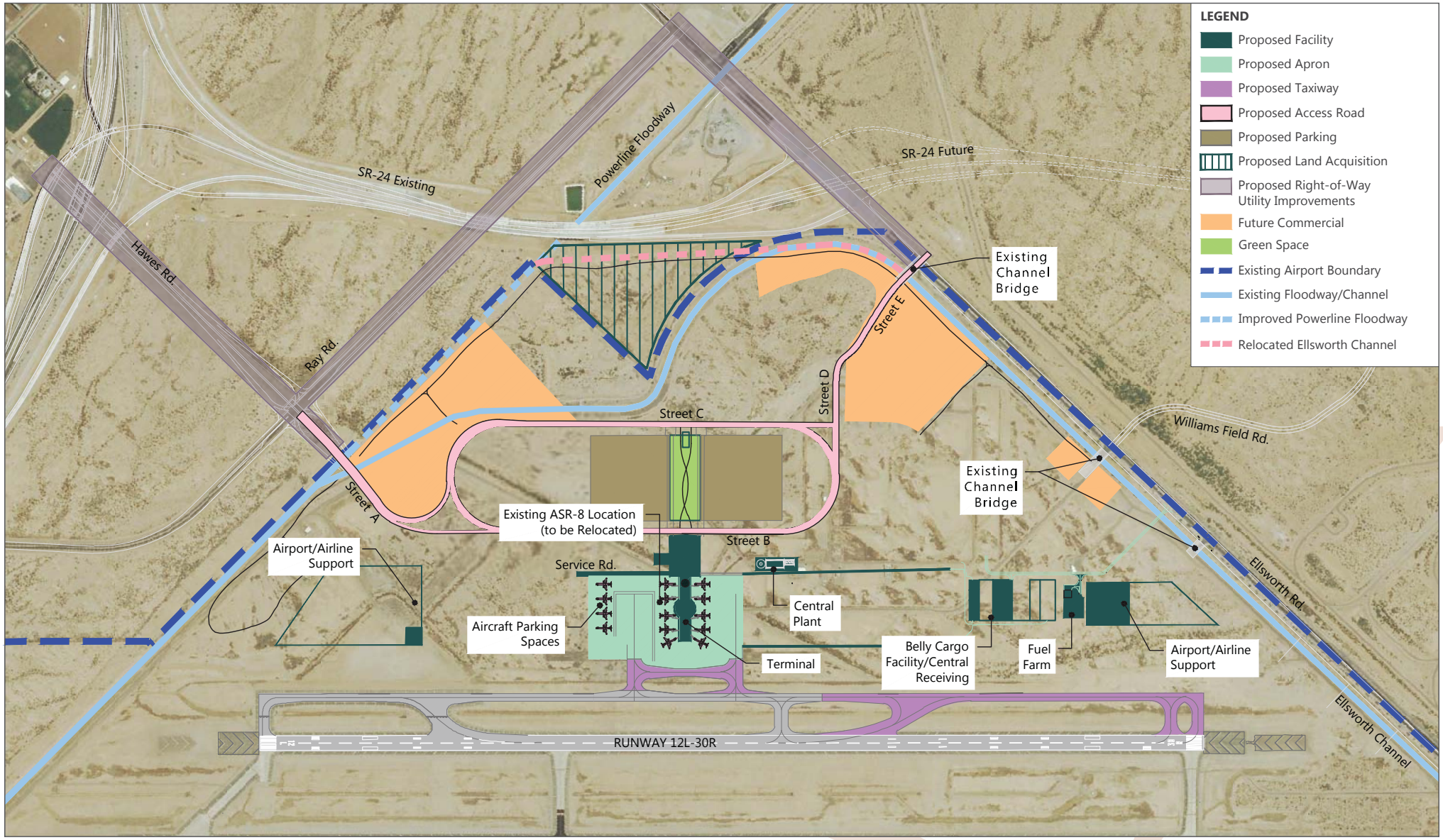
NO → **ELIMINATED** from further consideration

NO → **ELIMINATED** from further consideration

LOCATION	ALTERNATIVE	ALTERNATIVE MEETS THE CRITERIA			RETAINED FOR FURTHER ANALYSIS IN THE DRAFT EA
		STEP 1 CRITERIA	STEP 2 CRITERIA	STEP 3 CRITERIA	
OPERATIONAL ALTERNATIVES	Use of Other Modes of Transportation	No, does not provide centralized terminal facility			No
	Use of Other Public Airports	No, does not provide centralized terminal facility			No
ON-SITE ALTERNATIVES	No Action Alternative	No, does not provide centralized terminal facility			Yes
	Alternative 1 Expansion of Existing Passenger Terminal Complex	No, does not provide centralized terminal facility			No
	Alternative 2 Southwest Area Development	Yes, provides centralized terminal facility	Yes, provides limited potential for commercial development opportunities	No, does not provide direct access to major highways	No
	Alternative 3 Northeast Area Development	Yes, provides centralized terminal facility	Yes, provides potential commercial development opportunities	Yes, provides direct access to major highways	Yes
OFF-SITE ALTERNATIVES	**Alternative 4** West Expansion of the Existing Passenger Terminal Complex	Yes, provides centralized terminal facility	No, provides less commercial development opportunities than other viable alternatives		No

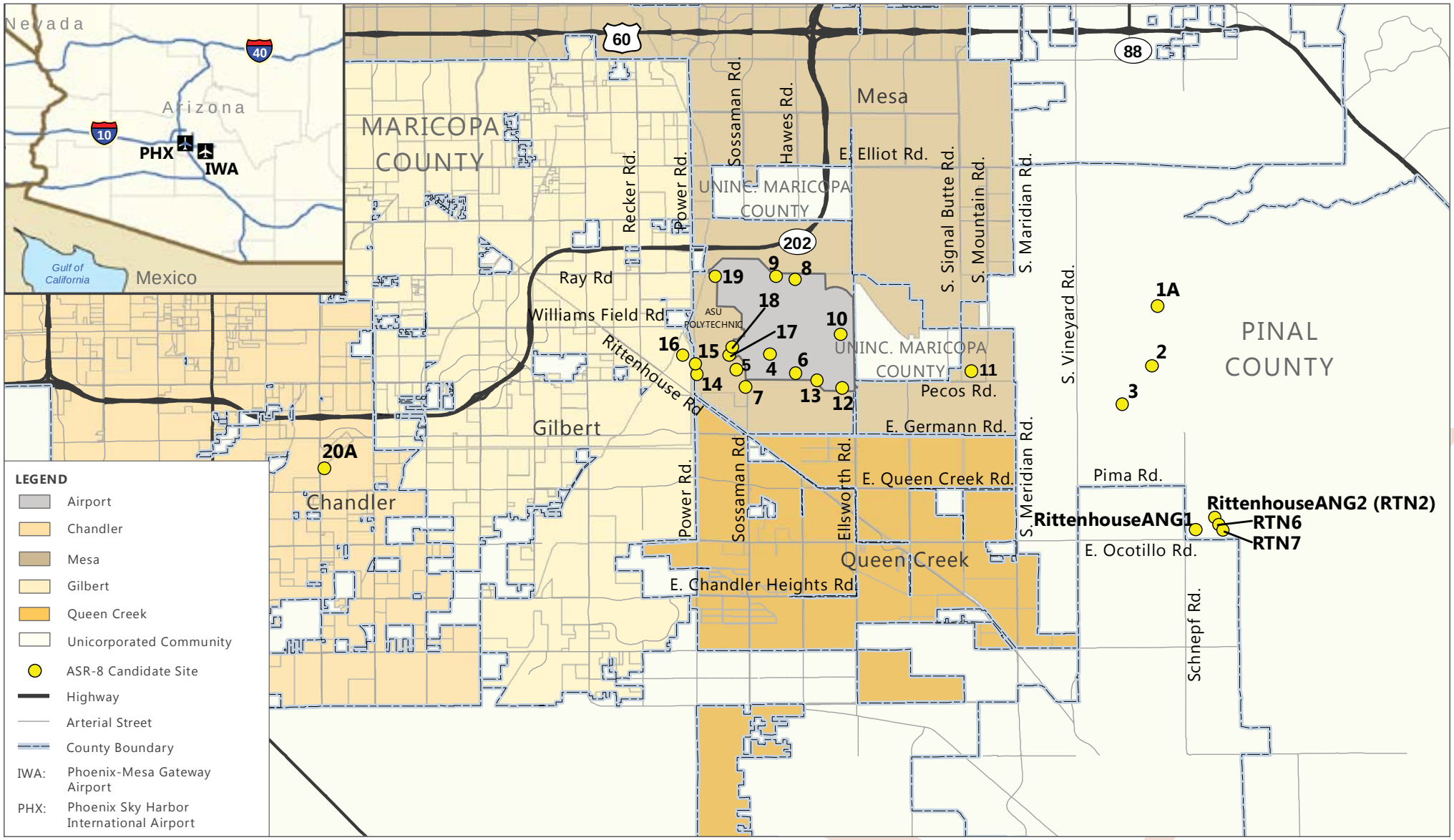
TERMINAL PROPOSED ACTION

PhxMesa Gateway Airport



ASR-8 CANDIDATE SITES

PhxMesa Gateway Airport



SUMMARY OF ASR-8 ALTERNATIVES SCREENING PROCESS

PhxMesa Gateway Airport

STEP 1

Would the alternative meet exclusionary criteria?

NO

Potential for significant impacts or physical constraints exist

YES

STEP 2

Would the alternative meet restrictive criteria?

NO

Impacts environmental resources; terrain is steep; fails to meet other FAA radar criteria

YES

STEP 3

Would the alternative meet selective criteria?

NO

Lacks Accessibility, less desirable soil/geology, not proximate to utilities, line-of-sight issues

YES

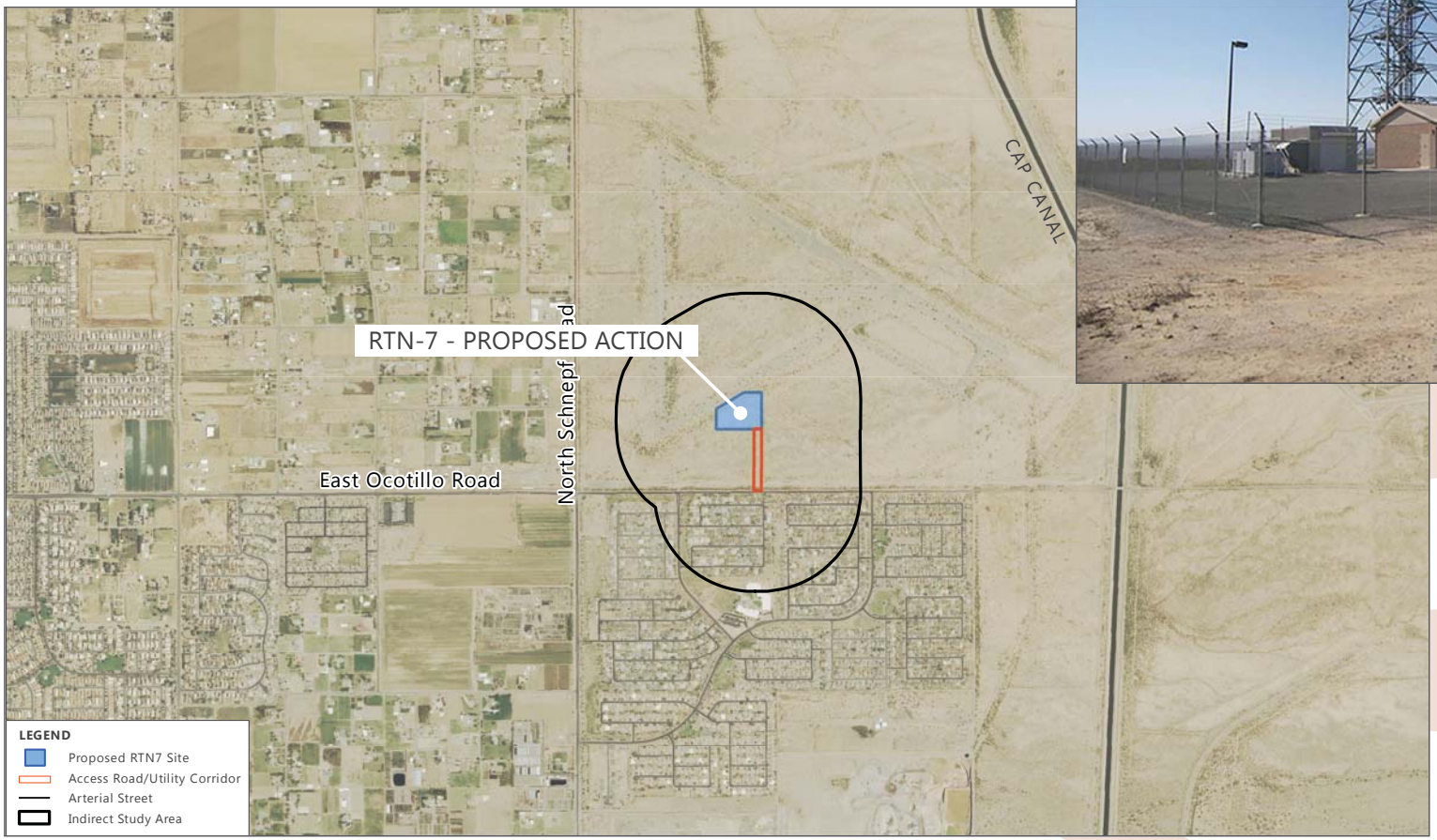
EVALUATE ENVIRONMENTAL CONSEQUENCES

Retain for detailed analysis of environmental impacts within Chapter 4.0, Environmental Consequences and Mitigation Measures of this EA.

ASR-8 PROPOSED ACTION

PhxMesa Gateway Airport

TYPICAL AIRPORT SURVEILLANCE RADAR (ASR) FACILITY



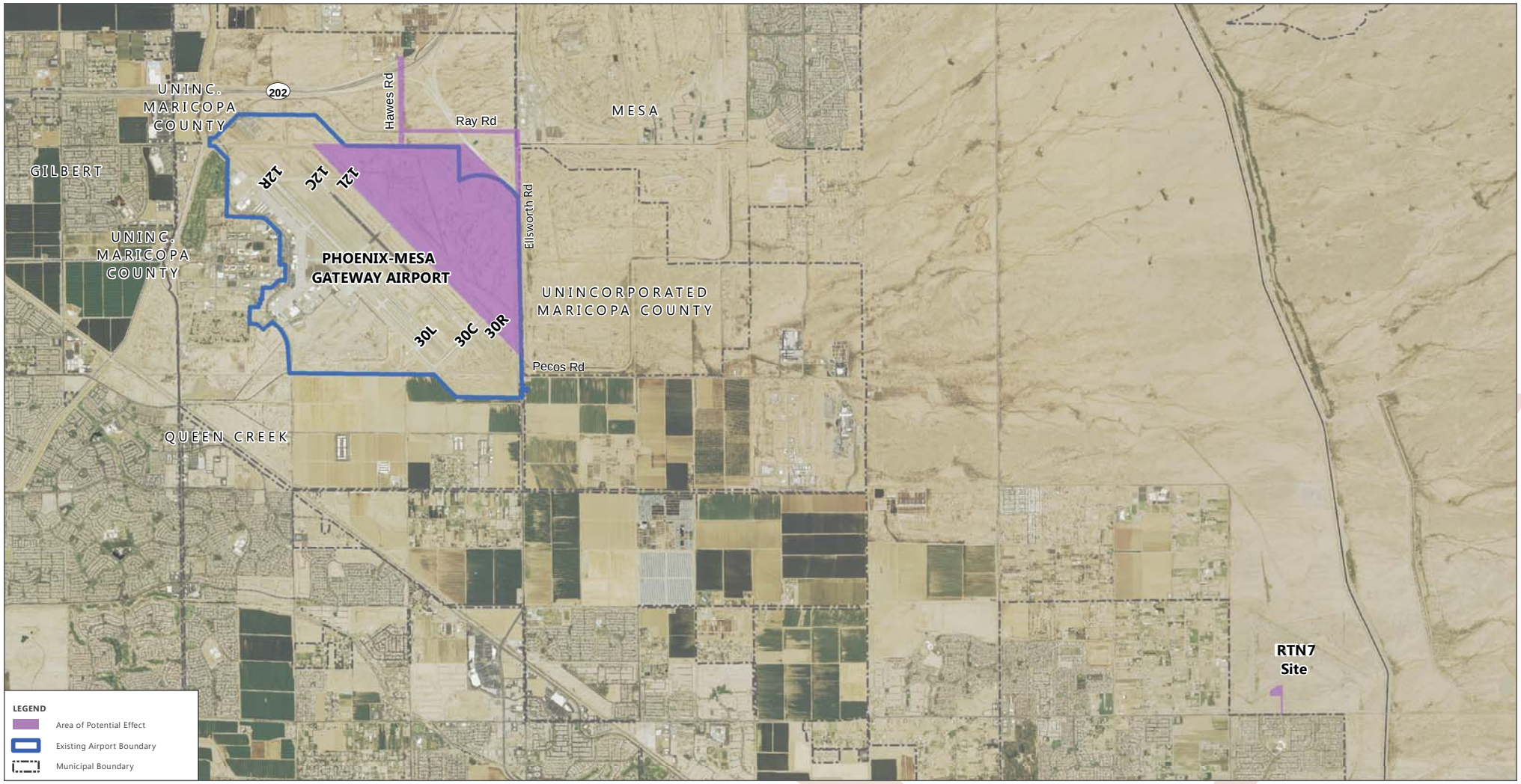
ENVIRONMENTAL IMPACT CATEGORIES ANALYZED

PhxMesa Gateway Airport

- Air Quality
- Biological Resources
- Climate
- Department of Transportation Act Section 4(f)
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical, Architectural, Archaeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Compatible Land Use
- Socioeconomic Impacts, Environmental Justice, Children's Health and Safety Risks
- Visual Effects
- Water Resources
- Cumulative Impacts

HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL AND CULTURAL RESOURCES AREA OF POTENTIAL EFFECT

PhxMesa Gateway Airport



NEXT STEPS

PhxMesa Gateway Airport

1. Complete Draft EA
2. Distribute Draft EA to Agencies and Public (July 2016)
3. Public Meeting/ Info Workshop (Aug 2016)
4. Review and Revise Document
5. Prepare and Publish Final EA (Dec 2016)

Appendix J

Section 106 and

Native American Consultation

SHPO - 2016 - 1244 (133608)
ARIZONA STATE HISTORIC PRESERVATION OFFICE

U.S Department
of Transportation
Federal Aviation
Administration

Western-Pacific Region
Airports Division

Federal Aviation Administration
P.O. Box 92007
Los Angeles, CA 90009-2007

RECEIVED
OCT 26 2016
ARIZONA STATE HISTORIC
PRESERVATION OFFICE

October 25, 2016

Ms. Kathryn Leonard
State of Arizona
Arizona State Parks
1100 W. Washington Street
Phoenix, Arizona 85007

Attention: Mr. David Jacobs

Dear Ms. Leonard:

Proposed Northeast Terminal Development Plan
Phoenix Mesa Gateway Airport
Mesa, Maricopa County, Arizona
Section 106 Coordination

This letter is a follow up to telephone conversations I had with David Jacobs of your staff. The Phoenix Mesa Gateway Airport Authority (Airport Authority) and the Federal Aviation Administration (FAA) are preparing federal environmental documentation under the National Environmental Policy Act (NEPA) of 1969, as amended for the Airport Authority's proposed Northeast Terminal Development Plan. Part of this plan includes relocation of the FAA-owned Airport Surveillance Radar (ASR) equipment on the airport to another location. The ASR is proposed to be relocated to the Rittenhouse Auxiliary Army Air Field (AAAF), located about 8.5 miles southeast of Phoenix Mesa Gateway Airport.

Our Phoenix Airports District Office consulted with you on this proposed undertaking by letter dated March 28, 2016. Subsequent to that letter, the FAA has learned the Bureau of Land Management (BLM), the federal agency that currently manages the property that is leased to the Arizona Army National Guard, had reviewed a Cultural Resources Survey document about the site prepared by SWCA in 2008. The Cultural Resources Survey had recommended the site was not eligible for inclusion into the National Register of Historic Places (NRHP) because it lacked historic integrity. FAA understands the BLM disagreed with SWCA's recommendation and determined the Rittenhouse AAAF was eligible for inclusion into the NRHP under Criterions A and D. However, FAA has recently learned the determination was made for Criterion D to protect possible buried archaeological artifacts, instead of more recent historical information for the site as a military airfield.

The proposed undertaking that FAA had consulted with your office includes relocation of the existing ASR to the Rittenhouse AAAF. FAA has reexamined the cultural resources report for the proposed undertaking, also prepared by SWCA, dated January 2014. FAA has also reviewed recent photos at the site. I have attached the photos for your

information. The attached photos show significant vegetation growing up through the remains of the significantly deteriorated pavement. The only area where vegetation has been cut down is the area the Arizona Army National Guard uses for helicopter operations training. Based on the information contained in the report and recent photos provided to FAA by the Airport Authority, FAA has determined the Rittenhouse AAAF is not eligible for inclusion into the NRHP under any of the four criterion specified in Title 36, Code of Federal Regulations (CFR) Section 60.4. FAA is mindful of the BLM's concerns about undiscovered subsurface artifacts. Thus FAA is including an Unanticipated Discovery Plan into the Draft EA to ensure proper treatment of any properties discovered during ground disturbing activities.

Based on the photos provided by the Airport Authority and the information contained in the Cultural Resources Report that indicate the site no longer retains historic integrity, the FAA has determined the Rittenhouse AAAF is not eligible for inclusion into the NRHP. **FAA seeks the Arizona SHPO's concurrence with this determination of eligibility.**

Assessment of Adverse Effects on Historic Properties.

Since the FAA has determined the Rittenhouse AAAF is not listed or eligible for listing on the NRHP, the FAA reaffirms its finding that the proposed construction of the ASR at the Rittenhouse AAAF will not affect any properties listed or eligible for listing on the NRHP under 36 CFR § 800.4(d)(1). **FAA seeks the SHPO's concurrence with this finding.**

If you have any further questions about this matter, please call me at 310/725-3615.

Sincerely,

David B. Kessler, AICP
Regional Environmental Protection Specialist

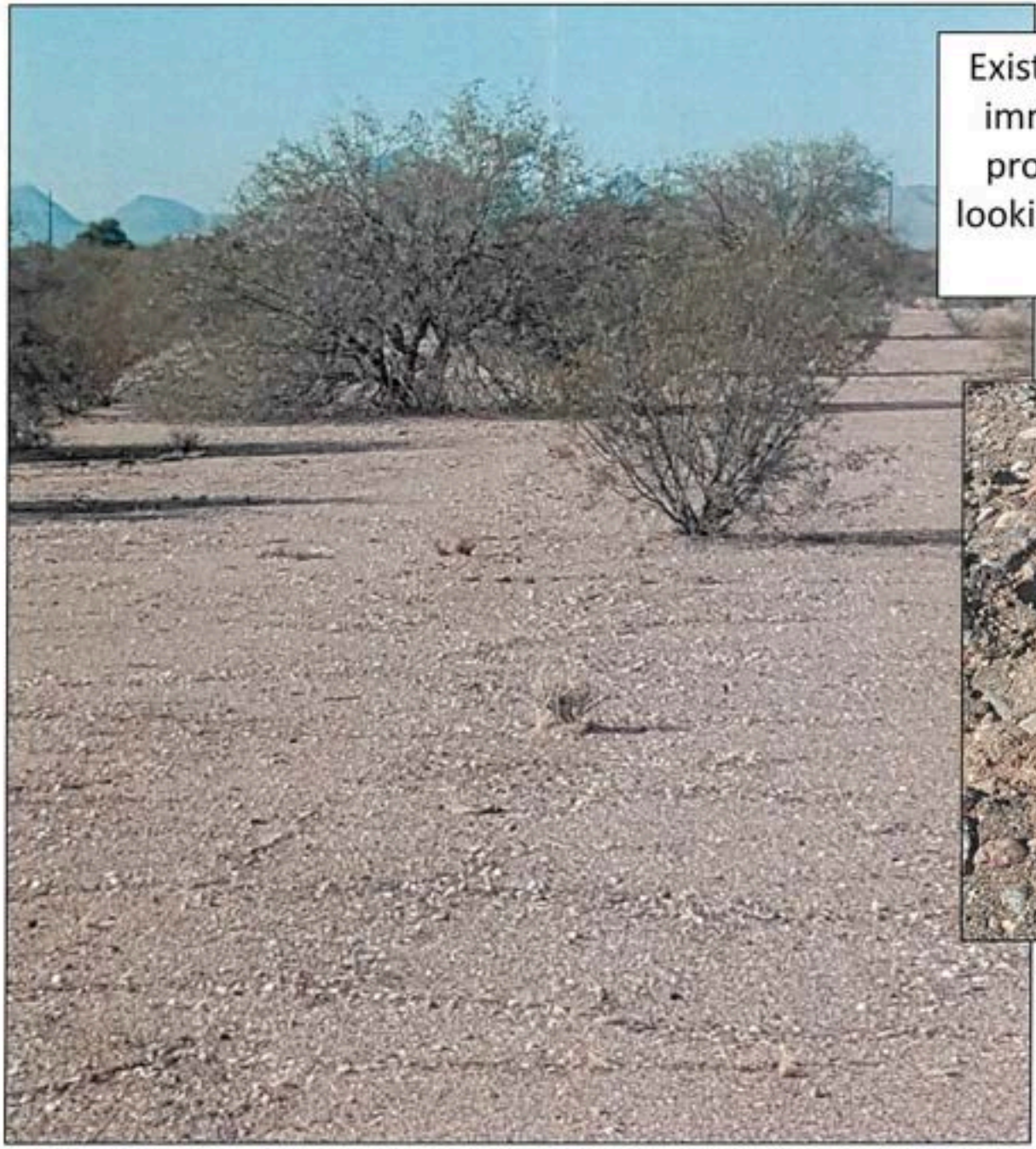
Enclosures: – Photos showing vegetation growing up through former runway pavement.

Cc:PHX-600

I concur with FAA's NRHP eligibility determinations and findings of effect by the proposed undertaking as described above.

Arizona SHPO

2 NOV 16
Date



Existing portion of the runway immediately adjacent to the proposed ASR Site (RTN 7) – looking from west to east down the runway

Close up view of asphalt condition adjacent to the proposed ASR site

Approximate location of the ASR site – from the runway looking south toward Ocotillo Road

For comparison, this photo depicts the existing Heliport site, currently utilized for training purposes

SHPO - 2015 - 0664(130401)
ARIZONA STATE HISTORIC PRESERVATION OFFICE

U.S. Department of Transportation
Federal Aviation Administration

Western-Pacific Region
Airports Division
Phoenix Airport District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

March 28, 2016

RECEIVED
FEDERAL AVIATION ADMINISTRATION
APR 14 2016
PHOENIX AIRPORTS DISTRICT OFFICE
RECEIVED

RECEIVED
APR 04 2016
ARIZONA STATE HISTORIC PRESERVATION OFFICE

Mr. James Garrison
State of Arizona
Arizona State Parks
1300 W. Washington Street
Phoenix, AZ 85007

RE: SHPO-2015-0664(126221)

Proposed Northeast Development Area Plan
Phoenix-Mesa Gateway Airport
Mesa, Maricopa County, Arizona

Dear Mr. Garrison:

In a letter dated July 20, 2015, the Federal Aviation Administration (FAA) provided a copy of the National Register of Historic Places (NRHP) eligibility Data Testing Plan for the above referenced undertaking for your review and concurrence. To date, the FAA has received concurrence on the Area of Potential Effect (APE) and the Data Testing Plan as part of our consultation with your office under Section 106 of the National Historic Preservation Act.

Continuing with that consultation, enclosure (1) contains the findings from implementing the approved Data Testing Plan, *Results of National Register of Historic Places Eligibility Testing of Four Sites at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County, AZ.*

Within the Northeast Area Development Plan APE, there were four previously unrecorded archaeological sites [AZ U:10:316(ASM), AZ U:10:317(ASM) AZ U:10:320(ASM) and AZ U:10:321(ASM] that were located during a pedestrian survey in 2015. Eligibility for listing in the NRHP of these four recorded sites was unknown. Results of the eligibility testing determined that there were no archaeological features or significant cultural deposits identified during the investigation. It was determined that the four archaeological sites did not warrant additional study or preservation and did not contain enough integrity to make them eligible for listing in the NRHP as an individual site or as a contributing resources to a district.

The FAA has determined that the proposed undertaking will not compromise the integrity of any individual or contributing historic resource that is eligible for listing in the NRHP that may exist within the APE. Pursuant to Title 36, Code of Federal Regulations (CFR), Section 800.5, the FAA is requesting your concurrence with our determination of **No Adverse Effect** for the proposed undertaking.

Should you have any additional questions, please feel free to contact me at amanda.velasquez@faa.gov or 602-792-1067.

Sincerely,

Amanda Velasquez
Environmental Protection Specialist

Encl: (1) Results of National Register of Historic Places Eligibility Testing of Four Sites

CONCUR

6 APRIL 16

Arizona State Historic Preservation Office

GILA RIVER INDIAN COMMUNITY

POST OFFICE BOX 2140, SACATON, AZ 85147

TRIBAL HISTORIC PRESERVATION OFFICE

(520) 562-7162
Fax: (520) 562-5083

April 26, 2016

Amanda Velasquez
Environmental Protection Specialist
Federal Aviation Administration
Western-Pacific Region, Airports Division
Phoenix Airport District Office
3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, Arizona 85012

RE: Proposed Northeast Development Area Plan, Results of National Register of Historic Eligibility Testing at Four Sites, Phoenix-Mesa Gateway Airport (PMGAA), Maricopa County, Arizona

Dear Ms. Velasquez,

The Gila River Indian Community Tribal Historic Preservation Office (GRIC-THPO) has received your consultation package dated March 28, 2016. The GRIC-THPO initially responded to this undertaking on October 12, 2015. The PMGAA is proposing to implement the Northeast Development Area Plan (NADP) to begin extensive modifications to the PMGAA including construction of a new 300,000 square terminal with 14 gates. The Federal Aviation Administration (FAA) has submitted for review an archaeological testing report for sites: 1) AZ U:10:316(ASM); 2) AZ U:10:317(ASM); 3) AZ U:10:320(ASM); and 4) AZ U:10:321(ASM). The sites had been previously unrecorded and were indentified and recorded during an archaeological survey of the project area in 2015. The results of eligibility testing showed that there were no archaeological features or significant cultural deposits at any of the sites. None of the sites are considered Register eligible properties. The FAA has made a determination of no adverse effect for this undertaking.

The GRIC-THPO agrees that the sites are not Register eligible and we concur with a finding of no adverse effect. The proposed project area is within the ancestral lands of the Four Southern Tribes (Gila River Indian Community; Salt River Pima-Maricopa Indian Community; Ak-Chin Indian Community and the Tohono O'Odham Nation).

Thank you for consulting with the GRIC-THPO. If you have any questions please do not hesitate to contact me or Archaeological Compliance Specialist Larry Benallie, Jr. at 520-562-7162.

Respectfully,

Barnaby V. Lewis
Tribal Historic Preservation Officer
Gila River Indian Community

SHPO - 2015 - 0664 (126221)
ARIZONA STATE HISTORIC PRESERVATION OFFICE

U.S. Department of Transportation
Federal Aviation Administration

Western-Pacific Region
Airports Division
Phoenix Airport District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

June 17, 2015

JUN 19 2015

Mr. James Garrison
State of Arizona
Arizona State Parks
1300 W. Washington Street
Phoenix, AZ 85007

Proposed Northeast Development Area Plan
Phoenix-Mesa Gateway Airport
Mesa, Maricopa County, Arizona
Section 106 Consultation

Dear Mr. Garrison:

The Phoenix-Mesa Gateway Airport Authority (PMGAA) and the Federal Aviation Administration (FAA) are preparing an Environmental Assessment under the National Environmental Policy Act (NEPA) of 1969, as amended, for PMGAA's proposed Northeast Development Area Plan (NADP) at the Phoenix-Mesa Gateway Airport. The plan will correct existing deficiencies with the existing passenger terminal complex.

PMGAA proposes to undertake the NADP to address deficiencies with the existing passenger terminal and to accommodate the existing and forecast number of passengers at the Airport at an acceptable level of service. The proposed facilities would be located on property owned or leased by the PMGAA northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel, south of Ray Road and west of Ellsworth Road (**Exhibit 1**). The existing passenger terminal complex is deficient in a number of areas as measured by passenger processing level-of-service and ground transportation access. Multiple existing passenger terminal functional areas are inefficient in processing existing passenger levels. These inefficiencies will become more and more evident over time as passenger levels increase. Air service demands are expected to increase in accordance with the region's population growth.

The proposed facilities, depicted on **Exhibit 2**, include:

- Terminal Building: 300,000 square foot building with 14 gates
- Access Roadways
- Passenger and employee parking, rental car facilities
- Airfield, taxiway, and taxilane improvements
- Infrastructure Improvements: relocated and expanded utilities, service roads, perimeter fencing

- Ancillary/Support Facilities including: Aircraft Rescue and Firefighting Facility (ARFF), airline support and airport support facilities
- Land Acquisition (Lease): 30 acres in Airport's northeast area (a 30-acre parcel would be purchased from the Arizona Department of Transportation (ADOT) by the City of Mesa and subsequently leased to the PMGAA)
- Site Preparation: Grading, demolition of existing buildings and structures
- Infrastructure for commercial development

An Airport Surveillance Radar (ASR-8), owned and operated by the FAA, is located on the east side of the Airport and provides regional radar coverage. The ASR-8 would be affected by the proposed terminal development and would have to be relocated. A new location on Bureau of Land Management (BLM) land southeast of the Airport in Pinal County has been identified. The relocation of the ASR would necessitate construction of a platform and access road/utility corridor from North Schnepf Road east to the ASR site.

The Federal action requiring compliance with NEPA and review under Section 106 of the National Historic Preservation Act of 1966, as amended, is approval of Federal funding for airport development and approval for an updated Airport Layout Plan once facilities have been constructed.

1. Background and Area of Potential Effects

The FAA determined the Area of Potential Effects (APE) boundaries through consultation with PGMAA on the extent of the proposed ground disturbing activities.

The APE is not contiguous in order to include the relocated ASR-8 site (**Exhibits 3 and 4**). The terminal area portion of the APE consists of approximately 700 acres located on the northeast side of the Airport in Mesa, Arizona (**Exhibit 5**). The main portion of the project site is bordered to the north by the Powerline Floodway (just south of Ray Road), Ellsworth Road to the east, and Runway 12L-30R to the southwest. The right-of-way (ROW) limits of three roadways are also included in the project site to allow for access and utility improvements: Ellsworth Road beginning from the southern limits of the project site north to its intersection with Ray Road; Ray Road from Ellsworth Road west to the intersection with Hawes Road; and Hawes Road from the intersection of Ray Road to the intersection with Santan Freeway (State Route 202). The southwest corner of Ray Road and Ellsworth Road intersection and part of the State Route 24 project currently under construction are not included as part of the project site.

The ASR-8 portion of the APE is approximately 6 acres and is located approximately 8.7 miles southeast of the Airport and about 0.45 mile east of North Schnepf Road (**Exhibit 6**). This portion of the APE is owned by BLM and leased to the Arizona Army National Guard (AZ-ANG). No existing facilities exist on the proposed ASR-8 site. The ASR-8 site is within the Rittenhouse Training Area, an approximately 480-acre AZ-ANG facility located in Queen Creek, Pinal County. The Rittenhouse Training Area is bordered to the south by East Ocotillo Road, North Schnepf Road to the west, Central Arizona Project (CAP) to the east, and open desert to the north.

The terminal area project site is located in Sections 20, 21, 28, 29, and 33, Township 1S, Range 7E, Gila and Salt River Baseline and Meridian, Maricopa County, Arizona (*Higley, Arizona* United States Geological Survey (USGS) 7.5-minute topographic map [USGS 2011]). The PMGAA owns the majority of the property within the project site, with the exception of an approximate 30-acre parcel currently owned by ADOT and the Ray Road, Ellsworth Road, and Hawes Road roadway ROW.

The relocated ASR-8 project site is located in Section 15, Township 2S, Range 8E, Gila and Salt River Baseline and Meridian, Pinal County, Arizona. The project area is included on the Desert Well, Arizona and Sacaton NE, Arizona United States Geological Survey (USGS) 7.5-minute topographic maps.

Pursuant to Title 36, Code of Federal Regulations (CFR), Section 800.4, *Identification of Historic Properties*, **The FAA is seeking concurrence with the APE for the proposed undertaking from the Arizona State Historic Preservation Officer (SHPO).**

2. Native American Consultation.
Concurrent with this APE consultation request, FAA is sending letters to the Ak Chin Indian Community, Fort McDowell Yavapai Nation, Gila River Indian Community, Salt River-Pima Indian Community, Pascua Yaqui, Yavapai-Apache Nation, and The Hopi Tribe to initiate tribal consultation under Section 106. On-going consultation with interested tribes will continue concurrently with SHPO consultation.

3. Area of Potential Effects Surveys
Cultural resource surveys were conducted in the APE and results of these surveys are enclosed for your information. FAA is unable to make a determination of eligibility at this time as additional information is required. A site testing plan is currently in preparation. Upon completion, FAA will provide you with the proposed plan for your review and comment.

Should you have any additional questions, please feel free to contact me at amy.gibbons@faa.gov or 602-792-1066.

Sincerely,

Amy Gibbons
Amy Gibbons, PMP
Environmental Protection Specialist

CONCUR

Arizona State Historic Preservation Office

Enclosures

THE HOPI TRIBE

Herman G. Honanie
CHAIRMAN

Alfred Lomahquahu Jr.
VICE-CHAIRMAN

RECEIVED
FEDERAL AVIATION ADM.
PHOENIX FIELD OFFICE

JUN 30 2015

June 25, 2015

Amy Gibbons, Environmental Protection Specialist
Federal Aviation Administration
3800 N. Central Ave., Suite 1025, 10th Floor
Phoenix, Arizona 85012

Re: Proposed Northeast Development Area Plan, Phoenix-Mesa Gateway Airport

Dear Ms. Gibbons,

This letter is in response to your correspondence dated June 17, 2015, with enclosed cultural resources survey reports regarding the Phoenix-Mesa Gateway Authority proposing to implement the Northeast Development Plan Area at the Phoenix –Mesa Gateway Airport and is seeking Federal Aviation Administration (FAA) funding. The Hopi Tribe claims cultural affiliation to earlier identifiable cultural groups in Arizona including the Phoenix-Mesa area. The Hopi Cultural Preservation Office supports the identification and avoidance of our ancestral sites, and we consider the prehistoric archaeological sites of our ancestors to be Traditional Cultural Properties. Therefore, we appreciate the FAA's solicitation of our input and your efforts to address our concerns.

The Hopi Cultural Preservation Office requests consultation on any proposal with the potential to adversely affect prehistoric cultural resources in Arizona. We have reviewed the enclosed cultural resources survey reports and understand no cultural resources were identified in the Airport Surveillance Radar-8 Relocation project area. However in the 700 acre Northeast Development Plan Area numerous previously and newly recorded prehistoric sites are identified including AZ U:10:127 (ASM) at which a cremation burial was identified and left in place.

Therefore, we have determined that this project is likely to adversely affect cultural resources significant to the Hopi Tribe. We look forward to being provided with copies of the testing plan for five newly recorded sites of indeterminate National Register eligibility currently in preparation and a copy of any proposed treatment plans for review and comment. If you have any questions or need additional information, please contact Terry Morgart at the Hopi Cultural Preservation Office at 928-734-3619 or tmorgart@hopi.nsn.us. Thank you for your consideration.

Respectfully,

Leigh J. Kuwanwisiwma, Director
Hopi Cultural Preservation Office

xc: Arizona State Historic Preservation Office

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division
Phoenix Airport District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

March 28, 2016

Mr. James Garrison
State of Arizona
Arizona State Parks
1300 W. Washington Street
Phoenix, AZ 85007

RE: SHPO-2015-0664(126221)

Proposed Northeast Development Area Plan
Phoenix-Mesa Gateway Airport
Mesa, Maricopa County, Arizona

Dear Mr. Garrison:

In a letter dated July 20, 2015, the Federal Aviation Administration (FAA) provided a copy of the National Register of Historic Places (NRHP) eligibility Data Testing Plan for the above referenced undertaking for your review and concurrence. To date, the FAA has received concurrence on the Area of Potential Effect (APE) and the Data Testing Plan as part of our consultation with your office under Section 106 of the National Historic Preservation Act.

Continuing with that consultation, enclosure (1) contains the findings from implementing the approved Data Testing Plan, *Results of National Register of Historic Places Eligibility Testing of Four Sites at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County, AZ.*

Within the Northeast Area Development Plan APE, there were four previously unrecorded archaeological sites [AZ U:10:316(ASM), AZ U:10:317(ASM) AZ U:10:320(ASM) and AZ U:10:321(ASM] that were located during a pedestrian survey in 2015. Eligibility for listing in the NRHP of these four recorded sites was unknown. Results of the eligibility testing determined that there were no archaeological features or significant cultural deposits identified during the investigation. It was determined that the four archaeological sites did not warrant additional study or preservation and did not contain enough integrity to make them eligible for listing in the NRHP as an individual site or as a contributing resources to a district.

The FAA has determined that the proposed undertaking will not compromise the integrity of any individual or contributing historic resource that is eligible for listing in the NRHP that may exist within the APE. Pursuant to Title 36, Code of Federal Regulations (CFR), Section 800.5, the FAA is requesting your concurrence with our determination of **No Adverse Effect** for the proposed undertaking.

Should you have any additional questions, please feel free to contact me at amanda.velasquez@faa.gov or 602-792-1067.

Sincerely,

Amanda Velasquez
Environmental Protection Specialist

Encl: (1) Results of National Register of Historic Places Eligibility Testing of Four Sites

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division
Phoenix Airport District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

June 17, 2015

Angela Garcia-Lewis
Cultural Preservation Compliance Supervisor
Cultural and Environmental Services
10005 E Osborn Road
Scottsdale, AZ, 85256

Proposed Northeast Development Area Plan
Phoenix-Mesa Gateway Airport
Mesa, Maricopa County, Arizona
Section 106 Consultation

Dear Ms. Garcia-Lewis:

The Phoenix-Mesa Gateway Airport Authority (PMGAA) proposes to implement the Northeast Development Area Plan (NADP) at the Phoenix-Mesa Gateway Airport. PGMAA is requesting FAA funding and approval of a change to the Airport Layout Plan. The FAA is seeking tribal input related to the proposed undertaking.

PMGAA proposes to undertake the NADP to address deficiencies with the existing passenger terminal and to accommodate the existing and forecast number of passengers at the Airport at an acceptable level of service. The proposed facilities would be located on property owned or leased by the PMGAA northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel, south of Ray Road and west of Ellsworth Road (**Exhibit 1**). The existing passenger terminal complex is deficient in a number of areas as measured by passenger processing level-of-service and ground transportation access. Multiple existing passenger terminal functional areas are inefficient in processing existing passenger levels. These inefficiencies will become more and more evident over time as passenger levels increase. Air service demands are expected to increase in accordance with the region's population growth.

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- Infrastructure Improvements: relocated and expanded utilities, service roads, perimeter fencing

- Ancillary/Support Facilities including: Aircraft Rescue and Firefighting Facility (ARFF), airline support and airport support facilities
- Land Acquisition (Lease): 30 acres in Airport's northeast area (a 30-acre parcel would be purchased from the Arizona Department of Transportation (ADOT) by the City of Mesa and subsequently leased to the PMGAA)
- Site Preparation: Grading, demolition of existing buildings and structures
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The FAA determined the Area of Potential Effects (APE) boundaries through consultation with PGMAA on the extent of the proposed ground disturbing activities.

The APE is not contiguous in order to include the relocated ASR-8 site (**Exhibits 3 and 4)**. The terminal area portion of the APE consists of approximately 700 acres located on the northeast side of the Airport in Mesa, Arizona (**Exhibit 5**). The main portion of the project site is bordered to the north by the Powerline Floodway (just south of Ray Road), Ellsworth Road to the east, and Runway 12L-30R to the southwest. The right-of-way (ROW) limits of three roadways are also included in the project site to allow for access and utility improvements: Ellsworth Road beginning from the southern limits of the project site north to its intersection with Ray Road; Ray Road from Ellsworth Road west to the intersection with Hawes Road; and Hawes Road from the intersection of Ray Road to the intersection with Santan Freeway (State Route 202). The southwest corner of Ray Road and Ellsworth Road intersection and part of the State Route 24 project currently under construction are not included as part of the project site.

The ASR-8 portion of the APE is approximately 6 acres and is located approximately 8.7 miles southeast of the Airport and about 0.45 mile east of North Schnepf Road (**Exhibit 6**). This portion of the APE is owned by BLM and leased to the Arizona Army National Guard (AZ-ANG). No existing facilities exist on the proposed ASR-8 site. The ASR-8 site is within the Rittenhouse Training Area, an approximately 480-acre AZ-ANG facility located in Queen Creek, Pinal County. The Rittenhouse Training Area is bordered to the south by East Ocotillo Road, North Schnepf Road to the west, Central Arizona Project (CAP) to the east, and open desert to the north.

The terminal area project site is located in Sections 20, 21, 28, 29, and 33, Township 1S, Range 7E, Gila and Salt River Baseline and Meridian, Maricopa County, Arizona (*Higley, Arizona* United States Geological Survey (USGS) 7.5-minute topographic map [USGS 2011]). The PMGAA owns the majority of the property within the project site, with the exception of an approximate 30-acre parcel currently owned by ADOT and the Ray Road, Ellsworth Road, and Hawes Road roadway ROW.

The relocated ASR-8 project site is located in Section 15, Township 2S, Range 8E, Gila and Salt River Baseline and Meridian, Pinal County, Arizona. The project area is included on the Desert Well, Arizona and Sacaton NE, Arizona United States Geological Survey (USGS) 7.5-minute topographic maps.

Pursuant to Title 36, Code of Federal Regulations (CFR), Section 800.4, *Identification of Historic Properties*, **The FAA is seeking concurrence with the APE for the proposed undertaking from the Salt River Pima-Maricopa Indian Community.**

Cultural resource surveys were conducted in the APE and results of these surveys are enclosed for your information. FAA is unable to make a determination of eligibility at this time as additional information is required. A site testing plan is currently in preparation. Upon completion, FAA will provide you with the proposed plan for your review and comment.

The FAA has also initiated consultation with the Arizona State Historic Preservation Office (SHPO) for this project to obtain concurrence with the APE. On-going consultation with SHPO will continue concurrently with tribal consultation.

Please provide FAA with notification of your interest in the project and concurrence with the APE. Should you have additional information or further questions, concerns or comments, please contact me at 602-792-1066 or amy.gibbons@faa.gov.

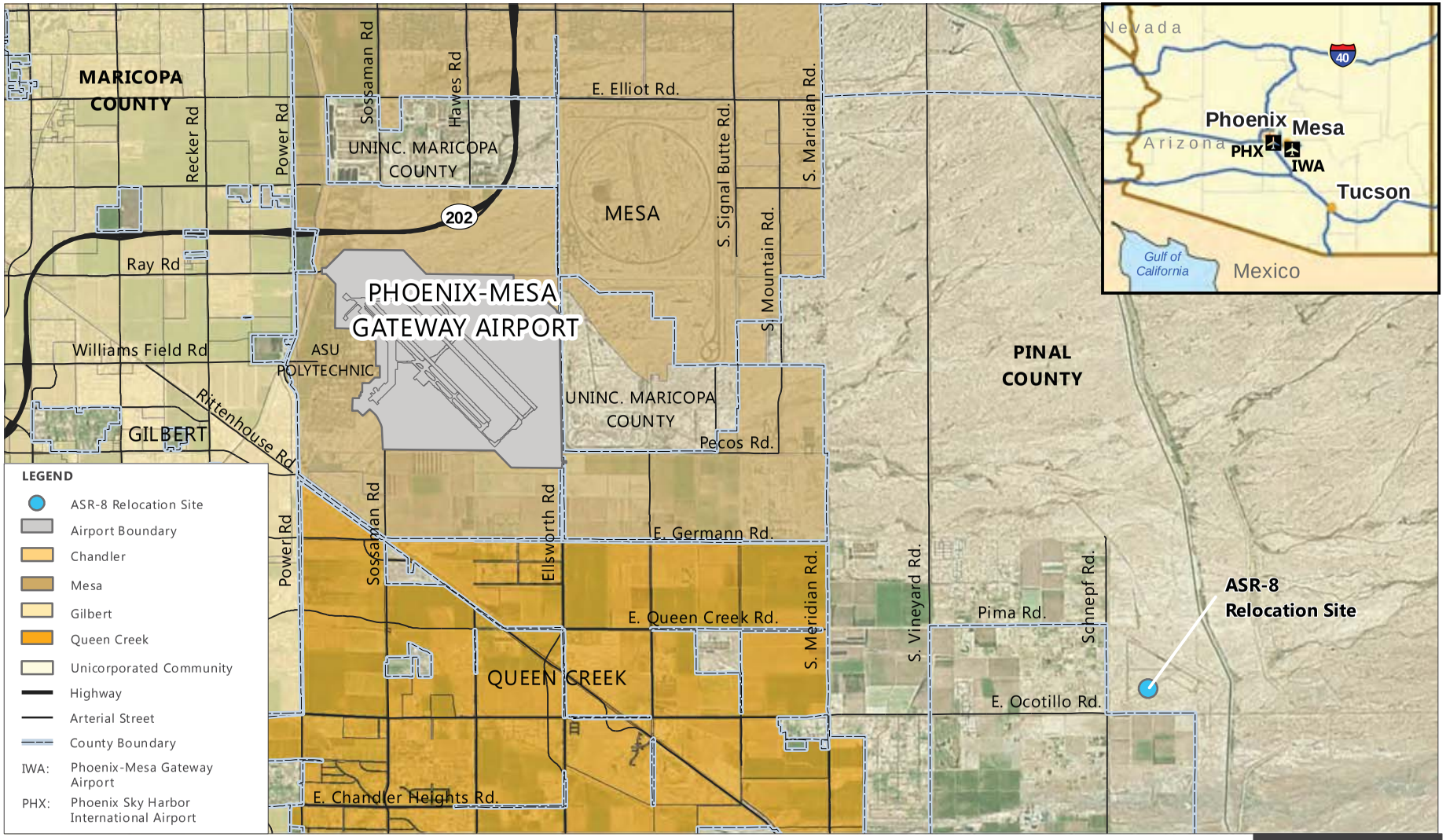
Sincerely,

Amy Gibbons

Amy Gibbons, PMP
Environmental Protection Specialist

Enclosures

[DRAFT]



SOURCE: Maricopa County Elections - City Data, 2014 (base map layers); IWA Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Data 2010 (base map layers).
U.S. DOT, FAA, ASR-8 Surveillance Radar Addendum, May 27, 2014.
PREPARED BY: Ricondo & Associates, Inc., October 2014.

EXHIBIT 1

NORTH 0 9,000 ft.

General Location and Vicinity Map

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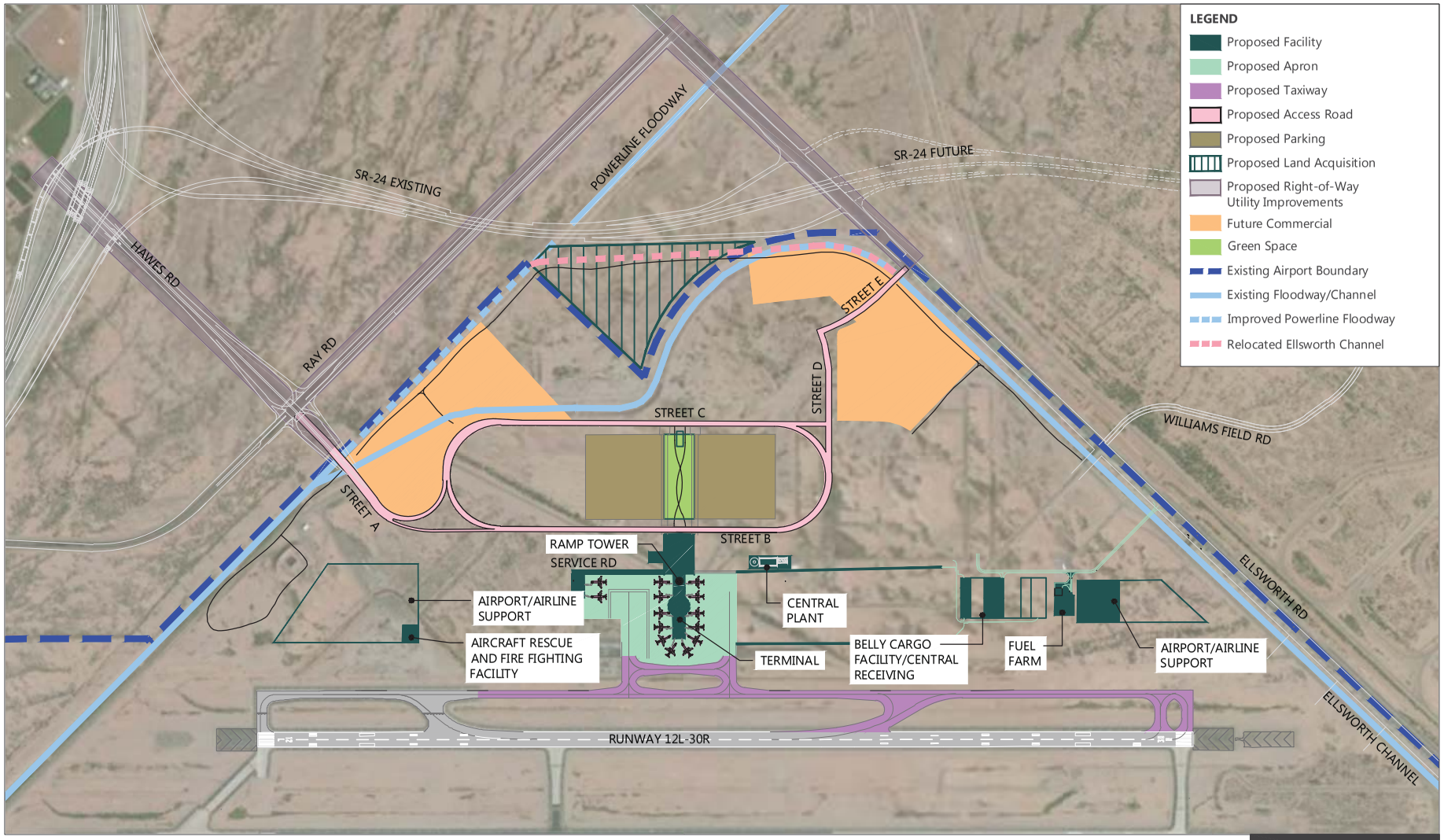


NOTE: The Proposed Action includes the relocation of the Airport Surveillance Radar to a new location southeast of the Airport in Pinal County (See Exhibits 1-5 and 1-6).

SOURCES: Coffman Associates, Inc., *Airport Master Plan for Phoenix -Mesa Gateway Airport,* Final Report, February 2009; U.S. Census, *2013 TIGER/Line Shapefiles*, accessed online: http://www.census.gov/cgi-bin/geo/shapefiles2013/main, March 2014; ESRI Database, Aerial Image, March 2014; Ricondo & Associates, Inc., October 2013.

PREPARED BY: Ricondo & Associates, Inc., June 2014.

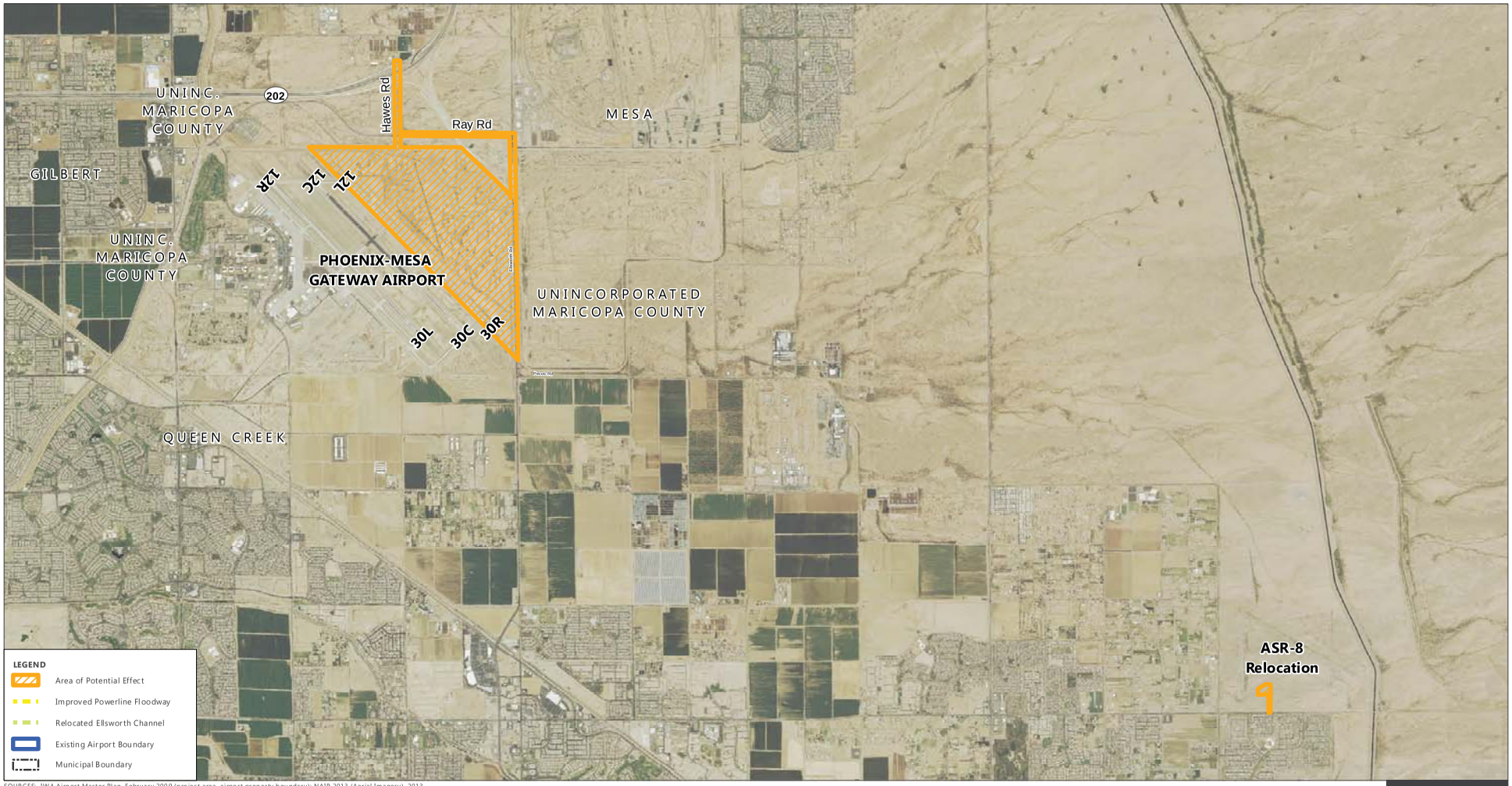
EXHIBIT 2

NORTH 0 1,500 ft.

Proposed Action

Drawing: C:\Projects\IWA\CAD\CAD\Proposed Action_20150421.dwg Layout: EX 2 Plotted: Apr 24, 2015, 11:26AM

[DRAFT]



SOURCES: IWA Airport Master Plan, February 2009 (project area, airport property boundary); NAIP 2013 (Aerial Imagery), 2013.
PREPARED BY: Ricondo & Associates, Inc., April 2015.

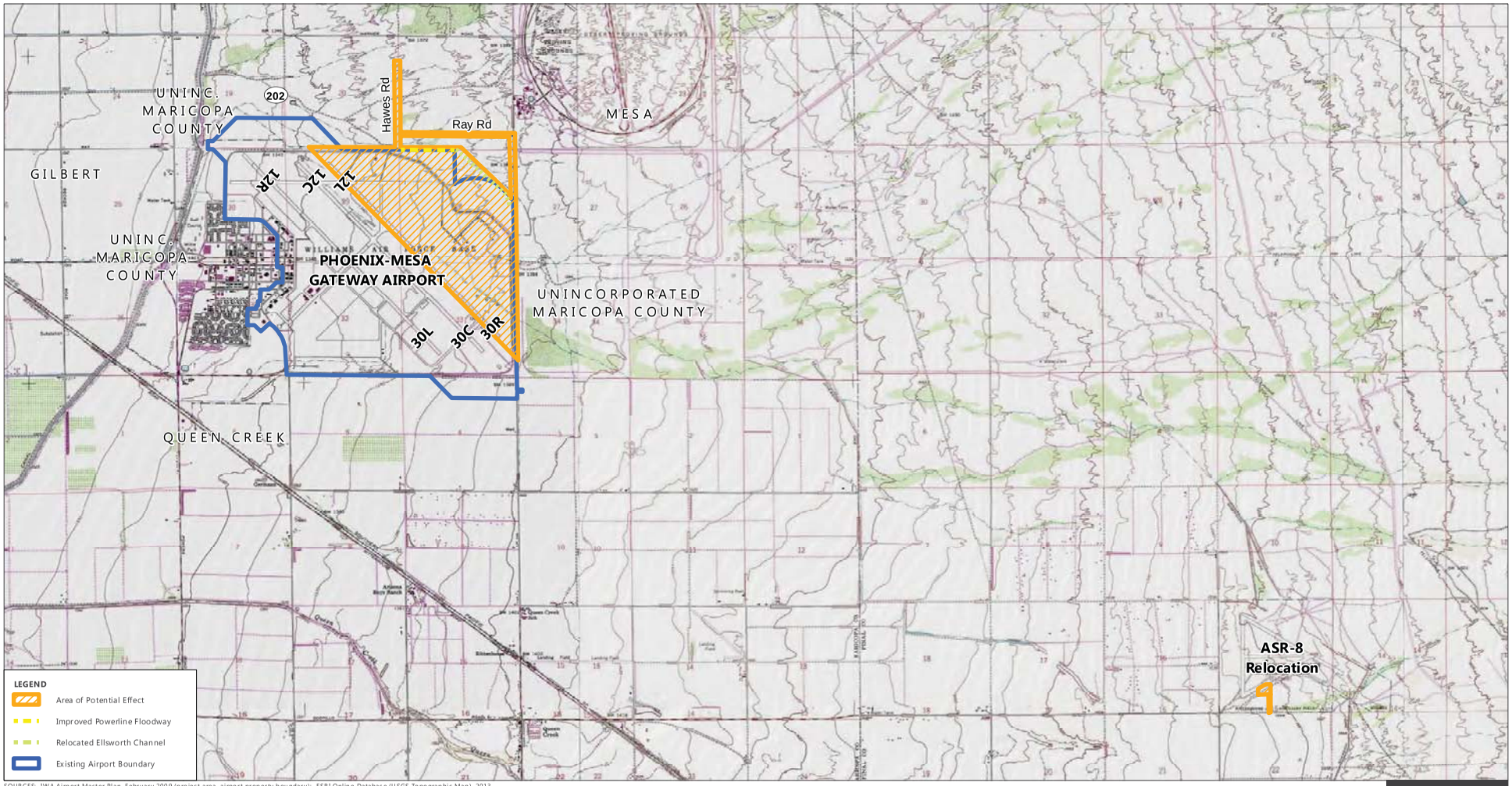
EXHIBIT 3

NORTH 0 4,500 ft.

W:\Projects\IWA\NADP EA\MXD\SHPO\Exhibit3_APE_20150420.mxd

Area of Potential Effect

[DRAFT]



SOURCES: IWA Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Online Database (USGS Topographic Map), 2013.
PREPARED BY: Ricondo & Associates, Inc., April 2015.

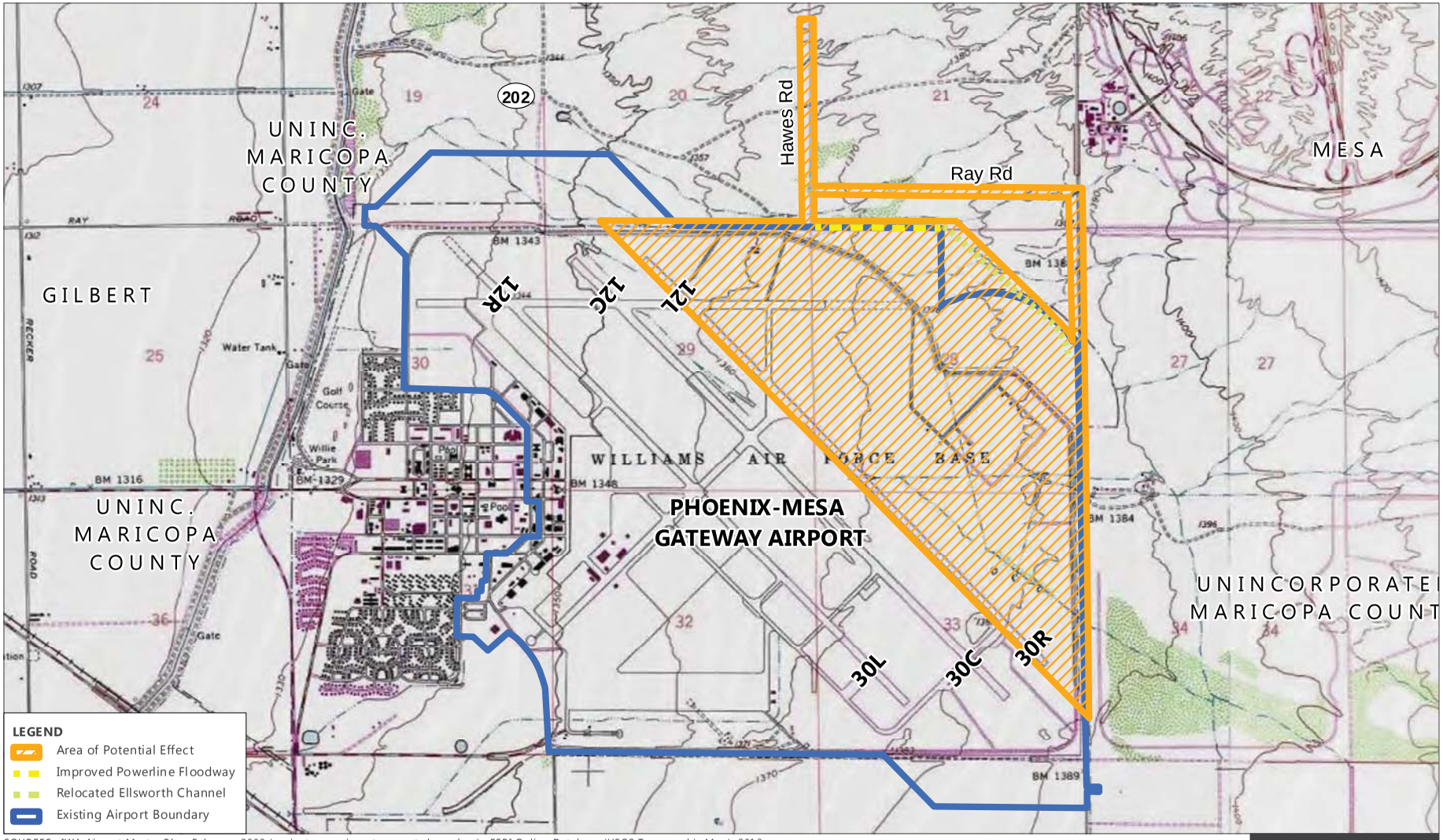
EXHIBIT 4

NORTH 0 4,500 ft.

W:\Projects\IWA\NADP EA\MXD\SHPO\Exhibit4_APE_Topo1_20150605.mxd

Area of Potential Effect Topographic Map

[DRAFT]



SOURCES: IWA Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Online Database (USGS Topographic Map), 2013.
PREPARED BY: Ricondo & Associates, Inc., April 2015.

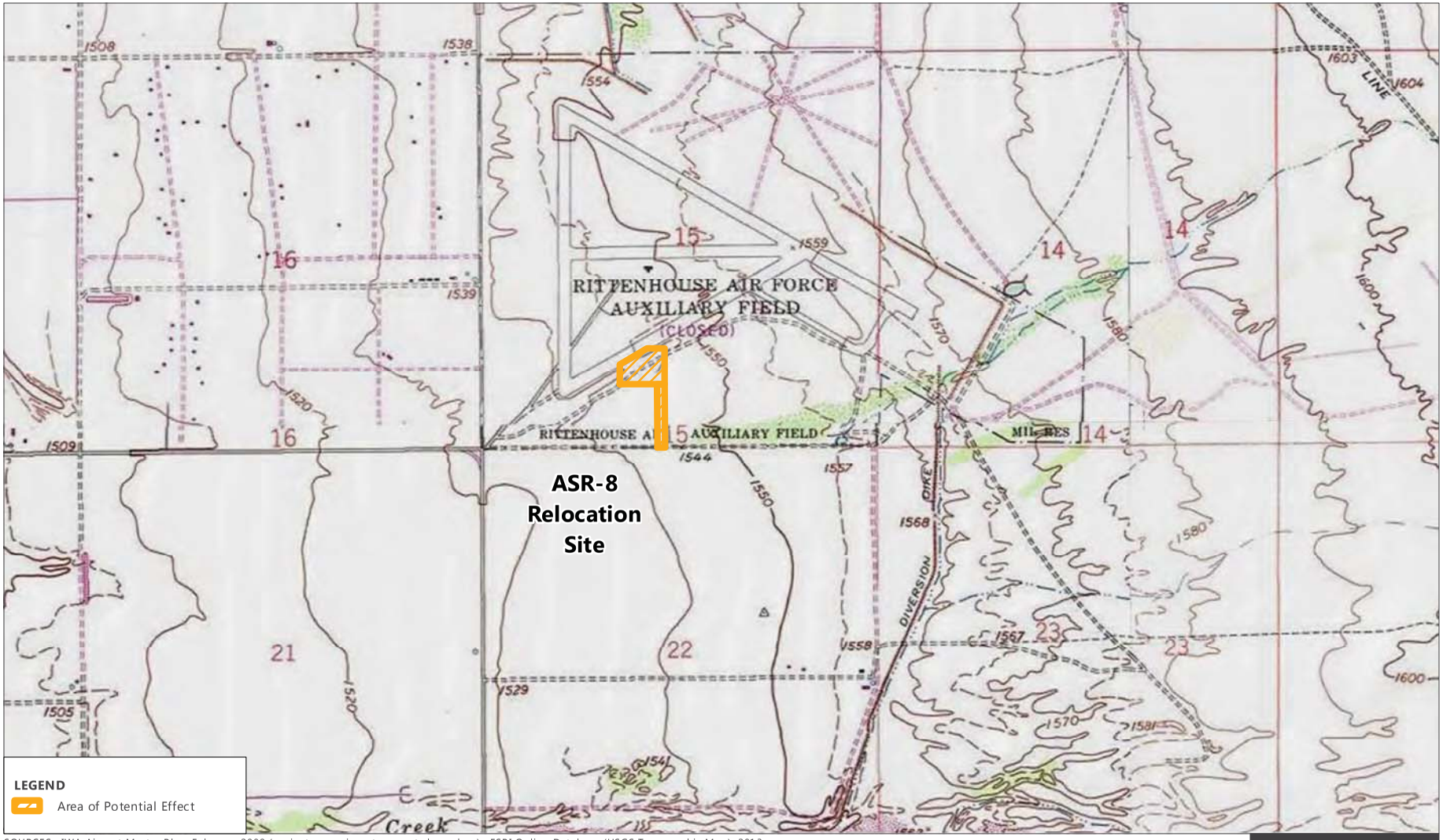
EXHIBIT 5

NORTH 0 3,000 ft.

Area of Potential Effect Topographic Map
Phoenix-Mesa Gateway Airport Northeast Area

W:\Projects\IWA\NADP EA\MXD\SHPO\Exhibit 5_APE_Topo2_20150605.mxd

[DRAFT]



SOURCES: IWA Airport Master Plan, February 2009 (project area, airport property boundary); ESRI Online Database (USGS Topographic Map), 2013.
PREPARED BY: Ricondo & Associates, Inc., April 2015.

EXHIBIT 6

NORTH 0 2,000 ft.

Area of Potential Effect Topographic Map
ASR-8 Relocation Site

W:\Projects\IWA\NADP EA\MXD\SHPO\Exhibit 6_APE_Topo3_20150605.mxd

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division
Phoenix Airport District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

March 28, 2016

Caroline Antone
Cultural Resources Manager
Ak Chin Him Dak Eco Museum and Archives
47685 N. Eco Museum Road
Maricopa, AZ, 85239

Proposed Northeast Development Area Plan
Phoenix-Mesa Gateway Airport
Mesa, Maricopa County, Arizona
Section 106 Consultation

Dear Ms. Antone:

In a letter dated July 20, 2015, the Federal Aviation Administration (FAA) provided a copy of the National Register of Historic Places (NRHP) eligibility Data Testing Plan for the above referenced undertaking for your review and concurrence. To date, the FAA has received concurrence on the Area of Potential Effect (APE) and the Data Testing Plan as part of our consultation with your office under Section 106 of the National Historic Preservation Act.

Continuing with that consultation, enclosure (1) contains the findings from implementing the approved Data Testing Plan, *Results of National Register of Historic Places Eligibility Testing of Four Sites at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County, AZ.*

Within the Northeast Area Development Plan APE, there were four previously unrecorded archaeological sites [AZ U:10:316(ASM), AZ U:10:317(ASM) AZ U:10:320(ASM) and AZ U:10:321(ASM] that were located during a pedestrian survey in 2015. Eligibility for listing in the NRHP of these four recorded sites was unknown. Results of the eligibility testing determined that there were no archaeological features or significant cultural deposits identified during the investigation. It was determined that the four archaeological sites did not warrant additional study or preservation and did not contain enough integrity to make them eligible for listing in the NRHP as an individual site or as a contributing resources to a district.

The FAA has determined that the proposed undertaking will not compromise the integrity of any individual or contributing historic resource that is eligible for listing in the NRHP that may exist within the APE. Pursuant to Title 36, Code of Federal Regulations (CFR), Section 800.5, the FAA is requesting your concurrence with our determination of **No Adverse Effect** for the proposed undertaking.

Should you have any additional questions, please feel free to contact me at amanda.velasquez@faa.gov or 602-792-1067.

Sincerely,

Amanda Velasquez
Environmental Protection Specialist

Encl: (1) Results of National Register of Historic Places Eligibility Testing of Four Sites

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division
Phoenix Airport District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

March 28, 2016

Karen Ray
Manager
Cultural Development Department
PO Box 17779
Fountain Hills, AZ, 85269

Proposed Northeast Development Area Plan
Phoenix-Mesa Gateway Airport
Mesa, Maricopa County, Arizona
Section 106 Consultation

Dear Ms. Ray:

In a letter dated July 20, 2015, the Federal Aviation Administration (FAA) provided a copy of the National Register of Historic Places (NRHP) eligibility Data Testing Plan for the above referenced undertaking for your review and concurrence. To date, the FAA has received concurrence on the Area of Potential Effect (APE) and the Data Testing Plan as part of our consultation with your office under Section 106 of the National Historic Preservation Act.

Continuing with that consultation, enclosure (1) contains the findings from implementing the approved Data Testing Plan, *Results of National Register of Historic Places Eligibility Testing of Four Sites at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County, AZ.*

Within the Northeast Area Development Plan APE, there were four previously unrecorded archaeological sites [AZ U:10:316(ASM), AZ U:10:317(ASM) AZ U:10:320(ASM) and AZ U:10:321(ASM] that were located during a pedestrian survey in 2015. Eligibility for listing in the NRHP of these four recorded sites was unknown. Results of the eligibility testing determined that there were no archaeological features or significant cultural deposits identified during the investigation. It was determined that the four archaeological sites did not warrant additional study or preservation and did not contain enough integrity to make them eligible for listing in the NRHP as an individual site or as a contributing resources to a district.

The FAA has determined that the proposed undertaking will not compromise the integrity of any individual or contributing historic resource that is eligible for listing in the NRHP that may exist within the APE. Pursuant to Title 36, Code of Federal Regulations (CFR), Section 800.5, the FAA is requesting your concurrence with our determination of **No Adverse Effect** for the proposed undertaking.

Should you have any additional questions, please feel free to contact me at amanda.velasquez@faa.gov or 602-792-1067.

Sincerely,

Amanda Velasquez
Environmental Protection Specialist

Encl: (1) Results of National Register of Historic Places Eligibility Testing of Four Sites

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division
Phoenix Airport District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

March 28, 2016

Barnaby Lewis
Tribal Historic Preservation Officer
Tribal Resources Management Program
PO Box 2140
Sacaton, AZ 85147

Proposed Northeast Development Area Plan
Phoenix-Mesa Gateway Airport
Mesa, Maricopa County, Arizona
Section 106 Consultation

Dear Mr. Lewis:

In a letter dated July 20, 2015, the Federal Aviation Administration (FAA) provided a copy of the National Register of Historic Places (NRHP) eligibility Data Testing Plan for the above referenced undertaking for your review and concurrence. To date, the FAA has received concurrence on the Area of Potential Effect (APE) and the Data Testing Plan as part of our consultation with your office under Section 106 of the National Historic Preservation Act.

Continuing with that consultation, enclosure (1) contains the findings from implementing the approved Data Testing Plan, *Results of National Register of Historic Places Eligibility Testing of Four Sites at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County, AZ.*

Within the Northeast Area Development Plan APE, there were four previously unrecorded archaeological sites [AZ U:10:316(ASM), AZ U:10:317(ASM) AZ U:10:320(ASM) and AZ U:10:321(ASM] that were located during a pedestrian survey in 2015. Eligibility for listing in the NRHP of these four recorded sites was unknown. Results of the eligibility testing determined that there were no archaeological features or significant cultural deposits identified during the investigation. It was determined that the four archaeological sites did not warrant additional study or preservation and did not contain enough integrity to make them eligible for listing in the NRHP as an individual site or as a contributing resources to a district.

The FAA has determined that the proposed undertaking will not compromise the integrity of any individual or contributing historic resource that is eligible for listing in the NRHP that may exist within the APE. Pursuant to Title 36, Code of Federal Regulations (CFR), Section 800.5, the FAA is requesting your concurrence with our determination of **No Adverse Effect** for the proposed undertaking.

Should you have any additional questions, please feel free to contact me at amanda.velasquez@faa.gov or 602-792-1067.

Sincerely,

Amanda Velasquez
Environmental Protection Specialist

Encl: (1) Results of National Register of Historic Places Eligibility Testing of Four Sites

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division
Phoenix Airport District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

March 28, 2016

Richard Telles
Yaqui Studies Language Specialist
Language and Culture Department
7474 S Camino de Oeste
Tucson, AZ 85757

Proposed Northeast Development Area Plan
Phoenix-Mesa Gateway Airport
Mesa, Maricopa County, Arizona
Section 106 Consultation

Dear Mr. Telles:

In a letter dated July 20, 2015, the Federal Aviation Administration (FAA) provided a copy of the National Register of Historic Places (NRHP) eligibility Data Testing Plan for the above referenced undertaking for your review and concurrence. To date, the FAA has received concurrence on the Area of Potential Effect (APE) and the Data Testing Plan as part of our consultation with your office under Section 106 of the National Historic Preservation Act.

Continuing with that consultation, enclosure (1) contains the findings from implementing the approved Data Testing Plan, *Results of National Register of Historic Places Eligibility Testing of Four Sites at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County, AZ.*

Within the Northeast Area Development Plan APE, there were four previously unrecorded archaeological sites [AZ U:10:316(ASM), AZ U:10:317(ASM) AZ U:10:320(ASM) and AZ U:10:321(ASM] that were located during a pedestrian survey in 2015. Eligibility for listing in the NRHP of these four recorded sites was unknown. Results of the eligibility testing determined that there were no archaeological features or significant cultural deposits identified during the investigation. It was determined that the four archaeological sites did not warrant additional study or preservation and did not contain enough integrity to make them eligible for listing in the NRHP as an individual site or as a contributing resources to a district.

The FAA has determined that the proposed undertaking will not compromise the integrity of any individual or contributing historic resource that is eligible for listing in the NRHP that may exist within the APE. Pursuant to Title 36, Code of Federal Regulations (CFR), Section 800.5, the FAA is requesting your concurrence with our determination of **No Adverse Effect** for the proposed undertaking.

Should you have any additional questions, please feel free to contact me at amanda.velasquez@faa.gov or 602-792-1067.

Sincerely,

Amanda Velasquez
Environmental Protection Specialist

Encl: (1) Results of National Register of Historic Places Eligibility Testing of Four Sites

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division
Phoenix Airport District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

March 28, 2016

Vincent Randall
Director
Apache Cultural Program
2400 W. Datsi Street
Camp Verde, AZ, 86322

Proposed Northeast Development Area Plan
Phoenix-Mesa Gateway Airport
Mesa, Maricopa County, Arizona
Section 106 Consultation

Dear Mr. Randall:

In a letter dated July 20, 2015, the Federal Aviation Administration (FAA) provided a copy of the National Register of Historic Places (NRHP) eligibility Data Testing Plan for the above referenced undertaking for your review and concurrence. To date, the FAA has received concurrence on the Area of Potential Effect (APE) and the Data Testing Plan as part of our consultation with your office under Section 106 of the National Historic Preservation Act.

Continuing with that consultation, enclosure (1) contains the findings from implementing the approved Data Testing Plan, *Results of National Register of Historic Places Eligibility Testing of Four Sites at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County, AZ.*

Within the Northeast Area Development Plan APE, there were four previously unrecorded archaeological sites [AZ U:10:316(ASM), AZ U:10:317(ASM) AZ U:10:320(ASM) and AZ U:10:321(ASM] that were located during a pedestrian survey in 2015. Eligibility for listing in the NRHP of these four recorded sites was unknown. Results of the eligibility testing determined that there were no archaeological features or significant cultural deposits identified during the investigation. It was determined that the four archaeological sites did not warrant additional study or preservation and did not contain enough integrity to make them eligible for listing in the NRHP as an individual site or as a contributing resources to a district.

The FAA has determined that the proposed undertaking will not compromise the integrity of any individual or contributing historic resource that is eligible for listing in the NRHP that may exist within the APE. Pursuant to Title 36, Code of Federal Regulations (CFR), Section 800.5, the FAA is requesting your concurrence with our determination of **No Adverse Effect** for the proposed undertaking.

Should you have any additional questions, please feel free to contact me at amanda.velasquez@faa.gov or 602-792-1067.

Sincerely,

Amanda Velasquez
Environmental Protection Specialist

Encl: (1) Results of National Register of Historic Places Eligibility Testing of Four Sites

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division
Phoenix Airport District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

March 28, 2016

Peter Steere
Tribal Historic Preservation Officer
Cultural Affairs Department
PO Box 837
Sells, AZ 85634

Proposed Northeast Development Area Plan
Phoenix-Mesa Gateway Airport
Mesa, Maricopa County, Arizona
Section 106 Consultation

Dear Mr. Steere:

In a letter dated July 20, 2015, the Federal Aviation Administration (FAA) provided a copy of the National Register of Historic Places (NRHP) eligibility Data Testing Plan for the above referenced undertaking for your review and concurrence. To date, the FAA has received concurrence on the Area of Potential Effect (APE) and the Data Testing Plan as part of our consultation with your office under Section 106 of the National Historic Preservation Act.

Continuing with that consultation, enclosure (1) contains the findings from implementing the approved Data Testing Plan, *Results of National Register of Historic Places Eligibility Testing of Four Sites at Phoenix-Mesa Gateway Airport, Mesa, Maricopa County, AZ.*

Within the Northeast Area Development Plan APE, there were four previously unrecorded archaeological sites [AZ U:10:316(ASM), AZ U:10:317(ASM) AZ U:10:320(ASM) and AZ U:10:321(ASM] that were located during a pedestrian survey in 2015. Eligibility for listing in the NRHP of these four recorded sites was unknown. Results of the eligibility testing determined that there were no archaeological features or significant cultural deposits identified during the investigation. It was determined that the four archaeological sites did not warrant additional study or preservation and did not contain enough integrity to make them eligible for listing in the NRHP as an individual site or as a contributing resources to a district.

The FAA has determined that the proposed undertaking will not compromise the integrity of any individual or contributing historic resource that is eligible for listing in the NRHP that may exist within the APE. Pursuant to Title 36, Code of Federal Regulations (CFR), Section 800.5, the FAA is requesting your concurrence with our determination of **No Adverse Effect** for the proposed undertaking.

Should you have any additional questions, please feel free to contact me at amanda.velasquez@faa.gov or 602-792-1067.

Sincerely,

Amanda Velasquez
Environmental Protection Specialist

Encl: (1) Results of National Register of Historic Places Eligibility Testing of Four Sites

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division
Phoenix Airport District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

March 28, 2016

Leigh Kuwanwisiwma
Director
Hopi Cultural Preservation Office
PO Box 123
Kykotsmovi, AZ, 86039

Proposed Northeast Development Area Plan
Phoenix-Mesa Gateway Airport
Mesa, Maricopa County, Arizona
Section 106 Consultation

Dear Mr. Kuwanwisiwma:

In a letter dated July 20, 2015, the Federal Aviation Administration (FAA) provided a copy of the National Register of Historic Places (NRHP) eligibility Data Testing Plan for the above referenced undertaking for your review and concurrence. To date, the FAA has received concurrence on the Area of Potential Effect (APE) and the Data Testing Plan as part of our consultation with your office under Section 106 of the National Historic Preservation Act.

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Should you have any additional questions, please feel free to contact me at amanda.velasquez@faa.gov or 602-792-1067.

Sincerely,

Amanda Velasquez
Environmental Protection Specialist

Encl: (1) Results of National Register of Historic Places Eligibility Testing of Four Sites

Appendix K

Draft Environmental Assessment Circulation

K.1 Notice of Availability of Draft Environmental Assessment for Review and Comment

K.2 Agency Mailing List and Example Agency Letter

K.3 Public Workshop and Hearing Materials

K.4 Agency Comment Letters and Responses

Appendix K.1

Notice of Availability of Draft Environmental Assessment for Review and Comment

Transportation, Federal Aviation Administration
Phoenix-Mesa Gateway Airport Authority
Phoenix-Mesa Gateway Airport
Draft Environmental Assessment Proposed Northeast Area Development Plan and Associated Improvements

NOTICE OF AVAILABILITY OF DRAFT ENVIRONMENTAL ASSESSMENT, PUBLIC WORKSHOP AND PUBLIC HEARING

Pursuant to Title 49, United States Code, Section (§) 47106(c)(1)(A), notice is hereby given that Phoenix-Mesa Gateway Airport Authority (PMGAA), proposes to implement the Northeast Area Development Plan and Associated Improvements Project at the Phoenix-Mesa Gateway Airport (IWA), Mesa, Maricopa County, Arizona (the Proposed Action). The purpose of the Proposed Action is:

Provide a centralized passenger terminal complex capable of efficiently serving passenger operations;

Provide passengers with a level of service that is consistent and competitive with other air carrier airports in the southwestern United States;

Avoid the current situation in which passengers must use air-stairs and walk across the aircraft parking apron to the terminal building during the summer months when temperatures can exceed 110 degrees Fahrenheit;

Provide adequate space in the passenger terminal area and landside areas for potential future revenue-producing commercial development;

Develop new revenue streams that can help the PMGAA become as financially self-sufficient as possible;

Provide adequate automobile parking facilities, including long-term parking within a reasonable walking distance to the terminal building; and

Provide more efficient automobile access to IWA for passenger service via the local freeway system.

The Proposed Action includes construction of: a purpose-built passenger terminal with second level boarding and equivalent number of gates as the existing terminal on undeveloped land on the northeast side of Airport property; airfield, taxiway, taxilane and apron improvements to provide airfield access; associated roadway, parking, fencing, and utility infrastructure; ancillary/support facilities, and completion of site preparation for future revenue generating commercial development. The Proposed Action also includes: relocation of utilities, service roads and perimeter fencing as well as relocation of the airport surveillance radar (ASR-8) off-airport; leasing 20-plus acres from Arizona Department of Transportation northeast of existing Airport property for the relocation of the Ellsworth Channel, and demolition of existing, unoccupied buildings. A Draft Environmental Assessment (EA) of the economic, social, and environmental impacts of the Proposed Action and its alternatives (including the No Action Alternative) has been prepared.

The Draft EA evaluates the potential environmental effects of the Proposed Action described above and its alternatives, and has been prepared pursuant to the requirements of Section 102(2)(c) of the National Environmental Policy Act of 1969 (NEPA), and Section 509(b)(5) of the Airport and Airway Improvement Act of 1982, as amended. The FAA is the lead federal agency to ensure compliance with NEPA for airport development actions. The Draft EA has also been prepared in accordance with FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, and FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. Pursuant to the federal Endangered Species Act, Clean Water Act, Clean Air Act, and National Historic Preservation Act, the Draft EA includes an analysis of prudent or feasible alternatives analysis, potential impacts, and mitigation measures, as appropriate.

The Proposed Action would require the relocation of a portion of the Ellsworth Channel and the improvement of a portion of the Powerline Floodway. The Channel and Floodway are considered Waters of the U.S. under the jurisdiction of the U.S. Army Corps of Engineers (USACE). Specifically, 2,900 feet of the Ellsworth Channel would be relocated. With the relocation, the Ellsworth Channel would intersect the Powerline Floodway 3,000 feet east of the current confluence. To accommodate the additional flow, 3,000 feet of the Powerline Floodway would be reconstructed and widened. The proposed relocation and improvements would require coordination with the Flood Control District of Maricopa County and the City of Mesa. Consultation would be required with the USACE for a Clean Water Act Section 404 permit for potential discharges, and consultation would also be required with the Arizona Department of Environmental Quality for the accompanying Clean Water Act Section 401 permit related to water quality.

Beginning on November 10, 2016, the Draft EA will be available for public review through the Airport's website at www.gatewayairport.com/ea and in the following locations during normal business hours, through December 28, 2016:

Federal Aviation Administration, Western-Pacific Region, Office of the Airports Division, 15000 Aviation Boulevard, Hawthorne, CA 90261

Federal Aviation Administration, Phoenix Airports District Office, 3800 N. Central Avenue, Suite 1025, 10th Floor, Phoenix, AZ 85012

Phoenix-Mesa Gateway Airport Authority, 5835 South Sossaman Road, Mesa, AZ 85212-6014

City of Mesa Library, 64 East 1st Street, Mesa, AZ 85201

Southeast Regional Library, 775 N. Greenfield Road, Gilbert, AZ 85234

Queen Creek Library, 21802 S. Ellsworth Road, Queen Creek, AZ 85142

A Public Workshop on the Draft EA will be held on Tuesday, December 13, 2016 from 5:30 p.m. to 6:00 p.m., local time, immediately followed by a Public Hearing from 6:00 p.m. to 7:00 p.m. local time in the Saguaro Room; Phoenix-Mesa Gateway Airport Administration Building; 5835 South Sossaman Road; Mesa, AZ 85212. Oral and written comments will be accepted at the Public Hearing.

Comments must be received by 5:00 p.m. local time on December 28, 2016. Please ensure adequate time for mailing. Comments can only be accepted with the full name and address of the individual commenting.

Before including your address, phone number, email address, or other personal identifying information in your comment, be advised that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask the FAA in your comment to withhold from public review your personal identifying information, the FAA cannot guarantee that it will be able to do so. Comments received on the Draft EA and the responses to those comments will be disclosed in the Final EA.

Written comments on the adequacy of the information disclosed in the Draft EA may be submitted online at NAGPEA@ericongo.com or by mail to: Amy Brancato, Phoenix-Mesa Gateway Airport Authority, 5835 South Sossaman Road, Mesa, AZ 85212-6014

Pub: November 10, 2016

AFFIDAVIT OF PUBLICATION

NOTICE OF AVAILABILITY OF DRAFT ENVIRONMENTAL ASSESSMENT

05

Arizona Business Gazette

The business resource

PO BOX 194
Phoenix, Arizona 85001-0194
(602) 444-7315 FAX (602) 444-5901

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

Tabitha James, being first duly sworn, upon oath deposes and says: That she is the Supervisor of the Arizona Business Gazette, a newspaper of general circulation in the counties of Maricopa, Coconino, Pima and Pinal, in the State of Arizona, published weekly at Phoenix, Arizona, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates indicated.

11/10/2016

Sworn to before me this
10TH day of
NOVEMBER 2016

BRIAN BILLINGS
Notary Public - Arizona
Maricopa County
My Commission Expires
July 25, 2018

Notary Public

Attachment K.2

Agency Mailing List and Notice of Availability

NADP Draft EA
Interested Parties Mailing List

First Name	Last Name	Affiliation/Company	Position	Email	Address	PMGAA
Janavee	Bricker	Adobe Club of Gold Canyon			10890 Maverick Trail, Gold Canyon, Arizona 85118	NOA
Thayne	Klingler	Allegiant Air	Manager, Airports	thayne.klingler@allegiantair.com	8360 S. Durango Dr., Las Vegas, Nevada 89113	NOA
Larry	Johnson	Apache Junction Chamber of Commerce		larr@ajchamber.com	P.O. Box 1747, Apache Junction, Arizona 85117-1747	NOA
Mary	Niemczyk	ASU Faculty for Aviation	Aviation Chair & Associate Professor	mary.niemczyk@asu.edu	7231 E. Sonoran Arroyo Mall, Santan Hall 330, Mesa, Arizona 85212	NOA
Jeffrey	Blilie	Beus Gilbert LLC		jblilie@beusgilbert.com	701 N 44th Street, Phoenix, AZ 85008-6504	NOA
Mike	Sutton	Cassidy Turley	Vice President Land Group	mike.sutton@cassidyturley.com	2375 E Camelback Road, Suite 300, Phoenix, AZ 85016	NOA
Dr. Linda	Lujan	CGC, Pecos Campus	President	linda.lujan@cgcmail.maricopa.edu, linda.lujan@cgc.edu	2626 E. Pecos Rd., Chandler, Arizona 85225-2499	NOA
Kevin	Thompson	City of Mesa, District 6	Councilman	councilmember.thompson@Mesaaz.gov	Office of the Mayor & Council, City of Mesa, P.O. Box 1466, Mesa, Arizona 85211-1466	NOA
Randy	Payne	City of Phoenix Aviation, Planning & Environm	Project Manager	randy.payne@phoenix.gov	3400 E. Sky Harbor Blvd., Suite 3300, Phoenix, Arizona 85034	NOA
Alan	Jackson	CMC Steel Arizona (Business in area)	Manager	alan.jackson@cmc.com	11444 E. Germann Rd., Mesa, Arizona 85212	NOA
Chuck	Gray	Congressman Salmon's Office	District Director	Chuck.Gray@mail.house.gov	P.O. Box 1290, Mesa, Arizona 85211	NOA
Dea	McDonald	DMB		dmcdonald@dmbinc.com	7600 E. Doubletree Ranch Rd., Suite 300, Scottsdale, Arizona 85258-2137	NOA
Eric	Emmert	East Valley Chambers of Commerce Alliance	Consultant	eric@dornpolicygroup.com	3030 N. Central Ave., Suite 1408, Phoenix, Arizona 85012	NOA
Mike	Hutchinson	East Valley Partnership	Project Director, East Valley Aviation & Aerospace Alliance/Superstition Vistas	mhutchinson@evp-AZ.org	535 W. Baseline Rd., Suite 107, Mesa, Arizona 85210	NOA
Jim	Rounds	Elliott Pollack		rounds@edpco.com	Elliott D. Pollact & Company, 7505 E. 6th Ave., Suite 100, Scottsdale, Arizona 85251	NOA
Al	Mittelstaedt	EVIT	Aviation Program Director	amittelstaedt@evit.com	1601 W. Main St., Mesa, Arizona 85201	NOA
Kathy	Tilque	Gilbert Chamber of Commerce	President	kathy@gilbertchamber.com	P.O. Box 527, Gilbert, Arizona 85299-0527	NOA
Barry	Broome	Greater Phoenix Economic Council	President and CEO	bbroome@gpec.org	2 N. Central Ave., Suite 2500, Phoenix, Arizona 85004	NOA
Sally	Harrison	Mesa Chamber of Commerce		sharrison@mesachamber.org	40 North Center St. #104, Mesa, Arizona 85201	NOA
Sandie	Smith	Pinal Partnership	President and CEO	sandie@pinalpartnership.com	P.O. Box 904, Florence, Arizona 85132	NOA
Marquis	Scott	Queen Creek Chamber of Commerce	President	president@queencreekchamber.org	22246 S Ellsworth Rd, Queen Creek, AZ 85142	NOA
Tony	Alvarado	Salt River Project		Tony.Alvarado@srpnet.com	Mail Station ISB231, P.O. Box 52025, Phoenix, Arizona 85072	NOA
Brian	Bednar	Salt River Project		brian.bednar@srpnet.com	Mail Station ISB231, P.O. Box 52025, Phoenix, Arizona 85072	NOA
Linda	Edwards	Town of Gilbert	Planning Manager	Linda.Edwards@gilbertaz.gov	50 E. Civic Center Dr., Gilbert, Arizona 85296	NOA

NOA = Notice of Availablity
CD = Compact Disc

NADP Draft EA
Agency Contacts Mailing List

First Name	Last Name	Affiliation/Company	Position	Email	Address	PMGAA
Caroline	Antone	Ak-Chin Indian Community	Cultural Resource Manager	cantone@ak-chin.nsn.us	42507 W. Peters & Nall Rd., Maricopa, Arizona 85138	CD
Suzanne	Rowe, DPO	Arizona State Office, Bureau of Land Management		srowe@blm.gov	One North Central Ave., Suite 800, Phoenix, Arizona 85004-4427	CD
Catherine V.	Jerrard, P.E.	BRAC Support Branch, AFCEC/CZRD-Griffis	Program Manager	catherine.jerrard@us.af.mil	706 Brooks Rd., Building 45, Rome, New York, 13441	CD
		Federal Emergency Management Agency (FEMA)	Environmental & Historic Preservati	FEMA-RIX-EHP-Documents@dhs.go	P.O. Box 10055, Hyattsville, Maryland 20782-8055	CD
Alan	Hansen, P.E.	Federal Highway Administration, Arizona Division	Team Leader Planning, Environmen	Alan.Hansen@dot.gov	4000 N Central Ave # 1500, Phoenix, AZ 85012	CD
Timothy S.	Phillips, P.E.	Flood Control District of Maricopa County	Chief Engineer & General Manager		2801 W. Durango St., Phoenix, Arizona 85009	CD
Barnaby	Lewis	Gila River Indian Community	Tribal Historic Preservation Officer		P.O. Box 2140, Sacaton, Arizona 85147	CD
Leigh	Kuwanwisiwma	Hopi Tribe, Cultural Preservation Office	Director		P.O. Box 123, Kykotsmovi, Arizona 86039	CD
Angela	Garcia-Lewis	Salt River Pima-Maricopa Indian Community	NAGPRA Coordinator		Cultural Preservation Program, 10005 E. Osborn Rd., Scottsdale, Arizona 85256	CD
James	Garrison	State Historic Preservation Office, Arizona State Parks			1300 W. Washington St., Phoenix, Arizona 85007	CD
Peter	Steer	Tohono O'odhamNation	Tribal Historic Preservation Officer	peter.steere@tonation-nsn.gov	Cultural Affairs Office, P.O. Box 837, Sells, Arizona 85634	CD
Sallie	Diebolt	USACE- Los Angeles District, Arizona-Nevada Area Office			3636 N. Central Ave., Suite 900, Phoenix, Arizona 85012	CD
Henry	Darmin	Arizona Department of Environmental Quality	Director		1110 W. Washington St., Phoenix, Arizona 85007	NOA
Shane	O-Brien, PE	Arizona Department of Transportation, Intermodal Transportation Division, Environmental Planning Group	Manager		1611 West Jackson St., Mail Drop EM02, Phoenix, Arizona 85007	NOA
Sandra A.	Fabritz-Whitney	Arizona Department of Water Resources			3550 N. Central Ave., 2nd Fl., Phoenix, Arizona 85012	NOA
Laura	Canaca	Arizona Game and Fish Department, WMHB- Project Evaluation Program			500 W. Carefree Hwy, Phoenix, Arizona 85086-5000	NOA
Vanessa	Hickman	Arizona State Land Department	Commissioner		1616 W. Adams, Phoenix, Arizona 85007	NOA
Dean	Giles	Maricopa Association of Governments, Environmental Programs, Air Quality Planning Program	Air Quality Planning Program Specialist		302 North 1st Ave., Suite 300, Phoenix, Arizona 85003	NOA
William	Wiley	Maricopa County Air Quality Department	Director		1001 N. Central Ave, Suite 125, Phoenix, Arizona 85004	NOA
Debra	Stark	Maricopa County, Planning & Development Department	Director	debrastark@mail.maricopa.gov	501 N. 44th St., Suite 200, Phoenix, Arizona 85008	NOA
Mike	Sabatini	MCDOT		mikesabatini@mail.maricopa.gov	2901 W. Durango, Phoenix, Arizona 85009	NOA
Greg	Stanley	Pinal County, Development Services	Assistant County Manager	Greg.Stanley@pinalcountyaz.gov	31 N. Pinal St., Building F, Florence, Arizona 85132	NOA
David L.	McKay	U.S. Department of Agriculture, Natural Resources Conservation Service, Arizona State Office			230 N. First Ave., Suite 509, Phoenix, Arizona 85003-1733	NOA
Dr. Benjamin	Tuggle	U.S. Fish and Wildlife Service, Region 2	Regional Director		Mailing Address: P.O. Box 1306, Albuquerque, New Mexico 87103-1306. FedEx/UPS Address: 500 Gold Avenue SW, Rm#, Albuquerque, New Mexico 87102	NOA
Alan	Hansen	US Department of Transportation, Federal Highway Administration, Arizona Division, Planning, Environment, Air Quality, and Realty	Team Leader		4000 North Central Ave., Suite 1500, Phoenix, Arizona 85012-1906	NOA
Deborah	Jordan	US EPA Region 9, Air Quality Division	Director		75 Hawthorne St., San Francisco, California 94105	NOA

NOA = Notice of Availablity
CD = Compact Disc

U.S. Department of Transportation
Federal Aviation Administration

Phoenix-Mesa Gateway Airport Authority
Phoenix-Mesa Gateway Airport

Draft Environmental Assessment
Proposed Northeast Area Development Plan and Associated Improvements

NOTICE OF AVAILABILITY OF DRAFT ENVIRONMENTAL ASSESSMENT, PUBLIC WORKSHOP AND PUBLIC HEARING

Pursuant to Title 49, United States Code, Section (§) 47106(c)(1)(A), notice is hereby given that Phoenix-Mesa Gateway Airport Authority (PMGAA), proposes to implement the Northeast Area Development Plan and Associated Improvements Project at the Phoenix-Mesa Gateway Airport (IWA), Mesa, Maricopa County, Arizona (the Proposed Action). The purpose of the Proposed Action is:

- Provide a centralized passenger terminal complex capable of efficiently serving passenger operations;
- Provide passengers with a level of service that is consistent and competitive with other air carrier airports in the southwestern United States;
- Avoid the current situation in which passengers must use air-stairs and walk across the aircraft parking apron to the terminal building during the summer months when temperatures can exceed 110 degrees Fahrenheit;
- Provide adequate space in the passenger terminal area and landside areas for potential future revenue-producing commercial development;
- Develop new revenue streams that can help the PMGAA become as financially self-sufficient as possible;
- Provide adequate automobile parking facilities, including long-term parking within a reasonable walking distance to the terminal building; and
- Provide more efficient automobile access to IWA for passenger service via the local freeway system.

The Proposed Action includes construction of: a purpose-built passenger terminal with second level boarding and equivalent number of gates as the existing terminal on undeveloped land on the northeast side of Airport property; airfield, taxiway, taxilane and apron improvements to provide airfield access; associated roadway, parking, fencing, and utility infrastructure; ancillary/support facilities, and completion of site preparation for future revenue generating commercial development. The Proposed Action also includes: relocation of utilities, service roads and perimeter fencing as well as relocation of the airport surveillance radar (ASR-8) off-airport; leasing 20-plus acres from Arizona Department of Transportation northeast of existing Airport property for the relocation of the Ellsworth Channel, and demolition of existing, unoccupied buildings. A Draft Environmental Assessment (EA) of the economic,

social, and environmental impacts of the Proposed Action and its alternatives (including the No Action Alternative) has been prepared.

The Draft EA evaluates the potential environmental effects of the Proposed Action described above and its alternatives, and has been prepared pursuant to the requirements of Section 102(2)(c) of the *National Environmental Policy Act of 1969* (NEPA), and Section 509(b)(5) of the *Airport and Airway Improvement Act of 1982*, as amended. The FAA is the lead federal agency to ensure compliance with NEPA for airport development actions. The Draft EA has also been prepared in accordance with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*. Pursuant to the federal Endangered Species Act, Clean Water Act, Clean Air Act, and National Historic Preservation Act, the Draft EA includes an analysis of prudent or feasible alternatives analysis, potential impacts, and mitigation measures, as appropriate.

The Proposed Action would require the relocation of a portion of the Ellsworth Channel and the improvement of a portion of the Powerline Floodway. The Channel and Floodway are considered Waters of the U.S. under the jurisdiction of the U.S. Army Corps of Engineers (USACE). Specifically, 2,900 feet of the Ellsworth Channel would be relocated. With the relocation, the Ellsworth Channel would intersect the Powerline Floodway 3,000 feet east of the current confluence. To accommodate the additional flow, 3,000 feet of the Powerline Floodway would be reconstructed and widened. The proposed relocation and improvements would require coordination with the Flood Control District of Maricopa County and the City of Mesa. Consultation would be required with the USACE for a Clean Water Act Section 404 permit for potential discharges, and consultation would also be required with the Arizona Department of Environmental Quality for the accompanying Clean Water Act Section 401 permit related to water quality.

Beginning on November 10, 2016, the Draft EA will be available for public review through the Airport s website at www.gatewayairport.com/ea and in the following locations during normal business hours, through December 28, 2016:

- Federal Aviation Administration, Western-Pacific Region, Office of the Airports Division, 15000 Aviation Boulevard, Hawthorne, CA 90261
- Federal Aviation Administration, Phoenix Airports District Office, 3800 N. Central Avenue; Suite 1025, 10th Floor; Phoenix, AZ 85012
- Phoenix-Mesa Gateway Airport Authority, 5835 South Sossaman Road, Mesa, AZ 85212-6014
- City of Mesa Library, 64 East 1st Street, Mesa, AZ 85201
- Southeast Regional Library, 775 N. Greenfield Road, Gilbert, AZ 85234
- Queen Creek Library, 21802 S. Ellsworth Road, Queen Creek, AZ 85142

A Public Workshop on the Draft EA will be held on Tuesday, December 13, 2016 from 5:30 p.m. to 6:00 p.m., local time, immediately followed by a Public Hearing from 6:00 p.m. to 7:00 p.m. local time in the

Saguaro Room; Phoenix-Mesa Gateway Airport Administration Building; 5835 South Sossaman Road; Mesa, AZ 85212. Oral and written comments will be accepted at the Public Hearing.

Comments must be received by **5:00 p.m. local time** on **December 28, 2016**. Please ensure adequate time for mailing. Comments can only be accepted with the full name and address of the individual commenting.

Before including your address, phone number, email address, or other personal identifying information in your comment, be advised that your entire comment including your personal identifying information may be made publicly available at any time. While you can ask the FAA in your comment to withhold from public review your personal identifying information, the FAA cannot guarantee that it will be able to do so. Comments received on the Draft EA and the responses to those comments will be disclosed in the Final EA.

Written comments on the adequacy of the information disclosed in the Draft EA may be submitted online at NADPEA@ricondo.com or by mail to:

Tony Bianchi
Phoenix-Mesa Gateway Airport Authority
5835 South Sossaman Road
Mesa, AZ 85212-6014

Attachment K.3

Public Workshop and Hearing Materials

K.3.1 Public Workshop/Hearing Sign-in Sheets

Phoenix-Mesa Gateway Airport
Public Workshop/Hearing
Tuesday, December 13, 2016

SIGN-IN SHEET - PLEASE PRINT

Name	Organization	Address	Phone Number	E-Mail Address
Samantha Novotny	Western Technologies			s.novotny@wt-us.com
Ken Snyder	Dibble Engineering	7500 N. Dreamy Draw Dr. #200 Phoe	602-571-4131	Ken.Snyder@dibblecorp.com
Don Phan	FAA			
Tony Biondi	PMGAA			tbiondi@gatewayairport.com
Stephanie Carver	PMGAA			scarver@gatewayairport.com
T. Brian O'Neill	PMGAA			tboneill@gatewayairport.com
Bob Draper	PMGAA			bdraper@gatewayairport.com
Brian Sexton	PMGAA			bsexton@gatewayairport.com
Jeanine Rogers	PMGAA	5835 S. Sossaman Rd Mesa, AZ 85212	4809887628	jeannierogersfamilyenterprises.com

PhxMesa **Gateway** Airport

Phoenix-Mesa Gateway Airport
Public Workshop/Hearing
Tuesday, December 13, 2016

SIGN-IN SHEET - PLEASE PRINT

Name	Organization	Address	Phone Number	E-Mail Address
Suze He Numkena			623-399-7315	snumkena@wt-us.com

PhxMesa **Gateway** Airport

K.3.2 Public Workshop Boards

PUBLIC WORKSHOP OBJECTIVES

Phoenix-Mesa Gateway Airport

Provide information about Proposed Action and Alternatives

Describe the National Environmental Policy Act (NEPA) process

Update the public on the project s progress since the Public Workshop in April

Describe the purpose and need for the project, alternatives, environmental impacts, and mitigations

Collect community comments on the Draft EA

ENVIRONMENTAL ASSESSMENT PROCESS

Phoenix-Mesa Gateway Airport

Septemeber 12, 2013
PUBLIC SCOPING AND AGENCY MEETING

July 2013 - November 2015
SURVEYS AND BASELINE CONDITIONS

November 2013 - January 2016
DOCUMENTATION
TECHNICAL REPORTS

January 2016 - July 2016
IMPACT ANALYSIS

April 2016
PUBLIC OPEN HOUSE

April 2016-November 2016
DOCUMENTATION
DRAFT ENVIRONMENTAL ASSESSMENT

November 10 - December 28, 2016
PUBLIC COMMENT PERIOD

January 2017
RESPONSE TO COMMENTS AND REVISIONS

January 2017
DOCUMENTATION
FINAL ENVIRONMENTAL ASSESSMENT

January/February 2017
FAA DETERMINATION

PURPOSE AND NEED OF THE PROPOSED PROJECT

Project Purpose/Benefits

Provide a centralized passenger terminal complex capable of efficiently serving passenger operations

Provide adequate space in the passenger terminal area and landside areas for potential future revenue-producing commerical development

Provide adequate automobile parking facilities within a reasonable walking distance to the terminal building

Provide more efficient automobile access to IWA for passenger service via the local freeway system

PURPOSE AND NEED OF THE PROPOSED PROJECT

Project Need

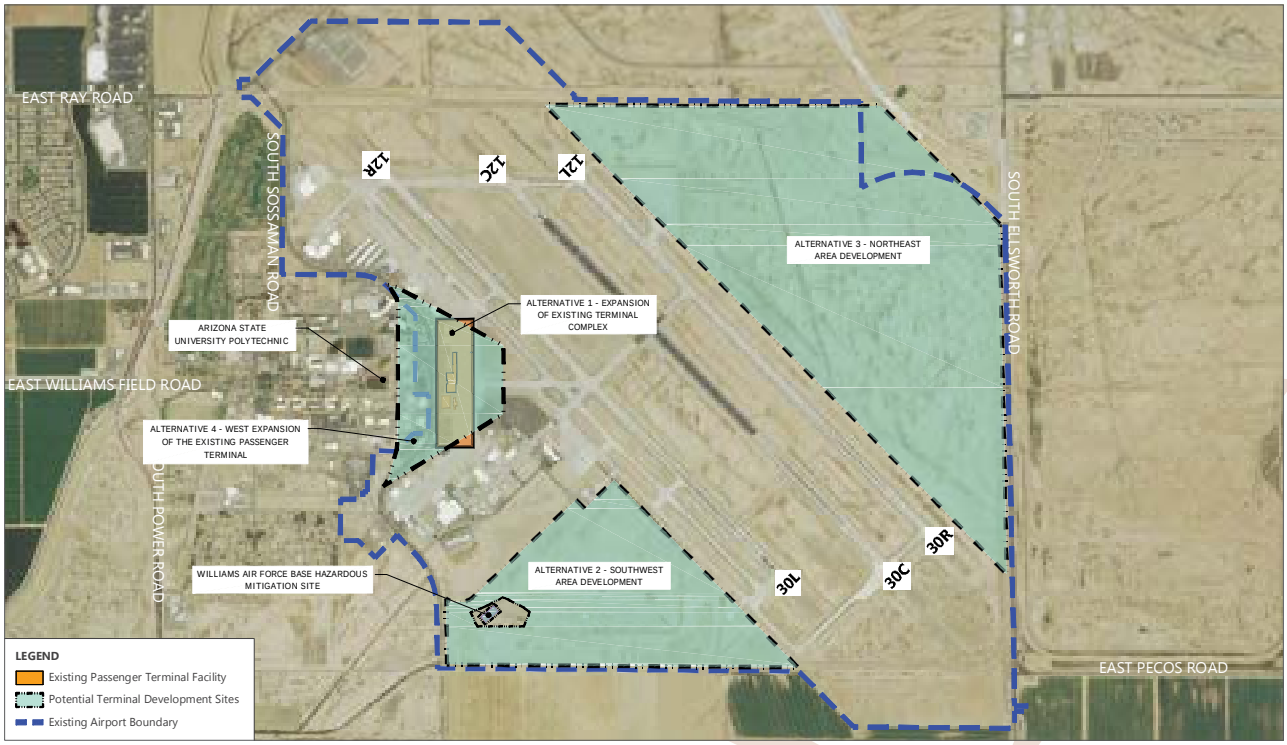
Existing terminal complex, in its current configuration, is a disparate, inefficient collection of terminal buildings

Space constraints prohibit any further expansion of either the passenger terminal area or landside areas in their current locations

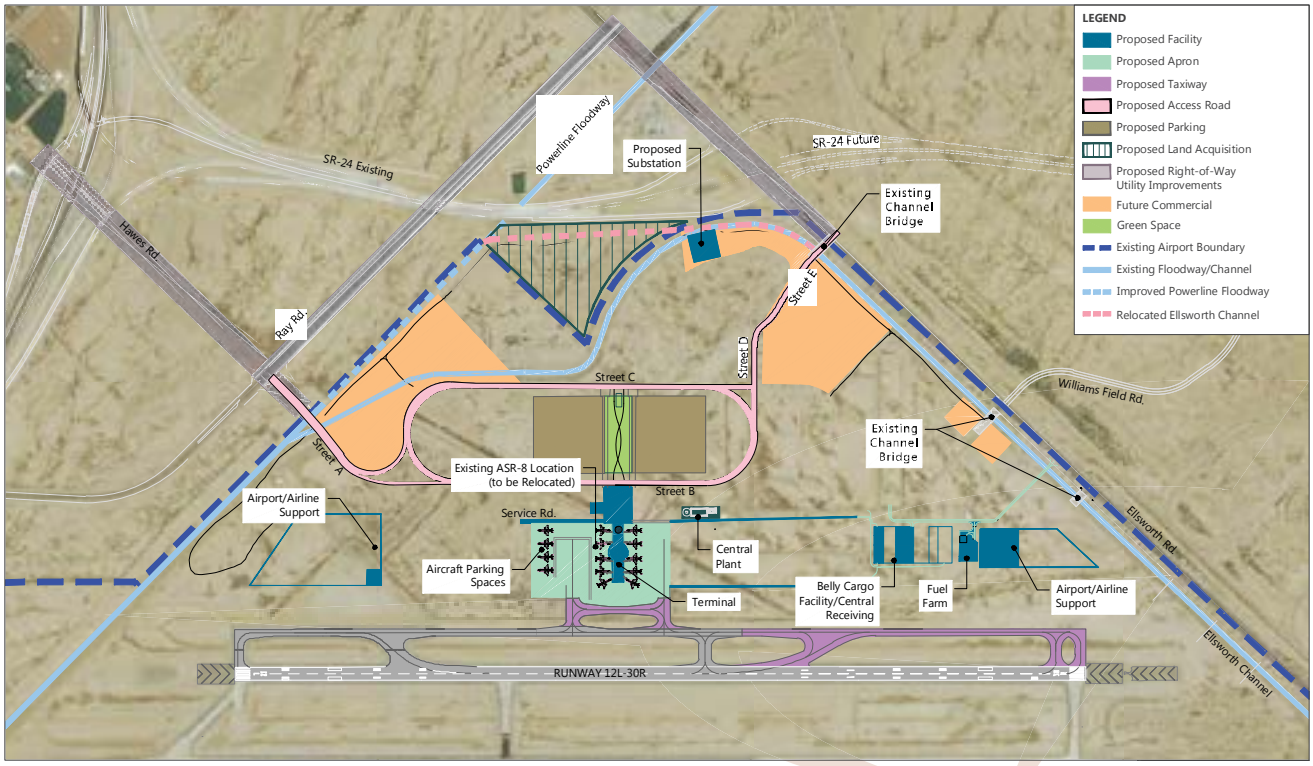
Existing terminal complex does not provide adequate automobile parking facilities within a reasonable walking distance to the terminal building

Existing terminal complex lacks direct freeway access

TERMINAL ALTERNATIVES



TERMINAL PROPOSED ACTION



ASR-8 PROPOSED ACTION

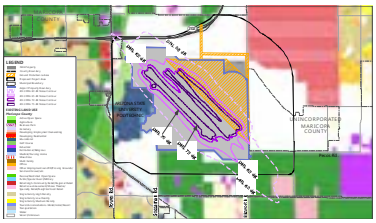
TYPICAL AIRPORT SURVEILLANCE RADAR (ASR) FACILITY

ENVIRONMENTAL IMPACT CATEGORIES ANALYZED

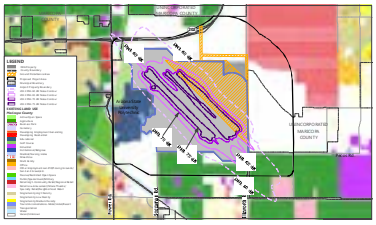
- Air Quality
- Biological Resources
- Climate
- Department of Transportation Act Section 4(f)
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical, Architectural, Archaeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Compatible Land Use
- Socioeconomic Impacts, Environmental Justice, Children s Health and Safety Risks
- Visual Effects
- Water Resources
- Cumulative Impacts

NOISE CONTOURS

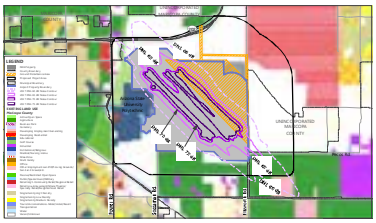
EXISTING NOISE CONTOURS 2013



NORTHEAST AREA DEVELOPMENT ALTERNATIVE:
2022 DNL NOISE CONTOURS



NORTHEAST AREA DEVELOPMENT ALTERNATIVE:
2027 DNL NOISE CONTOURS



CONSTRUCTION IMPACTS AND MITIGATION MEASURES

Impact Category	Potential Impacts	Mitigation
Air Quality	No Significant Impact	Yes
Biological Resources	No Significant Impact	Yes
Climate	No Significant Impact	
Coastal Resources	No Impact	
Department of 4(f) Resources	No Impact	
Farmlands	No Impact	
Hazardous Materials, Solid Waste, and Pollution Prevention	No Significant Impact	
Historical, Architectural, Archeological, and Cultural Resources	No Significant Impact	Yes
Land Use	No Significant Impact	
Natural Resources and Energy Supply	No Significant Impact	
Noise and Compatible Land Use	No Significant Impact	
Socioeconomic Impacts, Environmental Justice, and Children s Health and Safety Risks	No Significant Impact	
Visual Effects	No Significant Impact	
Water Resources	No Significant Impact	Yes
Wild and Scenic Rivers	No Impact	
Cumulative Impacts	No Significant Impact	

K.3.3 Public Workshop Handouts

Public Information Meeting/Hearing

Northeast Area Development Plan Draft Environmental Assessment

Phoenix-Mesa Gateway Airport
Administration Building; Saguaro Room
5:30 P.M. to 7:00 P.M.

December 13, 2016

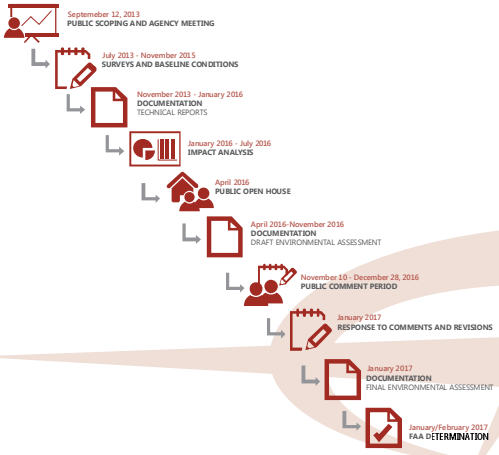
PUBLIC WORKSHOP OBJECTIVES

- Provide information about Proposed Action and Alternatives
- Describe the National Environmental Policy Act (NEPA) process
- Update the public on the project s progress since the Public Workshop in April
- Describe the purpose and need for the project, alternatives, environmental impacts, and mitigations
- Collect community comments on the Draft EA

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

- Required for projects receiving federal funding or approval
- Informs decision makers, agencies, organizations, and the public whether a federal action would significantly affect the environment
- Identifies environmental impacts of the proposed action, no action, and other reasonable alternatives
- Identifies measures to avoid, minimize, or mitigate adverse environmental impacts

ENVIRONMENTAL ASSESSMENT PROCESS



PURPOSE AND NEED OF THE PROPOSED PROJECT

Project Purpose/Benefits

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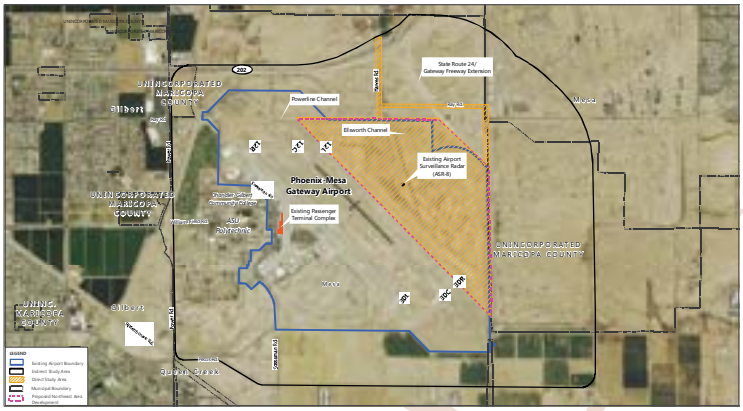
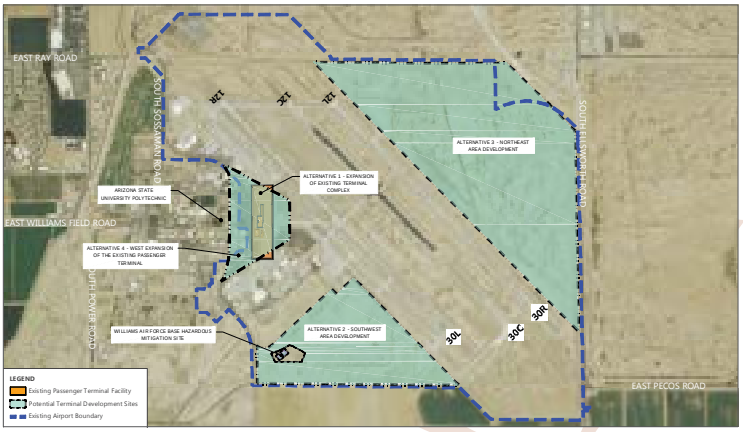
Existing terminal complex lacks direct freeway access

TERMINAL PROJECT LOCATION



TERMINAL ALTERNATIVES



SUMMARY OF TERMINAL ALTERNATIVES SCREENING PROCESS

STEP 1 — Would the Alternative Provide an Efficient Centralized Passenger Terminal Complex?
- NO → **ELIMINATED** from further consideration
- YES →

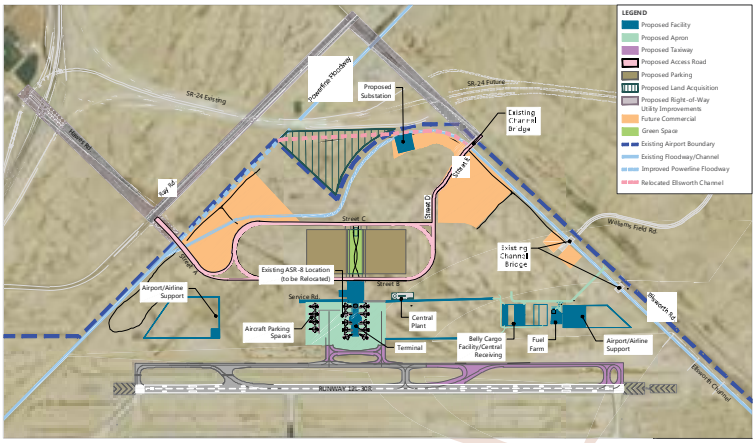
STEP 2 — Would the Alternative Provide Opportunity for Future Revenue-Producing Commercial Development?
- NO → **ELIMINATED** from further consideration
- YES →

STEP 3 — Would the Alternative Provide Direct Access to Major Highways?
- NO → **ELIMINATED** from further consideration
- YES →

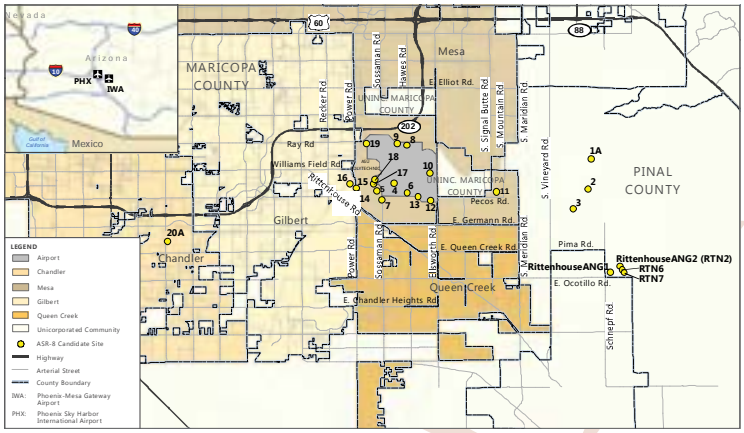
EVALUATE ENVIRONMENTAL CONSEQUENCES — Retain for detailed analysis of environmental impacts within Chapter 4.0, Environmental Consequences and Mitigation Measures of this EA.

LOCATION	ALTERNATIVE	ALTERNATIVE MEETS THE CRITERIA			RETAINED FOR FURTHER ANALYSIS IN THE DRAFT EA
		STEP 1 CRITERIA	STEP 2 CRITERIA	STEP 3 CRITERIA	
OPERATIONAL ALTERNATIVES	Use of Other Modes of Transportation	No, does not provide centralized terminal facility			No
	Use of Other Public Airports	No, does not provide centralized terminal facility			No
ON-SITE ALTERNATIVES	No Action Alternative	No, does not provide centralized terminal facility			Yes
	Alternative 1 Expansion of Existing Passenger Terminal Complex	No, does not provide centralized terminal facility			No
	Alternative 2 Southwest Area Development	Yes, provides centralized terminal facility	Yes, provides limited potential for commercial development opportunities	No, does not provide direct access to major highways	No
	Alternative 3 Northeast Area Development	Yes, provides centralized terminal facility	Yes, provides potential commercial development opportunities	Yes, provides direct access to major highways	Yes
OFF-SITE ALTERNATIVES	**Alternative 4** West Expansion of the Existing Passenger Terminal Complex	Yes, provides centralized terminal facility	No, provides less commercial development opportunities than other viable alternatives		No

TERMINAL PROPOSED ACTION



ASR-8 CANDIDATE SITES



SUMMARY OF ASR-8 ALTERNATIVES SCREENING PROCESS

STEP 1 — Would the alternative meet exclusionary criteria?
- NO → Potential for significant impacts or physical constraints exist
- YES →

STEP 2 — Would the alternative meet restrictive criteria?
- NO → Impacts environmental resources; terrain is steep; fails to meet other FAA radar criteria
- YES →

STEP 3 — Would the alternative meet selective criteria?
- NO → Lacks Accessibility, less desirable soil/geology, not proximate to utilities, line-of-sight issues
- YES →

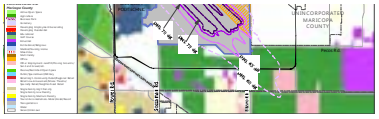
EVALUATE ENVIRONMENTAL CONSEQUENCES — Retain for detailed analysis of environmental impacts within Chapter 4.0, Environmental Consequences and Mitigation Measures of this EA.

ASR-8 PROPOSED ACTION

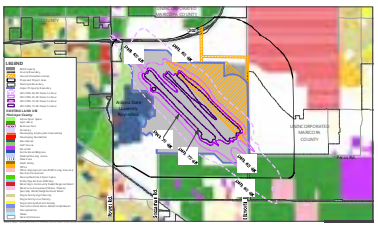
TYPICAL AIRPORT SURVEILLANCE RADAR (ASR) FACILITY

ENVIRONMENTAL IMPACT CATEGORIES ANALYZED

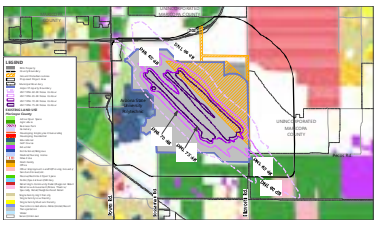
- Air Quality
- Biological Resources
- Climate
- Department of Transportation Act Section 4(f)
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical, Architectural, Archaeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Compatible Land Use
- Socioeconomic Impacts, Environmental Justice, Children s Health and Safety Risks
- Visual Effects
- Water Resources
- Cumulative Impacts



NORTHEAST AREA DEVELOPMENT ALTERNATIVE: 2022 DNL NOISE CONTOURS



NORTHEAST AREA DEVELOPMENT ALTERNATIVE: 2027 DNL NOISE CONTOURS



ARCHEOLOGICAL STEPS & FINDINGS

Northeast Area Development Alternative

2013 records search and archeological survey identified:

- 15 archaeological sites
  - Nine sites recommended or previously determined ineligible for listing in National Register of Historic Places (NRHP)
  - One site listed in NRHP
  - Five sites of indeterminate eligibility for listing in NRHP
- 70 Isolated Occurrences
  - All 70 Isolated Occurrences recommended or previously determined ineligible for listing in NRHP

2015: NRHP eligibility testing conducted; all but one of the newly recorded sites determined ineligible for NRHP consideration.

Northeast Area Development Alternative would avoid any ground disturbance or impacts to listed or eligible sites.

2016: State Historic Preservation Office (SHPO) and Tribal Historic Preservation Office (THPO) agreed with FAA s Finding of No Adverse Effect.

2016: Section 106 Consultation completed.

ARCHEOLOGICAL STEPS & FINDINGS

RTN7 Site Alternative

2013 records search and archeological survey identified within the RTN7 Site Alternative APE:

- One archaeological feature: an abandoned runway at the former Rittenhouse Auxiliary Airfield (RAAF).
- One Isolated Occurrence ineligible for listing in the NRHP.

RTN7 Site Alternative would be constructed adjacent to RAAF abandoned runway

- Determined ineligible for the NRHP by FAA.

FAA sought and received SHPO s concurrence with FAA s finding that the RAAF is not eligible for inclusion in the NRHP on November 2, 2016.

RTN7 Site Alternative would not affect any properties listed or eligible for listing on the NRHP.

NORTHEAST AREA DEVELOPMENT ALTERNATIVE: WETLANDS AND WATERS OF THE U.S.

WETLANDS AND WATERS OF THE U.S.

Northeast Area Development Alternative

Field surveys conducted did not identify any wetlands within the Ground Disturbance Area.

No jurisdictional wetlands would be impacted by the construction or operation of the Proposed Action.

The Proposed Action would require the relocation of a portion of the Ellsworth Channel and the improvement of a portion of the Powerline Floodway.

- The Channel and Floodway are considered Waters of the U.S. under the jurisdiction of the U.S. Army Corps of Engineers (USACE).
- Construction coordination would occur with Flood Control District of Maricopa County and the City of Mesa.
- Consultation would occur with USACE and Arizona Department of Environmental Quality for Clean Water Act permits.

No significant impacts to Waters of the U.S. would occur.

WETLANDS AND WATERS OF THE U.S.

RTN7 Site Alternative

Field surveys conducted did not identify any wetlands within the Ground Disturbance Area.

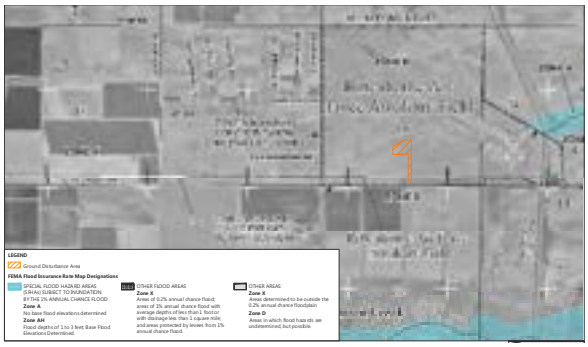
No jurisdictional wetlands would be impacted by the construction or operation of the Proposed Action.

No Waters of the U.S. were identified in the vicinity of the Ground Disturbance Area, therefore no impacts would occur.

FLOODPLAINS

NORTHEAST AREA DEVELOPMENT ALTERNATIVE: FLOODPLAINS

RTN7 SITE ALTERNATIVE: FLOODPLAINS



No impacts to the 100-year Floodplain

CONSTRUCTION IMPACTS AND MITIGATION MEASURES

Impact Category	Potential Impacts	Mitigation
Air Quality	No Significant Impact	Yes
Biological Resources	No Significant Impact	Yes
Climate	No Significant Impact	
Coastal Resources	No Impact	
Department of 4(f) Resources	No Impact	
Farmlands	No Impact	
Hazardous Materials, Solid Waste, and Pollution Prevention	No Significant Impact	
Historical, Architectural, Archeological, and Cultural Resources	No Significant Impact	Yes
Land Use	No Significant Impact	
Natural Resources and Energy Supply	No Significant Impact	
Noise and Compatible Land Use	No Significant Impact	
Socioeconomic Impacts, Environmental Justice, and Children s Health and Safety Risks	No Significant Impact	
Visual Effects	No Significant Impact	
Water Resources	No Significant Impact	Yes
Wild and Scenic Rivers	No Impact	
Cumulative Impacts	No Significant Impact	

CONSTRUCTION MITIGATION MEASURES

Air Quality

Post a publicly visible sign(s) with contact information to report dust complaints; response and/or corrective action within 24 hours.
All ground surfaces covered or treated to minimize fugitive dust emissions during construction (e.g., wetting down exposed soil, street sweeping, etc.).
All roadways, driveways, sidewalks, etc., completed as soon as practical; building pads laid as soon as practical after grading.
Prohibit diesel-fueled vehicle and equipment idling or queuing in excess of five minutes. Exemptions granted for safety-related and operational reasons.
All diesel-fueled construction and operational equipment will be outfitted with the best available emission control devices where technologically feasible.
Properly maintain all equipment and engines and keep up-to-date service records.

Biological Resources

Preconstruction surveys to be conducted to determine presence of:
- Sensitive plant species,
- Plants protected under the Arizona Native Plant Law,
- The western burrowing owl, and
- Migratory bird active nests or breeding behavior.

Species discovered would be avoided, removed, relocated, or otherwise mitigated, as determined by the appropriate agency.
Comply with Arizona Game and Fish Department and Arizona Department of Agriculture mitigation measures as directed.

CONSTRUCTION MITIGATION MEASURES

Historical, Architectural, Archaeological, and Cultural Resources

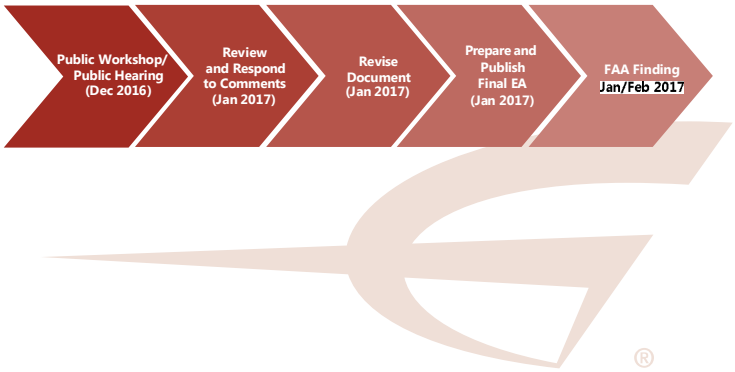
PMGAA will employ an Unanticipated Discovery Plan in the event an unanticipated discovery of previously unidentified archaeological resources is made during construction of the proposed undertaking:

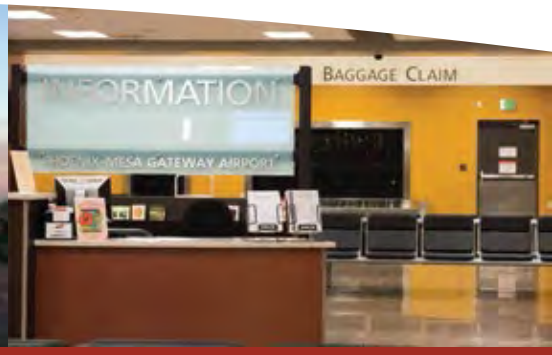
Construction activities in the vicinity of an archaeological discovery would cease until the FAA and the PMGAA conclude consultation with Arizona State Parks - Office of Historic Preservation.
In the event construction-related activities unearth human remains, ground-disturbing activities in the area of the discovery would immediately be halted and a temporary construction exclusion zone surrounding the site would be established to allow for further examination and treatment of the remains by state and local authorities.

Water Resources

Impacts to the Ellsworth Channel and the Powerline Floodway would require a Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers (USACE).
Mitigation measures would be approved by the USACE as part of the permitting process.
The PMGAA and the FAA would follow all permit requirements in the Clean Water Act Section 404 permit.

NEXT STEPS


Public Workshop/ Public Hearing (Dec 2016)
Review and Respond to Comments (Jan 2017)
Revise Document (Jan 2017)
Prepare and Publish Final EA (Jan 2017)
FAA Finding Jan/Feb 2017



PHOENIX-MESA GATEWAY AIRPORT AUTHORITY
Environmental Assessment for Northeast Area Development Plan

The Phoenix-Mesa Gateway Airport Authority (PMGAA) has initiated on behalf of the Federal Aviation Administration (FAA) the preparation of an Environmental Assessment (EA) for the Northeast Area Development Plan (NADP) at Phoenix-Mesa Gateway Airport.

PMGAA is undertaking the NADP to provide a developable area that can provide the users of Phoenix-Mesa Gateway Airport with a modern, efficient, and expandable passenger terminal complex at a level of service that is consistent and competitive with other air carrier airports in the southwestern United States, and to provide additional development and revenue opportunities.

The proposed facilities would be located northeast of Runway 12L-30R on a mostly undeveloped 700-acre parcel, south of Ray Road and west of Ellsworth Road.

WHAT IS AN ENVIRONMENTAL ASSESSMENT?

Before the proposed NADP can be approved or determined eligible for FAA funding, an EA is required. In accordance with FAA regulations, the EA is being conducted in compliance with FAA guidance that implements the National Environmental Policy Act (NEPA) of 1969.

Federal guidance for the environmental process encourages public involvement and identifies the analysis to be completed to determine the potential impacts in a number of environmental categories. Some of the categories with local concerns include: aircraft overflight and resulting noise concerns, compatible land use, historic and archaeological resources, air and water quality, stormwater management, and traffic impacts.

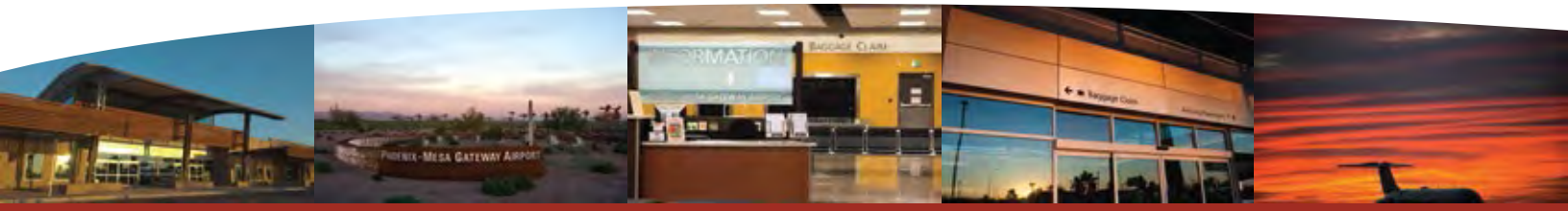
Alternatives evaluated during the NADP process as well as other viable alternatives for the passenger terminal development have been evaluated in the EA. Where actions were found to have environmental consequences, mitigation measures were identified and considered by the FAA. No significant environmental impacts would remain after mitigation measures are implemented.

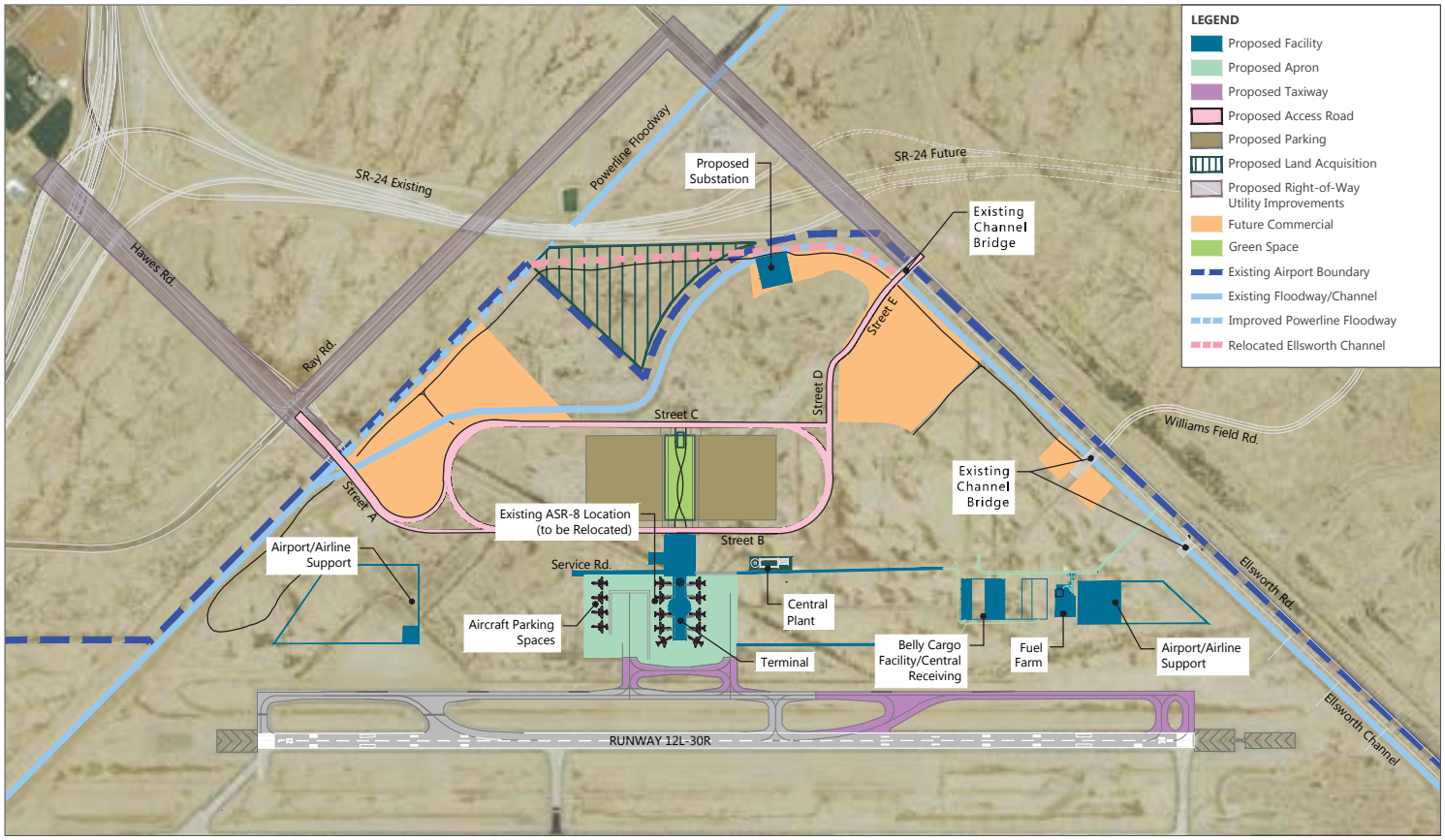
PUBLIC INVOLVEMENT

- Scoping meetings were held on September 12, 2013 to inform the public about the project and EA process and gain input on the issues and concerns to be addressed in the EA.
- A public information meeting was held on Thursday April 7, 2016 to provide the public an opportunity for comment concerning the Proposed Action, purpose and need for the Proposed Action, alternatives to the Proposed Action, and potential environmental effects of the Northeast Area Development Plan to be analyzed in the Draft EA.
- The Draft EA was released for public and agency comment November 10, 2016.
- A Public Workshop will be held on Tuesday, December 13, 2016 from 5:30 p.m. to 6:00 p.m., immediately followed by a Public Hearing from 6:00 p.m. to 7:00 p.m. in the Saguaro Room, Phoenix-Mesa Gateway Airport Administration Building; 5835 South Sossamman Road; Mesa, AZ 85212.
- Written comments on the Draft EA may be submitted online at NADPEA@ricondo.com or by mail to:
  Tony Bianchi, Phoenix-Mesa Gateway Airport Authority
  5835 South Sossaman Road
  Mesa, AZ 85212-6014

THE ENVIRONMENTAL ASSESSMENT (EA) PROCESS

Decision to Prepare an EA → Scoping Meetings / Public Information Workshop → Refinement of Work Plan as needed → Prepare Draft EA → Public Meeting / Information Workshop April 2016 → Distribute Draft EA to Agencies and Public November 2016 → Public Workshop/ Public Hearing December 2016 → Review and Revise Document → Prepare and Publish Final EA January 2017 → FAA Finding Issued





COMPONENTS OF THE PROPOSED ACTION

- Provide grading, site preparation, and utility connections for commercial development
- Passenger terminal complex with 10 gates and aircraft parking spaces
- Airfield, taxiway, and taxilane improvements
- Complete construction of full length parallel taxiway northeast of Runway 12L-30R
- Aircraft apron
- Access roadways and terminal curbfront improvements
- Vehicle parking spaces
- Relocation of utilities, service roads, and perimeter fencing
- Ancillary/support facilities for aviation
- Relocate Airport Surveillance Radar (ASR) off airport
- Relocate Ellsworth Channel
- Improve Powerline Floodway
- Demolition of existing buildings and structures within the northeast development area, grading for site preparation

Prepared December, 2016

K.3.4 Public Hearing Transcript

PUBLIC HEARING FOR THE NORTHEAST AREA DEVELOPMENT PLAN AND ASSOCIATED IMPROVEMENTS DRAFT ENVIRONMENTAL ASSESSMENT

REPORTER'S TRANSCRIPT OF PROCEEDINGS

Mesa, Arizona
December 13, 2016

TRANSCRIBED BY: CHRISTINE JOHNSON, RPR, RMR
Certified Reporter #50383

1 Be it remembered that heretofore on December 13,
2 2016, commencing at 6:00 p.m., at the offices of the
3 Phoenix-Mesa Gateway Airport Administration Building, 5835
4 South Sossaman Road, Mesa, Arizona, the following
5 proceedings were had, to wit:
6
7
8 OPENING REMARKS Page
9 BY MR. BRIAN O'NEILL 3
10
11
12 COMMENTS BY:
13 (No comments were made.)
14
15
16 CLOSING REMARKS
17 BY MR. BRIAN O'NEILL 7
18
19
20
21
22
23
24
25

1 HEARING OFFICER O'NEILL: So we're going to open
2 it up right now. Good evening, Ladies and Gentlemen, the
3 public hearing for the Northeast Area Development Plan and
4 Associated Improvement Draft Environmental Assessment has
5 now begun. The time is 6:00 p.m. on December 13th, 2016.
6 My name is Brian O'Neill and I'm the hearing
7 officer for tonight's public hearing. My role is to ensure
8 that this hearing is conducted in an orderly manner, which
9 maximizes the public's opportunity to comment on the Draft
10 Environmental Assessment.
11 The Proposed Action includes construction of: A
12 purpose-built passenger terminal with second-level boarding
13 and equivalent number of gates as the existing terminal on
14 undeveloped land on the northeast side of airport property;
15 airfield, taxiway, taxilane, and apron improvements to
16 provide airfield access; associated roadway, parking,
17 fencing and utility infrastructure; ancillary/support
18 facilities, and completion of site preparation for future
19 revenue-generating commercial development.
20 The Proposed Action also includes: Relocation of
21 utilities, service roads and perimeter fencing, as well as
22 relocation of the airport surveillance radar ASR No. 8
23 off-airport; leasing 20-plus acres from Arizona Department
24 of Transportation northeast of existing airport property for
25 the relocation of the Ellsworth Channel and demolition of

1 existing unoccupied buildings.
2 The purpose of today's hearing is to receive
3 public comment on the Draft Environmental Assessment in
4 accordance with the National Environmental Policy Act and
5 Federal Aviation Administration policies and procedures.
6 In addition to the public hearing, the Phoenix
7 Mesa-Gateway Airport Authority is also holding a public
8 workshop. The public workshop located in the back of this
9 room has display boards set up with Gateway Airport
10 Authority and consultant staff available to answer questions
11 you may have concerning the proposed project, alternatives
12 considered, and potential environmental impacts.
13 Please note that any questions you pose to the
14 staff and the public workshop will not become part of the
15 public record for this public hearing.
16 Tonight's hearing is scheduled to conclude at
17 7:00 p.m. Comments regarding the Draft Environmental
18 Assessment can be made in one of four ways: The first is by
19 making a public statement at the microphone during this
20 hearing. A second way that comments will be accepted is by
21 depositing written comments in the comment box located at
22 the front desk. Written comments can either be provided on
23 the written comment form provided at the sign-in table or on
24 other paper you provide. Written comments can also be
25 mailed to the Phoenix-Mesa Gateway Airport Authority at the

1 address printed at the bottom of the written comment form.
2 Finally, written comments can be submitted online to the
3 project e-mail address, which is NADPEA@ricondo.com.
4 All comments, no matter how they are provided,
5 will be treated equally in the Phoenix -- by the
6 Phoenix-Mesa Gateway Airport Authority. Written comments
7 will be accepted until 5:00 p.m. on December 28th, 2016.
8 If you wish to make a public statement during this
9 hearing, please fill out one of the speaker registration
10 cards located at the sign-in table and give it to the
11 assistant at the sign-in table. Speakers will be called in
12 the order the cards are received. When your name is called,
13 please come to the microphone, state and spell your name for
14 the court reporter and then proceed with your comments.
15 Please note that no questions concerning the
16 project will be accepted or answered by the hearing officer.
17 If you have any questions regarding the Draft Environmental
18 Assessment, please see one of the staff members in the
19 public workshop area.
20 In the interest of providing all speakers the
21 opportunity to speak on record, please limit your comments
22 today to three minutes. If time permits, speakers will be
23 provided additional opportunity to speak after everyone
24 desiring to speak has spoken.
25 While you're limited in the length of your oral

1 comments here, there is no size limit to written comments.
2 All comments made at the microphone will be recorded by a
3 certified court reporter and along with any written comments
4 received will be made part of the Environmental Assessment
5 record. This record will be incorporated into the
6 Environmental Assessment and submitted to the Federal
7 Aviation Administration. If you are reading from prepared
8 remarks, the court would appreciate a copy of your comments.
9 I will now call the first speaker, if there are
10 any speakers that wish to speak tonight. It is now 6:09 and
11 no one has signed up to speak. If you would like to present
12 oral testimony, please fill out a speaker registration card
13 available at the sign-in table. Speakers will be called in
14 the order that the card is received.
15 Does anyone who previously spoke wish to continue
16 their comments? If there are no other speakers, we will
17 break until the speaker card is filled out and submitted.
18 Thank you.
19 (Whereupon, a recess was taken from 6:09 p.m. to
20 7:00 p.m.)
21 HEARING OFFICER O'NEILL: Ladies and Gentlemen, it
22 is now 7:00 p.m. Written comments can either be deposited
23 in one of the comment boxes located in this room, mailed to
24 the Phoenix-Mesa Gateway Airport Authority at the address
25 printed at the bottom of the comment form or submitted

online on the project e-mail at NADPEA@ricondo.com by 5:00 p.m. on December 28th, 2016.

Thank you for attending tonight. This concludes the public hearing on the Draft Environmental Assessment for the Northeast Area Development Plan and Associated Improvements at Phoenix-Mesa Gateway Airport.

(The proceedings concluded at 7:02 p.m.)

****

I, CHRISTINE JOHNSON, having been first duly sworn and appointed as Official Court Reporter herein, do hereby certify that the foregoing pages, inclusive, constitute a full, true and accurate transcript of all the proceedings had in the above matter, all done to the best of my skill and ability.

DATED this _____day of _____, 2016.

Christine Johnson, RPR, RMR
Certified Court Reporter No. 50383

Attachment K.4

Agency Comment Letters and Responses

GILA RIVER INDIAN COMMUNITY
POST OFFICE BOX 2140, SACATON, AZ 85147

TRIBAL HISTORIC PRESERVATION OFFICE

(520) 562-7162
Fax: (520) 562-5083

November 15, 2016

Tony Bianchi
Phoenix-Mesa Gateway Airport Authority
5835 South Sossaman Road
Mesa, Arizona 85212-6014

RE: Draft Environmental Assessment (EA) Proposed Northeast Area Development Plan and Associated Improvements, Phoenix-Mesa Gateway Airport Authority (PMGAA), Phoenix-Mesa Gateway Airport, Mesa, Arizona

Dear Mr. Bianchi,

The Gila River Indian Community Tribal Historic Preservation Office (GRIC-THPO) has received the draft EA for the proposed Northeast Area Development Plan and Associated Improvements at the Phoenix-Mesa Gateway Airport. The GRIC-THPO initially responded to this undertaking on October 12, 2015 and April 26, 2016. The PMGAA is proposing to implement the Northeast Development Area Plan (NADP) to begin extensive modifications to the PMGAA including construction of a new 300,000 square foot terminal with 14 gates. The Federal Aviation Administration (FAA) submitted an archaeological testing report for sites: 1) AZ U:10:316(ASM); 2) AZ U:10:317(ASM); 3) AZ U:10:320(ASM); and 4) AZ U:10:321(ASM). The results of eligibility testing showed that there were no archaeological features or significant cultural deposits at any of the sites. None of the sites are considered Register eligible properties. The draft EA indicates that no historic properties would be adversely affected by this undertaking. The FAA has made a determination of no adverse effect for this undertaking.

The GRIC-THPO agrees that the sites are not Register eligible and we concur with a finding of no adverse effect. The draft EA addresses the management of known cultural resources in the project area and the draft EA is an acceptable document. The GRIC-THPO will continue to participate in the consultation process for this undertaking. The proposed project area is within the ancestral lands of the Four Southern Tribes (Gila River Indian Community; Salt River Pima-Maricopa Indian Community; Ak-Chin Indian Community and the Tohono O'Odham Nation). T-1-01

Thank you for consulting with the GRIC-THPO. If you have any questions please do not hesitate to contact me or Archaeological Compliance Specialist Larry Benallie, Jr. at 520-562-7162.

Respectfully,

Barnaby V. Lewis
Tribal Historic Preservation Officer
Gila River Indian Community

RESPONSE TO COMMENT T-1

Response T-1-01:

Comment noted. The PMGAA welcomes the continued participation of the Gila River Indian Community-Tribal Historic Preservation Office in the consultation process for this project.

F-1

From: Lambert, Cheryl - NRCS, Phoenix, AZ
To: NADPEA ricondo
Subject: Phoenix Mesa Gateway Airport NE Area Dev. Plan Comment
Date: Thursday, December 08, 2016 4:46:22 PM
Attachments: Phx-Mesa Airport_NEAreaDevPlan__CustomSoilReport_12.8.16.pdf
Web Soil Survey_nrcs142p2_050731.pdf

Hello Mr. Bianchi,

I would like to comment on the Phoenix-Mesa Gateway Airport Northeast Area Development Plan (EA-NOA) which the NRCS at the Phoenix State Office received by mail. My comments concern the Farmland Protection Policy Act (FPPA), which the NRCS is responsible for. The only project location I considered is the Proposed Land Acquisition, since the rest appears to be located within the existing Airport boundary. FPPA does not apply for this project, since it if located in an Urban Area. I am providing a custom soils report from the Web Soil Survey website, Urban Area map and Web Soil Survey brochure for reference. Please let me know if you have any questions or comments. F-1-01

Best regards, Cheryl Lambert

MBA, NRCS Certified Conservation Planner
State Environmental Liaison & Technical Service Provider (TSP) Coordinator
Arizona NRCS Asian American and Pacific Islander- SEPM
USDA, Natural Resources Conservation Service
230 N. 1st Ave. Suite 509, Phoenix, AZ 85003, Office: (602) 280-8787 Website: www.az.nrcs.usda.gov

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RESPONSE TO COMMENT F-1

Response F-1-01:

The PMGAA thanks you for the information provided. Section 3.2 Environmental Resources Not Affected agrees with your conclusion that the Farmland Protection Policy Act is not applicable to this project.

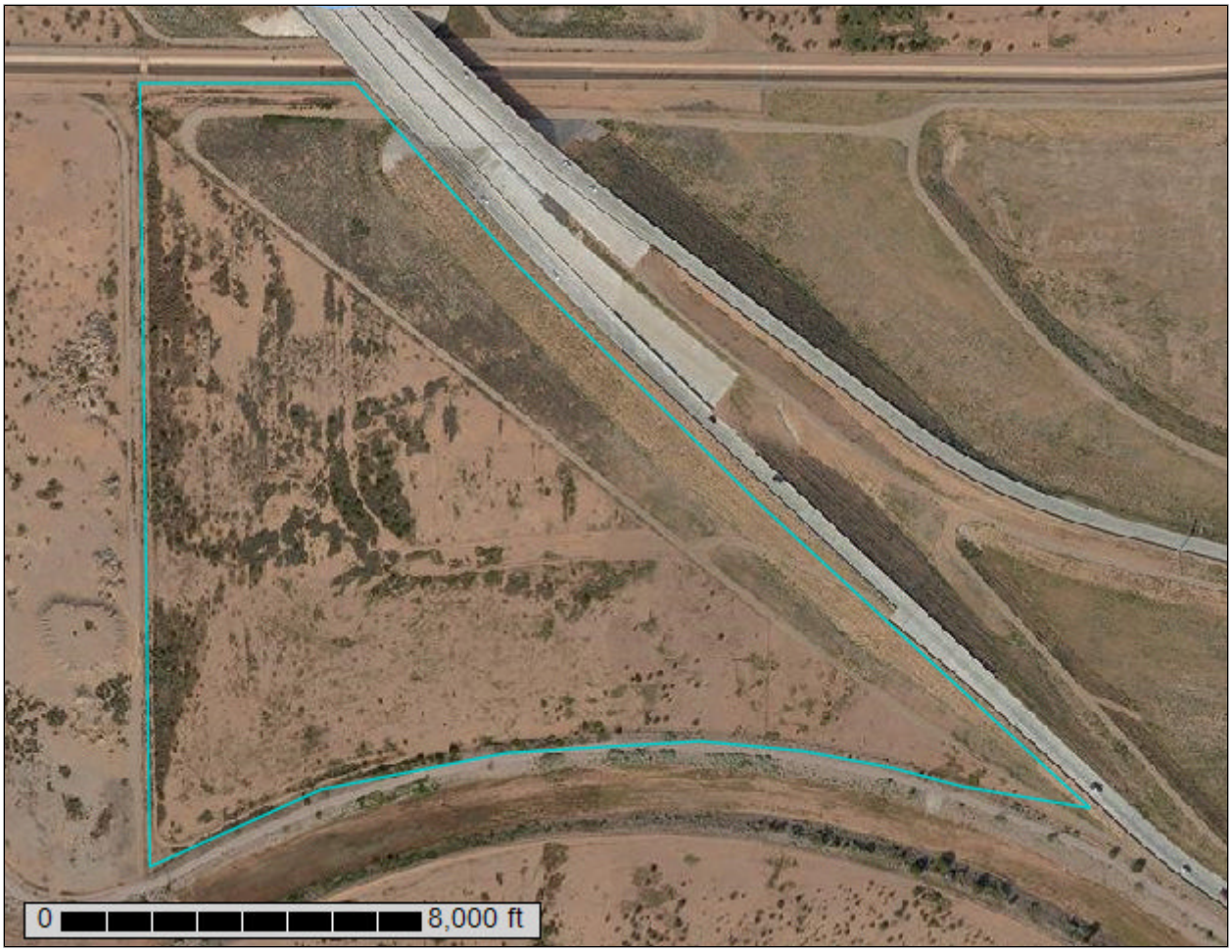
United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties

Phoenix-Mesa Airport NE Area Development Plan



December 8, 2016

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

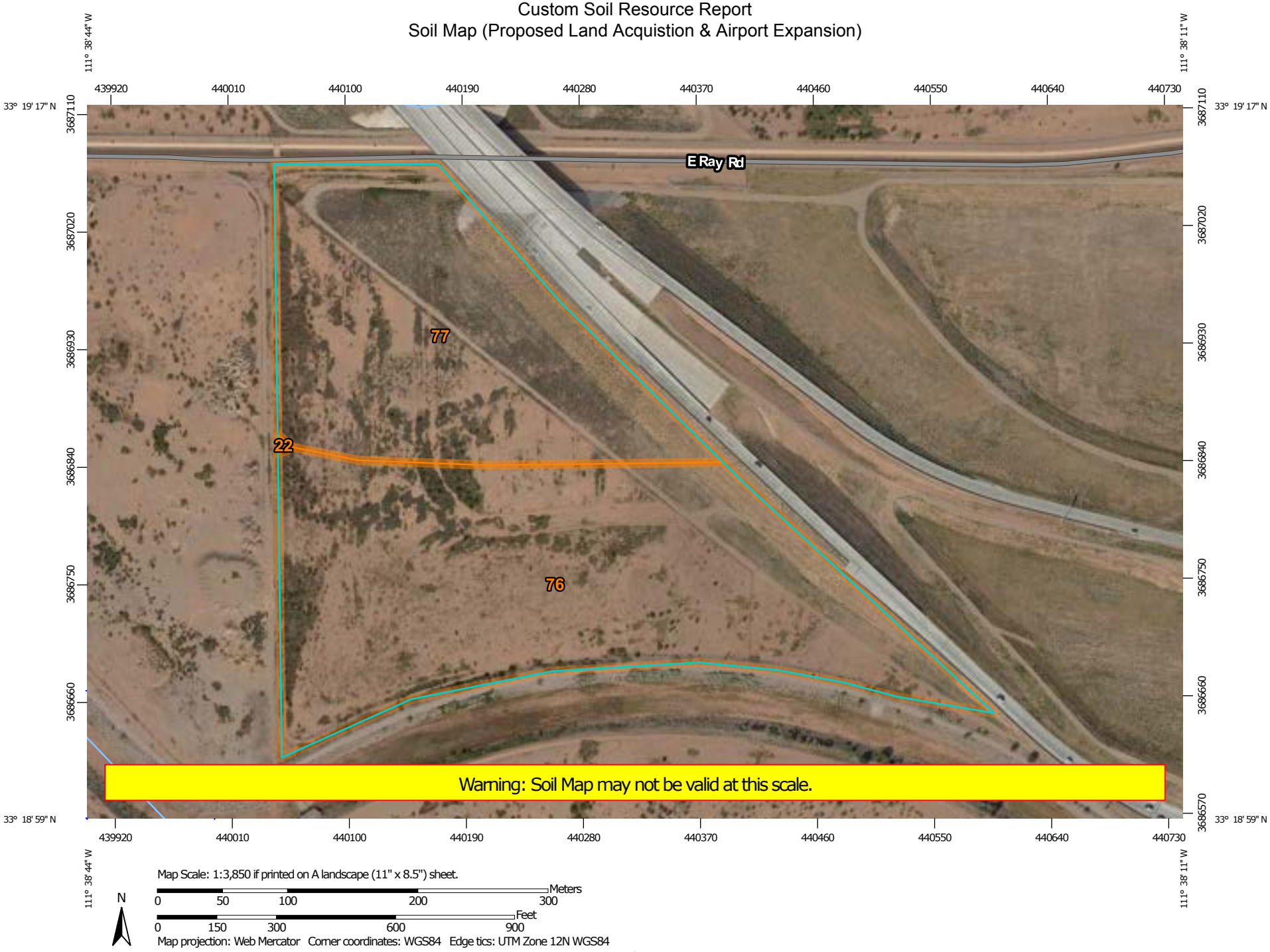
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Proposed Land Acquistion & Airport Expansion)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties
Survey Area Data: Version 10, Oct 1, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 3, 2014—Jan 20, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Proposed Land Acquistion & Airport Expansion)

Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties (AZ645)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
22	Contine clay loam	0.0	0.1%
76	Mohall loam, calcareous solum	18.8	59.1%
77	Mohall clay loam	13.0	40.9%
Totals for Area of Interest		**31.8**	**100.0%**

Map Unit Descriptions (Proposed Land Acquistion & Airport Expansion)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that

have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties

22—Contine clay loam

Map Unit Setting

National map unit symbol: 1s5k
Elevation: 1,200 to 2,200 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Contine and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Contine

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

A - 0 to 2 inches: clay loam
Btk - 2 to 30 inches: clay loam
Bk - 30 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Clay Loam Upland 7-10" p.z. (R040XB205AZ)
Hydric soil rating: No

76—Mohall loam, calcareous solum

Map Unit Setting

National map unit symbol: 1s8w
Elevation: 1,200 to 2,200 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Mohall and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mohall

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

A - 0 to 7 inches: loam
Btk - 7 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: Limy Fan 7-10" p.z. (R040XB207AZ)
Hydric soil rating: No

77—Mohall clay loam

Map Unit Setting

National map unit symbol: 1s8x
Elevation: 1,200 to 2,200 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Mohall and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mohall

Setting

Landform: Fan terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

A - 0 to 2 inches: clay loam
Btk - 2 to 42 inches: clay loam
C - 42 to 60 inches: extremely cobbly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 25 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: Clay Loam Upland 7-10" p.z. (R040XB205AZ)
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

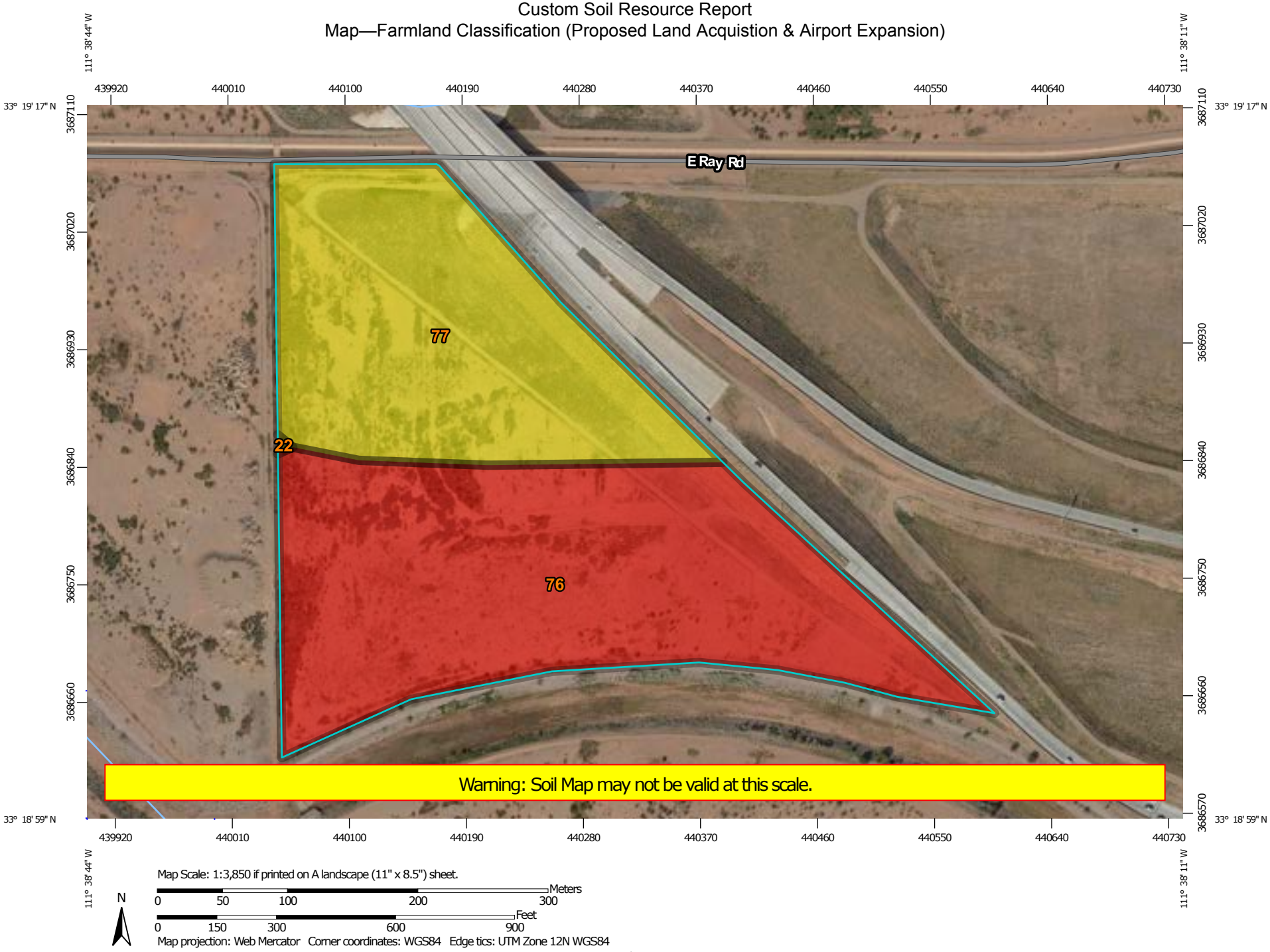
Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Farmland Classification (Proposed Land Acquistion & Airport Expansion)

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Map—Farmland Classification (Proposed Land Acquistion & Airport Expansion)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Water Features

MAP INFORMATION

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties
Survey Area Data: Version 10, Oct 1, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 3, 2014—Jan 20, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Farmland Classification (Proposed Land Acquistion & Airport Expansion)

Farmland Classification— Summary by Map Unit — Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties (AZ645)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
22	Contine clay loam	Prime farmland if irrigated	0.0	0.1%
76	Mohall loam, calcareous solum	Not prime farmland	18.8	59.1%
77	Mohall clay loam	Prime farmland if irrigated	13.0	40.9%
Totals for Area of Interest			**31.8**	**100.0%**

Rating Options—Farmland Classification (Proposed Land Acquistion & Airport Expansion)

Aggregation Method: No Aggregation Necessary

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The majority of soil attributes are associated with a component of a map unit, and such an attribute has to be aggregated to the map unit level before a thematic map can be rendered. Map units, however, also have their own attributes. An attribute of a map unit does not have to be aggregated in order to render a corresponding thematic map. Therefore, the "aggregation method" for any attribute of a map unit is referred to as "No Aggregation Necessary".

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Nonirrigated Capability Class (Proposed Land Acquistion & Airport Expansion)

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations that show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels-capability class, subclass, and unit. Only class and subclass are included in this data set.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

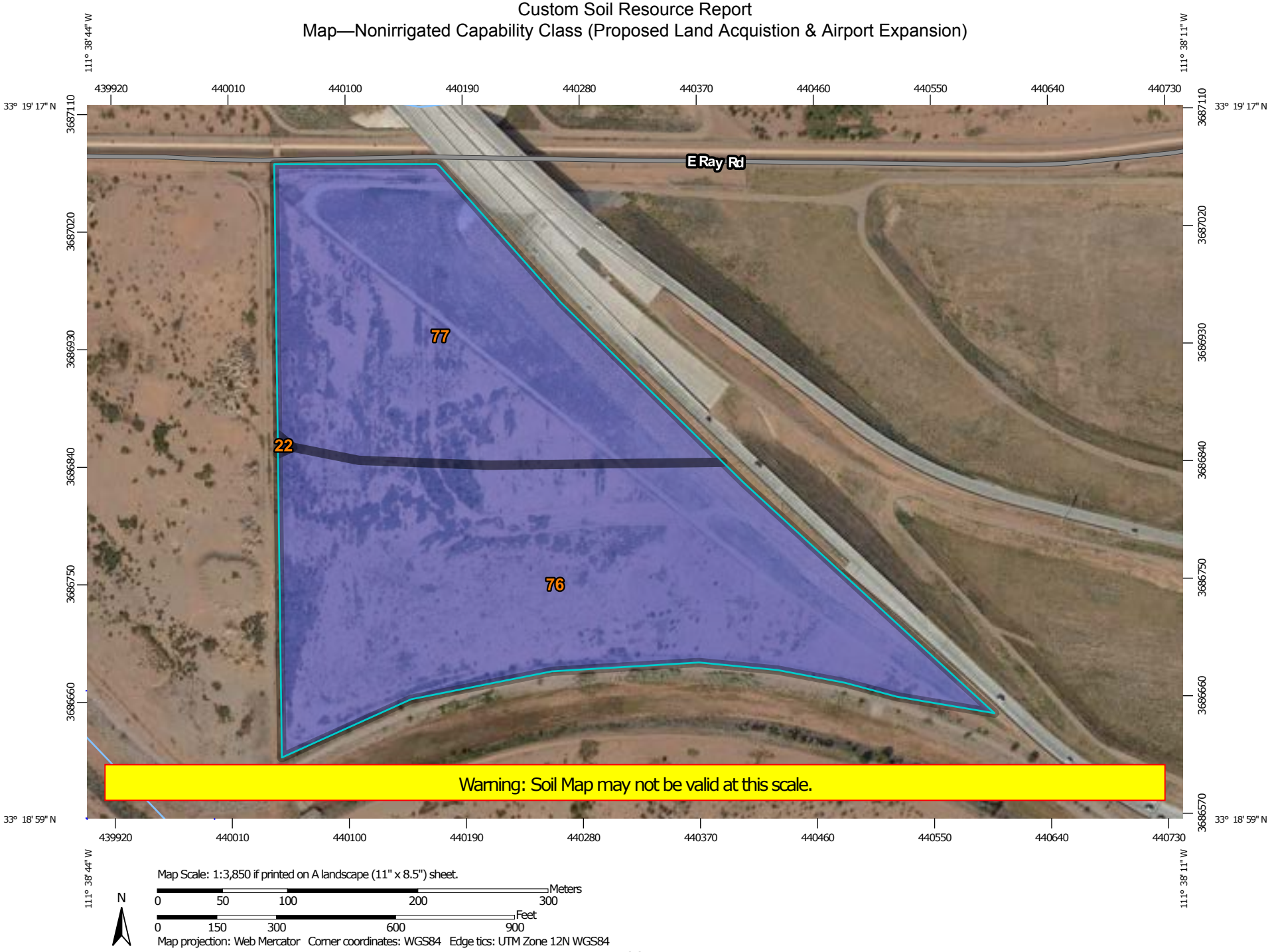
Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Custom Soil Resource Report
Map—Nonirrigated Capability Class (Proposed Land Acquistion & Airport Expansion)



Map Scale: 1:3,850 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Capability Class - I

Capability Class - II

Capability Class - III

Capability Class - IV

Capability Class - V

Capability Class - VI

Capability Class - VII

Capability Class - VIII

Not rated or not available

Soil Rating Lines

Capability Class - I

Capability Class - II

Capability Class - III

Capability Class - IV

Capability Class - V

Capability Class - VI

Capability Class - VII

Capability Class - VIII

Not rated or not available

Soil Rating Points

Capability Class - I

Capability Class - II

Capability Class - III

Capability Class - IV

Capability Class - V

Capability Class - VI

Capability Class - VII

Capability Class - VIII

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties
Survey Area Data: Version 10, Oct 1, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 3, 2014—Jan 20, 2015

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Table—Nonirrigated Capability Class (Proposed Land Acquistion & Airport Expansion)

Nonirrigated Capability Class— Summary by Map Unit — Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties (AZ645)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
22	Contine clay loam	7	0.0	0.1%
76	Mohall loam, calcareous solum	7	18.8	59.1%
77	Mohall clay loam	7	13.0	40.9%
Totals for Area of Interest			**31.8**	**100.0%**

Rating Options—Nonirrigated Capability Class (Proposed Land Acquistion & Airport Expansion)

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be

considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Nonirrigated Capability Subclass (Proposed Land Acquistion & Airport Expansion)

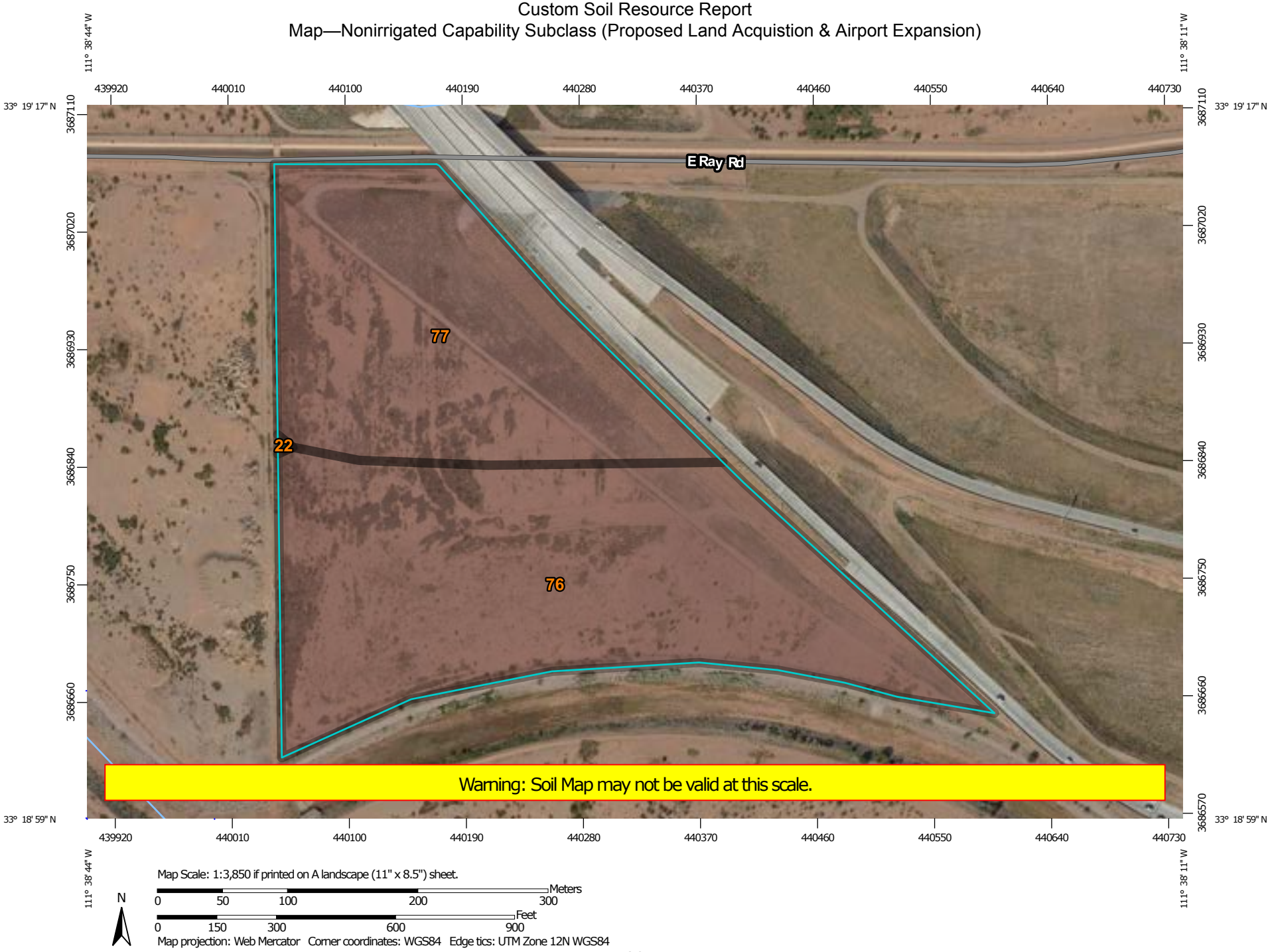
Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations that show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels-capability class, subclass, and unit. Only class and subclass are included in this data set.

Capability subclasses are soil groups within one capability class. They are designated by adding a small letter, "e," "w," "s," or "c," to the class numeral, for example, 2e. The letter "e" shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; "w" shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); "s" shows that the soil is limited mainly because it is shallow, droughty, or stony; and "c," used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by "w," "s," or "c" because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, or wildlife habitat.

Map—Nonirrigated Capability Subclass (Proposed Land Acquistion & Airport Expansion)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Erosion
- Soil limitation within the rooting zone
- Excess water
- Climate condition
- Not rated or not available

Soil Rating Lines

- Erosion
- Soil limitation within the rooting zone
- Excess water
- Climate condition
- Not rated or not available

Soil Rating Points

- Erosion
- Soil limitation within the rooting zone
- Excess water
- Climate condition
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties
Survey Area Data: Version 10, Oct 1, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 3, 2014—Jan 20, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Nonirrigated Capability Subclass (Proposed Land Acquistion & Airport Expansion)

Nonirrigated Capability Subclass— Summary by Map Unit — Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties (AZ645)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
22	Contine clay loam	s	0.0	0.1%
76	Mohall loam, calcareous solum	c	18.8	59.1%
77	Mohall clay loam	c	13.0	40.9%
Totals for Area of Interest			**31.8**	**100.0%**

Rating Options—Nonirrigated Capability Subclass (Proposed Land Acquistion & Airport Expansion)

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be

considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Hydric Rating by Map Unit (Proposed Land Acquistion & Airport Expansion)

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite

determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

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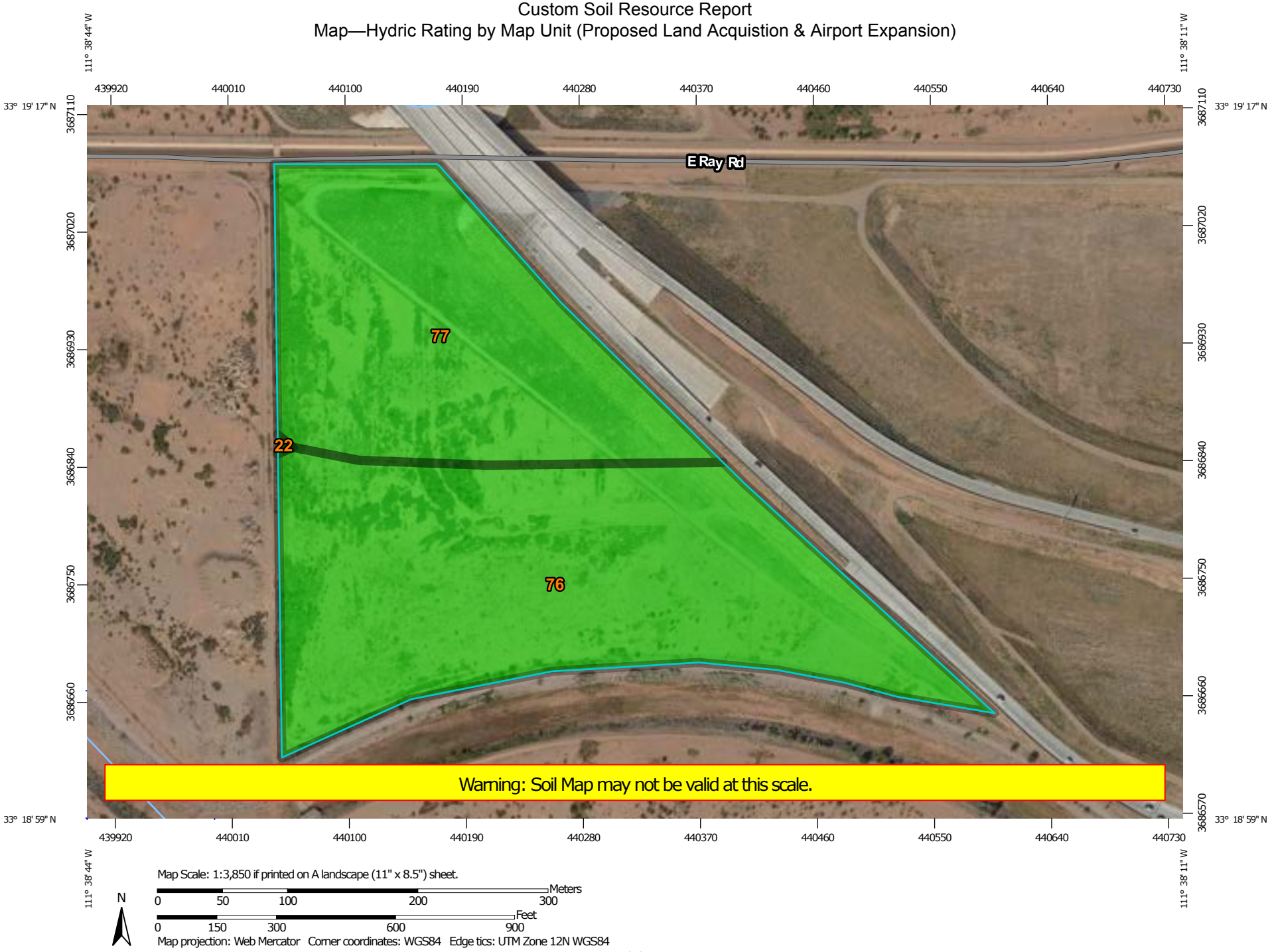
Custom Soil Resource Report
Map—Hydric Rating by Map Unit (Proposed Land Acquistion & Airport Expansion)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Hydric (100%)

Hydric (66 to 99%)

Hydric (33 to 65%)

Hydric (1 to 32%)

Not Hydric (0%)

Not rated or not available

Soil Rating Lines

Hydric (100%)

Hydric (66 to 99%)

Hydric (33 to 65%)

Hydric (1 to 32%)

Not Hydric (0%)

Not rated or not available

Soil Rating Points

Hydric (100%)

Hydric (66 to 99%)

Hydric (33 to 65%)

Hydric (1 to 32%)

Not Hydric (0%)

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Survey Area Data: Version 10, Oct 1, 2015

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Date(s) aerial images were photographed: Nov 3, 2014—Jan 20, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydric Rating by Map Unit (Proposed Land Acquistion & Airport Expansion)

Hydric Rating by Map Unit— Summary by Map Unit — Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties (AZ645)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
22	Contine clay loam	0	0.0	0.1%
76	Mohall loam, calcareous solum	0	18.8	59.1%
77	Mohall clay loam	0	13.0	40.9%
Totals for Area of Interest			**31.8**	**100.0%**

Rating Options—Hydric Rating by Map Unit (Proposed Land Acquistion & Airport Expansion)

Aggregation Method: Percent Present

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Percent Present" returns the cumulative percent composition of all components of a map unit for which a certain condition is true. For example, attribute "Hydric Rating by Map Unit" returns the cumulative percent composition of all components of a map unit where the corresponding hydric rating is "Yes". Conditions may be simple or complex. At runtime, the user may be able to specify all, some or none of the conditions in question.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

References

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United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

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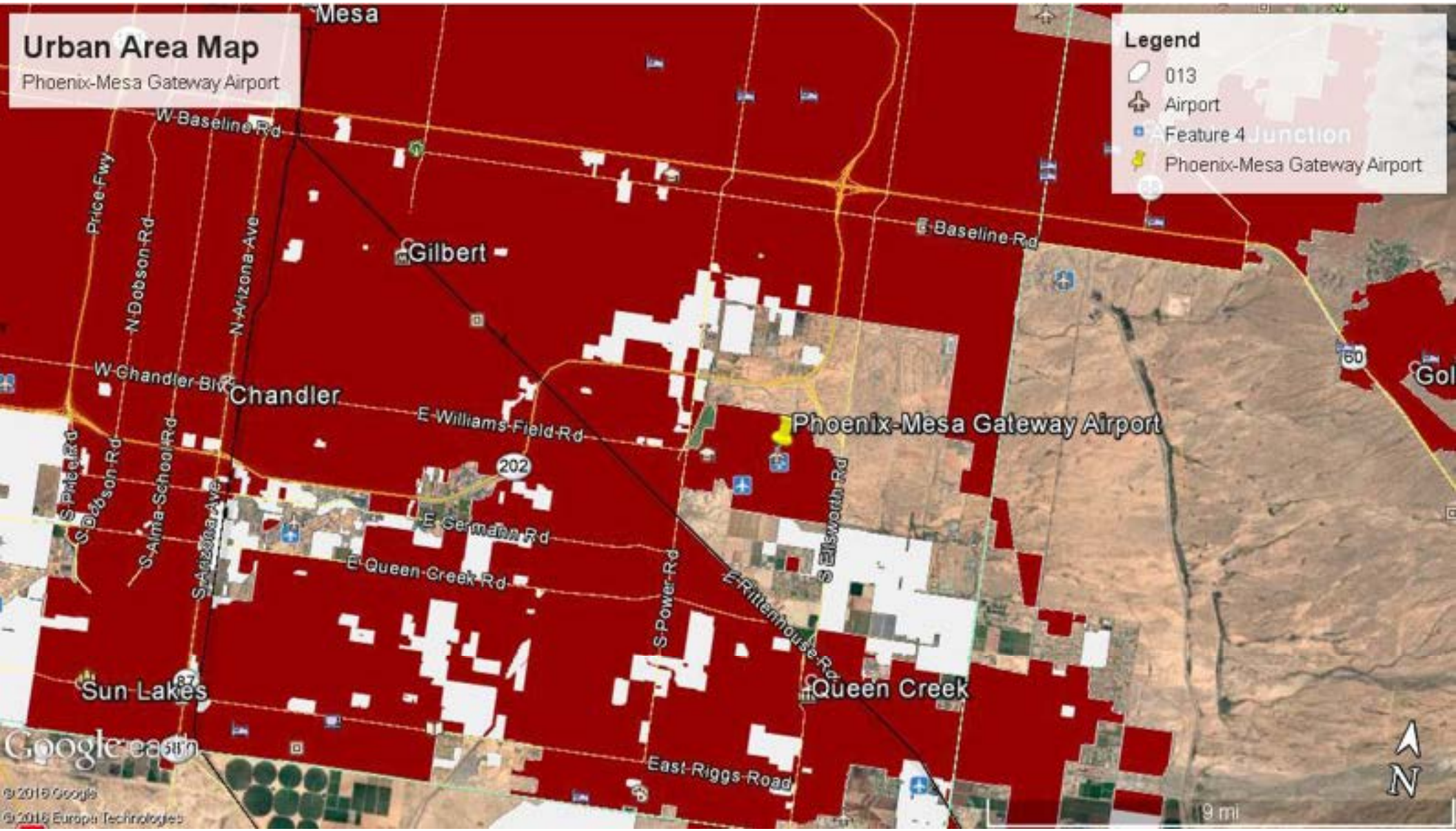
Urban Area Map
Phoenix-Mesa Gateway Airport
Legend
013
Airport
Feature 4
Phoenix-Mesa Gateway Airport
Mesa
W Baseline Rd
E Baseline Rd
Price Fwy
N Dobson Rd
N Arizona Ave
Gilbert
W Chandler Blvd
Chandler
E Williams Field Rd
202
Phoenix-Mesa Gateway Airport
S Price Rd
S Dobson Rd
S Alma School Rd
S Arizona Ave
E Germann Rd
E Queen Creek Rd
S Power Rd
E Rittenhouse Rd
S Ellsworth Rd
Queen Creek
Sun Lakes
87
60
East Riggs Road
Google earth
© 2015 Google
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9 mi
N

Soil Survey Data

Soil survey data are a product of the National Cooperative Soil Survey, a joint effort of the USDA Natural Resources Conservation Service and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants.

Web Soil Survey (WSS)

The Web Soil Survey provides agricultural producers, agencies, Technical Service Providers, and others electronic access to relevant soil and related information needed to make land-use and management decisions. The WSS:

- Provides an alternative to traditional hardcopy publication,
- Provides the means for quicker delivery of information,
- Provides electronic access to full soil survey report content,
- Provides access to the most current data,
- Allows customers to get just the information they want, and
- Provides customers with the ability to download spatial and tabular soils data for use in GIS (replaces functionality of former Soil Data Mart).
- Additional help is available at "Contact Us" or by emailing soilshotline@lin.usda.gov.

Current, Custom
Soil Maps & Reports:
Fast.
Free.
Friendly.

Print a Hydric Soil Map

- Complete Steps 1, 2, and 3
- From the "Soil Data Explorer" tab, click on the "Suitabilities and Limitations for Use" tab
- Click on "Land Classifications"
- Click on "Hydric Rating by Map Unit"
- Click the "View Rating" button
- Click the "Legend" tab to open or close the map symbol legend
- Click the "Printable Version" button
- Click the "View" button
- On the browser menu bar, select File and Print; or click the print icon

Print a Soil Chemical Properties Report

- Complete Steps 1, 2, and 3
- From the "Soil Data Explorer" tab, click the "Soil Reports" tab
- Click on "Soil Chemical Properties"
- Click on "Chemical Soil Properties"
- Click the "View Soil Report" button
- Click the "Printable Version" button
- Click the "View" button
- On the browser menu bar, select File and Print; or click the print icon

USDA Natural Resources Conservation Service
United States Department of Agriculture

National Cooperative Soil Survey

USDA is an equal opportunity provider and employer.

March 2014

USDA Natural Resources Conservation Service
United States Department of Agriculture

Web Soil Survey

http://websoilsurvey.nrcs.usda.gov

Define.

Search / Locate

Collect.

Analyze Data

Develop.

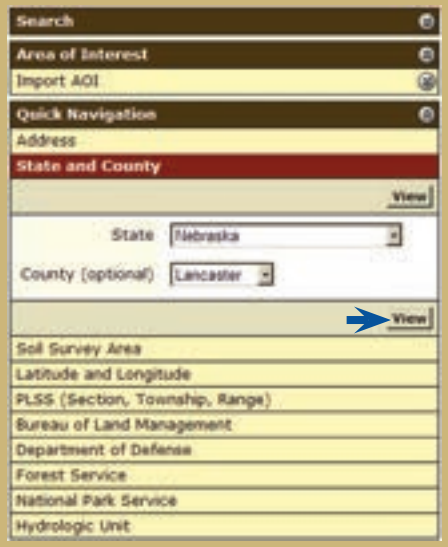
Custom Reports & Maps

"Helping People Help the Land"

Accessing Web Soil Survey

- Open the Web Soil Survey (WSS) site at: http://websoilsurvey.nrcs.usda.gov and click the "Start WSS" button.

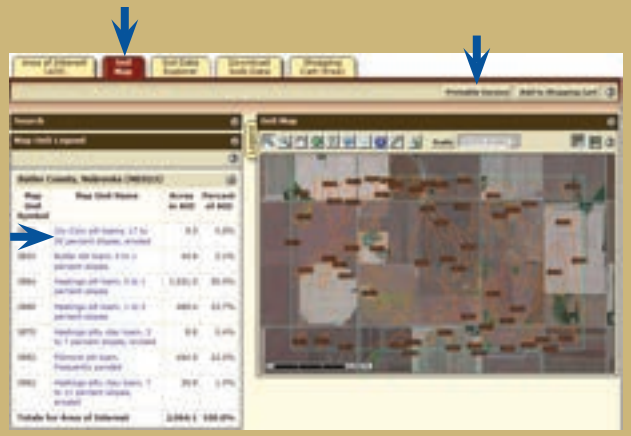
Step 1. Define Your Area of Interest (AOI)



- Several methods are available to zoom into a geographic area of interest. You can enter an address; select a state and county; enter section, township, and range information; or you can import a boundary file from your local computer to set the AOI.
- Click the "View" button to see the area.

- Use the zoom in tool (plus sign) to click and drag a rectangular box around a specific area. Repeat, as necessary, to zoom further.
- Select an AOI tool to draw a rectangular box or irregular polygon that defines the AOI and allows selection of associated soil data. Once the AOI has been defined, you can save it for use at a later date.

Step 2. View and Print Your Soil Map

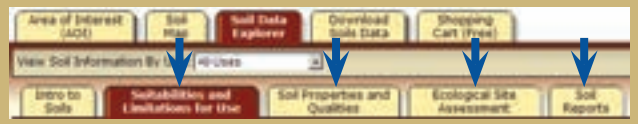


- Click on the "Soil Map" tab.
- Click on a map unit name to view a map unit description. Click the X to close the narrative.
- Print your soil map by clicking on the "Printable Version" button; then click the "View" button. On the browser menu bar, select File and Print; or click the print icon. Close the window.

Step 3. Explore Your Soil Information

WSS generates thematic maps of soil interpretations and chemical or physical properties. Tabular data reports are also available.

- Click on the "Soil Data Explorer" tab.



- Click on the tabs below "Soil Data Explorer" and explore available information (default tab is "Suitabilities and Limitations for Use").

Step 4. Add Items to the Free Shopping Cart and Check Out

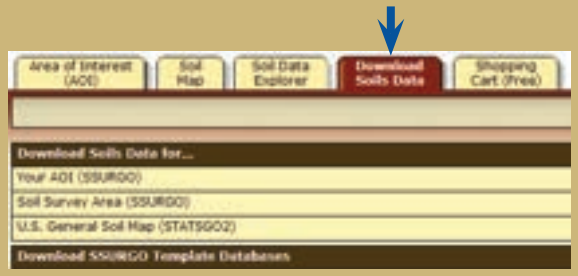
WSS allows you to collect a variety of thematic maps and reports in the Shopping Cart, then print or download the content into one file or document.

- Soil map, map unit legend, and map unit descriptions are automatically added.

- Items viewed in Step 3 can be added by clicking the "Add to Shopping Cart" button.
- View your cart contents by clicking the "Shopping Cart (Free)" tab. Items checked on the Table of Contents are included.

- Get your Custom Soil Resource report.
  - -- Click the "Check Out" button
  - -- Select a delivery option and click OK

Step 5. Download Soils Data for Use in GIS



WSS now allows you to download spatial and tabular SSURGO and STATSGO2 soils data for use in your local GIS. SSURGO data can be downloaded for your defined AOI or for a soil survey area. STATSGO2 data can be downloaded for individual states or for the whole U.S.

NOTE: At any time during Steps 2, 3, 4, or 5, you can redefine the soil map location by clicking on the "Area of Interest" tab and clicking the "Clear AOI" button. Repeat Step 1.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

DEC 19 2016

David B. Kessler
Federal Aviation Administration
Western-Pacific Region (AWP-600)
Airports Division
P.O. Box 92007
Los Angeles, CA 90009

Subject: Comments for the Draft Environmental Assessment for the Phoenix-Mesa Gateway Airport, Maricopa County, Arizona

Dear Mr. Kessler:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Assessment for the proposed Phoenix-Mesa Gateway Airport terminal project in Maricopa County, Arizona. EPA offers the following comments to assist in the development of the Final Environmental Assessment for the project, pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

Our attached detailed comments provide recommendations for 1) Hazardous Air Pollutants; 2) Noise; 3) Parking Facility; 4) Ground Transportation; and 5) Green Building.

We appreciate the opportunity to offer comments for the Environmental Assessment. When the Final EA is ready, please send one CD copy to the address above (specify Mail Code ENF 4-2). If you have any questions, please contact Zac Appleton, the lead reviewer for this project, at 415-972-3321 or appleton.zac@epa.gov.

Sincerely,

Carolyn Mulvihill

Carolyn Mulvihill, Acting Transportation Team Supervisor
Environmental Review Section

cc: Tony Bianchi, Phoenix-Mesa Gateway Airport Authority

Enclosures: EPA Detailed Comments

Hazardous Air Pollutants

EPA welcomes the Draft Environmental Assessment (EA)'s inclusion of the Hazardous Air Pollutants emissions inventories, itemized in Table 4-4, fulfilling the Federal Aviation Administration (FAA)'s intention to quantify total airport hazardous air pollutant emissions, broken down by pollutant and source category, described in EPA's August 15, 2014 letter regarding the proposed Phoenix Airport Air Quality Assessment Protocol. F-2-01

Noise

The Draft EA states that the area east of the proposed Northeast Area Development Alternative includes the old General Motors Proving Ground which is "planned for future commercial retail/social and residential uses" and that residential and other development already appears underway in the new "Eastmark" area on either side of South Signal Butte Road, north of Ray Road. We also note that the Airfield Overlay District includes three Airport Overflight Areas, and that the Draft EA states that "all planned land uses within, and in the immediate vicinity of, the Northeast Area Development Alternative GDA and PPA are compatible with aircraft operations – either through land use restrictions or avigation easements and/or noise attenuation practices."

Recommendation:

Since the "Eastmark" development may have occurred after the FAA's noise impact analysis, which is provided in the Draft EA Appendices (Exhibits F-1, F-2), was completed, EPA recommends the Final EA clarify if the actual and planned mixed use developments east of the proposed Northeast Area Development Alternative are covered by Airport Overflight Area restrictions, avigation easements, and/or by what noise attenuation practices. F-2-02

Parking Facility

The Draft EA commits the airport to "constructing parking spaces equivalent to what is currently available," that is 4,020 parking spaces as enumerated in the Appendices. The Draft EA also forecasts an increase of over 257,000 enplaned passengers by the year 2030 (Table 1-1). It also appears that an area north of Ray Road and east of State Route 24 may be considered for use as an Overnight Parking Lot. Taken together, the proposed land area that may go towards automobile growth is significant, and it is unclear if it is sufficient for the forecast passenger growth.

Recommendations:

- EPA recommends the Final EA offer a quantified account of existing and planned vehicle parking spaces for the proposed project, and what fraction of the forecast passenger growth will be satisfied with this supply. We recommend the use of parking structures where feasible to minimize the stormwater and other impacts of expansive parking lots. F-2-03
- We further recommend the Final EA discuss the potential for deploying renewable energy solutions on parking structures and lots, to partially supply the airport's electricity need, and support the project's Purpose and Need to "help the PMGAA become as financially self-sufficient as possible." F-2-04

Ground Transportation

EPA notes that the current transit access to the Phoenix-Mesa Gateway Airport is on South Sossaman Road, which includes a Valley Metro bus stop that also serves Arizona State University Polytechnic Campus. If the Phoenix-Mesa Gateway Airport Authority (PMGAA) proceeds with the proposed

Northeast Area Development Alternative (Alternative 3), and primary airport access shifts to State Route 24, the dislocation of convenient bus service could negatively impact airport (facility and retail) employee and passenger ground transportation options.

Recommendation:
We recommend the Final EA describe any bus, shuttle service, and other rideshare facilities that will be incorporated in the proposed Northeast Area Development Alternative, and disclose any outreach to and commitments made by Valley Metro to serve the new location. F-2-05

Green Building

EPA notes that a project of the size proposed can be an opportunity to promote sustainability and incorporate recycled materials. In particular, FAA led a number of Airport Sustainability Planning pilots (https://www.faa.gov/airports/environmental/sustainability/), including participation with Flagstaff Pulliam Airport, which may have generated results that are directly applicable to the Phoenix-Mesa Gateway Airport project. FAA also published (https://www.faa.gov/documentlibrary/media/advisory_circular/150_5370_10F.pdf) an Advisory Circular (AC 150/5370-10F) in 2011 which includes recommendations and testing protocols for use of flyash in concrete, recycled concrete aggregate, and hot-mix asphalt for types of surfaces. FAA also offers research in warm-mix asphalt for airfield pavements (http://www.airtech.tc.faa.gov/ATT2014/Papers/P10023%20-%20Mejias-Santiago%20et%20al.pdf), which could offer additional opportunities to reduce environmental impacts for your project.

Recommendation:
We recommend the Final EA describe and quantify any sustainability or recycled materials practices the Phoenix-Mesa Gateway Airport project will incorporate, in line with relevant FAA studies and Advisory Circular recommendations. F-2-06

RESPONSE TO COMMENT F-2

Response F-2-01:

Comment noted.

Response F-2-02:

The text of Section 3.9.2.1 has been clarified to note that the Eastmark development is covered by the AOA-3 boundary. The sentence stating, "All planned land uses within, and in the immediate vicinity of, the Northeast Area Development Alternative GDA and PPA are compatible with aircraft operations—either through land use restrictions or avigation easements and/or noise attenuation practices." is accurate and was not changed. The Eastmark area has been labeled on Exhibits 3-6, 3-7 and 3-9; 4-3 and 4-4; and F-1 and F-2.

The Eastmark Community Plan and the related rezoning were approved by the City of Mesa on November 3, 2008.[1] While no part of the Eastmark project area was exposed to noise of DNL 60 or greater at the time of Community Plan approval, the project did lie within the 2000 Airport Land Use Compatibility Plan's AOA-3 boundary – the area subject to frequent low altitude aircraft overflights. The approved Community Plan included several airport compatibility regulations for future development, as summarized below.[2]

1. The Master Developer was required to dedicate an avigation easement over the entire property at the time the first development unit plan (DUP) was approved. (A DUP is an intermediate level plan for an individual phase of the development. The DUP must include sufficient detail regarding land uses, design themes, and other development standards "to ensure cohesive, integrated, high-quality design.")[3]

2. The Master Developer was required to provide written disclosures of the proximity of the Airport to all potential property buyers.

3. All residential uses within one-half mile south of Elliot Road were required to incorporate construction standards and techniques to achieve an outdoor-to-indoor noise level reduction of 25 dB.

4. Notwithstanding the requirements above, all residential uses within the Property were required to incorporate the following specific sound insulation measures:

a. Exterior wall insulation of R-13 adjacent to livable areas.

b. Ceiling insulation of R-30 over livable areas.

c. Exterior doors to livable areas must be solid core or insulated, with weather-tight gaskets and thresholds.

d. Exterior windows adjacent to livable areas must be double-glazed.

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[1] City of Mesa, Ordinance Number 4893, November 8, 2008.

[2] Mesa Proving Grounds Community Plan, April 28, 2011, Section 4, page 4.

[3] Mesa Proving Grounds Community Plan, April 28, 2011, Section 4, page 1.

e. Sole plates of exterior walls adjacent to livable areas must be caulked or sealed at the floor line.

5. No single-family detached housing units were to be allowed within the area from Elliot Road to one-half mile south of Elliot Road.

6. Maximum structure heights were limited to ensure compatibility with airspace protection requirements.

7. The Master Developer was required to provide an open space area with minimum dimensions of 75 feet in width and 660 feet in length parallel and adjacent to Elliot Road, generally between Ellsworth and Crimson Roads and south of Elliot Road.

Response F-2-03:

A footnote was added to the parking bullet under Section 1.4 Proposed Action to indicate the current number of parking spaces available. The Airport currently has just under 4,000 spaces in use:

- Terminal Daily Lot – 876 spaces
- Hourly Parking Lot – 186 spaces
- Ray Road Economy Lot – 2809 spaces

The parking facilities have not yet been designed. A quantified account of planned vehicle parking spaces for the proposed project is not available at this time. Based on available acreage, approximately another 2,000 parking spaces could be constructed at the north end of the airport for long term parking in the Ray Road Economy Lot expansion, if needed to accommodate future demand. This lot would remain open and continue in use with the relocation of the passenger terminal complex.

The Proposed Action would include short term parking adjacent to the relocated terminal. Initially, a similar number of short-term spaces as existing (1,065), with a buffer to accommodate increased demand based on occupancy rates on existing spaces would be constructed. In the future, if demand warrants, parking structures would be considered if they're financially feasible. The text of Section 4.12.3.3 Operational Impacts was edited to add a reference to parking structures as a means of decreasing impervious surface area.

Response F-2-04

Opportunities, such as solar power, green space and possible LEED elements, would also be considered in future planning activities as a means to help provide financial and environmental sustainability. As the terminal design progresses, elements such as those suggested may be incorporated into the design where feasible and affordable. The text of Section 4.8.3.1 Operational Impacts was edited to add a reference to renewable energy. However, any potential renewable energy facilities on or near Airport property would need to adhere to FAA design criteria and could only be implemented as long as they did not cause glare or reflectivity issues for air traffic controllers and pilots or interfere with navigational facilities and radar coverage.

Response F-2-05

In regards to ground transportation and connectivity, Valley Metro and Maricopa Associations of Governments are aware of the anticipated growth of the Gateway Area and can address connectivity through updates to the Regional Transportation Plan. The PMGAA has also identified areas that can be reserved for

transit use and connectivity to the terminal and parking areas. Shuttle service from the Ray Road economy lot would shift to the future terminal to serve passengers and could possibly include carpool/ride share areas for employees.

Although there is no commitment at this time, Valley Metro has sought out opportunities to meet local demands of the Airport as well as the employees and universities located adjacent to the Airport. As the new terminal will be along a major north-south corridor, this route will be a common thoroughfare for traffic. PMGAA anticipates continued coordination with Valley Metro to meet future passenger and employee demand for public transit. The text of Section 4.10.3.1 Surface Transportation was adjusted to clarify passenger ground transportation options.

Response F-2-06

The Proposed Action is not yet designed and construction materials have not been specified. Pavement design will be in accordance with FAA Advisory Circular 150/5320-6F, *Airport Pavement Design and Evaluation* and pavement specifications AC 150/5370-10G, *Standards for Specifying Construction of Airports*. The Proposed Action involves the placement of new pavement, and doesn't offer the opportunity for the use of recycled pavement as existing pavement will stay in place. Opportunities to incorporate sustainable construction practices and materials into the proposed Project will be considered during the design and procurement process, which has not yet commenced. As the terminal design progresses, elements such as those suggested may be incorporated into the design where feasible and affordable. No changes to the EA text were made.